# Alvance Recycling and Billet Casting Facility

## Environmental Impact Assessment Report

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| Client: | Alvance British Aluminium |
| Project/Proposal No: | 3539 |
| Version: | 1 |
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# Document Information

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# Volume I Non-Technical Summary

## Non-Technical Summary

# Volume I – Non-Technical Summary

# 1. Non-Technical Summary

## 1.1 Introduction

ITPEnergised has prepared this Environmental Impact Assessment Report (EIA Report) on behalf of Alvance British Aluminium ('the Applicant') in regard to a planning application made to The Highland Council ('THC') for an Aluminium Recycling and Billet Casting Facility with associated hardstanding, landscaping and drainage (for purposes of this EIA Report referred to as 'the Proposed Development') situated on the site of the existing Lochaber Smelter, Fort William.

1.1.1 The existing Lochaber Smelter is a hydro-powered aluminium smelter which has the capacity to produce around 47,500 tonnes of aluminium annually. Operated by the Applicant, the Smelter is one of the key employers in Fort William, employing around 175 staff.

1.1.2 The Applicant aims to protect existing jobs and progressively expand metal manufacturing and downstream engineering, taking advantage of abundant metal scrap availability in the UK. The Proposed Development is expected to create 70 direct jobs, whilst retaining the existing direct and indirect jobs associated with the existing Smelter.

### *Location*

1.1.3 The Proposed Development site currently comprises an area of scrub adjacent to the existing Smelter. The planning application boundary is centred on national grid reference (NGR) 212289 774767 and covers an area of 25.9 hectares (ha), closely overlapping the boundary of the previously consented AWP, albeit with significantly smaller development footprint (approximately 4.95 ha centred on NGR 2122260,774828).

### *Planning Applications and Environmental Impact Assessment ('EIA')*

1.1.4 An "EIA development" is defined in the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the 'EIA Regulations') as either a "Schedule 1 development" or a "Schedule 2 development" likely to have significant effects on the environment by virtue of factors such as its nature, size or location. In line with the EIA Regulations, an application for planning permission for EIA development must be accompanied by an EIA Report.

1.1.5 The Proposed Development falls within the list of developments set out in Schedule 1 and as such the Applicant has prepared an EIA Report to support the planning application.

## 1.2 Approach to EIA

1.2.1 EIA aims to protect the environment by ensuring that the local planning authority (in this case THC), when deciding whether to grant planning permission for a project which is likely to have potentially significant effects on the environment, does so in the full knowledge of the likely significant effects and is able to apply planning and other controls to minimise and mitigate those effects.

1.2.2 EIA is the systematic process of compiling, assessing, presenting and mitigating all of the likely significant environmental effects of a proposed development. The key stages in the EIA process are presented in chapter 2 of the EIA Report, with an overview of the specific methodology adopted for each technical study provided within the respective technical chapters (chapters 6 to 14).

1.2.3 A technical review of the likely significant effects of the Proposed Development and the studies previously completed for the AWP application concluded that the following topics should be scoped into the EIA:

- Landscape and Visual Impact Assessment.
- Hydrology and Hydrogeology.

➢ Ecology and Biodiversity.

➢ Access, Traffic and Transport.

➢ Noise and Vibration.

➢ Air Quality.

➢ Climate Change.

➢ Major Accidents and Disasters.

➢ Socio-economic Effects.

## 1.3 Proposed Development

1.3.1 The location of the Proposed Development and wider context is shown on Figure NTS-1 below.

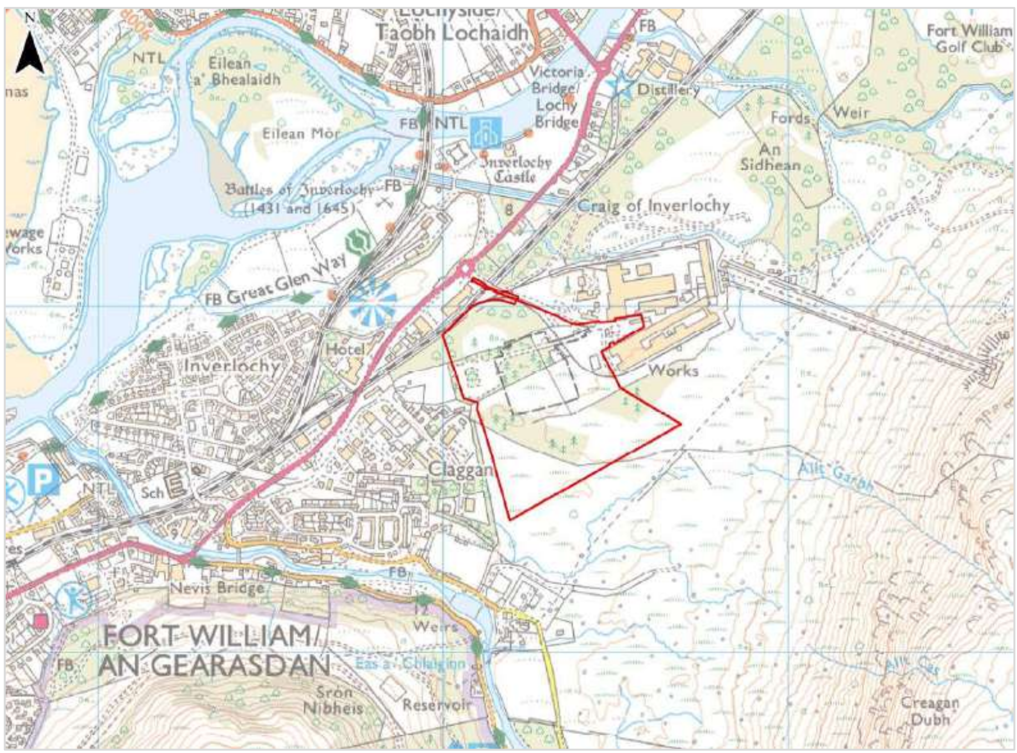


*Figure NTS-1: Location and Context of Proposed Development*

1.3.2 The Proposed Development comprises an aluminium recycling and billet casting facility with capacity to produce up to 100,000 tonnes per annum of aluminium billet using recycled aluminium and primary aluminium from the existing Smelter.

1.3.3 The main physical characteristics of the Proposed Development are:

➢ A 12,245 $m^2$ aluminium recycling and billet casting facility of length 185 m and width 75 m.

➢ Associated development surrounding the facility and covering an area of approximately 3.69 ha, including:

- a hard standing area of approximately 10,200 $m^2$ to the south of the facility, to be used to store final products;
- a new access road around the plant;

- required drainage and Sustainable Urban Drainage System (SuDS);
- landscaping and planting – primarily associated with reinstatement of disturbed ground and the SuDS pond;
- Liquified Petroleum Gas (LPG) / Substitute Natural Gas (SNG) gas storage infrastructure; and
- associated oxygen, nitrogen and argon systems.

1.3.4 The main process which will be carried out in the facility is the melting and casting of primary aluminium (from the Smelter) and secondary aluminium (recycled material, transported to site) to produce billets of various specifications, sizes and lengths. The facility will include a casting pit approximately 25 m depth and 7 m by 7 m wide, secondary metal storage areas, fume abatement systems, melting furnaces and auxiliary plant equipment.

1.3.5 The operation of the Proposed Development can be visualised as shown in Figure NTS-2.

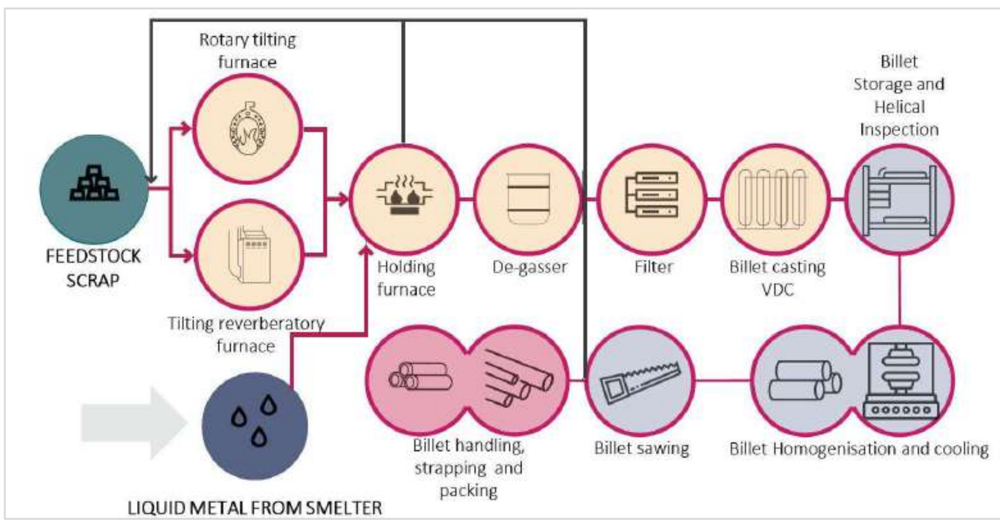


*Figure NTS-2: Recycling and Billet casting Technical Process Flow Diagram*

1.3.6 The Proposed Development will operate continuously, day and night, for approximately 330 days a year.

1.3.7 Subject to securing the appropriate permissions, consents and licences, the intention is to initiate the construction of the Proposed Development in late 2021, and for the development to be operational by January 2024; however, this includes a 7 month contingency for potential delays due to COVID-19. From inception, the construction programme is expected to last 17-18 months. The construction phase will comprise initial enabling and earth works to prepare the site, followed by construction of the aluminium recycling and billet casting facility and associated support infrastructure and the installation of billet production plant internal to the facility.

1.3.8 The layout of the Proposed Development is shown on Figure NTS-3.

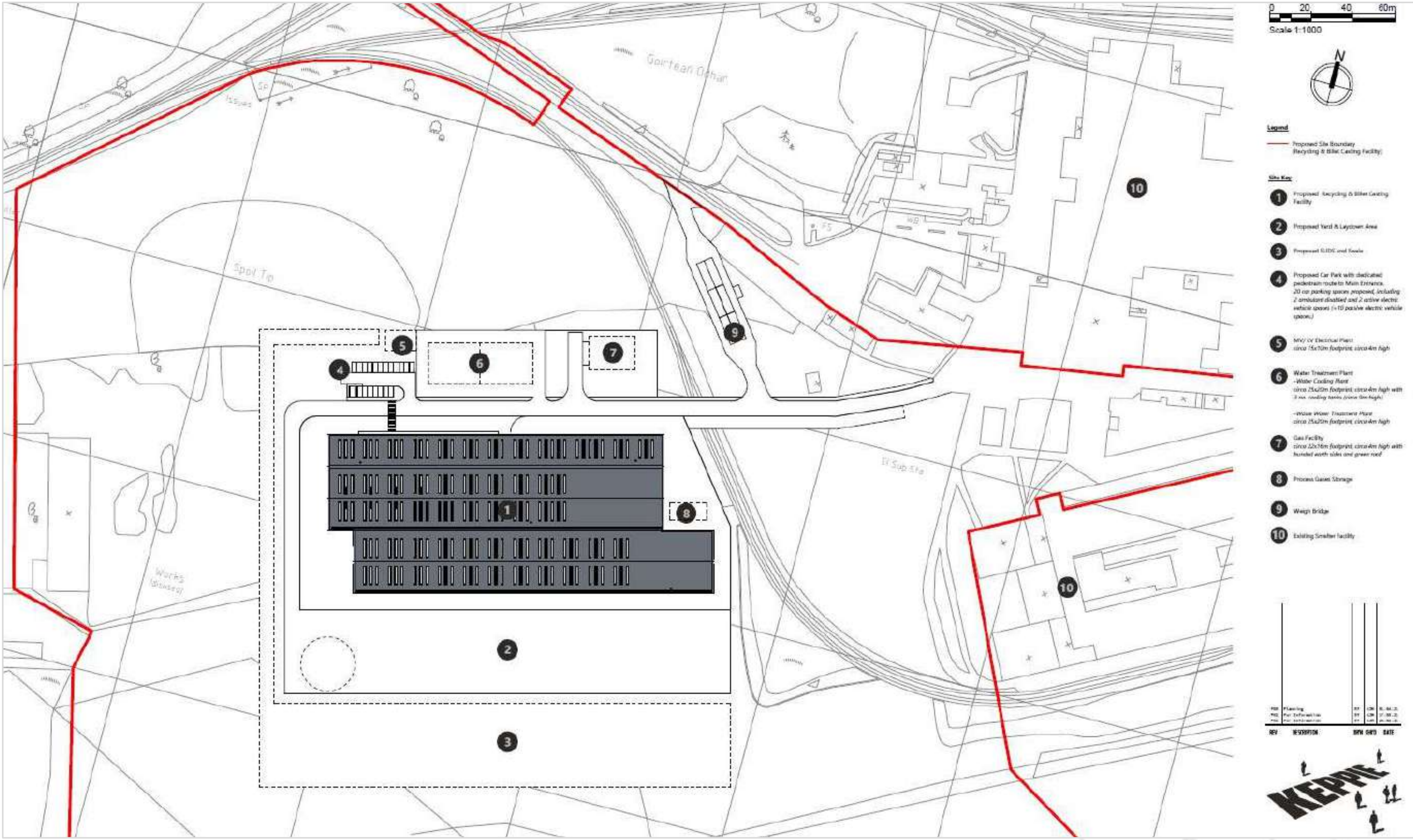


*Figure NTS-3: Proposed Development Layout*

## 1.4 Site Selection, Design Iteration and Alternatives

### *Site Selection and Alternatives*

1.4.1 The Proposed Development sits approximately three kilometres to the north-east of Fort William town centre, next to Britain's last aluminium Smelter (also operated by the Applicant) in an area of scrub land adjacent to the Smelter.

1.4.2 Planning Permission Reference: 17/05202/FUL permits the construction of an Alloy Wheel Plant (AWP) to the west of the existing Smelter with a footprint that closely overlaps that of the Proposed Development. Planning consent for the AWP was granted in 2018 (subject to Matters Specified in Conditions); however, after strategic review of the alloy wheel manufacturing landscape in the UK, Europe and North Africa, together with a downturn in vehicle production, it has been decided not to pursue this project at the current time.

1.4.3 The Applicant is therefore looking to bring forward the Proposed Development in order to maximise the existing Smelter output, protect existing jobs and expand downstream engineering opportunities.

### *Design Iteration*

1.4.4 The Applicant has undertaken a number of design iterations for the Proposed Development, taking into account the environmental constraints of the site.

1.4.5 The final layout and location for all elements of the Proposed Development has been informed by a robust EIA and design iteration process, considering potential environmental, landscape and visual impacts and their effects, physical constraints, and health and safety considerations.

1.4.6 The information used to inform the design iteration process has included consultation responses received, baseline data and the specific impact assessments with their respective conclusions described in this EIA Report.

1.4.7 The Proposed Development layout is considered to represent the most appropriate design, considering potential environmental impacts and their effects, physical constraints, and health and safety considerations.

## 1.5 Planning Policy

1.5.1 The planning policy framework relevant to the Proposed Development has been set out in chapter 5 of the EIA Report for information. The Planning Statement submitted separately as part of the planning application provides an assessment of the proposed development against the policy context.

## 1.6 Landscape and Visual Impact Assessment

1.6.1 A Landscape and Visual Impact Assessment has been undertaken for the Proposed Development which summarises the project, describes the existing landscape and views and considers their sensitivity to change, and identifies and quantifies the significance of changes likely to arise from the Proposed Development.

1.6.2 Effects on landscape character will arise within the site from the physical changes and also from increased proximity and visibility of the Proposed Development, within 1-2 km to the south and west of the site. These effects will be of slight adverse significance.

1.6.3 The extent of large-scale visual effects will be limited to within the site, where they will only be experienced by site workers and visitors.

1.6.4 Outside the site, existing mixed pine and birch woodland and buildings around the site will screen most views, but effects of major-moderate will arise where the building is seen in open elevated views within up to 1 km. Effects will be moderate or moderate-slight within up to 2.5 km, and between 2.5-4 km, the scale of effects will reduce to slight, with the building increasingly seen at a distance in the context of the existing smelter and townscape. Beyond approximately 4-5 km effects will typically be negligible.

1.6.5 The National Scenic Area (NSA) lies immediately to the southeast of the site extending well beyond the study area to encompass Ben Nevis, Glen Coe, Glen Etive, Loch Leven and Rannoch Moor. In line with its designation, the NSA is of National value. Combining the considerations of susceptibility and value, the NSA is judged to be of medium sensitivity to the Proposed Development. Permanent effects on the special qualities of the NSA will be of small scale and localised in extent. They will be of low magnitude and slight significance. On balance, the effects are considered to be adverse as they reflect a localised increase in influence from industrial buildings on the NSA.

1.6.6 Effects on nearby settlements will be confined to glimpsed views between or over intervening buildings and vegetation. Such views will be of slight adverse significance. It is considered that the effects resulting from the Proposed Development fall below the Residential Visual Amenity Threshold referred to in LI TGN 02/2019.

1.6.7 Effects on primary road and rail routes will be minimal.

1.6.8 Walkers heading towards Fort William along the West Highland Way will experience adverse effects of moderate-slight significance due to views from short open stretches of the route in which the Proposed Development will be seen in forward views. Walkers descending from Ben Nevis along the main path will see occasional views of the Proposed Development ahead of them as they complete their descent. Effects here will be of slight-minimal adverse significance.

1.6.9 Effects on the panoramic viewpoint at Proposed Development alongside and behind other industrial and retail buildings with similar form and scale.

1.6.10 Effects on all other landscape and visual receptors within the study area will be minimal.

## 1.7 Hydrology and Hydrogeology

1.7.1 There are no statutory designated sites relevant to hydrology or hydrogeology within the boundaries of the Proposed Development. A single internationally designated site relevant to hydrology or hydrogeology is located within the EIA study area; the Ben Nevis Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), which is located approximately 410 m from the Proposed Development site boundary. However, whist the sensitivity of this receptor is considered to be high, it is located upgradient of the site and therefore there is no potential impact to this feature from the Proposed Development.

1.7.2 There are a number of hydrological and hydrogeological receptors that could potentially be impacted by the Proposed Development, including Loch Linhe, the River Nevis, the River Lochy, and their upstream tributaries, Drinking Water Protected Areas (Surface), and licensed abstractions. Hydrogeological receptors identified include the superficial and bedrock aquifers at and around the Proposed Development, which are low productivity aquifers.

1.7.3 Potential Groundwater Dependent Terrestrial Ecosytems were identified at the Proposed Development based on ecology surveys carried out, but on review have been scoped out as they were identified as being surface water and rainwater fed.

1.7.4 No Private Water Supplies were identified at or around the Proposed Development and the public supply water mains running south-north through the site will be protected during the construction phase via standard measures and in liaison with Scottish Water.

1.7.5 A Flood Risk Assessment was undertaken and confirms that the Proposed Development is at no significant flood risk from all sources.

1.7.6 Nearby licensed abstractions are considered to be suitably distanced and upstream of the Proposed Development or unaffected by the development.

1.7.7 Embedded mitigation includes elements of a Construction Environmental Management Plan (CEMP) which will be in place to control potentially polluting activities to prevent adverse impact to downstream persons, properties and environment during the construction phase.

1.7.8 Additionally, for the operational stage, a proposed foul and surface water drainage design has been developed which mitigates increased discharge rates and flood risk and sets out methods to enhance water quality.

1.7.9 Standard/embedded mitigation measures include pre-construction site investigation works to refine the understanding of ground and groundwater conditions and inform detailed foundation and infrastructure design, agreement and implementation of a CEMP, and a suitable Drainage Strategy to control and treat surface and foul drainage.

1.7.10 The likely effects on hydrological and hydrogeological receptors, taking account of the standard mitigation measures, have been assessed as minor-negligible and not significant.

## 1.8 Ecology and Biodiversity

1.8.1 The ecological baseline for the Proposed Development was established through a thorough desk study for historical and noteworthy records of priority species within a defined search area beyond the site boundary and field surveys to identify Important Ecological Features (IEFs). In consultation with NatureScot, it was agreed that the baseline data from the consented AWP EIA Report (Golder, 2017), supplemented with data obtained through update surveys in 2021, should be used to inform the current assessment.

1.8.2 There are no statutory designated sites relevant to ecology within the boundaries of the Proposed Development. There are a number of national and international statutory designated sites relevant to ecology in the study area of the Proposed Development, as follows:

- Ben Nevis SAC, located adjacent to the Proposed Development.
- Ben Nevis SSSI, located adjacent to the Proposed Development.
- Ach an Todhair SSSI, located within 3.3 km of the of the Proposed Development.
- Three areas of ancient woodland within two kilometres of the Proposed Development.

1.8.3 There are also 16 habitats including 13 national vegetation classification (NVC) communities within the Proposed Development study area. Of these habitats; blanket bog; wet modified bog; dry dwarf shrub heath; wet dwarf shrub heath; semi-natural broadleaved woodland; and marshy grassland are considered to be of local or higher conservation value. The desk study identified records of a number of protected species within two kilometres of the site including badger, otter, Scottish wildcat, pine marten, red squirrel, bat species, common lizard and slow-worm. Protected mammal surveys found no evidence of protected species within the study area.

1.8.4 The air quality assessment undertaken as part of the EIA process (chapter 8) has confirmed that deposition impacts on habitats within the Ben Nevis SAC and SSSI are below Critical Load thresholds or, where they exceed these, only represent a slight increase to existing exceedances. As such, measurable effects on the designated sites are not considered significant.

1.8.5 Through a reasoned process of evaluation and consideration most important ecological features have been scoped out of the assessment as they are not vulnerable to significant effects from the Proposed Development. Recently disturbed peatland within the site (now classified as wet modified bog) has been assessed as the Proposed Development will cause a loss of this habitat. Without mitigation, residual impacts would be adverse, medium and significant. However, following consultation with NatureScot and SEPA on this project and the previously consented AWP project, a draft Peat Management Plan has been developed whereby excavated peat will be used to restore peatland habitat in areas of conifer plantation woodland on the wider site. As a result, an overall increase in peatland habitat is predicted as a result of the Proposed Development with residual impacts considered to be beneficial and significant.

1.8.6 Although no impacts are anticipated on protected mammals including red squirrel, pine marten and badger, appropriate mitigation and best practice construction methods are proposed in order to ensure no impacts are experienced by these species.

## 1.9 Access, Traffic and Transport

1.9.1 The Proposed Development will be accessed by road via the A82 from the existing Lochaber Smelter access roundabout. The existing access road into the site from the roundabout is suitable for all vehicles and active travel movements expected. A new internal access road will be constructed to take both staff and operational (HGV) traffic. A new walking and cycling link will be constructed to link with the wider walking and cycling infrastructure within the vicinity of the site.

1.9.2 A traffic modelling exercise has been undertaken using the existing model for Fort William and has determined that the modest level of trip generation which will arise from the Proposed Development will have a negligible impact on the local road network.

1.9.3 A full assessment of environmental effects has been undertaken for the Lochaber Smelter access road and concludes that, as a worst-case, effects during construction and operation will be minor and not Significant.

1.9.4 Elsewhere within the study area, traffic associated with both the construction and operation of the Proposed Development will not exceed a 30% increase to the baseline, while the traffic within Fort William will not exceed 10%. This is within the thresholds set out within the EIA Regulations and it is therefore concluded that the potential environmental effects arising from development traffic (both construction and operational) will not be significant.

1.9.5 Mitigation measures including a Construction Traffic Management Plan and Travel Plan will be introduced to reduce as far as practicable the impacts associated with construction and operational traffic. No further surveying or monitoring will be required in relation to traffic and transport once construction of the Proposed Development is complete and operation has commenced.

## 1.10 Noise

1.10.1 Potential noise and vibration effects associated with the Proposed Development have been assessed.

1.10.2 Consultation with SEPA was undertaken to agree the scope and approach to the assessment and it was agreed that the design of the Proposed Development should seek to not increase operational noise levels at noise-sensitive receptors above the existing rated noise level from the Smelter. The noise chapter therefore evaluates noise from the Proposed Development in accordance with BS4142, and also considers the increase to existing noise levels from the existing Smelter.

1.10.3 Baseline noise levels were found to be dominated by road traffic across much of the study area, with continuous broad-band droning from the existing Smelter Fume Treatment Plant audible at the closest monitoring locations.

1.10.4 Baseline noise levels have been used to derive thresholds for the evaluation of noise impacts during the construction and operational phases. Predicted construction phase noise levels at noise sensitive receptors (NSRs) meet the derived threshold noise levels. Noise impacts are therefore considered to be negligible and noise effects evaluated as not significant.

1.10.5 No significant sources of vibration have been identified during the construction phase therefore vibration impacts have been scoped out.

1.10.6 Projected construction and operational phase road traffic increases have been screened against existing flows and found to be not significant, therefore detailed evaluation of noise from road traffic has been scoped out.

1.10.7 Predicted operational noise from the Proposed Development results in low/very low impacts when evaluated in accordance with BS4142. Increases over the rated level of the smelter at NSRs arising due to the Proposed Development range are minimal (approximately 1 dB at the most-affected NSR). Noise impacts arising from operation of the Proposed Development are therefore negligible, and noise effects have therefore been evaluated as 'not significant'.

1.10.8 Mitigation has been specified for the construction phase; a CEMP has been drafted and will be agreed with THC, setting out methods by which unnecessary noise from the works will be minimised. Operational phase noise mitigation enables noise levels to be controlled both by design and by management; building materials and plant items have been selected which will limit noise emission at source, and deliveries of materials and potentially noisy activities will be scheduled to occur during the daytime period only.

## 1.11 Air Quality

1.11.1 Consideration has been given to the potential effects of the Proposed Development on local air quality arising during the construction and operational phases. Potential impacts have been predicted using ADMS5 modelling software at representative ecological and human health receptors in proximity to the Proposed Development and associated transportation routes. A number of sensitivity analyses have been undertaken to minimise modelling uncertainty and numerous conservative assumptions have been made to ensure that the AQIA is based on the worst-case scenario.

1.11.2 The dispersion modelling study has considered emissions from the Smelter and Generators operating at their permitted Emissions Limit Values (ELVs) and the Proposed Development at its proposed ELVs.

1.11.3 The conclusions of the air quality chapter are that:

- Impacts associated with the change in traffic flows associated with the Proposed Development construction and operational phases are negligible adverse and therefore not significant.
- Unmitigated construction phase dust impacts have been assessed as low, resulting in minor adverse and therefore not significant effects. Nevertheless, good-practice mitigation measures and site-specific mitigation measures will be adopted, resulting in negligible adverse residual effects.
- Predicted Environmental Contributions (PECs) at human receptors are below the relevant Environmental Assessment Levels and as such result in negligible adverse effects, considered to be not significant.
- Potential effects of Dioxins/Furans are concluded to be not significant.
- The change in long-term critical level of $NO_x$ is predicted to be greater than 1% at four selected ecological receptors, therefore the PECs have been considered. The PECs at these ecological receptors are predicted to be significantly below 70% of the $NO_x$ critical level and therefore it is concluded that there are no likely significant effects of airborne $NO_x$.
- The change in short-term concentration of HF is predicted to be <10% of the critical level at all selected receptors, therefore it is concluded that there are no likely significant effects.

- The change in long-term nutrient nitrogen deposition is predicted to be <1% of the critical load at all selected receptors, therefore it is concluded that there are no likely significant effects.
- The change in long-term acid deposition is predicted to be >1% at four selected receptors within the Ben Nevis SAC. However, it is noted that the acid deposition associated with the Proposed Development at these receptors is between 2% and 45% lower than the acid deposition calculated for the previously consented AWP. Overall, even allowing for all the conservative assumptions, the Proposed Development is predicted to result in a lower impact compared to that calculated for the previously consented AWP.
- Where the potential for likely significant effect has been predicted, the area of the affected habitat is predicted to be small (between 0.02% and 4.2%) and the Proposed Development contributions, whilst exceeding the 1% criterion at the four receptors, do not in themselves cause any exceedances of the critical load function or the 70% criterion. Rather, the baseline critical load is already >70% of the Critical Load Function at all four locations.
- Based on the detailed analysis of potential ecological effects, it is considered that the Proposed Development is not likely to result in measurable effects upon the Ben Nevis SAC. The effects of emissions are therefore assessed to be minor adverse and not significant.

## 1.12 Climate Change

1.12.1 An assessment of the potential effects of greenhouse gas (GHG) emissions associated with the construction and operation of the Proposed Development on climate change was conducted. A climate resilience assessment was also undertaken to assess the vulnerability of the Proposed Development to climate change impacts.

1.12.2 The assessment considered emissions arising from the construction and operational phases of the Proposed Development including the following activities: the embodied carbon of construction materials, construction plant, transportation, and electricity and fuel consumption.

1.12.3 The GHG emissions calculated for the construction phase are conservative and based on standard specifications of bulk materials. Emissions from construction plant were calculated using factors based on indicative heavy plant types, duration and area. Heavy duty vehicle emissions for the transportation of spoil arisings were also evaluated.

1.12.4 GHG emission impacts from the construction phase are considered minor and from the operational phase are considered moderate in the context of regional emissions for the Highlands.

1.12.5 As the terms for the materials procurement process are drawn up, the Applicant will look to substitute alternative materials of lower carbon intensity and the same engineering properties such as recycled steel and/or high PFA cement blends as applicable. Furnaces with high fuel efficiency will be specified. A Peat Management Plan will also be agreed to minimise any GHG emissions from the degradation of disturbed peat.

1.12.6 Climate resilience impacts on the Proposed Development associated with high temperatures are considered to be of minor significance, with changes to wind speed and precipitation considered as of negligible significance.

1.12.7 Mitigation measures applied to the operation of the Proposed Development, including the increased usage of hydroelectric power, will contribute to reducing GHG emissions. Reducing GHG emissions from fossil gas usage will be explored as alternative thermal technologies become commercially viable.

## 1.13 Major Accidents and Disasters

1.13.1 The potential for activities at the Proposed Development to cause major accidents or be affected by natural disasters was considered, in both cases focussing on where harm to the environment as a consequence could reasonably occur.

1.13.2 The likelihood of a natural disaster leading to major environmental damage is assumed to be very low and has been assessed as negligible.

1.13.3 Major accidents were grouped according to two principal hazard areas: gases and molten metal.

1.13.4 A leak or failure of the proposed gas systems could cause injury, loss of life and structural damage. Environmental impacts would be limited to temporary effects on local air quality and potential damage to soil, groundwater and local watercourses from contaminated firewater runoff. The risk of this type of accident will be controlled by suitable instrumentation and routine inspection and maintenance driven by standard operating procedures.

1.13.5 Molten metal loss could cause injury, loss of life and structural damage but is considered unlikely to have any further off-site environmental effects or impacts on soil and groundwater.

1.13.6 The boiling of water engulfed by molten aluminium can cause an explosive release of steam metal droplets followed by a strongly exothermic reaction between aluminium and water. Hydrogen is also produced during this reaction but not in sufficient quantities to present a major hazard in its own right. Explosive releases of molten metal would be controlled within the building envelope and are therefore considered unlikely to have off-site environmental effects or impacts on soil and groundwater. These risks will be controlled by strict procedures for the drying of scrap and other feedstock for melting and the control of sources of liquids within the Proposed Development.

## 1.14 Socio-economic Effects

1.14.1 Lochaber has an ageing population which is expected to decline over the next decade. The area has high economic activity rates coupled with a low unemployment rate and a distinct industrial structure which reflects the area's main operations and attractions. Tourism is a significant source of employment in the area and so the Lochaber economy will have been particularly adversely impacted by the COVID-19 pandemic.

1.14.2 It is estimated that the construction of the Proposed Development will generate:

- £4.0 million GVA and support 46 years of employment in Lochaber;
- £9.8 million GVA and support 114 years of employment in Highland; and
- £23.7 million GVA and support 291 years of employment in Scotland.

1.14.3 The effect of the construction of the Proposed Development has been assessed as minor beneficial at the Lochaber level, and negligible at both the Highland and Scotland level. The construction phase can also contribute to the economic recovery from the COVID-19 pandemic by providing temporary construction jobs locally, regionally and nationally.

1.14.4 During operation, it is estimated that the direct impact of the Proposed Development would be:

- £35.7 million GVA and support 256 jobs in Lochaber;
- £36.9 million GVA and support 281 jobs in Highland; and
- £43.0 million GVA and support 401 jobs in Scotland.

1.14.5 The retention of the Lochaber smelter and the jobs created by the Proposed Development are important to the future of the local economy, as they will contribute to the diversity of the local economic base, will bring opportunities for up-skilling, and safeguard local manufacturing jobs. For these reasons, the effect of the operation of the Proposed Development was assessed as major beneficial and significant.

1.14.6 The Proposed Development will contribute to retention, to diversification of Highland's economic base and maintain its attractiveness to investment. As a result, the effect of the operation of the Proposed Development on the economy of Highland was assessed as moderate beneficial and significant.

1.14.7 From the perspective of the Scottish economy, the Proposed Development will contribute to the geographical spread of economic opportunities across Scotland, reduce its vulnerability to trade shocks and make a contribution to the Scottish balance of trade. Its effect on the Scottish economy was assessed as minor beneficial.

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# Volume II EIA Report

# Chapter 1 Introduction

# 1. Introduction

# 1. Introduction

ITPEnergised has prepared this Environmental Impact Assessment Report (EIA Report) on behalf of Alvance British Aluminium ('the Applicant') in regard to a planning application made to The Highland Council ('THC') for an aluminium recycling and billet casting facility with associated hardstanding, landscaping and drainage (for purposes of this EIA Report referred to as 'the Proposed Development') situated adjacent to the site of the existing Lochaber Smelter, Fort William.

## 1.1 The Applicant

1.1.1 The Applicant for the Proposed Development is Alvance British Aluminium. Alvance British Aluminium was established in 2016 and is a limited company incorporated in Scotland (Company no. SC549732) and having its registered office at Lochaber Smelter, Fort William, Scotland, PH33 6TH.

## 1.2 Background

1.2.1 The existing Lochaber Smelter is a hydro-powered aluminium smelter which has the capacity to produce 47,500 tonnes of aluminium annually. Operated by the Applicant, the Smelter is one of the key employers in Fort William, employing around 175 staff.

1.2.2 The Applicant aims to protect existing jobs at the Smelter, generate renewable energy, and progressively expand metal manufacturing and downstream engineering by taking advantage of abundant metal scrap availability in the UK and re-melting to make value added products for sale in the UK. The Proposed Development is expected to create 70 direct jobs, whilst retaining the existing direct and indirect jobs associated with the Smelter.

1.2.3 The Proposed Development is located in an area identified in the West Highland and Islands Local Development Plan for industrial purposes associated with the existing Smelter. Planning Permission Reference: 17/05202/FUL permits the construction of an Alloy Wheel Plant (AWP) to the west of the existing Smelter with a footprint that closely overlap that of the Proposed Development. Planning consent for the AWP was granted in 2018 (subject to Matters Specified in Conditions); however, due to recent changes in demand for aluminium products, as well as a reduced demand across the UK automotive industry, it is now proposed to bring forward the Proposed Development at the site instead of the AWP.

## 1.3 Site Description

1.3.1 The existing Lochaber Smelter site encompasses a total land area of approximately 68 hectares (ha), located approximately three kilometres north-east of Fort William town centre. The site was developed in the 1920s and has subsequently been expanded over the years to deliver the current facilities.

1.3.2 The Proposed Development site currently comprises an area of scrub adjacent to the existing Smelter. The planning application boundary is centred on national grid reference (NGR) 212289 774767 and covers an area of 25.9 ha, closely overlapping the boundary of the previously consented AWP, albeit with significantly smaller development footprint (approximately 4.95 ha centred on NGR 2122260,774828). Access to the site is gained from the A82 via existing routes through the Smelter site.

1.3.3 The location of the Proposed Development and wider context is shown as Drawing 3.1 in Volume III.

## 1.4 The Proposed Development

1.4.1 The Proposed Development comprises an aluminium recycling and billet casting facility with capacity to produce up to 100,000 tonnes per annum of aluminium billet using recycled aluminium and primary aluminium from the existing Smelter. A full description of the Proposed Development is set out in chapter 3; with a summary of the main characteristics below:

- 12,245 $m^2$ aluminium recycling and billet casting building of length 185 m and width 75 m.
- Associated development surrounding the facility and covering an area of approximately 3.69 ha, including:
  - a hard standing area of approximately 10,200 $m^2$ to the south of the facility, to be used to store final products;
  - a new access road around the plant;
  - required drainage and Sustainable Urban Drainage System (SuDS);
  - landscaping and planting – primarily associated with reinstatement of disturbed ground and the SuDS pond;
  - Liquified Petroleum Gas (LPG) / Substitute Natural Gas (SNG) gas storage infrastructure; and
  - associated oxygen, nitrogen and argon systems.

1.4.2 The main process which will be carried out in the building is the melting and casting of primary aluminium (from the Smelter) and secondary aluminium (recycled, transported to site) to produce billets of various specifications, sizes and lengths. The building will include a casting pit approximately 25 m depth and 7 m by 7 m wide, secondary metal storage areas, fume abatement systems, melting furnaces and auxiliary plant equipment.

1.4.3 The manufacture of the billet itself involves the following operations/processes:

- an area which will include a rotary furnace and melting furnace;
- holding furnaces;
- a fume gas treatment plant;
- launder system;
- vertical casting machine;
- homogenising furnace;
- log entry system; and
- ultrasonic inspection station.

1.4.4 Molten aluminium from the Smelter will enter the Proposed Development through an entry point in the north-eastern façade of the building in a ladle pulled by a tractor vehicle. Scrap aluminium will enter via the south-western corner of the building.

1.4.5 Scrap and waste products will be stored in bays in the southern end of the building, before being combined with molten aluminium within furnaces in the central area of the building and transferred to casting and pressing processes in the central and southern areas of the building. Billet will leave the building via an exit point in the north-western corner and be transferred to the adjacent external storage area by forklift truck.

1.4.6 Ancillary processes with components external to the building will comprise an oxygen and process gas plant and cast pit steam handling.

1.4.7 The Proposed Development will operate continuously, day and night, for approximately 330 days a year.

1.4.8 Subject to securing the appropriate permissions, consents and licences, the intention is to initiate the construction of the Proposed Development in late-2021, and for the development to be operational by January 2024 (however this includes a 7 month contingency for potential delays due to COVID-19). From inception, the construction programme is expected to last 17-18 months.

## 1.5 Designated Sites

### *Hydrology, Hydrogeology Designations*

1.5.1 There are no statutory designated sites relevant to hydrology or hydrogeology within the boundaries of the Proposed Development.

1.5.2 A single internationally designated site relevant to geology, hydrology or hydrogeology (i.e. Special Areas of Conservation) is located within the EIA study area, the Ben Nevis Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), which is located approximately 410 m from the Proposed Development site boundary. It is noted that whilst the sensitivity of this receptor is considered to be high, it is located upgradient of the site and therefore there is no potential impact to this feature from the Proposed Development.

### *Ecological Designations*

1.5.3 There are no statutory designated sites relevant to ecology within the boundaries of the Proposed Development.

1.5.4 There are a number of national and international statutory designated sites relevant to ecology in the study area of the Proposed Development, as follows:

- Ben Nevis Special Area of Conservation (SAC), located adjacent to the Proposed Development.
- Ben Nevis Site of Special Scientific Interest (SSSI), located adjacent to the Proposed Development.
- Ach an Todhair SSSI, located within 3.3 km of the of the Proposed Development.
- Three areas of ancient woodland within two kilometres of the Proposed Development.

### *Landscape Designations*

1.5.5 The Proposed Development is located directly adjacent to the Ben Nevis and Glen Coe National Scenic Area (NSA) and the Ben Nevis Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC).

1.5.6 Three wild land areas (WLAs) lie within the 10 km study area, with the ZTV study indicating potential limited areas of visibility approximately four kilometers or more from the site.

## 1.6 Purpose of Environmental Impact Assessment (EIA)

1.6.1 The Proposed Development is classified as a 'major' development, under the terms of The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009.

1.6.2 An "EIA development" is defined in the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the 'EIA Regulations') as either a "Schedule 1 development" or a "Schedule 2 development" likely to have significant effects on the environment by virtue of factors such as its nature, size or location. In line with the EIA Regulations, an application for planning permission for EIA development must be accompanied by an EIA Report.

1.6.3 The Proposed Development falls within the list of developments set out in Schedule 1 and as such the Applicant has prepared an EIA Report to support the planning application for the Proposed Development.

1.6.4 The EIA process is the systematic process of identifying, predicting and evaluating the environmental impacts of a proposed development. This EIA Report sets out the conclusions of the EIA process undertaken in relation to the Proposed Development. Where appropriate, it also sets out mitigation measures designed to prevent, reduce and, if at all possible, offset potential significant adverse environmental impacts. An assessment of residual effects, those expected to remain following implementation of mitigation measures, is also presented.

1.6.5 The main findings and conclusions of the EIA Report are summarised in a Non-Technical Summary (NTS) presented in Volume I.

## 1.7 EIA Project Team

1.7.1 The assessment has been undertaken by ITPEnergised supported by external consultants as shown in Table 1.1.

*Table 1.1 – EIA Team*

| Discipline | Lead Specialist | Qualifications | Accreditations | Professional Experience (years) |
|---|---|---|---|---|
| Landscape, Seascape and Visual Impact | Susan Irwine,<br>LDA Design (external) | BA (Hons) Landscape Architecture | Chartered Member of the Landscape Institute (CMLI) | 30+ |
| Hydrology and Hydrogeology | Zak Ritchie, ITPEnergised | BEng(hons), Civil Engineering, MSc Water Resources Management | Member of the Chartered Institute of Water and Environmental Management (MCIWEM)<br>Chartered Water and Environment Manager (C.WEM)<br>Chartered Engineer (CEng) | 10+ |
| Ecology and Biodiversity | Jenny Diack,<br>ITPEnergised | MSc. (Hons) Ecological Science | Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) | 14+ |
| Traffic and Transport | Alan DeVenny,<br>Systra (external) | BEng (Hons) Civil & Transportation Engineering, PhD Civil Engineering | Chartered Engineer<br>Member of Institution of Civil Engineers | 21+ |
| Noise and Vibration | Simon Waddell,<br>ITPEnergised | - BSc (Hons) Environmental Geoscience<br>- Postgraduate Diploma in Acoustics and Noise Control – Institute of Acoustics<br>Certificate of Competence in Environmental Noise Measurement – Institute of Acoustics | Member of the Institute of Acoustics (IoA) | 15+ |
| Air Quality | Annie Danskin,<br>ITPEnergised | BEng (Hons.) Environmental Engineering | Member of the Institution of Environmental Sciences (MIEnvSc) | 20+ |
| Climate Change | Gavin Bollan,<br>ITPEnergised | BSc (Hons) Environmental Science | Member of the Institution of Environmental Sciences, Fellow of the Institute of Air Quality Management, Chartered Scientist, Chartered Environmentalist | 25+ |
| Major Accidents and Disasters | | | | |

| Discipline | Lead Specialist | Qualifications | Accreditations | Professional Experience (years) |
|---|---|---|---|---|
| Socio-economic Effects | Graeme Blackett, BiGGAR Economics (external) | BA (Hons) Economics | Member Institute for Economic Development (MIED)<br>Member Economic Development Association Scotland (MEDAS) | 25+ |
| EIA co-ordination, introductory and concluding chapters, CEMP | Ruth Fain, ITPEnergised | MGeol. (Hons) Environmental Geology | Chartered Scientist (CSci)<br>Member of the Institution of Environmental Sciences (MIEnvSc)<br>NEBOSH General Certificate | 18+ |

1.7.2 The EIA team members are recognised 'competent experts' in their field and have extensive experience in EIA and therefore Regulation 5(5) of the EIA Regulations is considered to have been complied with. The EIA team has worked closely with the Applicant to develop and assess the Proposed Development and the EIA Report has been compiled and approved by professional and competent EIA practitioners using their professional judgement. CVs for EIA team members are provided in Volume IV Technical Appendix 1.1.

## 1.8 Availability of the EIA Report

1.8.1 When the planning applications for the Proposed Development are formally submitted to THC for consideration, once validated and registered, they will be advertised in the Oban Times. The notice will provide details of when and how representations can be made. THC will allow the opportunity for representations to be made on the Proposed Development, which will be taken into account before making decisions on the applications.

1.8.2 Due to restrictions on social movement at the time of application, and in accordance with The Town and Country Planning (Miscellaneous Temporary Modifications) (Coronavirus) (Scotland) Regulations 2020, this EIA Report has been submitted for publishing online and will be made available for viewing on THC planning portal.

1.8.3 A link to the electronic version of the reports supporting the applications, including this EIA Report, will also be made available on the Alvance project consultation website:

https://alvancealuminiumgroup.com/billet-plant-consultation/.

1.8.4 If required, hard copies of the EIA Report are available at a cost of £200 per copy. Digital copies of the EIA Report (on USB) are also available, free of charge, from:

Rosie Flannigan
Alvance British Aluminium
Lochaber Smelter
North Road
Fort William
PH33 6TH

1.8.5 Any representations on this EIA Report or the planning applications, should be made directly to THC.

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# Chapter 2 Approach to EIA

# 2. Approach to EIA

# 2. Approach to EIA

## 2.1 Introduction

2.1.1 The structure of this EIA Report follows the requirements of Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the 'EIA Regulations') and relevant good practice guidance. This EIA Report comprises a Non-Technical Summary (NTS), the main EIA Report text, accompanying drawings and technical appendices.

## 2.2 Legislation, Policy and Guidance

2.2.1 The Proposed Development is classified as a 'major' development, under the terms of The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009.

2.2.2 An "EIA development" is defined in the EIA Regulations as either a "Schedule 1 development" or a "Schedule 2 development" likely to have significant effects on the environment by virtue of factors such as its nature, size or location. In line with the EIA Regulations, an application for planning permission for EIA development must be accompanied by an EIA Report.

2.2.3 The Proposed Development falls within the list of developments set out in Schedule 1 and as such the Applicant has prepared an EIA Report to support the planning application for the Proposed Development.

2.2.4 Regulation 4 of the EIA Regulations sets out the procedure for undertaking an EIA and Regulation 5 and Schedule 4 provide details of the information to be included within an EIA Report.

2.2.5 In addition to the EIA Regulations, in undertaking the EIA regard has been had to the following:

- The Town and Country Planning (Scotland) Act 1997 (as amended) (Scottish Government, 1997);
- Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 (HMSO, 1997b);
- Planning Circular 1/2017: Environmental Impact Assessment Regulations (Scottish Government, 2017a);
- Scottish Planning Policy (Scottish Government, 2014a);
- National Planning Framework 3 (Scottish Government, 2014b);
- Planning Advice Note (PAN) 1/2013 Environmental Impact Assessment (Scottish Government, 2017b);
- Guidelines for Environmental Impact Assessment, Institute of Environmental Management and Assessment (IEMA, 2006);
- A Handbook on Environmental Impact Assessment Version 5 (Scottish Natural Heritage, 2018);
- The Highland-wide Local Development Plan (The Highland Council, 2012) and related supplementary guidance; and
- The West Highland and Islands Local Development Plan (The Highland Council, 2019) and related supplementary guidance.

## 2.3 The EIA Process

2.3.1 EIA aims to protect the environment by ensuring that the local Planning Authority, in this case The Highland Council (THC), when deciding whether to grant planning permission for a project which is likely to have potentially significant effects on the environment, does so in the full knowledge of the likely significant effects and is able to apply planning and other controls to minimise and mitigate those effects.

2.3.2 EIA is the systematic process of compiling, assessing, presenting and mitigating all of the likely significant environmental effects of a Proposed Development. The key stages in the EIA process are presented in this chapter, with an overview of the specific methodology adopted for each technical study provided within the respective technical chapters (chapters 6 to 14).

2.3.3 In order for the EIA process to be effective, it should be an iterative process throughout the project design stage, rather than as an assessment undertaken once the project design has been finalised. The Applicant has engaged with the EIA process throughout the initial and detailed design stages of the Proposed Development which has enabled mitigation to be embedded into the design and potential for adverse environmental effects to be minimised.

2.3.4 The findings of the EIA are presented in this EIA Report, which has been prepared in accordance with the EIA Regulations.

### *Screening and Scoping*

2.3.5 The Proposed Development falls within the list of developments set out in Schedule 1 and as such the Applicant has undertaken EIA to support the planning application for the Proposed Development.

2.3.6 A formal scoping opinion was not been requested from THC due to project timescales and the fact that the previously consented alloy wheel plant (AWP) (Application ref. 17/05202/FUL) and associated EIA process is recent and the consultation is considered to be directly relevant to the Proposed Development. However, an informal EIA scoping document was submitted to THC in February 2021 which set out the proposed technical assessments included in this EIA Report.

#### EIA Scope

2.3.7 The Proposed Development planning application boundary area covers 25.9 ha and overlaps closely with that of the previously consented AWP, albeit with significantly smaller development footprint (approximately 4.95 ha). An EIA was carried out in relation to the AWP due to the nature of the proposals and their scale and an EIA Report (Golder, 2017) submitted as part of the Planning Application for the AWP. In addition, the following assessments were carried out post-consent and have been taken into account in the assessment of potential effects of the proposed development:

- a Geophysical Survey carried out by Golder (Golder, 2019);
- a Ground Investigation carried out by Soil Engineering Geoservices Ltd (SEGL, 2019);
- an Archaeological Metal Detector Survey carried out by CFA Archaeology (and submitted to THC in relation to condition 4 of the AWP consent); and,
- a Pre-construction Survey of Breeding Birds and Protected Terrestrial Mammals carried out by Alba Ecology (Alba, 2018).

2.3.8 There were no significant adverse effects predicted as a result of the AWP and no subsequent matters of concern raised by the above investigations. As such, environmental aspects that are unaffected by the change in proposed end-use and redesign of the associated plant, namely Geology and Ground Contamination, Forestry and Cultural Heritage, have not been further assessed during this EIA process.

2.3.9 Technical aspects that are affected by the change in proposed end-use and redesign of the associated plant have been assessed as part of this EIA.

## *Consultation*

2.3.10 As the Proposed Development is a 'major' development the Applicant has undertaken statutory pre-application consultation (PAC) as required by the Planning etc. (Scotland) Act 2006 and described in The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008.

2.3.11 PAC requirements include the necessity to provide the local authority with a minimum of 12 weeks' notice prior to the submission of a major planning application and within that time period to undertake an agreed programme of consultation with communities/stakeholders.

2.3.12 The Applicant has consulted with the general public as part of the evolutionary process of the Proposed Development. In this regard, consistent with planning legislation for major development projects and in accordance with the (emergency) provisions set out in the Town and Country Planning (Miscellaneous Temporary Modifications) (Coronavirus) (Scotland) Regulations 2020, a programme of compliant pre-application community engagement has been undertaken.

2.3.13 A public consultation event was held online on Thursday 25th February 2021 between the hours of 3.30 pm and 7 pm.

2.3.14 A standalone Pre-Application Consultation (PAC) Report has been prepared and is being submitted as part of the planning application and provides full details of the procedures and associated online meetings, correspondence, online public exhibitions and discussions which have taken place with the local community and others and the influence of such consultation on the Proposed Development.

2.3.15 Direct consultation has also been undertaken with relevant statutory and non-statutory consultees as applicable to confirm and agree the scope of the technical assessments. Details of relevant matters arising from consultation are included in each technical chapter and summarised for ease of reference in a Consultation Log included as Technical Appendix 2.1.

## *Technical Assessment and EIA*

2.3.16 EIA is designed to inform the decision-making process by identifying potentially significant environmental effects which then leads to the design and incorporation of appropriate mitigation measures into both the design of the scheme and the way in which it is constructed and operated.

2.3.17 The main steps in each of the technical impact assessments are as follows:

- Baseline Surveys (where appropriate and possible given COVID-19 restrictions) to provide information on the existing environmental character of the existing site and surrounding area.
- Consideration of the possible interactions between the Proposed Development and the existing and predicted future site conditions. These interactions or effects are assessed using stated criteria based on accepted guidance and best practice.
- Using robust design parameters for the Proposed Development, prediction of the likely environmental effects, including direct effects and any indirect, secondary, short, medium and long-term, permanent and temporary, positive and negative effects.
- Identification of any uncertainties inherent in the methods used, the predictions made, and the conclusions drawn during the course of the assessment process.
- Identification of mitigation measures designed to avoid, reduce or off-set adverse effects as well as enhancement measures that could result in beneficial effects. Assessment of alterations to the design and the reassessment of previously proposed mitigation to establish suitable mitigation for the Proposed Development.

- Assessment of the significance of any residual effects after mitigation, in relation to the sensitivity of the feature impacted upon and the magnitude of the effect predicted, in line with the relevant methodology.
- Reporting of the results of the EIA.

### *Assessment of Effects*

2.3.18 Throughout the assessment, a distinction has been made between the term 'impact' and 'effect'. The EIA Regulations refer to the requirement to report the significance of "effects". An impact is defined as the likely change to the characteristics/nature of the receiving environment as a result of the Proposed Development (e.g. noise from the process), whereas the 'effect' relates to the significance of the impact (e.g. a significant residual noise effect on residential properties). These terms have been adopted throughout this EIA Report to present a consistent approach to the assessment and evaluation of effects and their significance.

2.3.19 The exception to this is the landscape and visual impact assessment which classifies the level of physical and perceptual change to the receiving environment as the "magnitude of change" in line with the recommendations of the Guidelines for Landscape and Visual Impact Assessment third edition (Landscape Institue et al., 2013). However, this terminology should be considered interchangeable with "magnitude of impact".

2.3.20 Within this EIA Report, the assessment of effects for each environmental topic takes into account the environmental impacts of both the construction and operational phases of the Proposed Development and the environmental impacts should the Proposed Development not be granted planning permission (the do-nothing scenario).

2.3.21 In order to determine whether or not the potential effects of the Proposed Development are likely to be 'significant', a number of criteria are used. Criteria vary between topics but generally include:

- international, national and local designations or standards;
- relationship with planning policy and guidance;
- sensitivity of the receiving environment;
- magnitude of impact;
- reversibility and duration of the effect; and,
- inter-relationship between effects.

2.3.22 Effects that are considered to be significant, prior to mitigation but following the implementation of best practice, are identified within this EIA Report. The significance attributed to the resultant effect is informed by an exercise of professional judgement in relation to the sensitivity of the affected receptor(s) and the nature and magnitude of the predicted changes/impacts. For example, a major adverse change/impact on a feature or site of low importance will have an effect of lesser significance than the same impact on a feature or site of high importance.

2.3.23 Table 2-1 below is used as a guide to the relationship between the sensitivity of the identified receptor and the anticipated magnitude of an impact/change. Professional judgement is however equally important in establishing the suitability of this guiding 'formula' to the assessment of the significance of each individual effect.

*Table 2-1 Inter-Relationship between Magnitude of Impact and Sensitivity of Receptor*

| | | Sensitivity of Receptor / Receiving Environment to change | | | |
|---|---|---|---|---|---|
| | | High | Medium | Low | Negligible |
| Magnitude of Impact / change | High | Major | Moderate to Major | Minor to Moderate | Minor to Negligible |
| | Medium | Moderate to Major | Moderate | Minor | Negligible |
| | Low | Minor to Moderate | Minor | Negligible to Minor | Negligible |
| | Negligible | Minor to Negligible | Negligible | Negligible | Negligible |

2.3.24 The following terms are used in this EIA Report, unless otherwise stated, to determine the level of effects predicted to occur:

- **major beneficial** or **adverse** effect – where the Proposed Development would result in a significant improvement (or deterioration) to the existing environment;
- **moderate beneficial** or **adverse** effect – where the Proposed Development would result in a noticeable improvement (or deterioration) to the existing environment;
- **minor beneficial** or **adverse** effect – where the Proposed Development would result in a small improvement (or deterioration) to the existing environment; and
- **negligible** effect – where the Proposed Development would result in no discernible improvement (or deterioration) to the existing environment.

2.3.25 Using professional judgement and with reference to the Guidelines for Environmental Impact Assessment (IEMA, 2006), the majority of the assessments within this EIA Report consider effect levels of moderate or major to be significant, and effect levels of minor or negligible to be non-significant. Where there are deviations from this, these are clearly stated within the individual technical chapters (E.g. Landscape and Visual, Noise and Vibration).

2.3.26 Summary tables that outline the predicted effects associated with an environmental issue, the appropriate mitigation measures required to address these effects and subsequent overall residual effects are provided in chapters 15 and 16. A distinction has also been made where appropriate between direct and indirect, short and long term, permanent and temporary, and beneficial and adverse effects.

### *Cumulative Effects*

2.3.27 Part 5 of Schedule 4 of the EIA Regulations sets out the matters that require to be incorporated within EIA Reports. The EIA Regulations state that EIA Reports should include an assessment of *"the cumulation of effects with other existing and/or approved development, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources".*

2.3.28 Cumulative effects are those which result from incremental changes caused by past, present or reasonably foreseeable future actions resulting from the introduction of the Proposed Development. These cumulative effects cover the combined effect of individual impacts from the Proposed Development and combined impacts of other developments. Developments considered in addition to the Proposed Development are other similar type proposals either built, with the benefit of an extant planning permission or, specifically allocated in a development plan.

2.3.29 Within this EIA Report, cumulative effects for each technical discipline are covered as required on a chapter by chapter basis with a summary of overall effects included in the residual effects chapter (chapter 16).

### *Mitigation and Monitoring Measures*

2.3.30 The EIA Regulations require the EIA Report to present a description of the measures proposed to avoid, reduce and, if possible, offset significant adverse effects. Wherever reasonably practicable, mitigation measures have been proposed for each significant environmental effect predicted, taking various forms including:

- changes to the scheme design;
- physical measures applied; and
- measures to control particular aspects of the construction or operation of the Proposed Development.

2.3.31 Where none of the above have been deemed practicable, the Proposed Development design is required to include measures to offset any significant adverse effects.

2.3.32 Monitoring measures are also required to examine the mitigation measures to ensure that they have the desired outcomes.

2.3.33 Mitigation measures and monitoring requirements are presented as commitments in order to ensure a level of certainty as to the environmental effects of the Proposed Development. There are various ways in which a level of certainty can be ensured, such as through the use of binding and enforceable planning conditions. For the avoidance of any doubt, the Applicant is committed to implementing all mitigation measures and monitoring requirements identified in this EIA Report.

2.3.34 A schedule of all of the mitigation measures and monitoring requirements proposed in this EIA Report is presented in chapter 15.

### *Enhancement*

2.3.35 Similar to the reporting of mitigation measures, where opportunities for environmental enhancement are proposed these have been included in relevant technical chapters and summarised in chapter 15.

## 2.4 Scope of the EIA

### *Technical Scope*

2.4.1 A technical review of the likely significant effects of the Proposed Development and the studies previously completed for the AWP application concluded that the following topics should be scoped into the EIA:

- Landscape and Visual Impact Assessment.
- Hydrology and Hydrogeology.
- Ecology and Biodiversity.
- Access, Traffic and Transport.
- Noise and Vibration.
- Air Quality.
- Climate Change.
- Major Accidents and Disasters.
- Socio-economic Effects.

2.4.2 Effects on Human Health are dealt with where appropriate in the relevant technical chapters, such as air quality, noise etc. and not as a separate chapter of the EIA Report.

### *Spatial Scope*

2.4.3 The spatial scope of the EIA, in other words the geographical coverage of the assessment undertaken, has taken account of a number of factors, in particular:

- the extent of the Proposed Development (Drawing 3.1);
- the nature of the baseline environment, sensitive receptors and the likely impacts that could arise; and
- the distance over which predicted effects are likely to remain significant and, particularly, the existence of pathways which could result in the transfer of effects to a wider geographical area than the extent of proposed physical works.

### *Temporal Scope*

2.4.4 The baseline year used for the assessment of environmental effects is 2020. However, appropriate technical disciplines have carried out pre-assessment studies and/or literature reviews from wider timeframes, for example, ecology surveys have been undertaken during the period 2017-2021 and the Climate chapter refers to datasets spanning the period 1981-2010 as relevant.

2.4.5 Construction of the Proposed Development is anticipated to commence in late 2021. For construction effects, the assessment also takes into account the time of day that works are likely to be undertaken, for example, if any night-time working is required.

2.4.6 The Proposed Development comprises an aluminium billet production facility with associated hardstanding, landscaping and drainage. The Proposed Development is anticipated to be operational for at least 40 years.

2.4.7 As appropriate, a Decommissioning Plan will be prepared following cessation of activities, based on contemporary approaches to decommissioning of industrial developments.

## 2.5 Consideration of Alternatives

2.5.1 The EIA Regulations require consideration of alternatives and an indication of the reasons for selecting the site advanced, except where limited by constraints of commercial confidentiality.

2.5.2 The Applicant considered a number of alternative layouts for the Proposed Development, to arrive at the design for which permission is sought. A full description of the initial site identification process and subsequent design iteration process is given in chapter 4.

## 2.6 Assumptions, Limitations and Uncertainty

2.6.1 The EIA process is designed to enable informed decision-making based on the best available information about the environmental implications of a proposed development. However, there will always be some uncertainty inherent in the scale and nature of the predicted environmental effects as a result of the level of detailed information available at the time of assessment, the potential for minor alterations to the Proposed Development following completion of the EIA Report and/or the limitations of the prediction processes.

2.6.2 A number of assumptions have been made during the EIA process and are described below:

- The principal land uses adjacent to the Proposed Development will remain unchanged during the course of the Proposed Development's lifetime.
- Information provided by third parties, including publicly available information and databases, are correct at the time of submission.

2.6.3 Specific assumptions may also be made with regard to the individual technical disciplines. As applicable, these are detailed within each technical chapter.

2.6.4 Any limitations to the EIA are summarised in each technical chapter, where relevant, together with the means proposed to mitigate these.

2.6.5 The likely construction impacts of the Proposed Development have been developed by the Applicant's project team based on the most likely methods of construction, plant, access routes and working areas etc. for the purposes of the EIA.

## 2.7 EIA Report

2.7.1 The EIA Report is comprised of five volumes:

- Volume I – Non-Technical Summary;
- Volume II – Main EIA Report;
- Volume III – Drawings; and
- Volume IV – Technical Appendices.

2.7.2 As prescribed by the EIA Regulations, the EIA Report includes:

- a Non-Technical Summary (EIA Report Volume I);
- a description of the Proposed Development (EIA Report Volume II, chapter 3);
- a description of the reasonable alternatives studied by the Applicant, which are relevant to the Proposed Development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the Proposed Development on the environment (EIA Report Volume II, chapter 4);
- a description of the likely significant effects of the Proposed Development on the environment (EIA Report Volume II, chapters 6 to 14);
- a description of the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment (EIA Report Volume II, chapters 6 to 14 and summarised in chapter 16); and
- any other information specified in Schedule 4 of the EIA Regulations that is relevant to the specific characteristics of the Proposed Development and to the environmental features likely to be affected (EIA Report Volume II).

2.7.3 Volume III contains the associated Drawings that inform the EIA Report.

2.7.4 Volume IV contains relevant supporting reports and information for each of the technical disciplines prepared to inform the EIA chapters in Volume II of the EIA Report.

2.7.5 Additional standalone planning documents which form part of the planning applications include:

- Planning Statement;
- Design and Access Statement;
- Pre-Application Consultation (PAC) Report; and
- Transport Assessment.

## 2.8 References

Alba Ecology Limited. (2018). *Pre-construction Survey of Breeding Birds and Protected Terrestrial Mammals*

Golder Associates UK Limited. (2017). *Alloy Wheel Facility: EIA Report.*

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# Chapter 3 Description of Proposed Development

# 3. Description of Proposed Development

# 3. Description of Proposed Development

## 3.1 Introduction

3.1.1 The EIA Regulations Schedule 4 (1(a) and (b)) require that the EIA Report must include *"a description of the location of the development; and a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases"*.

## 3.2 Proposed Development

3.2.1 The location of the Proposed Development and wider context is shown on Volume III Drawing 3.1.

3.2.2 The planning application boundary is centred on national grid reference (NGR) 212289 774767 and covers an area of 25.9 ha, closely overlapping the boundary of the previously consented AWP, albeit with significantly smaller development footprint (approximately 4.95 ha centred on NGR 2122260, 774828).

3.2.3 The proposed site is not currently in use and comprises an irregular area of scrub land which is bounded to the south by peatland/bog, to the east by the existing Smelter, to the north by a track and the west by the footprint of the former carbon factory.

3.2.4 The Proposed Development comprises an aluminium recycling and billet casting facility with capacity to produce up to 100,000 tonnes per annum of aluminium billet using recycled aluminium and primary aluminium from the existing Smelter.

3.2.5 For the purposes of the EIA and to provide a robust 'worst-case', it has been assumed that the Proposed Development will utilise 100,000 tonnes of recycled aluminium; however, in reality billet fabrication requires the addition of primary aluminium, and so the tonnage of recycled aluminium used in the process will be less than 100,000 tonnes per annum.

3.2.6 The main physical characteristics of the Proposed Development are:

- A 12,245 $m^2$ aluminium recycling and billet casting facility of length 185 m and width 75 m.
- Associated development surrounding the facility and covering an area of approximately 3.69 ha, including:
  - a hard standing area of approximately 10,200 $m^2$ to the south of the facility, to be used to store final products;
  - a new access road around the plant;
  - required drainage and Sustainable Urban Drainage System (SuDS);
  - landscaping and planting – primarily associated with reinstatement of disturbed ground and the SuDS pond;
  - Liquified Petroleum Gas (LPG) / Substitute Natural Gas (SNG) gas storage infrastructure; and
  - associated oxygen, nitrogen and argon systems.

3.2.7 Reproduced from the Design and Access Statement produced by Keppie as part of the planning submission, Figure 3.1 gives an overview of the Proposed Development process and how it interacts with the existing hydro power plant and Smelter.

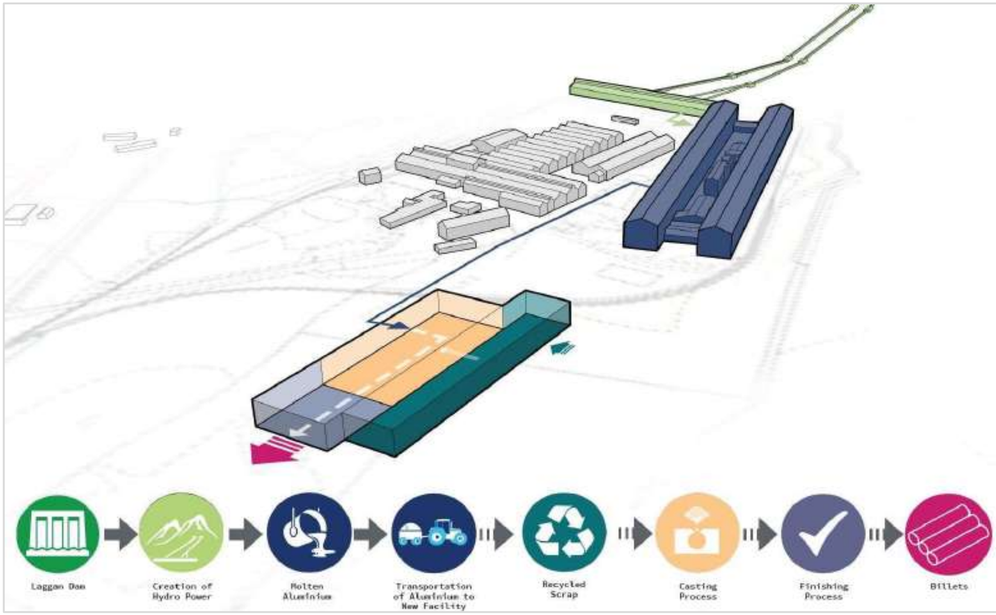


*Figure 3.1 Anoxometric Site and Process Diagram*

3.2.8 The main process which will be carried out in the Proposed Development is the melting and casting of primary aluminium (from the Smelter) and secondary aluminium (recycled material, transported to site) to produce billets of various specifications, sizes and lengths. The facility will include a casting pit approximately 25 m depth and 7 m by 7 m wide, secondary metal storage areas, fume abatement systems, melting furnaces and auxiliary plant equipment.

3.2.9 Subject to securing the appropriate permissions, consents and licences, the intention is to initiate the construction of the Proposed Development in late 2021, and for the development to be operational by January 2024 (however this includes a 7 month contingency for potential delays due to COVID-19). From inception, the construction programme is expected to last 17-18 months.

3.2.10 The construction phase will comprise initial enabling and earth works to prepare the site, followed by construction of the aluminium recycling and billet casting facility and associated support infrastructure and the installation of billet production plant internal to the facility.

3.2.11 The Proposed Development will operate continuously, day and night, for approximately 330 days a year.

## 3.3 Construction

3.3.1 A Construction Method Statement will be developed following appointment of a Principal Contractor and submitted to The Highland Council (THC) for agreement and approval prior to any construction activities commencing at the Proposed Development.

### Enabling Works

3.3.2 Prior to commencement of construction at the Proposed Development, the Principal Contractor will finalise a Construction Method Statement and detailed Construction Environmental Management Plan (CEMP) and submit these to THC for approval. Once in receipt of approval, ecology mitigation tasks will be carried out in accordance with the finalised CEMP, EIA Report and all relevant environmental legislation.

3.3.3 The Principal Contractor will establish a preliminary site compound area for use in the initial stages of construction during the mobilisation stage. Once the preliminary site compound area is established, site clearance and earthworks operations will commence.

### Earthworks

3.3.4 The stripping of topsoil and peat removal operations will be undertaken in line with an agreed Peat Management Plan, a draft version of which is included as Technical Appendix 8.2.

3.3.5 Excavation works will be undertaken within the first 3 months and, before any works are carried out, a works plan will be produced that will divide donor and receptor areas into a range of cells to be worked sequentially.

3.3.6 The material to be excavated will comprise acrotelmic pseudo-fibrous peat, catotelmic pseudo-fibrous peat and amorphous peat. Where possible, the acrotelmic pseudo-fibrous peat will be excavated as peat turves. All peat layers will be kept separate.

3.3.7 Low centre of gravity, low ground pressure, wide tracked machinery will be used in order to minimise the risk of compaction of the peat.

3.3.8 Excavation will be done sequentially, working from northeast to southwest. Excavation will be done in separate 'cells' which will match the capacity of cells in the receptor areas.

3.3.9 Turves will be stored adjacent to the construction area in a way that ensures they remain moist and viable.

3.3.10 Classification of excavated materials will depend on their identified re-use in reinstatement works.

### Construction Works

3.3.11 The Principal Contractor will establish a construction compound and carry out the onsite primary road works to help facilitate subsequent work tasks.

3.3.12 Once the above works have been completed, the Principal Contractor will commence the construction of the aluminium recycling and billet casting facility. Foundations will be completed prior to steelwork erection for the building, cladding and roofing. After the cladding and roofing is completed the floor slabs will be constructed. The final task will be the interior fit-out and installation of the mechanical and electrical processing plant within. Associated roads, hardstanding areas and drainage construction works will then be carried out.

### Construction Environmental Management

3.3.13 All construction works will be subject to a CEMP to minimise environmental impacts during this phase of the Proposed Development. The CEMP will contain, as a minimum, the following management plans:

- Pollution Prevention Management Plan;
- Construction Noise Management Plan;
- Dust and Air Quality Management Plan;
- Construction Waste Management Plan;
- Water Quality and Pollution Management Plan;
- Peat Management Plan; and
- Construction Traffic Management Plan.

3.3.14 An outline CEMP, for information at the planning stage, is included as Technical Appendix 3.1. On procurement of the Principal Contractor, the outline CEMP will be reviewed and updated and submitted to THC for approval prior to any construction activities commencing at the Proposed Development.

## 3.4 Operation

3.4.1 The operation of the Proposed Development can be visualised as shown in Figure 3.2.

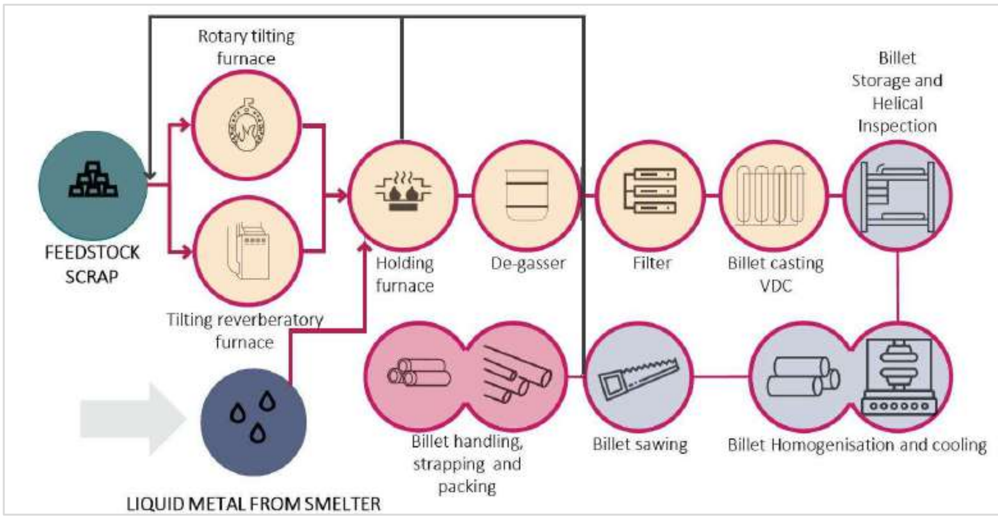


*Figure 3.2 Recycling and Billet Casting Technical Process Flow Diagram*

3.4.2 The process will comprise mixing of molten aluminium from the existing Smelter with melted scrap aluminium followed by casting of the metal to form billet. A schematic of the process layout is included as Figure 3.3.

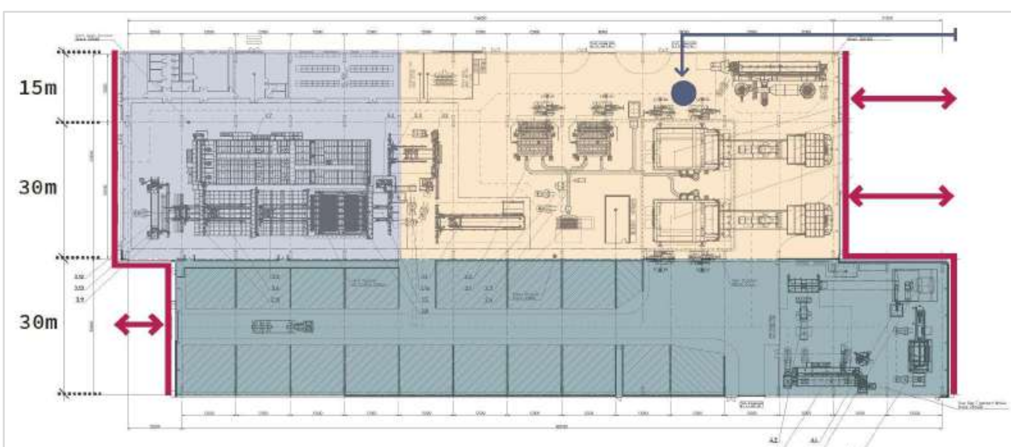


*Figure 3.3 Proposed Process Layout*

3.4.3 Molten aluminium from the existing Smelter will enter the Proposed Development through an entry point in the north-eastern façade of the building in a ladle pulled by a tractor vehicle. Scrap aluminium will enter via the south-western corner of the building.

3.4.4 Scrap and waste products will be stored in bays in the southern end of the building, and materials will be moved around in this area by a shovel.

3.4.5 Scrap and molten aluminium will be combined within furnaces in the central area of the building. The melting area will include melting and rotary furnaces to accept and melt the solid secondary aluminium. Lauders will then transport the molten material to holding furnaces which will accept the molten primary aluminium metal from the smelter along with the secondary aluminium. The metal will be alloyed to the correct specification in this furnace and stirred using an electromagnetic stirrer.

3.4.6 A fume gas treatment plant will be used for all the furnaces to capture and treat the gases from this process.

3.4.7 The molten materials will then be transferred by lauder system to casting machine in the central and southern areas of the building. Inline metal degassing and rod grain refiners will treat the metal whilst in the lauders.

3.4.8 Using a vertical casting machine, the alloyed metal will be cast in pre-determined cast drop weights (between 30 – 50 t) in multiple strands to form billets. A cooling water control system consisting of regulating valves and flowmeter will be utilised to ensure uniform solidifying profile, before the billets are removed by overhead crane.

3.4.9 The billets will be placed on a log entry system and moved through the building via log laydown table, log accumulator system and intermediate roller table. The billet will undergo helical ultrasonic inspection to ensure quality requirements, with any reject material being sawn and recycled back to the melting furnace at the start of the process.

3.4.10 A billet saw will be used to remove tops and tails of cast billet. Swarf produced from this process will be briquetted by a press and with the tops and tails recycled back into the melting or rotary furnace. All sawn billets will then be fed by walking beam to the continuous homogenizing furnace. The billets will be heated and held at a certain temperature for a length of time depending on specification to ensure quality properties are met.

3.4.11 Finally, the billets will enter a forced cooling zone after the homogenizing furnace to cool the billets at the desired rate, prior to entering a packing system for automated strapping of billets and stacking for storage.

3.4.12 Billet will leave the building via an exit point in the north-eastern corner and be transferred to the adjacent external storage area by fork lift truck.

3.4.13 Ancillary processes with components external to the building will comprise an oxygen and process gas plant and cast pit steam handling.

3.4.14 A Site Layout Plan for the Proposed Development is included in Volume III as Drawing 3.2.

## 3.5 Decommissioning

3.5.1 Although the Proposed Development does not have a pre-determined operational lifespan, it is anticipated to be operational for at least 40 years and possibly more. As appropriate, a Decommissioning Plan will be prepared following cessation of activities, based on contemporary approaches to decommissioning at that time.

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# Chapter 4 Site Selection, Design Iteration and Alternatives

# 4. Site Selection, Design Iteration and Consideration of Alternatives

# 4. Site Selection, Design Iteration and Consideration of Alternatives

## 4.1 Introduction

4.1.1 The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) require that EIA Reports include *"a description of the reasonable alternatives studied by the developer, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment"* (Regulation 5(2)(d)) (Scottish Government, 2017).

4.1.2 Schedule 4 of the aforementioned Regulations also requires *"a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects"* (Scottish Government, 2017).

4.1.3 This chapter provides a description of the site selection process, alternatives and design iterations considered prior to arriving at the final design of the Proposed Development, as described in chapter 3. Throughout the process, the Applicant has considered key environmental receptors and has aimed to remove and reduce environmental effects as far as possible through design.

4.1.4 In terms of site selection, the key driver was the Applicant's vision to: *'create a sustainable, economic, social and environmental future for the Lochaber smelter and power station, its employees and the local community'.*

4.1.5 The planning application boundary is centred on national grid reference (NGR) 212289 774767 and covers an area of 25.9 ha, closely overlapping the boundary of the previously consented AWP, albeit with significantly smaller development footprint (approximately 4.95 ha centred on NGR 2122260, 774828).

4.1.6 The Proposed Development involves the following principal elements:

- A 12,245 $m^2$ aluminium recycling and billet casting facility of length 180 m and width 75 m.
- Associated development surrounding the facility and covering an area of approximately 3.69 ha, including:
  - a hard standing area of approximately 10,200 $m^2$ to the south of the facility, to be used to store final products;
  - a new access road around the plant;
  - required drainage and Sustainable Urban Drainage System (SuDS);
  - landscaping and planting – primarily associated with reinstatement of disturbed ground and the SuDS pond;
  - Liquified Petroleum Gas (LPG) / Substitute Natural Gas (SNG) gas storage infrastructure; and
  - associated oxygen, nitrogen and argon systems.

## 4.2 Site Selection

4.2.1 Fort William is the main town in Lochaber, sitting between the head of Loch Linnhe and the foot of Ben Nevis. The town is well located with good access to Inverness, Glasgow and Edinburgh. The Proposed Development sits approximately three kilometres to the north-east of Fort William town centre, next to Britain's last aluminium Smelter (also operated by the Applicant) in an area identified in the West Highland and Islands Local Development Plan for industrial purposes associated with the existing Smelter.

4.2.2 The Lochaber Smelter site encompasses a total land area of circa 68 ha. The plant was originally developed in the 1920s and has subsequently been expanded over the years to deliver the current facilities. The Proposed Development site currently comprises an area of scrub adjacent to the existing Smelter and is well connected to the A82 to the north. The Glasgow to Fort William Railway line also runs parallel with the A82. The principal railway line and maintenance line for the Lochaber Smelter facility branch off from this main line, allowing for the movement of goods in and out of the site by rail.

### *Opportunities and Constraints*

4.2.3 The Proposed Development is located directly adjacent to the Ben Nevis and Glen Coe National Scenic Area (NSA) and in close proximity to the Ben Nevis Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), located approximately 410 m to the east of the site. The sensitive setting of the site, in terms of both visual and ecological importance, has been a key consideration throughout the development of the project.

4.2.4 Other key site constraints and considerations of relevance to the EIA have included:

- access (existing access points, the existing road through the site, potential connection to A82, HGV and car access, weigh bridges);
- connectivity with existing industrial plant;
- presence and character of peat deposits;
- existing Railway Lines – main railway, principal and maintenance railway line as a route for materials movement;
- renewable (hydro) power source; and
- water connections and the principal water main to the west boundary.

## 4.3 Previous Planning Application Alternative

4.3.1 Planning Permission Reference: 17/05202/FUL permits the construction of an Alloy Wheel Plant (AWP) to the west of the existing Smelter with a footprint that closely overlap that of the Proposed Development. Planning consent for the AWP was granted in 2018 (subject to Matters Specified in Conditions); however, after strategic review of the alloy wheel manufacturing landscape in the UK, Europe and North Africa, together with a downturn in vehicle production, it has been decided not to pursue this project at the current time.

4.3.2 The Applicant is therefore looking to bring forward the Proposed Development in order to maximise existing Smelter output, protect existing jobs and expand downstream engineering to create 70 additional jobs at the site.

## 4.4 'Do-Nothing' Alternative

4.4.1 The 'do-nothing' scenario is a hypothetical alternative conventionally considered during the EIA process as a basis for comparing the Proposed Development being promoted. The 'do nothing' scenario represents the current baseline situation as described in the individual chapters of this EIA Report.

4.4.2 Without development, it is considered that the Proposed Development site would likely be left as an area of scrub land, as is the case now.

4.4.3 Whilst it is recognised that the baseline would not remain static for the lifetime of the Proposed Development with, for example, potential changes to biodiversity and landscape as a result of climate change, the current baseline has been assumed throughout the EIA Report in order to produce a precautionary and robust approach.

## 4.5 Design Principles

### *Key Environmental Design Objectives*

4.5.1 With respect to the overall Proposed Development, project design iteration has been on-going throughout the EIA process. The design process has considered the following key environmental design objectives:

- Minimising the visibility of the Proposed Development from designated landscapes, sensitive character areas and human receptor locations, and careful consideration of the visual impact through the articulation of the plan and building form;
- Following best practice guidance e.g. CIEEM (2018; 2019) which identifies a hierarchy of mitigation for potential impacts:
    - avoid and prevent adverse ecological impacts in the first place, especially those that would likely be significant to important receptors;
    - minimise and reduce adverse impacts that cannot be avoided; and,
    - compensate and offset for any remaining likely significant residual impacts.
- Avoiding and minimising construction and operational disturbance to legally protected species;
- Minimising construction and operational disturbance to sensitive habitats and ecological receptors;
- Avoiding noise and air quality impacts on nearby sensitive human and ecological receptors;
- Minimising greenhouse gas emissions associated with construction and operation of the Proposed Development; and
- The development of a rational, efficient and environmentally responsive design.

### *Key Technical Design Considerations*

4.5.2 In addition to the above noted environmental objectives, there has also been a requirement to meet key technical and operational design requirements stipulated by the Applicant. The design team has worked closely to spatially coordinate the process, engineering and architectural aspects of the design.

4.5.3 Consideration of the integration of the existing Smelter operations with the Proposed Development has also been a key technical design consideration developed with the Applicant for the emerging proposals.

## 4.6 Proposed Development Design Iterations

4.6.1 The Applicant has undertaken a number of design iterations for the Proposed Development, taking into account the environmental constraints of the site.

### Design Constraints

4.6.2 The design of the preferred layout has been governed by:

- The presence and character of peat deposits; and
- the orientation of the adjacent existing Smelter buildings (from a landscape and visual perspective);
- site levels and topography;
- safety considerations required for the trafficking of molten aluminium;
- existing infrastructure and HGV routes around the site;
- existing railway line and crossing points, and access and egress to the north
- working within the extremities of site (e.g. location of existing water main, existing concrete foundations etc.)

4.6.3 Figure 4.2 outlines the key constraints pertaining to the Proposed Development.


*Figure 4.1 Site Constraints*

### Design Iterations

4.6.4 A number of design iterations have been made to ensure that the environmental effects of the Proposed Development are minimised. Figure 4.2 shows a number of building locations and orientations considered for the Proposed Development

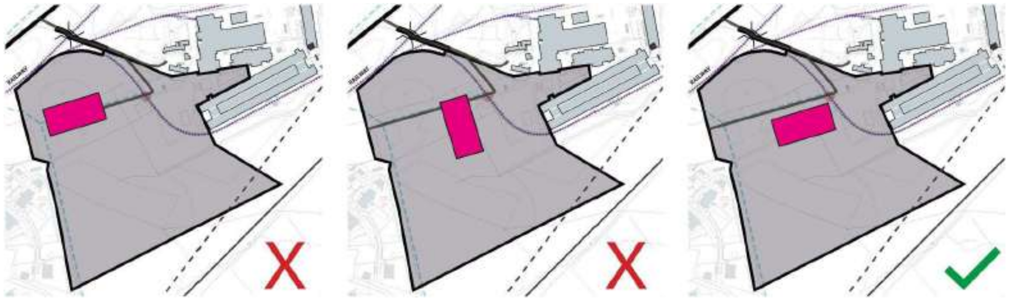

*Figure 4.2 Initial Development Design Options*

4.6.5 The preferred layout aims to minimise the build footprint over 'deep' peat ground and utilise the existing road infrastructure.

4.6.6 Ecological and hydrogeological factors taken into account throughout the design process for the Proposed Development included the following:

- a minimum 50 m buffer for any infrastructure or construction activity around all watercourses. No watercourse crossings are anticipated; and
- avoidance of areas of deeper peats (i.e. areas of >1 m depth), habitats of significant conservation value and consideration of areas with the potential to support protected species in relation to the Billet Plant and associated infrastructure, as far as practicable.

4.6.7 The optimum location proposed for the Proposed Development is immediately adjacent to the existing Smelter, overlapping the boundary of the previously consented AWP, albeit with significantly smaller development footprint. The design aims to create a strong east-west axis/orientation which connects well in a visual sense to the existing Smelter buildings.

4.6.8 The asset of the existing road is utilised and extended to provide vehicular access to the south of the facility. A separate dedicated molten aluminium route is also proposed to the north providing safe separate access routes for pedestrians and HGVs.

### Embedded Design Mitigation

4.6.9 Review and iteration of the proposed infrastructure within the proposed Launch Site has facilitated effective mitigation and resulted in potentially significant effects being avoided or minimised as far as reasonably practicable, as detailed below.

**Landscape**

4.6.10 Design iteration of the proposed development was undertaken as part of the preparation of the Landscape Visual Impact Assessment (chapter 6) to reduce the visual effects. The following embedded mitigation measures have been adopted:

- The form and alignment and height of the Proposed Development has been designed to follow the existing buildings on site and present a simple alignment of rooflines in views.
- The floor height of the proposed building is set as closely as feasible to existing ground levels (allowing for its necessary size and operational requirements).
- Proposed planting has been limited by:

- internal access road servicing the proposed development, including access to the hardstanding area and SuDS pond to the south;
- the presence of deep peat – where planting or any form of disturbance is not desirable;
- new SuDS pond – this has been designed with informal and varying edge gradients and water depth and includes a number of small islands. All of which allow for a varied and more natural planting regime leading to improved biodiversity and habitat opportunities;
- recognition of the advice in the Highland Forest and Woodland Strategy which indicates that towards the southern areas of the site and the NSA, planting should only be provided where required for necessary mitigation; and
- recognition that visual effects cannot be mitigated by planting for elevated views, and the only notable open views from lower-lying areas will be from Glen Nevis.

- Woodland planting and further tree planting within the site to compensate for previous felling, if required will be carried out by the Alvance Estate Team (Jahama Highland Estates).
- Lighting will be designed to meet the requirements of BS EN 12464-2:2014 and will use LED lamp technology. Light pollution will be minimised in terms of unnecessary spill of light both upwards, and horizontally beyond the area intended to be lit.
- Lighting to the south side of the building will be kept to the absolute minimum levels required for safe operation and maintenance of the plant in order to minimise the effects of lighting on the National Scenic Area.
- External lighting for maintenance areas to the west and south sides of the building will only be switched on when required for maintenance.
- Lighting on the building will be designed to be seen by site visitors rather than at a distance, will face downwards, and will not be included on the south side of the building.

4.6.11 All of the mitigation measures are inherent to the design, and no post-construction monitoring measures are proposed. Should planting be undertaken it will likely focus on providing amenity for site visitors; repair where existing woodlands have been damaged by spoil heaps or vehicles to the north of the proposed road; and planting in the southern area of the site to further break up visibility of the building in views from Glen Nevis.

**Drainage**

4.6.12 The following considerations have been taken into account in the iterative design of the Proposed Development, considered as embedded mitigation:

- A 50 m buffer has been maintained around all surface watercourses.
- The proposed foul and surface water drainage designs outlined in the Drainage Impact Assessment (DIA) included as Technical Appendix 7.2.
- A Construction Environmental Management Plan (CEMP) will be in place to control potentially polluting activities to prevent adverse impact to downstream persons, properties and environment during the construction phase.
- All earthmoving works or similar operations will be carried out in accordance with BSI Code of Practice for Earth Works BS6031:2009.
- Proposed Development drainage design mitigating increased discharge rates and flood risk, as well as enhancing the water quality.

- All site discharges and temporary water abstraction will be regulated under the CAR licensing regime and all necessary licenses sought from SEPA prior to the commencement of an operations on-site.

**Flood Risk**

4.6.13 The management of surface water drainage from developed areas (positive runoff) of the site will comprise the conveyance of runoff through a combination of conventional roof drainage, linear drains and filter drains. Collected runoff will drain to a formal constructed SuDS wetland feature prior to controlled discharge to the existing ditch located to the north of the site.

4.6.14 In addition to the above, interception drainage is proposed to collect and convey upgradient catchment 'run-on' to the site. These upgradient catchment areas will be managed by a perimeter cut-off drain, independent of the development drainage and discharged to land north of the development maintaining the current baseline hydrological continuity.

*4.6.15* Surface water discharge from the Proposed Development will be limited to the mean annual peak flood (Qbar) rate of runoff thus controlling the 'peak' discharge and discharge volume for all storm events up to and including the design 1:200-year plus climate change event.

**Water Quality**

4.6.16 Proprietary pollution prevention infrastructure is proposed for the more heavily trafficked storage areas to the south of the billet plan. Surface runoff from these areas will pass through a bypass separator (Klargester NSBE010 or similar approved) prior to discharge to the constructed wetland.

**Ecology and Biodiversity**

4.6.17 The proposed site layout has taken into consideration known important ecology and biodiversity features. The ecological baseline has been considered throughout the design process for the Proposed Development, with an aim to either eliminate or reduce the potential for any significant effects on receptors and following the "mitigation hierarchy" as described in CIEEM guidance (CIEEM 2018). The mitigation hierarchy follows a sequence of avoidance, mitigation, compensation and enhancement measures. Embedded ecology mitigation includes the following:

- Existing tracks have been used where possible, in order to reduce the footprint of the Proposed Development;
- Areas of disturbed ground have been priorities over intact peatland; and
- Infrastructure has been sited at least 50 m from any areas of standing water and watercourses.

4.6.18 The Applicant will appoint a suitably qualified Ecological Clerk of Works (ECoW) prior to the commencement of any construction activities. The ECoW will be present and oversee all construction activities as well as providing toolbox talks to all site personnel with regards to priority species and habitats, as well as undertaking monitoring works, oversee the relocation of any significant stands of nationally important species of plants and briefings to relevant staff and contractors as appropriate.

4.6.19 A Peat Management Plan (PMP) will be implemented to minimise excavation of peat and to ensure the re-use of excavated peat within the site for biodiversity benefits.

4.6.20 A pre-construction survey for protected species will be carried out. If evidence of protected species presence is identified, additional mitigation may be identified and implemented to prevent impacts on individuals.

4.6.21 In order to prevent pollution of watercourses within the site (with particulate matter or other pollutants such as fuel), best practice techniques will be employed.

**Peat**

4.6.22 The location of the Proposed Development has been optimised to avoid areas of deep peat, but nevertheless an area of deeper peat cannot be wholly avoided through design. As such construction of the Proposed Development will require peat removal operations. These will be undertaken in line with an agreed Peat Management Plan, a draft version of which is included in Volume IV as Technical Appendix 8.2.

**Noise**

4.6.23 The following standard mitigation measures have been embedded in the design of the Proposed Development:

- All of the processes will be contained within the building and noise will therefore be attenuated across the building envelope. The proposed exterior cladding will provide a minimum sound reduction index of 30 dB;
- The building materials have been specified such that noise transmission through the walls and roof will be minimised, including an internal concrete baffle wall;
- Noise breakout via building access points will be minimised using fast-closing shutters and noisy internal process (e.g. unloading of scrap from HGVs and loading of scrap into the furnace) will only be undertaken when the shutters are closed;
- Noise from external services, such as the oxygen and process gas plant and the roof-mounted stacks will be controlled at source by selection of quiet plant; and
- Potentially noisy external services and activities, including transporting finished billet to a storage area, have been sited such that proposed buildings will screen noise transmission towards the closest NSRs.

**Air Quality**

4.6.24 Abatement technologies have been considered in order to minimise the impacts of emissions from the Proposed Development sources at sensitive receptors. The following emission reductions compared to Best Available Technique Emission Limit Values (ELVs) have been included in the final design and assessment based on the solution currently proposed by the prospective equipment manufacturers:

- 90% for HCl at BP2Large and Small;
- 81% for NOx at BP2Large and 80% at BP2Small;
- 33% for CO at BP2Large and 67% at BP2Small;
- 33% for TVOC at BP2Small.

**Climate Change**

4.6.25 As the terms for the materials procurement process are drawn up, the Applicant will look to substitute alternative materials of lower carbon intensity and the same engineering properties such as recycled steel and/or high PFA cement blends as applicable. A Peat Management Plan as previously outlined will be agreed and implemented to minimise any GHG emissions from the degradation of disturbed peat.

4.6.26 Mitigation measures applied to the operation of the Proposed Development, such as the increased usage of hydroelectric power, will contribute to reducing GHG emissions. Reducing GHG emissions from fossil gas usage will be explored as alternative thermal technologies become commercially viable. Furnaces with high fuel efficiency will be specified.

## 4.7 Summary

4.7.1 The final layout and location for all elements of the Proposed Development has been informed by a robust EIA and design iteration process, considering potential environmental, landscape and visual impacts and their effects, physical constraints, and health and safety considerations. The information used to inform the design iteration process has included consultation responses received, baseline data and the impact assessments undertaken with their respective conclusions described in this EIA Report.

4.7.2 The Proposed Development layout as described in chapter 3 is considered to represent the most appropriate design, considering potential environmental impacts and their effects, physical constraints, and health and safety considerations.

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# Chapter 5 Planning Policy Framework

# 5. Planning Policy Framework

# 5. Planning Policy Framework

## 5.1 Introduction

5.1.1 This chapter sets out the relevant planning policy context relevant to the Proposed Development and has been compiled by JLL.

5.1.2 Section 25 of The Town and Country Planning (Scotland) Act 1997, as amended by the Planning etc. (Scotland) Act 2006 states:

*"Where, in making any determination under the Planning Acts, regard is to be had to the Development Plan, the determination shall be made in accordance with the plan unless material considerations indicate otherwise".*

5.1.3 Accordingly, the relevant provisions of the current Development Plan and other material considerations are detailed below.

5.1.4 This chapter does not consider the accordance of the Proposed Development with the Development Plan but identifies the planning policy framework and relevant considerations. A separate Planning Statement assesses the accordance of the Proposed Development with the Development Plan and material considerations. The Planning Statement is submitted as part of the Planning Application.

## 5.2 The Development Plan

5.2.1 The statutory Development Plan applicable to the Proposed Development comprises:

- The Highland-wide Local Development Plan (as continued in force, April 2012);
- The West Highland and Islands Local Development Plan (WestPlan) (adopted 30 September 2019); and
- Statutorily adopted Supplementary Guidance.

## 5.3 The Highland-wide Local Development Plan

5.3.1 The Highland-wide Local Development Plan (HwLDP) sets out The Highland Council (THC's) vision for the area and indicates where development should, and should not, take place. The HwLDP policies considered to be relevant to the Proposed Development are listed in Table 5.1, below, and are set out and assessed in detail in the Planning Statement.

5.3.2 Table 5.1 Relevant Policies from the Highland-wide Local Development Plan

| Policy Reference | Policy Heading |
|---|---|
| Policy 28 | Sustainable Design |
| Policy 29 | Design Quality and Place-Making |
| Policy 30 | Physical Constraints |
| Policy 31 | Development Contributions |
| Policy 34 | Settlement Development Areas |
| Policy 36 | Development in the Wider Countryside |
| Policy 41 | Business and Industrial Land |
| Policy 42 | Previously Used Land |
| Policy 51 | Trees and Development |

| Policy Reference | Policy Heading |
|---|---|
| Policy 52 | Principle of Development in Woodland |
| Policy 55 | Peat and Soils |
| Policy 56 | Travel |
| Policy 57 | Natural, Built and Cultural Heritage |
| Policy 58 | Protected Specie |
| Policy 59 | Other Important Species |
| Policy 60 | Other Important Habitats and Article 10 Features |
| Policy 61 | Landscape |
| Policy 62 | Geodiversity |
| Policy 63 | Water Environment |
| Policy 64 | Flood Risk |
| Policy 65 | Waste Water Treatment |
| Policy 66 | Surface Water Drainage |
| Policy 70 | Waste Management Facilities |
| Policy 71 | Safeguarding of Waste Management Sites |
| Policy 72 | Pollution |
| Policy 73 | Air Quality |
| Policy 74 | Green Networks |
| Policy 77 | Public Access |

## 5.4 The West Highland and Islands Local Development Plan (WestPlan)

5.4.1 WestPlan was adopted on 30 September 2019. Page 2 of WestPlan sets out how it should be used and the relationship with the HwLDP and adopted Supplementary Guidance:

*"The main parts of the Plan are the Vision, the Strategy, policies that apply generally across the Plan area, and more detailed proposals and priorities for the larger settlements. The Plan is made up of maps and text. If you are interested in finding out what the Plan means for you then you need to read both. To get the complete picture, you need to read the relevant parts of this Plan together with the HwLDP and associated Supplementary Guidance. Conformity with a single policy or proposal in the Plan does not indicate conformity with the development plan as a whole."*

5.4.2 The aluminium smelter and surrounding land has been allocated for 'industry' (site FW26), with part of the application site being allocated for 'business' (site FW21). WestPlan comprises a Vision, Strategy, policies that apply generally across the Plan area, and more detailed proposals and priorities for the larger settlements.

5.4.3 Table 5.1 sets out THC's vision for the West Highland and Islands area, described as the following four inter-related headline outcomes:

### Growing Communities

5.4.4 All places are better designed. Larger settlements and their centres have retained and expanded facilities.

5.4.5 Their populations have increased because of this better access to facilities and because they are safe, attractive and healthy places to live.

### Employment

5.4.6 The local economy is growing, diverse and sustainable. West Highland has an enhanced reputation as a heritage tourism destination, as a base for marine renewables and as an effective place for working at home and with the land.

### Connectivity and Transport

5.4.7 Public Agencies and other partners co-ordinate and optimise their investment in agreed growth locations. Communities are better supported to become more self-reliant, to have more pride in their area and identity, to diversify their populations, and to have more control of local resources.

### Environment and Heritage

5.4.8 Resources are better managed:

- A higher proportion of journeys are shorter, safer, healthier, more reliable and made in a carbon efficient way.
- Water, heat sources, land and buildings are used, sited and designed in a way that is carbon clever and respectful of heritage resources.
- Waste is reduced, reused, recycled, or treated as close to source as possible to generate renewable energy.

5.4.9 Taken together, these inter-related headline outcomes form a shared vision for the area and a framework for decisions on development and investment in the area.

5.4.10 Section 2 of the Proposed WestPlan provides more detail in terms of the individual settlements within the area.

5.4.11 Paragraph 2.3 states that; *"the challenge for the future is to support further growth but to make the urban area and therefore the community more cohesive. Consolidation, rather than further scattering of development and better internal connectivity will help Fort William become a more coherent place"*.

5.4.12 Paragraph 2.6 sets out the following 'placemaking priorities' for Fort William:

*"Development in Fort William (including the communities from Corpach to Achintore) should encourage consolidation within the existing physical limits of the settlement, not further dispersal which would make better internal connectivity more difficult to achieve.*

*Fort William's industrial employers have good reason to remain in their current locations where they can best benefit from the resources of the physical environment. The Plan should enable in situ expansion of these enterprises. For example, diversification of the range of industrial processes at the smelter together with increased loading capacity at Corpach Quayside (including industrial buildings, land and lay-down space surrounding the BSW Sawmill) are critical components of the Plan. All associated housing requirements will be strongly supported to secure the availability of a range of housing options to attract and retain a skilled workforce …*

*Putting adequate public agency infrastructure where it can best support existing and future growth is also vital and this too means consolidation whether that be the completion of School rationalisation proposals, a flood scheme for Caol and Lochyside, travel and transport improvements, or shared public function buildings.*

*Increasing internal cohesion and connectivity are the main design objectives which means every development site and travel project will be asked to contribute to that aim whether it's a footpath, bus, road, green network, visual, sewer, or any other type of connection.*

*Connections are just as important to wildlife as people although instead of fibre optic cables it's about continuous habitat whether that's otters journeying up and down burnsides or other wildlife utilising strips of broadleaf woodland.*

*Safeguard, through appropriate siting and design, areas protected or otherwise important for nature conservation or landscape qualities".*

## 5.5 Supplementary Guidance

5.5.1 Scottish Government Planning Circular 6/2013: "development planning" sets out the role of Supplementary Guidance and how it should be considered:

*"Scottish Ministers envisage that to allow plans themselves to focus on vision, the spatial strategy, overarching and other key policies and proposals, that much detailed material can be contained in Supplementary Guidance.*

*Supplementary Guidance can be adopted and issued by a strategic development planning authority in connection with a SDP, or by a planning authority in connection with a Local Development Plan (LDP). Any such guidance will form part of the development plan, and have that status for decision making in line with section 25 of the Planning Act."*

5.5.2 The Highland Council (THC) have adopted a number of Supplementary Guidance Documents as detailed below.

### Sustainable Design Guide Supplementary Guidance (adopted January 2013)

5.5.3 This guidance has been developed to ensure that all future development is well-designed, sustainable and sympathetic to its surroundings. The guidance is based on four key sustainable design principles:

- Conserving and enhancing the character of the Highland area;
- Using resources efficiently;
- Minimising the environmental impact of development; and
- Enhancing the viability of Highland communities.

### Developer Contributions Supplementary Guidance (adopted March 2013)

5.5.4 The purpose of this supplementary guidance is to provide clear guidance on the methodology used to identify infrastructure requirements and the criteria that should be used to calculate mitigate requirements, including developer contributions, to support new development.

### Trees, Woodlands and Development Supplementary Guidance (adopted January 2013)

5.5.5 The purpose of this supplementary guidance is to ensure that applicants seeking planning permission effectively consider and subsequently manage existing trees and woodlands, as well as identifying opportunities for planting and management of new trees and woodlands.

### Highland's Statutorily Protected Species Supplementary Guidance (adopted March 2013)

5.5.6 The guidance aims to assist applicants when considering development in relation to their responsibilities towards protected species, setting out the key species to be aware of, the varying levels of protection afforded to them and how they should be dealt with in a development proposal to avoid breaking the law and to further the conservation of biodiversity.

#### Green Networks Supplementary Guidance (adopted January 2013)

5.5.7 The aim of this supplementary guidance is to help promote greenspace linkages and to safeguard and enhance wildlife corridors in and around new and existing developments.

#### Flood Risk and Drainage Impact Assessment Supplementary Guidance (adopted January 2013)

5.5.8 This supplementary guidance aims to improve the design and implementation of developments and their related drainage arrangements.

#### Historic Environment Strategy Supplementary Guidance (adopted January 2013)

5.5.9 The purpose of this strategy is to define THC's approach to the protection of the historic environment through the planning process.

#### Public Art Strategy Supplementary Guidance (adopted March 2013)

5.5.10 To help create places with distinctive identities and a clear sense of identity, this SG seeks the inclusion of developer funded Public Art where appropriate in new developments.

## 5.6 Material Considerations

5.6.1 Statements of Scottish Government Policy are material considerations that will be taken into account in development plans and development management decisions.

#### National Planning Framework

5.6.2 The Scottish Government published the third National Planning Framework (NPF3) on 23rd June 2014 and sets out the Scottish Government's central purpose "to create a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth".

*5.6.3* In the Ministerial Foreword to the NPF3 it is noted that: *"NPF3 brings together the plans and strategies in economic development, regeneration, energy, environment, climate change, transport and digital infrastructure to provide a coherent vision of how Scotland should evolve over the next 20 to 30 years".*

5.6.4 NPF3 is a long-term strategy for Scotland and is the spatial expression of the Government's Economic Strategy and plans for development and investment in infrastructure.

5.6.5 The Scottish Government are in the process of preparing a fourth National Planning Framework (NP 4) and published a Position Statement on 26 November 2020 setting out the Scottish Government's current thinking on the issues that will need to be addressed.

5.6.6 The ministerial foreword states:

*"National Planning Framework 4 will set out a new plan for Scotland in 2050. The strategy will have to make some big decisions about our future development. Our ambitious targets for addressing climate change demand a fresh approach and significant investment in infrastructure, as well as a new understanding of how zero carbon living might work. We need to anticipate and plan for our changing population to focus more on improved health and wellbeing and a better natural environment for everyone in Scotland. It is clear that good quality homes must be delivered in the right places, alongside the services and facilities that communities need. It is essential that planning supports our green economic recovery in the short term, as well as enabling strategic investment in the long term. And all of this must be achieved through a highly performing planning system that improves our places: our cities; towns; villages; rural; and island areas."*

#### Scottish Planning Policy

5.6.7 Scottish Planning Policy (SPP) was published on 23rd June 2014 and revised in December 2020. The purpose of the SPP is to set out national planning policies which reflect Scottish Government

Ministers' priorities for the operation of the planning system and for the development and use of land.

5.6.8 Paragraph (iii) states that, as a statement of Ministers' priorities, the content of the SPP is a material consideration that carries significant weight, although it is for the decision maker to determine the appropriate weight to be afforded to it in each case.

5.6.9 Paragraph 11 sets out the NPF3 and SPP single vision for Scotland's planning system:

"We live in a Scotland with a growing, low-carbon economy with progressively narrowing disparities in well-being and opportunity. It is growth that can be achieved whilst reducing emissions and which respects the quality of environment, place and life which makes our country so special. It is growth which increases solidarity – reducing inequalities between our regions. We live in sustainable, well-designed places and homes which meet our needs. We enjoy excellent transport and digital connections, internally and with the rest of the world".

## 5.7 Summary

5.7.1 This chapter has described the relevant planning policy framework that has informed the EIA. The Planning Statement submitted as part of the planning application provides an assessment of the Proposed Development against the policy context set out in this chapter.

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# Chapter 6 Landscape and Visual Impact

# 6. Landscape and Visual Impact

# 6. Landscape and Visual Impact

## 6.1 Introduction

### *Background*

6.1.1 LDA Design has been commissioned to carry out a landscape and visual impact assessment (LVIA) of a Recycling and Billet Casting Facility (the Proposed Development) at Fort William on behalf of the Applicant, to accompany a formal Environmental Impact Assessment (EIA). The assessment has been undertaken by Susan Irwine, CMLI and Samuel Hammersley BSc (Hons) MLA.

6.1.2 This assessment defines the existing landscape and visual baseline environments; assesses their sensitivity to change; describes the key landscape and visual related aspects of the Proposed Development; describes the nature of the anticipated change upon both the landscape and visual environments; assesses the effects during construction; the period following completion prior to the maturing of mitigation planting (short- to medium-term) and once the mitigation planting is mature (long-term).

### *The Site and Proposals*

6.1.3 The site is located within the boundary of the Lochaber Smelter which is approximately three kilometres north-east of Fort William town centre. The Proposed Development sits within a planning area of 25 hectares (ha) with a development footprint of 3.7 ha.

6.1.4 The site is in an area immediately adjacent to other existing large-scale development comprising retail, business and industrial uses with the A82 and West Highland railway line running alongside the site, to the west.

6.1.5 Drawing 6.1 - Site Context places the Proposed Development within its local context.

6.1.6 The site is located on low ground to the east of the head of Loch Linnhe and lies between the mouths of the River Lochy and the River Nevis. The ground rises steeply to the east and south-east towards Ben Nevis and the adjacent hills.

6.1.7 The long-distance route West Highland Way runs south from Fort William along Glen Nevis before rising through Nevis Forest and the hills that separate Glen Nevis and Loch Linnhe, before continuing approximately 161 km (100 miles) south to Milngavie, near Glasgow. The Great Glen Way, another long-distance walking route and the Glen Glen Canoe Trail follow the Caledonian Canal and the adjacent River Lochy along the forested river valley to the north, to Inverness.

6.1.8 To the west, Loch Linnhe enters The Narrows where it becomes Loch Eil. The ground rises on both sides of Loch Eil with the northern side containing notably more forestry than the south.

6.1.9 The area of ground for the Proposed Development is not currently used. It is irregular in shape, bounded to the south by peatland/bog, to the east by the existing Smelter buildings, to the north by a track and the west by the footprint of the former carbon factory. The site, itself, comprises peatland, with recorded peat depths ranging from approximately 0.2 m to 6.0 m (although generally less than 3.0 m).

6.1.10 The Proposed Development is located adjacent to the existing Smelter. Constructed in the 1920s, the Smelter produces aluminium by electrolysis of refined ores; the ore is melted then electrolysed using graphite anodes. The main activities on the site are:

- hydro-electric power generation;
- raw materials delivery, handling and storage;
- cast iron rodding of anodes and cathodes;

- aluminium smelting (electrolysis);
- aluminium casting; and
- waste handling and management.

6.1.11 The existing Smelter is primarily operated via the on-site hydroelectric power station. The water supply for power generation is drawn from Loch Treig and Laggan Reservoir and the water released from the powerhouse is collected in the 'Tail Race', which emerges in a cutting on the north west side of the landfill and ultimately discharges to the River Lochy approximately 600 m north-west of the Smelter.

6.1.12 A full description of the Proposed Development is set out in chapter 3. The main characteristics can be described as follows:

- Size and design – 12,245 $m^2$ building and 3.69 ha of developed land surrounding the building.
- Building length – 185 m.
- Building width – 75 m.
- Building height – Saw-tooth style roof 16.1 m to the lowest point and 19.3 m to the highest point.
- The three extract chimneys / stacks are to be located to the roof valleys. The stacks require to be approximately 3.5 m above where the stack penetrates the roof. This will place the top of the stacks at a height of circa 19.8 m.
- The main process which will be carried out in the building is the melting and casting of primary aluminium (from the Smelter) and secondary aluminium (transported to site) to produce billets of various specifications, sizes and lengths.
- The facility will include a casting pit of approximately 25 m in depth and 7 m by 7 m wide, secondary metal storage areas, fume abatement systems, melting furnaces and auxiliary plant equipment.
- A hard standing area (approximately 10,200 $m^2$) to the south of the Proposed Development, is proposed to store the final products for transportation.
- A new access road.
- Required drainage and Sustainable Urban Drainage System (SuDS).
- Landscaping and planting – primarily associated with reinstatement of disturbed ground and the SuDS pond.
- Liquified natural gas (LNG)/ synthetic natural gas (SNG) gas storage infrastructure.
- Oxygen, Nitrogen and Argon systems.

6.1.13 The manufacture of the billet itself involves the following operations/processes:

- an area which will include a rotary furnace and melting furnace;
- holding furnaces;
- a fume gas treatment plant;
- launder system;
- vertical casting machine;
- homogenising furnace;
- log entry system; and
- ultrasonic inspection station.

6.1.14 Whilst the Smelter operates 365 days of the year, the Proposed Development is anticipated to operate on average 330 days a year.

6.1.15 Access to the site will be gained from the A82. Traffic movements are considered in chapter 9.

6.1.16 The existing operation of the Smelter has been taken into account as part of the Baseline information and in the assessment of the Proposed Development.

### *The Study Area*

6.1.17 The extent of the study area for the Proposed Development has been defined by the visual envelope of the Proposed Development and the anticipated extent of visibility arising from the development itself, based on the Zone of Theoretical Visibility (ZTV) study. In this case a study area of 10 km has been proposed, as agreed with the planning authority for the previously consented alloy wheel plant (Application ref. 17/0502/FUL), which was on the same site. The Proposed Development building is smaller than the previous application and occupies significantly less site area. As such the 10 km radial study area is considered appropriate to cover all potential landscape and visual effects.

### *Report Structure*

6.1.18 This report is structured as set out in the EIA Report Table of Contents.

6.1.19 Supporting appendices have been prepared that supplement the sections regarding methodology, planning policy and baseline. The appendices are important to the assessment and should be read alongside this report.

## 6.2 Methodology

### *Overview*

6.2.1 *'Landscape and Visual Impact Assessment is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and people's views and visual amenity'.* (GLVIA 3, paragraph 1.1).

6.2.2 Paragraphs 2.20-2.22 of the guidance indicate that the two components (assessment of landscape effects, and assessment of visual effects) are *'related but very different consideration.'*

- The assessment method for this LVIA draws upon the established GLVIA3; An Approach to Landscape Character Assessment (Natural England, 2014), Landscape Institute Technical Information Note (LI TIN) 05/2017 regarding townscape character assessment; LI TGN 02/2019 Residential Visual amenity assessment (RVAA); LI Technical Guidance Note 06/19 Visual Representation of development proposals and other recognised guidelines.

6.2.3 The methodology is described in more detail in Technical Appendix 6.3.

### *Assessment Terminology and Judgements*

6.2.4 A full glossary is provided in Technical Appendix 6.1. The key terms used within this assessment are:

- Susceptibility and Value – which contribute to Sensitivity of the landscape or visual receptor.
- Scale, Duration and Extent - which contribute to the Magnitude of effect.
- Significance of Effect.

6.2.5 These terms are described in more detail below in Table 6.1 - Sensitivity of the Receptor, Table 6.2 - Landscape Value, Table 6.3 - Landscape and Visual Sensitivity and Tables 6.4 to 6.6 - Magnitude of Effect.

*Table 6.1 - Sensitivity of the Receptor*

| Susceptibility indicates the ability of a landscape or visual receptor to accommodate the Proposed Development *'without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.'* (GLVIA3, para. 5.40). | |
|---|---|
| High | Undue consequences are likely to arise from the Proposed Development |
| Medium | Undue consequences may arise from the Proposed Development |
| Low | Undue consequences are unlikely to arise from the Proposed Development |

6.2.6 Susceptibility of landscape character areas are influenced by their characteristics and are frequently considered (though often recorded as 'sensitivity' rather than susceptibility) within documented landscape character assessments and capacity studies.

6.2.7 Susceptibility of designated landscapes is influenced by the nature of the special qualities and purposes of designation and/or the valued elements, qualities or characteristics, indicating the degree to which these may be unduly affected by the development proposed.

6.2.8 Susceptibility of accessible or recreational landscapes is influenced by the nature of the landscape involved; the likely activities and expectations of people within that landscape and the degree to which those activities and expectations may be unduly affected by the development proposed.

6.2.9 Susceptibility of visual receptors is primarily a function of the expectations and occupation or activity of the receptors (GLVIA 3rd version, paragraph 6.32).

*Table 6.2 - Landscape Value*

| Landscape *Value* is *'the relative value that is attached to different landscapes by society'* (GLVIA3, page 157).Landscape *Value* is *'the relative value that is attached to different landscapes by society'* (GLVIA3, page 157). | |
|---|---|
| **National / International** | Designated landscapes which are nationally or internationally designated for their landscape value. |
| **Local / District** | Locally or regionally designated landscapes; also, areas which documentary evidence and/or site observation indicates as being more valued than the surrounding area. |
| **Community** | 'Everyday' landscape which is appreciated by the local community but has little or no wider recognition of its value. |
| **Limited** | Despoiled or degraded landscape with little or no evidence of being valued by the community. |

*Table 6 3 - Landscape and Visual Sensitivity*

| **Sensitivity** | | | | |
|---|---|---|---|---|
| **Landscape Sensitivity** | | | | |
| | | **Susceptibility** | | |
| | | **High** | **Medium** | **Low** |
| **Value** | **National/International** | High | High-Medium | Medium |
| | **Local/District** | High-Medium | Medium | Medium-Low |
| | **Community** | Medium | Medium-Low | Low |

| | | | | |
|---|---|---|---|---|
| | **Limited** | Low | Low-Negligible | Negligible |
| **Visual Receptor Sensitivity** | | | | |
| | | **Susceptibility** | | |
| | | **High** | **Medium** | **Low** |
| **Value** | **National/International** | High | High-Medium | Medium |
| | **Local/District** | High-Medium | High-Medium | Medium |
| | **Community** | High-Medium | Medium | Medium-Low |
| | **Limited** | Medium | Medium-Low | Low |

6.2.10 Sensitivity is assessed by combining the considerations of susceptibility and value described above. The differences in the tables reflects a slightly greater emphasis on value in considering landscape receptors, and a greater emphasis on susceptibility in considering visual receptors.

6.2.11 For visual receptors, susceptibility and value are closely linked - the most valued views are also likely to be those where viewers expectations will be highest. The value attributed relates to the value of the view, e.g., a National Trail is nationally valued for access, not necessarily for the available views.

*Table 6.4 -Magnitude of Effect – Scale of Effect*

| *Scale of effect is assessed for all landscape and visual receptors and identifies the degree of change which will arise from the development.* | |
|---|---|
| **Large** | Total or major alteration to key elements, features, qualities or characteristics, such that post development the baseline will be fundamentally changed. |
| **Medium** | Partial alteration to key elements, features, qualities or characteristics, such that post development the baseline will be noticeably changed |
| ***Scale of effect is assessed for all landscape and visual receptors and identifies the degree of change which will arise from the development.*** | |
| **Small** | Minor alteration to key elements, features, qualities or characteristics, such that post development the baseline will be largely unchanged despite discernible differences. |
| **Negligible** | Very minor alteration to key elements, features, qualities or characteristics, such that post development the baseline will be fundamentally unchanged with barely perceptible differences |

*Table 6.5 - Magnitude of Effect – Duration of Effect*

| **Duration of effect is assessed for all landscape and visual receptors and identifies the time period over which the change to the receptor as a result of the development will arise.** | |
|---|---|
| **Permanent** | The change is expected to be permanent and there is no intention for it to be reversed. |
| **Long-term** | The change is expected to be in place for 10-25 years and will be reversed, fully mitigated or no longer occurring beyond that timeframe. |
| **Medium-term** | The change is expected to be in place for 2-10 years and will be reversed, fully mitigated or no longer occurring beyond that timeframe. |
| **Short-term** | The change is expected to be in place for 0-2 years and will be reversed, fully mitigated or no longer occurring beyond that timeframe. |

6.2.12 Most effects will be Long term or Permanent; however, Medium or Short-term effects may be identified where mitigation planting is proposed, or local factors will result in a reduced duration of effect (for example where maturing woodland will screen views in future). The effects arising from the construction of the development will usually be Short term.

*Table 6.6 - Magnitude of Effect – Extent of Effect*

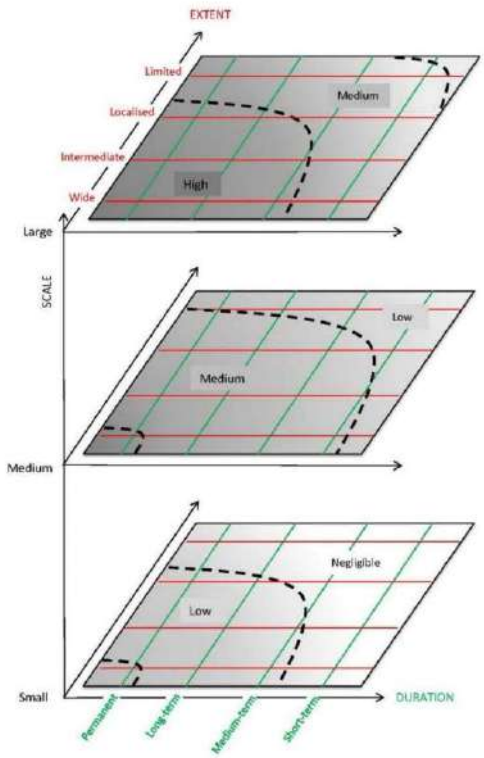
| Extent of effects is assessed for all receptors and indicates the geographic area over which the effects will be felt. | |
|---|---|
| Wide | Beyond 4 km, or more than half of receptor. |
| Intermediate | Up to approx. 2-4 km, or around half of receptor area. |
| Localised | Site and surroundings up to 2 km, or part of receptor area (up to approx. 25%). |
| Limited | Site, or part of site, or small part of a receptor area (< approx. 10%). |

6.2.13 Note: The generic method uses the terminology 'magnitude of impact' or magnitude of change to define the environmental impact of the proposed development. Judgements about 'magnitude of impact' are combined with judgements about receptor sensitivity to determine the overall classification of effects. The landscape and visual methodology use the terminology 'magnitude of effect' to define the environmental impact of the proposed development. Judgements about 'magnitude of effect' are combined with judgements about receptor sensitivity to determine the overall significance of effect.

6.2.14 Guidelines for Landscape and Visual Impact Assessment (3rd edition) specifically uses the term 'magnitude of effect' which is defined as the 'nature of the effect likely to occur' and is determined by combining judgements about scale of effect; extent of effect; and duration of effect.

6.2.15 The magnitude of effect is informed by combining the scale, duration and extent of effect. Figure 6.1 illustrates the judgement process.

*Figure 6.1 - Magnitude of Effect*



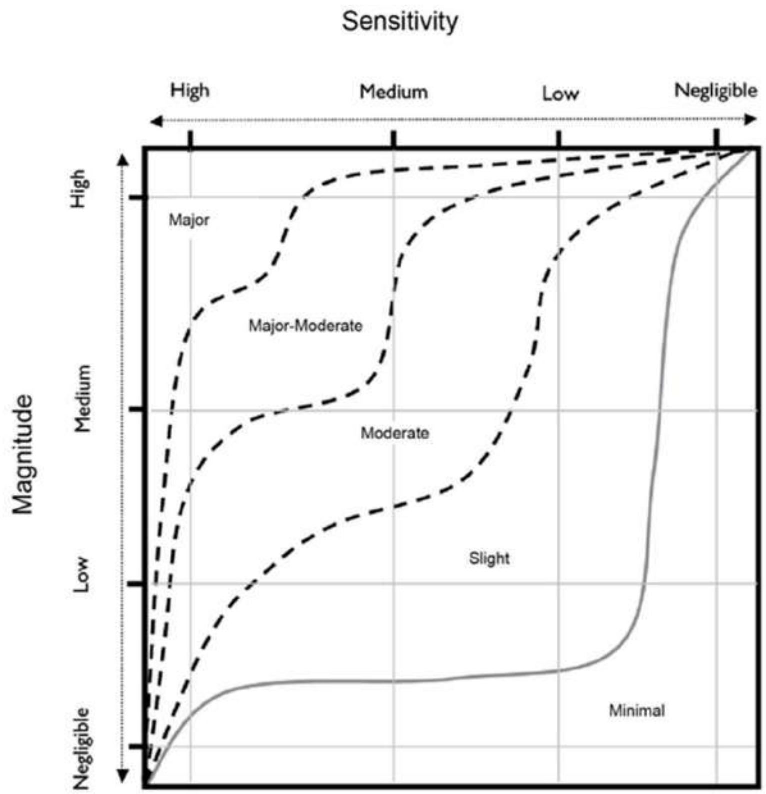

6.2.16 As can be seen in Figure 6.1, scale (shown as the layers of the diagram) is the primary factor in determining magnitude; most of each layer indicates that magnitude will typically be judged to be the same as scale but may be higher if the effect is particularly widespread and long lasting, or lower if it is constrained in geographic extent or timescale.

6.2.17 Where the scale of effect is judged to be negligible the Magnitude is also assumed to be negligible and no further judgement is required.

### Significance

6.2.18 Significance indicates the importance or gravity of the effect. The process of forming a judgement as to the degree of significance of the effect is based upon the assessments of magnitude of effects and sensitivity of the receptor to come to a professional judgement of how important this effect is. This judgement is illustrated in Figure 6.2.

*Figure 6.2 - Significance*




6.2.19 The significance ratings indicate a 'sliding scale' of the relative importance of the effect, with major being the most important and minimal being the least. Effects that are towards the higher level of the scale (major) are those judged to be most important, whilst those towards the bottom of the scale are "of lesser concern" (GLVIA, 3rd edition, para 3.35).

6.2.20 Where intermediate ratings are given, e.g. "moderate-slight", this indicates an effect that is both less than moderate and more than slight, rather than one which varies across the range. In such cases, the higher rating will always be given first; this does not mean that the impact is closer to that higher rating but is done to facilitate the identification of the more significant effects within tables. Intermediate judgements may also be used for judgements of Magnitude.

**Description of Significance of Effects**

6.2.21 Significance of Effects are defined as adverse, neutral or positive. Neutral effects are those which overall are neither adverse nor positive but may incorporate a combination of both.

6.2.22 The decision regarding the significance of effect and the decision regarding whether an effect is beneficial or adverse are entirely separate. For example, a rating of major and Positive will indicate an effect that was of great significance and on balance positive, but not necessarily that the proposals will be extremely beneficial.

6.2.23 Whether an effect is Positive, Neutral or Adverse is identified based on professional judgement. GLVIA 3rd edition indicates at paragraph 2.15 that this is a "particularly challenging" aspect of assessment, particularly in the context of a changing landscape.

## *Cumulative Assessment*

6.2.24 Cumulative assessment relates to the assessment of the effects of more than one development.

6.2.25 Developments that are subject to a valid planning application are included where specific circumstances indicate there is potential for cumulative effects to occur, with progressively decreasing emphasis placed on those which are less certain to proceed. Typically, operational and consented developments are treated as being part of the landscape and visual baseline. i.e. it is assumed that consented schemes will be built.

6.2.26 A new Water Canning Plant on the Smelter site is proposed which will be covered by a separate planning application. It is anticipated that the building will be approximately 66 m length by 24 m width and height of 7 m to the eaves and 11 m to the ridgeline. As it is possible that this will be constructed before the Proposed Development, it has been included as part of the assessment.

6.2.27 In addition, for this LVIA, the potential erection of a new steel framed, pvc clad boat shed, new slipway, improvements to existing slipway and construction of a new floating pontoon at Corpach, Fort William (Planning Application Reference: 16/03377/FUL) will be taken into consideration for the cumulative assessment.

### *Residential Amenity*

6.2.28 This LVIA does not include a separate residential amenity assessment. It is considered that the effects resulting from the Proposed Development will fall below the Residential Visual Amenity Threshold referred to in LI TGN 02/2019 as visual effects '*of such nature and / or magnitude that it potentially affects* "*living conditions2 or Residential Amenity'.* The guidance note further indicates that *'It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence as a result of introducing a new development into the landscape. In itself this does not necessarily cause particular planning concern. However, there are situations where the effect on the outlook / visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before.'*

### *Distances*

6.2.29 Where distances are given in the assessment, these are approximate distances between the nearest part of the site and the nearest part of the receptor in question, unless explicitly stated otherwise.

### *Assumptions and Limitations*

#### Desk-study & Fieldwork

6.2.30 The baseline conditions of the Proposed Development and the surrounding landscape described in the subsequent sections, has been informed by desk-study and fieldwork (the latter undertaken in February 2021).

The ZTV study (Drawings 6.5 - Bareground ZTV and 6.6 - Woodlands and Settlements ZTV) has been produced and used as a tool to inform the professional judgements made in this LVIA. The ZTV study has been modelled on the worst-case scenario of the maximum building height of 19.3 m, with three chimneys, as detailed by the architect, at 19.8m tall.

## 6.3 Planning Policy

### *National Planning Policy*

6.3.1 Relevant national planning policy is set out in Technical Appendix 6.4.

### *Local Planning Policy*

6.3.2 The site lies within the Scottish Highlands, in the administrative area of The Highland Council (THC). Current local planning policy is described in the following adopted documents:

- Highland-wide Local Development Plan (HwLDP), as continued in force, April 2012;

- West Highland and Islands Local Development Plan (WestPlan) adopted September 2019; and
- Relevant Supplementary Guidance.

### Highland-wide Local Development Plan (2012)

6.3.3 Policies of relevance to this LVIA are outlined below:

6.3.4 **Policy 28 – Sustainable Design** (abbreviated to focus on matters relevant to this chapter) states that:

*'The Council will support developments which promote and enhance the social, economic and environmental wellbeing of the people of Highland.*

*Proposed Developments will be assessed on the extent to which they [inter alia]:*

- *impact on individual and community residential amenity; and*
- *impact on the following resources, …, particularly within designated areas:*
    - *landscape;*
    - *scenery.*
- *demonstrate sensitive siting and high-quality design in keeping with local character and historic and natural environment and in making use of appropriate materials.*

*Developments which are judged to be significantly detrimental in terms of the above criteria will not accord with this Local Development Plan. All development proposals must demonstrate compatibility with the Sustainable* Design Guide: Supplementary Guidance, which requires that all developments should:

- *conserve and enhance the character of the Highland area; and*
- *minimise the environmental impact of development.*

*Developments that will have significant adverse effects will only be supported if no reasonable alternatives exist, if there is demonstrable over-riding strategic benefit or if satisfactory overall mitigating measures are incorporated.'*

6.3.5 Effects on landscape, scenery and character are considered in section 6.6. Details how the siting and design has responded to minimise environmental impacts on landscape and visual receptors.

6.3.6 **Policy 51 –Trees and Woodland** and **Policy 52 Principle of Development in Woodland** which sets out policy intentions to protect existing trees, woodland and hedges; and requirements for new planting to compensate or enhance vegetation cover as part of development proposals.

6.3.7 These policies also refer to Supplementary Guidance 'Trees, Woodland and Development' (adopted 2013), and the Highland Forest and Woodland Strategy 2018. These matters are discussed in section 6.4.13.

6.3.8 **Policy 57 Natural, Built and Cultural Heritage** sets out a hierarchy of protection for features of local/regional importance, national importance and international importance, referring to Technical Appendix 2 of the Local Plan, which provides the following list for landscape and visual receptors:

- International importance – there no landscape designations of international importance within the study area.
- National Importance – Tree Preservation Orders; inventoried Gardens and Designed Landscapes; National Scenic Areas; inventoried Ancient Woodland and Long-Established Semi- Natural Woodland; National Park.
- Local/regional importance – Local Landscape Area (previously Special Landscape Area), areas designated as Settlement Setting; inventoried Long Established

Plantation Origin Woodland and Other Woodlands on Roy Maps; Amenity trees/woodlands; Views over Open Water; Wild Land Areas.

6.3.9 The policy also sets out the intent to develop Supplementary Guidance in respect of Wild Land which has now been fulfilled in NatureScot's 'Assessing Impacts on Wild Land Areas – Technical Guidance' published in September 2020.

6.3.10 The following receptors will not be affected by the proposals:

- Tree Preservation orders – there are none within the site;
- National Park – the nearest National Park is outwith the 10 km study area;
- Inventoried Gardens and Designed Landscapes – none within the 10 km study area;
- Views over Open Water – these are none designated within the 10 km study area;
- Local Landscape Area (previously defined as Special Landscape Area) – there are none within the 10 km study area;
- Settlement Setting – these are not designated in respect of Fort William in the WestPlan;
- Inventoried woodlands – there are none within the site; and
- Amenity trees/woodlands – there are none designated within the site.

6.3.11 The remainder of the receptors identified above (National Scenic Area and Wild Land Areas) are considered.

6.3.12 **Policy 61 Landscape** states that:

*'New developments should be designed to reflect the landscape characteristics and special qualities identified in the Landscape Character Assessment of the area in which they are proposed. This will include consideration of the appropriate scale, form, pattern and construction materials, as well as the potential cumulative effect of developments where this may be an issue. The Council would wish to encourage those undertaking development to include measures to enhance the landscape characteristics of the area. This will apply particularly where the condition of the landscape characteristics has deteriorated to such an extent that there has been a loss of landscape quality or distinctive sense of place. In the assessment of new developments, the Council will take account of Landscape Character Assessments, Landscape Capacity Studies and its supplementary guidance on Siting and Design and Sustainable Design, together with any other relevant design guidance.'*

6.3.13 Matters relating to landscape character and the landscape character assessment are considered in sections 6.6.5 and 6.6.20. There is no landscape capacity study of relevance to the Proposed Development and study area.

6.3.14 **Policy 78 Long Distance Routes** indicates that *'The Council, with its partners, will safeguard and seek to enhance long distance routes and their settings.'* Within the study area this includes the West Highland Way, Great Glen Way, National Cycle Network and Great Glen Canoe Trail; which are considered in sections 6.6.38 to 6.6.42 and shown on Drawing 6.1 - Site Context.

### West Highland and Islands Local Development Plan (2019)

6.3.15 This document provides locally specific policies for the study area and the settlement of Fort William. The site lies within the Fort William settlement boundary but has no allocations or designations of relevance. The '**Placemaking Priorities – Fort William**' indicates that:

*'Fort William's industrial employers have good reason to remain in their current locations where they can best benefit from the resources of the physical environment. The Plan should enable in situ expansion of these enterprises. For example, diversification of the range of industrial processes at the Smelter together with increased loading capacity at Corpach quayside (including industrial buildings, land and lay-down space surrounding the BSW Sawmill) are critical components of the*

*Plan. All associated housing requirements will be strongly supported to secure the availability a range of housing options to attract and retain a skilled workforce.*

*Recent and expected future investment at the Smelter will result in a step-change in employment opportunities within Fort William and the wider Lochaber area. In the short term, the Plan should maximise the opportunities resulting from such growth but also safeguard land to accommodate its implications. Beyond the initial 5-year Plan period, additional land and investment will be needed and the Council and other relevant stakeholders are formulating a future vision document, Fort William 2040: Development and Assets which will signpost and coordinate the future investment intentions of a range of public and private agencies necessary to achieve the Plan's outcomes and priorities.'*

6.3.16 And the intent to:

*'Safeguard, through appropriate siting and design, areas protected or otherwise important for nature conservation or landscape qualities.'*

6.3.17 The site is identified as part of the industrial land use area 'FW25: Aluminium Smelter and Adjoining Land' under the plan with related policy setting out the following 'developer requirements' (abbreviated to focus on matters specifically related to this assessment):

*'Development in accordance with planning permission 17/05202/FUL. Alternative or additional proposals require the developer to prepare masterplan/developer brief which must address the following: … Additional landscape tree planting, potential to retain woodland for screening and to aid site integration with the green network; … Landscape and Visual Impact Assessment and high-quality siting and design that will avoid adverse impacts on the special qualities of the Ben Nevis and Glencoe NSA and principal Glen Nevis public viewpoints…'.*

### Local Guidance

6.3.18 In addition to the policy documents identified above, the relevant local guidance documents are as follows:

- Trees, Woodland and Development: Supplementary Guidance, adopted 2013;
- Highland Forest and Woodland Strategy, 2018;
- NatureScot Landscape Character Assessment, 2019; and
- Special Qualities of the National Scenic Areas: Ben Nevis and Glen Coe (Scottish Natural Heritage (now NatureScot), 2010).

6.3.19 These form part of the documented baseline and are reviewed in section 6.4, with accompanying commentary on the implications for the development siting and design and the assessment methodology, as appropriate.

## 6.4 Baseline

### Introduction

6.4.1 The Proposed Development, located within the boundary of the Lochaber Smelter, is situated approximately three kilometres north-east of Fort William town centre.

6.4.2 The site itself currently comprises a combination of woodland, scrub and peat moorland. In 2018 tree removal was undertaken to allow access for archaeological assessment work. An initial site strip to ground level was carried out, clear felling approximately 1.1 ha of conifer and scrub birch and approximately 1.6 ha of predominantly birch scrub has been mulched to ground level. Stump and root removal will occur as part of the future piling and site levelling works.

6.4.3 Significant groups of mixed birch and pine trees remain, surrounding the site. Although they do not completely screen the Smelter site, they do break up views reducing the massing of the buildings providing a continuity of tree groups which separate the various forms of built development in the local area.

6.4.4 The immediate context of the site is dominated by large scale industry, including the adjacent Smelter, with surrounding areas being a mix of business, industrial and retail uses to the west and north, and the majority of the land from the south-west to the north characterised by the settlements of Fort William and Corpach. Outdoor tourism and sports feature along Glen Nevis to the south, and in areas to the north-east along the A82. This active human landscape and townscape is dominated by the lochs, hills and mountains which separate and contain the lowland areas.

6.4.5 The site is not located within a 'sensitive area' as defined in Regulation 2(1) however it is directly adjacent to the Ben Nevis and Glen Coe National Scenic Area (NSA) and the Ben Nevis Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC). The site also overlies the areas defined by Historic Environment Policy Scotland (HEPS), 2019 for two inventory historic battlefield sites: Inverlochy I and II. Any connectivity between the Proposed Development and these designations are considered in 6.6.44.

6.4.6 Three wild land areas (13, 14 and 18 as described in sections 6.4.65 to 6.4.67) lie within the 10 km study area, with the ZTV study indicating potential limited areas of visibility approximately 4 km or more from the site. Effects on the Wild Land Areas will be assessed in line with NatureScot Guidance Note 'Assessing Impacts on Wild Land Areas – Technical Guidance', 2020.

6.4.7 Local Landscape Area (LLA) is the name used for the local landscape designation. Previously, names included Special Landscape Area and Area of Great Landscape Value.

6.4.8 The nearest LLAs (previously referred to as a Special Landscape Areas) are Ardgour to the southwest of the site and Loch Lochy and Loch Oich to the north-east. Both of these areas lie outside the 10 km study area and the preliminary ZTV indicates no potential visibility of the Proposed Development.

6.4.9 The locations of the landscape designations are indicated on Drawing 6.2 - Policy Context.

6.4.10 An overview of the baseline study results is provided in this section with the full baseline description of the individual landscape and visual receptors being provided alongside the assessment in Section 6.5 for ease of reference.

6.4.11 This section provides a review of the key local guidance documents and identifies those landscape and visual receptors which merit detailed consideration in the assessment of effects, and those which are not taken forward for further assessment as effects '*have been judged unlikely to occur or so insignificant that it is not essential to consider them further*' (GLVIA3, para. 3.19).

6.4.12 Both this baseline section and the effects section describe townscape/landscape character and visual receptors before considering designated landscape. It is common for designations to encompass both character and visual considerations within their special qualities or purposes of designation. It therefore makes a more natural reading sequence to draw together those aspects of character and views which relate to the designation if they have been described earlier in the chapter.

### *Key Local Guidance Documents*

6.4.13 The following guidance documents provide advice relevant to this assessment, as follows:

#### Trees, Woodland and Development: Supplementary Guidance, adopted 2013

6.4.14 This document provides guidance in respect of proposals for woodland or tree removals, planting and management.

6.4.15 The guidance sets out that woodland removals should be avoided or minimised where possible, and that compensatory planting may be required in the events of removals being a necessary part of a development.

6.4.16 The document also sets out a requirement for larger developments to benefit from advice from Forestry Consultants and/or Landscape Architects in development Landscape and Forestry Plans, in terms of both spatial planning and planning for future management of the woodland and landscape resource.

6.4.17 However, as described in section 6.4.2, some woodland removal has already been carried out to discharge the requirements of Planning Conditions 17 and 18 of Planning Permission Ref: 17/05202/FUL, which formed part of the pre-commencement site clearance and tree protection for the AWP.

6.4.18 The mitigation section of this LVIA will determine whether compensatory planting will be required.

**Highland Forest and Woodland Strategy, 2018**

6.4.19 This document sets out a vision and spatial strategy for woodland and forestry within Highland. Section 4 highlights the role of woodlands and forest within the landscape, noting that: *'a significant proportion of landscapes that are designated as National Scenic Areas (NSA) and Special Landscape Areas (SLA) identify woodlands as being part of their special qualities.'* It further recognises Wild Land Areas (WLAs) and provides aims for managing the effects on these areas.

6.4.20 Section 6 and the Policy Map of the strategy identify policy area and the level of opportunity for woodland expansion. These are set at a broad scale so lack precisely defined boundaries at the site level, but the site falls close to the boundaries of the 'Urban Areas', 'Existing Woodland' and 'Potential with Sensitivities'.

**NatureScot Landscape Character Assessments, 2019**

6.4.21 This document provides the landscape character assessment for the study area and is considered in sections 6.4.33 to 6.4.41.

**Special Qualities of the National Scenic Areas: Ben Nevis and Glen Coe (SNH, 2010)**

6.4.22 This forms part of a review of the Special Qualities of all the National Scenic Areas and the purpose of the review is described within the introduction to the study as follows:

*'The identification of the special qualities underpins the original reason for designating these areas and also provides a sound baseline for future work on the celebration, promotion and safeguarding of these outstanding landscapes. This national overview also provides a consistent basis for future consultation.'*

6.4.23 Special qualities are defined within the document as: *'" the characteristics that, individually or combined, give rise to an area's outstanding scenery" (SNH, 2008). Hence these special qualities underpin the reason for designation of an area as an NSA.'*

6.4.24 Within this assessment, these special qualities are used to describe and assess the effects upon the NSA as follows:

- In reviewing the baseline – to identify how the potentially affected areas of the NSA exhibit the special qualities and how susceptible those qualities are to the Proposed Development to inform a judgement about the susceptibility of the NSA.
- In determining effects to identify the magnitude of effect on each special quality to inform a judgement of effects on the NSA.

6.4.25 There are also a number of baseline landscape character studies which are considered in section 6.4.34 below.

### *ZTV Study*

6.4.26 A Zone of Theoretical Visibility (ZTV) study has been generated, based on the development proposals. These are shown on Drawing 6.5 – Bareground ZTV and Drawing 6.6 - Woodland and

Settlements ZTV and indicate areas of potential visibility. The analysis has been carried out using a topographic model both as a bare ground ZTV to show the maximum theoretical visibility taking into account topography only (Drawing 6.5 - Bareground ZTV) and including settlements and woodlands (with heights derived from NEXTMAP 25 surface mapping data) as visual barriers in order to provide a more realistic indication of potential visibility (Drawing 6.6 – Woodland and Settlements ZTV).

6.4.27 The ZTV study has been used to aid the identification of those receptors that are likely to be most affected by the Proposed Development and those which are unlikely to have visibility.

6.4.28 The ZTV for the Proposed Development (Drawing 6.6 – Woodland and Settlements ZTV) shows that potential visibility is mostly contained within two kilometres to the south and east of the site, extending out to five kilometres across rising ground beyond the lochs to the north-west and south-west. Nearby low-lying areas to the west are settled and well vegetated – views from within the settled areas will be limited to glimpsed views between or over buildings and trees.

6.4.29 Beyond 5 km, woodland and terrain combine to limit visibility, with the primary areas of visibility being from open areas of higher ground located north and north-west of the site, and some limited areas to the south, south-east and south-west.

6.4.30 Site observations have confirmed that vegetation and built form within the lower-lying areas of landscape and townscape will significantly reduce the extent of visibility of the Proposed Development, from that illustrated by the ZTV, such that visibility from settled areas and lower lying areas around the loch sides or within the Great Glen will be limited to occasional glimpsed and/or partial views. The more elevated areas have limited vegetation cover and visibility will largely match that shown by the ZTV study in these areas.

6.4.31 Effects on landscape or visual receptors outside the areas of visibility indicated by the ZTV will be negligible and are not assessed in detail.

### *Landscape Receptors*

6.4.32 A landscape ‘receptor’ is an element or assemblage of elements that will be directly or indirectly affected by the Proposed Development, such as vegetation features and physical areas. Through the combination of these landscape elements and features, there will be distinct characters, perceived and experienced differently by people.

#### Local Landscape Character

6.4.33 Paragraphs 5.13-5.15 of GLVIA, 3rd edition indicates that landscape character studies at the national or regional level are best used to “set the scene” and understand the landscape context. It indicates that Local Authority Assessments provide more detail and that these should be used to form the basis of the assessment of effects on landscape character – with (appropriately justified) adaptation, refinement and interpretation where required.

6.4.34 In respect of the study area, there is only one relevant landscape character assessment - NatureScot’s Landscape Character Assessment 2019 which forms part of the national dataset.

6.4.35 Landscape character types (LCT) within 10 km of the site are shown on Drawing 6.3 – Landscape Character. Consideration of the effects on the LCTs are reduced from the full 10 km as beyond five kilometres from the site, the addition of a new industrial building adjacent to a number of existing large industrial buildings of the same scale will have a negligible effect on character even in the limited areas where that change will be visible. The Landscape character types within 5 km of the site are:

- 233 – Mountain Massif - Lochaber (0.9 km south-east);
- 234 – Lochs with Settled Edges (contains site);
- 235 – Broad Forested Strath (1.4 km north-east); and

- 236 – Smooth Moorland Ridges (1 km south-west, 2.9 km west and 3.3 km north-west).

6.4.36 The site is situated in the Lochs with Settled Edges LCT which extends along the loch sides and slightly further inland towards the Great Glen.

6.4.37 The Mountain Massif - Lochaber character area rises to form Ben Nevis, starting from just beyond the site boundary.

6.4.38 Effects on these landscape character types are set out within section 6.6, with baseline description provided alongside the assessment of effects for ease of reference.

6.4.39 The following character areas are excluded from more detailed assessment on the basis that effects are likely to be negligible:

6.4.40 Broad Forested Strath LCT – this area is extensively forested and only two notable areas of visibility are identified on the ZTV study (Drawing 6.6 – Woodland and Settlements ZTV) – to the south of Torlundy, and within a larger more open area to the north of the A82.

6.4.41 The Smooth Moorland Ridges LCT is excluded from the more detailed assessment on the basis that effects are likely to be negligible due to the distance from the site and lack of intervisibility with the Proposed Development due to existing landform, settlement, forestry and tree groups.

### *Landscape Designations*

6.4.42 Landscape or natural heritage designations identify areas of the countryside that are significant due to their wildlife and/or scenery, and which are important for nature conservation and enhancement. The main national designations are based on formal statutory procedures which give the areas special management or protection. National designations are:

- Sites of Special Scientific Interest (SSSIs);
- National Parks;
- National Nature Reserves (NNRs);
- National Scenic Areas (NSAs); and
- Inventory of Gardens and Designed Landscapes.

6.4.43 National designations are sometimes overlaid by others originating from the European Union or international treaties, for example Special Protection Areas (SPAs), in recognition that a site has importance beyond Scotland.

6.4.44 In many places in Scotland, the scenery is highly valued locally. Local authorities often give these landscapes a local designation. Local Landscape Area (LLA), following Scottish Government policy, is the name used for the local landscape designation. Previous names include Special Landscape Area and Area of Great Landscape Value.

6.4.45 Local authorities also designate sites where certain policies apply, for example Local Nature Reserves (LNRs), regional parks and country parks.

6.4.46 Other important historic environment and landscape elements that are considered landscape receptors:

- Inventoried Gardens and designed landscapes – grounds consciously laid out for artistic effect.
- Inventoried Long Established Plantation Origin Woodland and Other Woodlands, Amenity trees/woodlands.

### *Visual Receptors*

6.4.47 Visual receptors are *'the different groups of people who may experience views of the development'* (GLVIA, 3rd edition, para 6.3). In order to identify those groups who may be significantly affected the ZTV study, baseline desk study and site visits have been used.

6.4.48 The different types of groups assessed within this report encompass local residents; people using key routes such as roads; cycle ways, people within accessible or recreational landscapes; people using Public Rights of Way; or people visiting key viewpoints. In dealing with areas of settlement, Public Rights of Way and local roads, receptors have been grouped into areas where effects might be expected to be broadly similar, or areas which share particular factors in common.

6.4.49 Representative viewpoints have been selected to assess the effects on visual receptors. In addition, specific viewpoints have been identified (see section 6.4.63) where there are key promoted viewpoints within the study area, or illustrative viewpoints to *'demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations'* (GLVIA, 3rd edition, para 6.19). The viewpoints were agreed via discussion with THC as part of the previous application for the AWP and have been used again due to the similarities between the developments. Relevant correspondence is included in Technical Appendix 6.7.

#### Visual Environment of Existing Site

6.4.50 As shown on Drawing 6.1 – Site Context, the site is located to the north-east of Fort William. From lower lying areas around the town and on the loch sides the site is rarely visible, and where it is seen, it is within glimpsed views which permit visibility either through or over trees and buildings. In such views, the site is typically seen as the long lines of the tops of buildings, seen over the trees within the site. The most visible element of the existing plant is the pair of pipes which descend Ben Nevis to provide water to the hydro power plant.

6.4.51 From the surrounding hills and mountains, the site is clearly seen, with views looking down over the site and onto the roofs of buildings. In views from Ben Nevis, the site is the closest built form at the foot of the slope, whereas in views from the west or north, it is seen beyond the rest of the town.

#### Visual Receptor Groups

6.4.52 The ZTV study (Drawings 6.5 – Bareground ZTV and 6.6 – Woodland and Settlements ZTV), indicates limited visibility from visual receptors beyond 5 km of the site. Main areas beyond this consists of areas of open moor and mountains where there are likely to be lower number of visual receptors. Given the nature of the proposals (i.e. an industrial building adjacent to other visible industrial buildings of a similar scale), it is judged that effects on these receptors are likely to be negligible, and they are not considered further; with the exception of the two key receptors of the Nevis Range resort and the summit of Ben Nevis.

6.4.53 The area is valued for recreation with Ben Nevis located to the southeast. Visitors to the mountain typically follow the primary walking routes, in particular the ascent from Achintee, but more adventurous walkers, runners and climbers access all parts of the mountain. An area of mountain bike trails within woodland lies to the north-east of the site, and beyond that is the Nevis Range resort which has panoramic viewpoints which can be visited via gondola.

6.4.54 Long distance recreational routes within the area include the West Highland Way which passes along Glen Nevis and ascends the sides of the Glen to the south of the site; and the Great Glen Way and Great Glen Canoe Trail which follow the Caledonian Canal to the north of the site. The sea locks and Neptune's Staircase lock flight are visitor destinations at the southern end of the Caledonian Canal. National cycle route 78 currently runs up the western wide of Loch Linnhe crossing at the passenger ferry before continuing north-east through the Great Glen.

6.4.55 Primary road and rail corridors also follow the valleys with the A82 running through the Great Glen past the site and through Fort William along the side of Loch Linnhe; the rail route following the same route but terminating at Fort William. The A830 runs westwards along the north side of Loch Eil and the A861 runs along the south side of Loch Eil and the west of Loch Linnhe.

6.4.56 As shown on Drawing 6.1 – Site Context, settlement within 5 km of the site consists primarily of the interconnected settlements of Fort William, Lochyside, Caol, Banavie and Corpach.

6.4.57 The following visual receptor groups are located within approximately 5 km of the site, as shown on Drawing 6.1:

- Claggan (community village, Fort William) – 0.3 km south-west.
- Inverlochy (residential area of Fort William) – 0.5 km west.
- Lochyside & Caol (residential area north of Fort William) – 0.9 km north-west.
- Banavie (residential area north of Fort William) – 2.3 km north.
- Corpach and Drumfada (residential areas west of Fort William) – 2.4 km north-west.
- Visitors to Ben Nevis ((summit) – recreational) – 5.6 km south-east.
- Witches cycle trails (recreational)– 2.7 km north-east.
- Nevis Range (recreational) – 5.5 km east.

6.4.58 The following groups will not be taken forward for detailed assessment, on the basis that visual effects are likely to be negligible, for the reasons indicated below:

- Banavie – Trees (not included in the ZTV study) in gardens and open spaces, including along roadsides and the canal, limit outward views such that the Proposed Development is unlikely to be seen, except perhaps for glimpsed views of the roofline from very limited locations. Viewpoint 8 shows a view from a slightly elevated point located near Banavie and inidicates limited visibility of the proposals.
- Visitors to Ben Nevis (summit) – Visibility from the summit of Ben Nevis will be prevented by intervening terrain, except for a very small area on a more difficult to access slope as indicated on Drawing 6.6 – Woodland and Settlements ZTV.
- Witches Cycle trails – With the exception of the bench located at viewpoint 5, which is situated to take advantage of an open view to the west, the cycle routes and paths largely pass-through forested areas and have little or no outward visibility in the direction of the site.
- Nevis Range – With the exception of very limited areas located at or near the panoramic viewpoints, visibility towards the site will be largely prevented by terrain. In views where it is seen the proposed building will be a distant element seen in a wide panorama and seen adjacent to other large buildings.

### *Key Routes*

#### Roads and Rail

6.4.59 The following main road and rail routes pass within the study area:

- A82 – 0.3 km north.
- A830 – 0.8 km north.
- A861 – 2.6 km west.
- West Highland Railway Line – 0.2 km north.

6.4.60 None of these will be taken forward for detailed assessment, on the basis that visual effects are likely to be negligible, for the reasons indicated below:

- A82 – The existing buildings are only briefly visible as the A82 passes the site – looking along the site entrance road. Works to alter the route and build new retail units, within the past three years, have involved some tree removals, but this has not resulted in views into the site being significantly opened up and views of the proposed building from the A82 (if they did arise) will be very limited and seen between the new retail buildings and above intervening trees. Viewpoint 1 looks down across the relevant stretch of the A82 and provides an indication of the screening between the road and the proposed new building.
- A830 – Whilst the ZTV Study indicates some theoretical visibility, the presence of trees (not included in the ZTV study) along roadsides limit outward views such that the proposals are unlikely to be seen by drivers using this busy route.
- A861 – The ZTV study indicates theoretical visibility of the proposed buildings to the south of the ferry crossing. Even at the nearest points of this route, the proposals will be seen as a roofline just above the trees within the site and seen beyond other buildings within Fort William. The presence of more nearby buildings will be more pronounced for areas further south than the ferry terminal, and visibility is broken by loch-side vegetation.
- West Highland Railway line – train passengers only have views to the side of the route, and not in front, which means that nearby objects are only briefly seen from a passing train. Given the proximity of the site to the railway and the fact that the route passes through trees as it passes the site, the Proposed Development is unlikely to be seen, except perhaps as a brief glimpse through trees (particularly in winter).

### Recreational Routes

6.4.61 The following long distance recreational routes lie within the study area:

- Great Glen Way – 0.5 km north-west.
- West Highland Way – 0.5 km south-est.
- Great Glen Canoe Trail – 2.4 km north.
- National Cycle Route 78 – 2.6 km west.
- Ben Nevis (path from Achintee House) – 1.8 km south.
- Ben Nevis (north car park route) – 2.2 km north-east.

6.4.62 The following routes will not be taken forward for detailed assessment, on the basis that visual effects are likely to be negligible, for the reasons indicated below:

- Great Glen Canoe Trail – The canoe trail runs north along the Caledonian Canal from Neptune's Staircase locks (viewpoint 8). The ZTV Study (Drawing 6.6 – Woodland and Settlements ZTV) indicates theoretical visibility from the canal for a small stretch to the south of Torcastle. However, this part of the canal is tree-lined, as is much of the rest of the route and canoeists within their canoes have a low eyeline in terms of outward views, so in practice are unlikely to be able to see views of the proposals at approximately 3.5 km distance.
- National Cycle Route 78 – This route follows the A861 through the study area (see above regarding A861).
- Ben Nevis (north car park route) - As shown by the ZTV study, the proposals will not be visible from this route apart from a very short stretch of the route immediately around viewpoint 5. In this view, the existing site is fully visible, and the existing buildings are closer to the viewer, which limits the effects arising from the proposals.

### *Specific Viewpoints*

6.4.63 The area is a popular visitor location and the following specific viewpoints (all panoramic viewpoints indicated on OS maps) are included within the assessment:

- Viewpoint 1, Primrose Hill – 0.4 km north-west.
- Viewpoint 6, Victoria Viewpoint, Nevis Range – 6.7 km east.
- Meall Beag, Nevis Range – 5.5 km east.

### *Landscape Designations and Value*

#### Designated Landscapes

6.4.64 The following designated landscapes lie within the study area:

- Ben Nevis and Glen Coe National Scenic Area – 0.3 km south-east.
- Wild Land Area 13: Moidart – Ardgour – 8.7 km south-west.
- Wild Land Area 14: Rannoch – Nevis – Mamores – Alder – 2.3 km south-east.
- Wild Land Area 18: Kinlochourn – Knoydart – Morar – 6.1 km north-wet.

6.4.65 NatureScot's 'Assessing Impacts on Wild Land Areas – Technical Guidance' advises that impacts on Wild Land Areas should be approached via a consideration of the Wild Land Qualities exhibited by each area, and the likely impacts on those qualities. The wild land areas listed above are excluded from the detailed assessment, on the basis that visual effects are expected to be negligible, for the reasons indicated below:

6.4.66 **Wild Land Area 14: Rannoch – Nevis – Mamores – Alder** – whilst this area lies quite close to the site, there will be very limited visibility of the proposals within 6 km as indicated by the ZTV study (Drawing 6.6 – Woodlands and Settlements ZTV), with only a small patch of visibility at Carn Dearg. Beyond 6 km, some larger areas of visibility arise, although these remain fragmented and at this distance, the Proposed Development will not impact on the qualities of the Wild Land Area.

6.4.67 **Wild Land Area 13: Moidart – Ardgour** – this area is located at some distance from the Proposed Development, which in the very limited area they will be visible (Drawing 6.6 – Woodlands and Settlements ZTV), will be seen looking over more nearby built form within Fort William. In this context, the proposals will not impact on the on the qualities of the Wild Land area.

6.4.68 **Wild Land Area 18: Kinlochourn – Knoydart – Morar** – this area is located at some distance from the proposals, which across the area they will be visible (Drawing 6.6 – Woodlands and Settlements ZTV), will be seen looking out across areas of built form within Caol and Lochyside and in between the existing buildings and the more extensive townscape of Fort William. In this context, the proposals will not impact on the qualities of the Wild Land area.

#### Local Landscape Value

6.4.69 The area around the site is well known for the valued landscape of Ben Nevis and attracts many visitors. The various national and local landscape designations provide a clear indication of the relative value of the landscapes within the study area (as set out within THC Planning policy 57) and have all been subject to relatively recent reviews.

6.4.70 Informed by this policy context, areas within the National Scenic Area (NSA) are assessed to be of National value; and Wild Areas are assessed to be of Local value. As set out within 6.3.10, the other valued factors listed under policy 57 are not relevant to this assessment, and the remaining study area is judged to be of Community value.

## 6.5 The Proposed Development

### *The Proposal*

6.5.1 The Proposed Development will comprise the following elements as described in more detail in chapter 3 and as set out in section 6.1.10. The main elements that influence the LVIA are:

- the Recycling and Billet Casting Facility building;
- new internal access roads;
- external building lighting and lighting to hardstanding area to the south; and
- new SuDS system, pond and associated planting.

### *Site Fabric*

6.5.2 A number of landscape features, comprising parts of the site's physical fabric, will be modified or removed, as follows:

- areas of scrub/rough grass, over and above areas of scrub and woodland previously removed;
- areas of peat moorland – excavated and reused / respread within the Smelter site;
- site levels generally.

### *Design approach in respect of landscape and visual matters*

6.5.3 The Highland Supplementary Design Guidance sets out the following guidance of specific relevance to landscape and visual effects:

- development should respect local character;
- the site, scale layout and design of the building should be considered in relation to its surroundings;
- where possible existing ground levels should be respected where to preserve natural contours and limit visual intrusion; and
- developments should minimise light pollution.

6.5.4 The design approach has been informed by the following key considerations in terms of the mitigation of landscape and visual effects:

- The form and alignment and height of the proposed building has been designed to follow the existing buildings on site and present a simple alignment of rooflines in views.
- The floor height of the proposed building is set as closely as feasible to existing ground levels (allowing for its necessary size and operational requirements).
- Proposed planting has been limited by:
  - internal access road servicing the proposed development, including access to the hardstanding area and SuDS pond to the south;
  - the presence of deep peat – where planting or any form of disturbance is not desirable (in line with SEPA guidance);
  - new SuDS pond – this has been designed with informal and varying edge gradients and water depth and includes a number of small islands. All of which allow for a varied and more natural planting regime leading to improved biodiversity and habitat opportunities;

- recognition of the advice in the Highland Forest and Woodland Strategy which indicates that towards the southern areas of the site and the NSA, planting should only be provided where required for necessary mitigation; and
- recognition that visual effects cannot be mitigated by planting for elevated views, and the only notable open views from lower-lying areas will be from Glen Nevis.

- Woodland planting and further tree planting within the site to compensate for previous felling, if required will be carried out by the Alvance Estate Team (Jahama Highland Estates).
- All lighting will be designed to meet the requirements of BS EN 12464-2:2014 and will use LED lamp technology. Light pollution will be minimised in terms of unnecessary spill of light both upwards, and horizontally beyond the area intended to be lit.
- Lighting to the south side of the building will be kept to the absolute minimum levels required for safe operation and maintenance of the plant in order to minimise the effects of lighting on the National Scenic Area.
- External lighting for maintenance areas to the west and south sides of the building will only be switched on when required for maintenance.
- Lighting on the building will be designed to be seen by site visitors rather than at a distance, will face downwards, and will not be included on the south side of the building.

6.5.5 All of the mitigation measures are inherent to the design, and no post-construction monitoring measures are proposed. Should planting be undertaken it will likely focus on providing amenity for site visitors; repair where existing woodlands have been damaged by spoil heaps or vehicles to the north of the proposed road; and planting in the southern area of the site to further break up visibility of the building in views from Glen Nevis.

### *Construction*

6.5.6 Construction is anticipated to be completed within 14 months of commencement. The earlier works of peat and wider site excavation will take place within the first three months and the shaft excavation will take place from months 3-6. The civil works on building foundations will take place from months 6-11 and the steel building erection from months 9-13.

6.5.7 The later stages will mostly consist of works inside the building and completion of smaller external elements such as the car parking and landscaping. The largest plant will be used during the earliest stages of the work. A mobile crane will be used to erect the frame of the building for approximately four to six months. It will require to be moved to different locations, but only raised as and when required for use.

## 6.6 Landscape and Visual Effects

### *Introduction*

6.6.1 This section sets out the effects that the Proposed Development will have on both landscape and visual receptors.

6.6.2 Magnitude of effects during construction will be Short term and temporary and seen in the context of the existing industrial site. Effects arising from the construction will be similar to the permanent effects in terms of landscape character and are not separately considered. Some localised Large and Medium scale effects will arise from views of the mobile crane, however, given the Short-term timescale, these effects will tend towards Low and negligible magnitude and are unlikely to be significant.

6.6.3 Magnitude of effects are also assessed during the period following completion when construction is complete.

6.6.4 All effects assessed, on completion, are considered to be Permanent.

### *Effects on Landscape Character*

6.6.5 The site lies near to one of the loch heads where the normally narrow landscape of the Lochs with Settled Edges opens out into a more expansive flat landscape at the foot of Ben Nevis. As the character area description notes, these wider areas permit greater built development – such as the housing and industry at Fort William including large scale industry such as the existing Lochaber Smelter and the timber yard at Corpach. The site itself is dominated by large scale industry, with surrounding areas being a mix of commercial and retail uses to the west and north. Residential areas are at Claggan and beyond, the more nearby commercial uses, to the west, north-west and southwest. Outdoor tourism and sports feature along Glen Nevis to the south, and in areas to the north-east along the A82. This active human landscape and townscape is dwarfed by the lochs, hills and mountains which separate and contain the lowland areas.

6.6.6 Magnitude of effects on landscape character will arise from two main aspects of the proposals:

- New internal access road – the road is not an atypical feature of this settled character area. Effects on character will be negligible.
- The proposed Recycling and Billet Casting Facility building - the existing Smelter buildings and the proposed building will be located adjacent to each other and the same orientation. This continuation of the form and orientation will have the result that magnitude of effects arising from the proposed buildings will primarily be 'more of the same' rather than the introduction of a new element. The visual footprint will also be similar. Areas where the new building will have greater influence on character than the existing smelters are located to the immediate south and southwest of the proposed building – where it will be notably closer than the existing buildings increasing the influence of the industrial buildings on the character. Effects to the west and north of the proposed building will be contained by the presence of vegetation within the site and the presence of the business park and commercial buildings in these directions.

6.6.7 Taking the above description of effects into account, no Large or Medium scale effects on landscape character will arise. Small scale effects on character will arise within the western and southern areas of the site and extend southwards along Glen Nevis to Achintee House (viewpoint 3) and up to approximately two kilometres from the building where channelled views along the Glen draw the eye towards the proposed building location. Beyond these areas, magnitude of effects will be negligible, including along the north edge of Cow Hill (in the vicinity of viewpoint 2) where despite proximity, the patchiness of visibility will mean that effects will not be extensive enough to alter the landscape character.

6.6.8 Descriptions for each of the assessed landscape character types are briefly summarised below, along with further observations from site-based work.

#### 233 – Mountain Massif – Lochaber Character Type (0.7 km south-east)

6.6.9 This character area is extensive, occupying the study area to the south and east of the site and extending beyond to encompass the ranges of peaks of Ben Nevis, Glen Coe and Glen Etive. The key characteristics are identified as:

- Grey craggy peaks of vast and imposing scale with sweeping concave slopes of steep, smooth rock faces which plummet into glaciated valleys.
- Strong visual force created by the slope profile and accentuated by tans of scree and bracken, which draws the eye up and down the slopes.

- Typical glacial forms such as aretes and corries within the hills, and moraine and erratics along the glen floors.
- Dense patches of coniferous woodland along the base and sides of the glens, often broken by brown plots of clear-felled forest.
- Deep rocky clefts within the hillside carved and highlighted by silvery burns and shadows, sometimes packed with birch trees, forming meandering mossy veins on the rock face.
- Glens affording a small-scale refuge from the vast mountainous masses and often containing roads, footpaths, settlement and picnic areas.
- Rivers along the glen floor that are wide and shingly near the mouth, steep and rocky higher up the glen; these are often highlighted by clumps of alder, rowan and birch.
- Single track roads, often with dead-ends, small bridges and stone dykes, concentrated along the small-scale glens; their scale provides a contrast to the experience of the vast scale of the landscape."
- Settlement is sparse comprising isolated farmhouses, outbuilding and bothies.
- The perception of this landscape is on of tremendous visual force, with steep, smooth rock faces that sweep down from summits into broad u-shaped glens such as Glen Nevis and Glen Coe.

6.6.10 No specific guidance is provided in relation to landscape sensitivities of direct relevance to this proposal, which lies outside of the character area. Given that the proposal is for a large-scale building, it is judged that the character area has a Medium susceptibility to impacts from development of this type and scale in adjacent lower-lying areas.

6.6.11 As set out within section 6.4.70, areas within the National Scenic Area are considered to be of National value - including most of this character area within the study area; whilst undesignated areas (including the area of forestry and cycle tracks to the east of the site within this character area) are judged to be of Community value.

6.6.12 Taking these considerations of susceptibility and value together, the part of the character area likely to be affected by the proposals (which lies to the south of the site) is assessed to have **high-medium** sensitivity to the Proposed Development.

6.6.13 Small scale effects will arise within the part of this character area 1-2 km south of the proposed building along Glen Nevis. These Permanent effects will arise across a Localised extent and will be of **low-negligible** magnitude, **slight** significance and, on balance**, adverse** due to the increased proximity of industrial scale buildings to the northern end of the Glen.

### 234 – Lochs with Settled Edges Character Type (includes site)

6.6.14 As shown on Drawing 6.3 – Landscape Character, this character area extends along the loch shores – extending beyond the study area to encompass Loch Eil, Loch Linnhe and Loch Leven. The key characteristics are identified as:

- 'Flat landscape contained between steep loch sides and open water.
- Extensive agriculture and settlement confined within a narrow loch side fringe; whose foreshore is subject to tidal influence.
- Loch heads and river mouths that permit more extensive farming and built development, including housing and small industrial estates.
- Communications confined to narrow loch edges where shingly beaches, rocky headlands, wooded banks and marshy platforms form a diverse water's edge.

- Extensive tracts of oak-birch woodland climbing from the loch side up into the foothills, often engulfing the settled edge and providing an enclosed micro landscape.
- Dense commercial forests descend to loch shore in some locations.
- Occasional policy grounds of big houses along the loch edge give rise to a proliferation of rhododendron and other ornamentals in some places, providing a lush and sheltered character.
- Linearly arranged crofting communities with vivid green croft fields contrast with the more subdued duller colours of surrounding hills.'

6.6.15 The site itself shows few of these varied characteristics being one of the wider areas of flat moorland, with industry and the adjacent mountain slopes being the dominant influences.

*6.6.16* The perception of the loch edge is described as 'generally small and diverse' and the guidance notes under the perception of this character type that *'loch heads are sensitive in visual terms where views are channelled down lochs and their glens to them. Given its narrow spatial extent within the glen, the settled edge has a strong influence both on landscape character and on one's experience of it. Buildings are often whitewashed, sometimes suburban in character, and stand out prominently against the hills and lochs and at night a string of lights seems to hang over dark loch waters. This landscape is frequently experienced amidst settlement when the detail and variety of built development along the loch edge is apparent and contrasts with the scale and homogeneity of the hillside and loch waters that enclose it. Views across the lochs to the opposite settled edges and hillsides above provide attractive visual detail.'*

6.6.17 No further guidance is provided and taking this into account it is judged that the character area has a High susceptibility to impacts from development of this type and scale.

6.6.18 As set out within section 6.4.70, areas of undesignated landscape, including this character area, are considered to be of Community value.

6.6.19 Taking these considerations together, the character area is assessed to have **medium** sensitivity to the Proposed Development.

6.6.20 As described above, Small scale effects will arise within the western and southern parts of the site extending to the edge of this character area 1 km south of the proposed building. These Permanent effects will arise across a Limited extent and will be of **negligible** magnitude, **minimal** significance and **neutral**.

### *Visual Effects*

#### Visual Aids

6.6.21 The method of visualisation selected for each viewpoint has been informed by Landscape Institute Technical Note 02/17 Visual representation. Viewpoints 1, 2, 3, 7, 8, 9 and 12 have been produced as photomontages and viewpoints 4, 5, 6, 10 and 11 are shown as photowires. These viewpoints have been selected as they include closer views in which vegetation will play a notable role in screening and/or are one of a pair or group where the appearance of the building will be similar to that in other viewpoints (i.e. viewpoints 9 and 11; viewpoints 4, 5 and 7).

6.6.22 The visualisations and photomontages are shown on Drawings 6.7 to 6.18 with the locations shown on Drawings 6.19 and 6.20.

- Drawing 6.7: Viewpoint 1 - Primrose Hill
- Drawing 6.8: Viewpoint 2 - Cow Hill
- Drawing 6.9: Viewpoint 3 - Achintee Road
- Drawing 6.10: Viewpoint 4 - Meall an t-Suidhe

- Drawing 6.11: Viewpoint 5 - Bench on North Face path
- Drawing 6.12: Viewpoint 6 - Sgurr Finniosgaig
- Drawing 6.13: Viewpoint 7 - Creag a Chail
- Drawing 6.14: Viewpoint 8 - Neptune's Staircase
- Drawing 6.15: Viewpoint 9 - Corpach Sea Locks
- Drawing 6.16: Viewpoint 10 - Trig point near Achaphubuil
- Drawing 6.17: Viewpoint 11 - Cemetery at Drumfada
- Drawing 6.18: Viewpoint 12 - West Highland Way
- Drawing 6.19: Viewpoint Locations 1 – 6
- Drawing 6.20: Viewpoint Locations 7 - 12

6.6.23 The method of visualisation has been informed by Landscape Institute Technical Guidance Note 06/19 – Visual Representation of Development Proposals and Visualisation Standards for Wind Energy Developments, THC, July 2016. Drawing on these technical guidance documents, the photowire visualisations are presented in the THC 50 mm panorama format (similar to Fig. 6 on page 8), and the photomontages in 75 mm single frame format (where this shows the entire development, or 50 mm otherwise) as illustrated by Drawings 10 and 12 of the guidance. Further detail on the visualisation methodology is provided in Technical Appendix 6.3.

6.6.24 The viewpoint description, description of effects and scale of effect for each viewpoint (Drawing 6.6 – Woodlands and Settlements ZTV) for an overview of locations) is set out on the relevant visualisation. The scale of effect at each viewpoint is summarised below in Table 6.7.

***Table 6.7 - Viewpoints – Scale of Effect***

| Viewpoint | Distance, direction | Scale of effect | Positive, Neutral, Adverse |
|---|---|---|---|
| VP01 – Primrose Hill | 0.3 km, NW | Medium | Neutral |
| VP02 – Cow Hill | 0.9 km, SW | Large-Medium | Adverse |
| VP03 – Achintee Road | 1.7 km, S | Small | Adverse |
| VP04 – Meall an t-Suidhe | 2.1 km, SE | Small | Neutral |
| VP05 – Bench on north face footpath | 2.2 km, NE | Small | Neutral |
| VP06 – Sgurr Finniosgaig | 6.6 km, E | Negligible | Neutral |
| VP07 – Creag a Chail | 1.6 km, SE | Medium-Small | Neutral |
| VP08 – Neptune's Staircase | 2.4 km, N | Negligible | Neutral |
| VP09 – Corpach Sea Locks | 3.1 km, NW | Negligible | Neutral |
| VP10 – Trig. Point near Achaphubuil | 3.6 km, W | Small | Neutral |
| VP11 – Cemetery at Drumfada | 4.2 km, NW | Negligible | Neutral |

| | | | |
|---|---|---|---|
| VP12 – West Highland Way | 3.6 km, S | Small | Neutral |

6.6.25 Each of the viewpoints is a 'sample' of the potential effects, representing a wide range of receptors – including not only those actually at the viewpoint, but also those nearby, at a similar distance and/or direction.

6.6.26 From these viewpoints it can be seen that:

- The extent of **large-scale** visual effects will be limited to within the site, where they will only be experienced by site workers and visitors.
- Outside the site, existing woodland and buildings around the site will often screen views, but effects of **large-medium** scale will arise where the building is seen in open elevated views within up to 1 km – such as Cow Hill and the lower-near slopes of Ben Nevis; and **medium** or **medium-small** scale within up to 2.5 km – affecting the slopes of Ben Nevis, channelled views from Glen Nevis and the panoramic viewpoint at Primrose Hill.
- Between 2.5 km and 4 km, the scale of effects will reduce to **small**, with the building increasingly seen at a distance in the context of the existing Smelter and townscape, such that effects will typically be **negligible** beyond approximately 4 km to 5 km.

### Visual Receptor Groups

6.6.27 This assessment focuses on effects on groups of visual receptors, incorporating effects on views from public spaces and streets within settlements (or around the houses in areas with isolated dwellings), and the routes and accessible landscape in the surrounding countryside. Residents and visitors within these communities are assessed to be of **high-medium** sensitivity. The assessment of effects on settlements focuses on the visual amenity of public spaces, though views from groups of dwellings will also be noted in the descriptions. Effects on private residential amenity are a separate matter, and only require assessment when a development is likely to have effects over the Residential Visual Amenity Threshold referred to in LI TGN 02/2019 (as set out within section 6.2.28). This not the case in respect of the Proposed Development.

6.6.28 **Claggan (0.3 km south-west)** - The proposed building will typically be screened by buildings and trees from Claggan and where it is seen will typically only be as the upper parts of the building seen through gaps over vegetation – often only in winter. The new building will also be seen, partly screened by the retained tree belt within the site, and alongside the existing smelter buildings from parts of the nearby sports pitch and from Achintee Road in glimpsed views as it passes the sports pitch.

6.6.29 Where the building is seen, the Permanent visual effects will be of Medium-Small scale and affect a Limited extent of the area resulting in effects of **Low** magnitude and **slight** significance. On balance, these effects will be **Adverse** as the building will be seen from a street where the existing buildings on site are not currently visible. Some local residents are also likely to have views of the proposed building from upstairs windows facing the site – mostly of the upper parts of the building above the retained trees.

6.6.30 **Inverlochy (0.5 km west)** – The proposed building will typically be screened by buildings and trees from Inverlochy, and where it is seen will typically only be as the top of the roofline seen through gaps. More open views are available from the park, car park and shopping area between Lundy Road and Locheil Road, however, even with the location of the play area on higher ground and availability of long views towards the site from the western end towards Montrose Avenue, the building is not likely to be visible from this area.

6.6.31 Where the building is seen, the Permanent visual effects will be of Medium-Small scale and affect a Limited extent of the area resulting in effects of **Low** magnitude and **slight** significance. On balance, these effects will be **Adverse** as the building will be seen from a key public space for the local community from where the existing buildings on site are not currently visible and there are currently attractive views of Ben Nevis. Local residents are also likely to have some views of the roofline of the proposed building from upstairs windows facing the site.

6.6.32 **Lochyside & Caol (0.9 km north-west)** – The proposed building is likely to be visible in long views looking southeast along Kilmallie Road and Clunes Avenue in Caol as these streets align directly towards the building. In these views, the building will be seen beyond and between the nearby buildings and trees. The proposed building will also be seen in between and looking over intervening vegetation in views from the B8006 in Lochyside between the railway and the A830.

6.6.33 Where the building is seen, the Permanent visual effects will be of Small scale and affect a Localised extent of the settlements resulting in effects of **Low** magnitude and **slight** significance. On balance, these effects will be **Adverse** as the building will be seen where the existing buildings on site are not currently visible, although Ben Nevis will remain the dominant form looking along the streets towards the site. Some local residents are also likely to have some views of the roofline of the proposed building from upstairs windows facing the site.

6.6.34 **Corpach and Drumfada (2.4 km north-west)** – The proposed building will be visible from the sea locks at Corpach (viewpoint 9), and, in winter, from a short stretch of the A830 as it passes through the village, but generally not from streets within Corpach as outward views towards the site are typically limited due to intervening buildings and trees. Drumfada is both more open and elevated and has less tree cover. Areas of green space near the top of Caledonian Road are likely to have some views of the proposals – similar to those shown for viewpoint 11 at the nearby cemetery.

6.6.35 Where the building is seen it will be visible alongside the existing plant and will be set behind existing woodland. The Permanent visual effects will be of negligible scale and affect a Localised extent of the settlements. The magnitude will be **negligible,** and no further assessment is required.

6.6.36 Drumfada residents are also likely to have views of the proposed building from windows facing the site, whilst this is likely to be less common from Corpach.

### *Key Routes*

#### Roads and Rail

6.6.37 As set out in sections 6.4.59 and 6.4.60 – effects on key road and rail routes are assessed to be negligible.

#### Recreational Routes

6.6.38 **Great Glen Way (0.5 km north-west)** – The Great Glen Way is a long-distance route which does not pass through any designated landscapes within the study area and tends to be enclosed rather than having valued outward views. Walkers using the route are assessed to be of High-Medium sensitivity.

6.6.39 The closest sections of the route, from Fort William past the site to Inverlochy, typically have buildings and trees in between the route and the site which will screen views of the development although glimpsed views are likely to arise in some locations, particularly in winter. As the route passes along the water's edge at Caol, views towards the site open up with distance, and the building is likely to be seen from here as a roofline above intervening trees and built form – in a similar way to the view from viewpoint 9 at Corpach Sea Locks. Passing away from the loch side and heading alongside the Caledonian Canal, views once again become enclosed, with viewpoint 8 at Neptune's Staircase representing one of the few views towards the site. Given the nature of this visibility pattern, the proposed building is only likely to be noticeable as occasional glimpsed views for walkers heading southwards towards Fort William. These Small-scale effects will arise for a limited extent of the route and will be of **negligible** magnitude, **minimal** significance and **neutral**.

6.6.40 **West Highland Way (0.5 km south-west)** – The West Highland Way enters the National Scenic Area to the south of the site as it leaves Fort William and offers views along and across the glen to Ben Nevis at various points along the route. Taking this into account, the value of views from this route is considered to be High, which combined with the High susceptibility of recreational walkers indicates High sensitivity.

6.6.41 As the route leaves Fort William along Glen Nevis it follows the road which is building, and tree lined. Outward views are limited, and visibility of the proposals is only likely to arise in the winter as glimpsed views from areas beyond the outskirts of the town. As the route leaves the road and ascends the western sides of the valley, more open views towards the site become available in places, in particular from the branch of the route which ascends from the café in Glen Nevis, and where localised felling has opened up views for approximately 1 km of the route near viewpoint 12. There are also presently more open areas around Dun Deardail Fort.

6.6.42 Given the nature of this visibility pattern, the proposed building is only likely to be noticeable for walkers heading northwards towards Fort William. These Small-scale effects will arise for a Localised extent of the long-distance route and will be of l**ow** magnitude, **moderate-slight** significance and **adverse**.

6.6.43 **Ben Nevis (path from Achintee House) (1.8 km south)** – This is a key route within the National Scenic Area, much used by visitors and users of this route are assessed to be of High sensitivity. As indicated by the ZTV study, the proposed building will be visible from approximately 500 m of the lowest part of the route and will not be seen otherwise. Given the orientation of the route in this location, these views will be more noticeable to those descending the mountain. Views will be similar to that shown from viewpoint 3, albeit with Achintee House and a nearby stand of trees seen in the foreground.

6.6.44 The Permanent visual effects will be of Small scale and affect a Limited extent of the route resulting in effects of **low-negligible** magnitude and **slight-minimal** significance. On balance, these effects will be **adverse** as the building will be seen in channelled views along the Glen.

### Specific Viewpoints

6.6.45 **Viewpoint 1, Primrose Hill (0.4 km north-west)** – effects on this viewpoint are assessed to be of Medium scale. Although marked on OS maps as a panoramic viewpoint and marked on the ground by the modest battlefield cairn, this viewpoint does not show signs of being frequently visited. Visitors will be of High susceptibility as they will have visited for the most part to see the view, but there is little indication that the view is of greater than Community value, taking into account the historic interest. Visitors to this viewpoint are judged to have a **medium** sensitivity.

6.6.46 The foreground is dominated by the movement of traffic along the A82 and the retail buildings, beyond which trees and buildings within the site can be seen. The proposed building will be seen in this context, being seen in a similar way to the existing buildings within the site as part of a group of long, relatively low rooflines formed by the retail units and industrial building amongst trees.

6.6.47 As indicated by the positioning of the bench at this viewpoint, apart from Ben Nevis, there is greater interest in looking out over the wide views away from the site – across the railway yard where trains can be seen, and views beyond to the river, lochs and hills beyond.

6.6.48 Given this wide panorama and the context in which the building will be seen, the Permanent visual effects will be of **medium** magnitude and **moderate** significance. On balance, these effects will be **neutral** as the building will be very similar in appearance and impact to existing buildings seen in the same part of the view.

6.6.49 Effects on viewpoints beyond 4 km, including viewpoint 6 (Sgurr Finniosgaig) and the nearby viewpoint at Meall Beag, are assessed to be **negligible to low magnitude, negligible to low sensitivity** with significance of effects being **negligible to slight.**

### *Designated landscapes*

**National Scenic Area – Ben Nevis and Glen Coe (0.3 km south-east)**

6.6.50 As shown on Drawing 6.2 – Policy Context, the National Scenic Area (NSA) lies immediately to the southeast of the site extending well beyond the study area to encompass Ben Nevis, Glen Coe, Glen Etive, Loch Leven and Rannoch Moor. The Special Qualities (defined as *'the characteristics that, individually or combined, give rise to an area's outstanding scenery')* of the NSA are identified in the 2010 SNH report regarding the topic as:

- *'a land of mountain grandeur;*
- *a land of classic highland vistas; and*
- *human settlement dwarfed by mountain and moorland',*

6.6.51 Location specific qualities relevant to the study area:

- *'the impressive massif of Ben Nevis; and*
- *the wild Mamores and secretive Glen Nevis'*

6.6.52 In order to determine the susceptibility of the NSA to the Proposed Development, the susceptibility of each of the special qualities is considered below, in Table 6.8 - National Scenic Areas Special Qualities, taking into account the more detailed commentary provided with the SNH report (see Technical Appendix 6.5):

***Table 6.8 - National Scenic Areas Special Qualities***

| Special Quality | Comment | Susceptibility |
|---|---|---|
| A land of mountain grandeur | This refers to the scale of the peaks including Ben Nevis, which, will be unaffected by the proposals. As discussed in section 6.4.51 of this assessment generates a degree of susceptibility to the presence of large-scale buildings nearby. | Low |
| A land of classic highland vistas | Views towards the site will not fall into this category, given the existing industrial buildings. | Low |
| Human settlement dwarfed by mountain and moorland | Large buildings such as that proposed have the potential to disrupt the balance of scale. | Medium |
| The impressive massif of Ben Nevis | This refers to Ben Nevis both as seen in views and as a challenge for walkers and climbers. The latter of these qualities will not be affected, but the proposed building will be visible in some views towards the mountain from the north and west. | Low |
| The wild Mamores and secretive Glen Nevis | As set out at section 6.4.65 of this assessment, the wild land qualities of the Mamores will not be affected by the proposals. Similarly, the more secretive mid and upper areas of the glen will also be unaffected. The building will however be seen in channelled views from parts of the lower Glen. | Low |

6.6.53 In line with its designation, the NSA is of National value. Combining the considerations of susceptibility and value, the NSA is judged to be of **medium** sensitivity to the Proposed Development.

6.6.54 As set out at section 6.6.7, of this assessment, there will be localised small scale effects on landscape character to the south of the proposed building, affecting the northern end of Glen Nevis, around and to the north of Achintee House. The proposed building will also be seen extensively in views from the NSA within 2 km of the site, as shown by the ZTV study (Drawing 6.6 – Woodlands and Settlements ZTV), although as discussed above, given the existing nature of these views, they are not 'classic highland vistas' for which the area is valued. Effect on these views, as illustrated by viewpoints 2, 3, 4, 5, 6, 7 and 12 will be Medium to Small scale, decreasing with distance. Views of the proposals from greater distances within the NSA will be limited in their extent and will tend to have negligible effects.

6.6.55 In views towards the proposed building and Ben Nevis, the full scale of the building will be partially concealed by intervening trees and built form and/or set in the context of existing buildings of the same scale (as shown by viewpoints 1, 8, 9, 10 and 11). Given these considerations, and the mass and proximity of Ben Nevis, the apparent scale relationship between Ben Nevis and nearby settlement will be unaffected.

6.6.56 Taking all these factors into account, Permanent effects on the special qualities of the NSA will be of Small scale and Localised in extent. They will be of **Low** magnitude and **slight** significance. On balance, the effects are considered to be **adverse** as they reflect a localised increase in influence from industrial buildings on the NSA.

#### Wild Land Areas

6.6.57 As set out in section 6.4.65 – effects Wild Land Areas are assessed to be negligible.

### *Summary of Landscape and Visual Effects*

6.6.58 Effects on the receptors assessed above are summarised in Table 6.9 - Summary of Effects. For receptors where the significance of effects varies, the distribution of effects is summarised. Effects apply during construction and operation.

6.6.59 Only effects of greater than negligible magnitude and/or minimal significance are included in the summary table.

*Table 6.9 - Summary of Effects*

| Receptor | Comments | Distance/ Direction | Sensitivity | Magnitude | Significance | Positive /Neutral /Adverse |
|---|---|---|---|---|---|---|
| **Landscape Character** | | | | | | |
| Mountain Massif | Localised, Permanent effects of small scale arising from increased proximity and visibility of industrial buildings within 1-2 km to the south of the site. | 0.7 km, SE | High-Medium | Low-Negligible | Slight | Adverse |
| **Visual Receptor Groups** | | | | | | |
| Claggan | Occasional glimpsed views seen between buildings and through vegetation. | 0.3 km, SW | High-Medium | Low | Slight | Adverse |
| Inverlochy | Occasional glimpsed views seen between buildings and through vegetation. | 0.5 km, W | High-Medium | Low | Slight | Adverse |
| Caol and Lochyside | Building seen in long views along Clunes Avenue and Kilmallie Road in Caol, and from B8006 between railway and A830. | 0.9 km, NW | High-Medium | Low | Slight | Adverse |
| **Key Routes** | | | | | | |
| West Highland Way | Occasional views from the route as it ascends the western slopes of Glen Nevis – primarily affecting northbound walkers. | 0.5 km, SW | High | Low | Moderate - Slight | Adverse |

| Receptor | Comments | Distance/ Direction | Sensitivity | Magnitude | Significance | Positive /Neutral /Adverse |
|---|---|---|---|---|---|---|
| Ben Nevis (path from Achintee House) | Views of the proposed building beyond Achintee house and nearby woodland for walkers descending from Ben Nevis. | 1.8 km, S | High | Low-Negligible | Slight-Minimal | Adverse |
| **Specific Viewpoints** | | | | | | |
| Viewpoint 1 – Primrose Hill | Views of the proposed building beyond the A82, nearby retail units and trees, looking similar to the existing buildings within the site in terms of scale and appearance. | 0.4 km, NW | Medium | Medium | Moderate | Neutral |
| **Landscape Designations** | | | | | | |
| Ben Nevis and Glen Coe National Scenic Area | Localised effects on views within 2 km of the site, and landscape character at the northern end of Glen Nevis. | 0.3 km, SE | Medium | Low | Slight | Adverse |

## 6.7 Summary of Significance of Effects

6.7.1 Effects on landscape character will arise within the site from the physical changes and from increased proximity and visibility of industrial buildings within one and two kilometres to the south of the site. These effects will be of slight significance and, on balance, adverse.

6.7.2 The extent of large-scale visual effects will be limited to within the site, where they will only be experienced by site workers and visitors.

6.7.3 Outside the site, existing woodland and buildings around the site will screen most views, but effects of major-moderate will arise where the building is seen in open elevated views within up to 1 km – such as Cow Hill and the lower-near slopes of Ben Nevis; and moderate or moderate-slight within up to 2.5 km – affecting the slopes of Ben Nevis, channelled views from Glen Nevis and the panoramic viewpoint at Primrose Hill.

6.7.4 Between 2.5 km to 4 km, the scale of effects will reduce to slight, with the building increasingly seen at a distance in the context of the existing Smelter and townscape, an effect which becomes more pronounced with distance such that effects will typically be negligible beyond approximately 4 km to 5 km.

6.7.5 Effects on nearby settlements will be confined to glimpsed views between or over intervening buildings and vegetation. Such views will be infrequently occurring from public spaces and effects on the most affected settlements (Caol and Lochyside; Corpach and Drumfada; Inverlochy and Claggan will be of slight significance and typically Adverse (except for Corpach and Drumfada where effects will be negligible). Some residents of these settlements will have views of the proposed building from their homes – particularly from upstairs windows. Drumfada will be most affected in this respect given the orientation of the streets and houses.

6.7.6 Effects on primary road and rail routes will be minimal.

6.7.7 Two of the long-distance recreational routes within the study area will experience greater than minimal effects. Walkers heading towards Fort William along the West Highland Way will experience Adverse effects of moderate-slight significance due to views from short open stretches of the route in which the building will be seen in forward views. Walkers descending from Ben Nevis along the main path will see occasional views of the building ahead of them beyond Achintee House and the nearby woodland as they complete their descent. Effects here will be of slight-minimal significance and Adverse.

6.7.8 Effects on the panoramic viewpoint at Primrose Hill will be of moderate significance and Neutral taking into account the positioning of the building alongside and behind other buildings with similar form and scale and the wide panoramic view available looking away from the site.

6.7.9 Effects on all other landscape and visual receptors within the study area will be minimal.

### *Statement of Significance*

6.7.10 As set out in the assessment methodology, effects that are major-moderate or major are judged to be significant. Effects of moderate significance or less are judged to constitute additional considerations. It should be noted that whilst an effect may be significant, that does not necessarily mean that such an impact will be adverse or unacceptable.

6.7.11 The findings of the Landscape and Visual Impact Assessment indicate that **no significant effects** will arise.

## 6.8 Cumulative assessment

### *Introduction*

6.8.1 As indicated in the 'Methodology' Section 6.2, the scope for potential cumulative effects of the Proposed Development includes the Proposed Development at Corpach, Fort William (Planning Application Reference: 16/03377/FUL). This development is located within the existing Corpach boatyard.

### *Assessment Methodology*

6.8.2 The LVIA assesses effects with consented but not constructed developments. As set out in 6.3.25, a new Water Canning Plant on the Smelter site is proposed which will be covered by a separate planning application. As it is anticipated that this will be constructed before the Proposed Development, it has formed part of the baseline.

6.8.3 For this LVIA, the potential erection of a new steel framed, pvc clad boat shed, new slipway, improvements to existing slipway and construction of a new floating pontoon at Corpach, Fort William will be taken into consideration for the cumulative assessment.

6.8.4 Cumulative effects are assessed on the same groups of landscape, townscape and visual receptors as the assessment for the main scheme. Landscape and visual receptors that are considered to receive effects of low-negligible or negligible magnitude (both localised and overall) from the Proposed Development are not included in this cumulative assessment, as an effect of such low magnitude manifestly adds nothing or very little regardless of the effects of other developments. If significant cumulative effects arise on those receptors, they will be as a result of other developments and as such are not relevant for consideration as part of this application.

### *Cumulative Effects on Landscape Character*

6.8.5 The following landscape character area was judged to receive low-negligible magnitude (locally or overall) as a result of the Proposed Development, and is therefore assessed for cumulative effects:

**233 – Mountain Massif – Lochaber Character Type (0.7 km south-east)**

6.8.6 Corpach and the proposals at the boatyard are within the lochs with Settled Edges LCT. There will be no direct or indirect effects on the Mountain Massif LCT. New work at the boatyard will be amongst existing building with the character of the area remaining unchanged. It is therefore considered that there is **no potential for any cumulative effects**.

### *Cumulative Visual Effects*

6.8.7 The assessment considers two types of cumulative visual effect, namely effects arising from combined and sequential views. These comprise:

- combined views which 'occur where the observer is able to see two or more developments from one viewpoint'. Combined visibility may either be in combination (where several developments are within the observer's arc of vision at the same time) or in succession (where the observer has to turn to see the various developments); and
- sequential views which 'occur when the observer has to move to another viewpoint to see different developments.'

6.8.8 This section assesses the anticipated cumulative visual effects arising from the proposal in combination with the existing and approved developments. For linear routes sequential views are also considered where relevant.

6.8.9 The LVIA assessed 12 viewpoints with regards to the Proposed Development. Of these, the following are views looking towards the Proposed Development with the Corpach development potentially in the same view and or a combined view:

- VP01 – Primrose Hill
- VP02 – Cow Hill
- VP04 – Meall an t-Suidhe
- VP05 – Bench on North Face footpath
- VP07 – Creag a Chail
- VP10 – Trig point near Achaphubuil

6.8.10 Views from the remaining viewpoint locations will not include views of both the Proposed Development and the Corpach development.

6.8.11 The Corpach boat yard is approximately 4 km from the Proposed Development with the settlements of Inverlochy, Caol and Corpach in between. The existing stockpile of materials, adjacent to the water, are very visible within views looking west towards the boat yard.

6.8.12 Both views of the Proposed Development and the Corpach Development will be within the context of existing development of similar scale and character and will only be visible, in combined views, from elevated locations. It is therefore considered that there is **no potential for any significant cumulative effects**.

#### Cumulative Effects on Visual Receptor Groups

6.8.13 The effects of the Proposed Development are highly localised due to the combination, location and relationship of existing built form. All of the receptor groups identified as receiving greater than negligible effects are located approximately between 0.3 km and 1.8 km of the Proposed Development.

6.8.14 Views of the Proposed Development, from the visual receptor groups, are glimpsed or long distance. The Proposed Development is located to the east of these receptor groups and the Corpach development is located to the west. As such both developments will not appear in the same view, but it will be possible to see both developments in combined views. However, as views will be glimpsed and or long distance and current views of the stockpiled materials are the dominant elements, it is therefore considered that there is **no potential for any significant cumulative effects**.

#### Cumulative Effects on Specific Viewpoints

6.8.15 Viewpoint 1 – Primrose Hill was assessed has having Neutral significance of effects, with regards to the Proposed Development. The Corpach development will not be visible within the same view although it is visible in a combined view by turning around. The existing views towards Corpach are dominated by the existing stock-piled materials. As such there is **no potential for any significant cumulative effects**.

#### Cumulative Effects on Landscape Designations

6.8.16 The Ben Nevis and Glen Coe NSA is within 0.3 km to the south-east of the Proposed Development and approximately 4.3 km to the south-east of the Corpach development. The LVIA concluded that there will be slight adverse effects from the Proposed Development. As there will be no direct or indirect impacts from the Corpach development there is **no potential for any cumulative effects**.

### *Statement of Cumulative Significance*

6.8.17 The findings of the Landscape and Visual Impact Cumulative Assessment indicate that **no significant effects** will arise.

## 6.9 References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# Chapter 7 Hydrology and Hydrogeology

# 7. Hydrology and Hydrogeology

# 7. Hydrology and Hydrogeology

## 7.1 Introduction

7.1.1 This chapter considers the effects the Proposed Development will likely have on hydrology and hydrogeology receptors. It assesses the current baseline conditions and identifies potential alteration of run-off volumes and rates, water quality and sediment regime of the surface water environment. This chapter also assesses the current baseline conditions of hydrogeology and identifies potential effects of the Proposed Development on hydrogeology including the impacts on the levels, flows and quality of groundwater and the effects on groundwater terrestrial ecosystems. The effects on private water supplies, both surface water and groundwater sources are also assessed.

7.1.2 A Flood Risk Assessment (FRA) has been undertaken to support this chapter and is included as Technical Appendix 7.1. The FRA provides a detailed overview of the existing hydrological and hydrogeological regime of the local area and site setting.

7.1.3 A Drainage Impact Assessment (DIA) has been prepared detailing surface and foul water drainage strategies, proposed Sustainable Drainage System (SuDS) features and hydraulic calculations, network sizing and treatment measure calculations. The DIA is included as Technical Appendix 7.2.

## 7.2 Legislation, Policy and Guidelines

7.2.1 The following section lists the relevant legislation, policy and guidelines that have been taken into consideration during the assessment of hydrology and hydrogeology effects.

### *Legislation*

7.2.2 Relevant legislation and guidance documents have been reviewed and taken into account as part of this hydrological and hydrogeological assessment. Of particular relevance are:

- Directive 2007/60/EC on the assessment and management of flood risks (EC, 2007);
- 2000/60/EC Water Framework Directive (EC, 2000);
- Control of Pollution Act (UK Government, 1974);
- Environmental Protection Act (UK Government, 1990);
- Environment Act (UK Government, 1995);
- Flood Prevention and Land Drainage (Scotland) Act (Scottish Executive, 1997);
- Contaminated Land (Scotland) Regulations as amended (Scottish Executive, 2005);
- The Water Environment and Water Services (Scotland) Act (Scottish Executive, 2003);
- Flood Risk Management (Scotland) Act (Scottish Government, 2009);
- The Water Environment (Controlled Activities) (Scotland) Regulations as amended (Scottish Government, 2011);
- The Private Water Supplies Act (Scotland) 2009;
- The Private Water Supplies (Scotland) Regulations 2017; and,
- The Water Resources (Scotland) Act (Scottish Government, 2013).

### *Planning Policy*

7.2.3 The Policies set out below include those from The Highland Wide Local Development Plan (HWLDP) which is a plan for the Highland Council Area as a whole and addresses the wider needs of The Highland Council (THC) are:

- **Policy 63 Water Environment**. This policy relates to the water environment and states that the council will support proposals for development that do not compromise the objectives of the Water Framework Directive (WFD). The council will consider the River Basin Management Plan for the Scotland River Basin District and the associated area management plans.
- **Policy 64 Flood Risk**. This policy states that development proposals should avoid areas susceptible to flooding and promote sustainable flood management. A Flood Risk Assessment or submission of other suitable information demonstrating compliance with Scottish Planning Policy (SPP) may be required for development proposals at risk of flooding.
- **Policy 66 Surface Water Drainage**: This policy states that Sustainable Drainage Systems (SuDS) should be designed in accordance with The SuDS Manual (CIRIA C697) and, where appropriate, the Sewers for Scotland Manual 2nd Edition must be used to drain all Proposed Development. Submission of planning applications should be informed by PAN 69: Planning and Building Standards Advice on Flooding paragraphs 23 and 24.
- **Policy 72 Pollution**: this policy states that proposals that may result in significant pollution such as water will only receive approval where a detailed assessment report of the potential pollution and is provided to show how the pollution can be avoided and mitigated if necessary.

7.2.4 Greater detail on how the outcomes set out in the HWLDP can be delivered at a more local level are provided in three additional Area Local Development Plans (LDP). These address local policy and spatial issues. The Proposed Development is located within the West Highland and Islands LDP area. The West Highland and Islands Local Development Plan (2019) is therefore relevant to this chapter. This document makes specific reference to the Aluminium Smelter and adjoining land in Fort William. Of relevance to this chapter, it states that additional proposals must address a minimum six metre buffer between watercourses and development and a Flood Risk and Drainage Impact Assessment with no development in areas shown to be at risk of flooding.

7.2.5 Relevant aspects of the Scottish Planning Policy (SPP), Planning Advice Notes (PAN) and other relevant guidance has also been considered. Of relevance to the hydrological and hydrogeological assessment presented within this chapter are the following polices:

- PAN 51: Planning, Environmental Protection and Regulation (Scottish Executive, 2006);
- Scottish Government Online Planning Advice on Flood Risk (2015);
- PAN 79: Water and Drainage (Scottish Executive, 2006); and,
- Scottish Planning Policy (Scottish Government, 2020).

### *Guidance*

7.2.6 Due cognisance has been taken of the following best practice guidelines/guidance:

- **The Highland Council (THC) Supplementary Guidance**: Flood Risk and Drainage Impact Assessment (The Highland Council, 2013).
- SEPA Pollution Prevention Guidance (PPGs) and the emerging replacement series of Guidance for Pollution Prevention (GPPs). The following PPGs and GPPs have been considered to be of particular relevance as part of this assessment:

- GP 1: Understanding your environmental responsibilities – good environmental practices (2020);
  - **PPG 3**: Oil Interceptors and Surface Water Drainage (2006); and
  - **GPP 5**: Works and maintenance in or near water (2018).
- **SEPA Guidance Note 2a**: Development Management Guidance on Flood Risk (2018);
- **SEPA Guidance Note 4**: Planning advice on wind farm developments, LUPS-GU4 (SEPA, 2017);
- **SEPA Guidance Note 31**: Guidance on assessing the impacts of development; proposals on groundwater abstractions and groundwater dependent terrestrial ecosystems (SEPA, 2014);
- **SEPA Policy 19**: Groundwater Protection Policy for Scotland (Version 3, 2009);
- **SEPA Policy 41**: Planning Authority Protocol - Development at Risk of Flooding: Advice and Consultation (2016);
- Technical Flood Risk Guidance for Stakeholders - SEPA Requirements for Undertaking a Flood Risk Assessment (Version 12, 2019); and
- **CIRIA C532**: 'Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors' (CIRIA, 2001).

## 7.3 Consultation

7.3.1 A screening opinion was submitted to SEPA (dated 30/11/2020) and a response received(dated 10/12/2020). Table 7.1 summarises the response received relevant to this chapter.

*Table 7.1 Screening Opinion SEPA Response*

| Consultation Response | Applicant Action |
|---|---|
| *'Due to the scale of the proposed plant, the applicant will be required to apply to us to make a substantial variation to the existing PPC permit due to the addition of a Schedule 1, Section 2.2, paragraph (b) (ii) Part A PPC activity.'* | Noted. |
| *'A detailed Drainage Impact Assessment should form part of the planning submission. It should follow recognised best practice and guidance and set out the strategy for the management of foul drainage, any aqueous effluents and surface waters. We would be very happy to provide advice on a draft version prior to its formal submission.'* | A Drainage Impact Assessment (DIA) has been carried out and is included as Technical Appendix 7.2. |
| *'The application should include information showing how connection to the public foul sewer will be made; the previously submitted Drainage Impact Assessment confirmed that connection was available to the west. As this was an issue with the previous application, we presume that the principle of connection has now been discussed and agreed with Scottish Water.'* | Details on connection to the public foul sewer are included in the DIA – Technical Appendix 7.2. A Pre-Development Enquiry (PDE) was submitted to Scottish Water who confirmed there is adequate capacity in the public foul sewer on Ben Nevis Drive for disposal of site welfare foul flows. |
| *'Confirmation should be provided as to whether the plant results in any other form of aqueous effluent and if* | Details on potential water emissions are outlined in |

| Consultation Response | Applicant Action |
| --- | --- |
| *so details (estimated volumes, chemical content etc) provided. Our preference is that this is also directed to the public foul drainage system. We ask that either confirmation is provided that Scottish Water have agreed the principle of accepting any such discharge or information on proposed private treatment, expected standards and discharge is required. Any direct discharges to the water environment should be subject to at least a H1 screening assessment which should ascertain the need for modelling. If detailed modelling of a discharge is required, then as outlined elsewhere we strongly encourage the developer to provide us with a method statement outlining the proposed approach prior to the work commencing.'* | Technical Appendix 7.2. The Recycling and Billet Casting Facility will operate a closed loop cooling water circuit with a cooling tower. A Water Treatment Plant (WTP) will treat backwash water from the auto backwash filter and re-circulate. There may be a requirement for the occasional discharge of 'blowdown' water from cooling process, this water will not be heavily contaminated and may be able to be discharged to the water environment through the WTP (final quality parameters to be determined). Other options for disposal include potentially to the public foul sewer or tankered off-site. |
| *'Information on surface water drainage should be provided. Proposals should follow recognised best practice such as The SuDS Manual, CIRIA C736 and the relevant BAT reference documents.*<br><br>*Roof rainwater should be harvested to help reduce overall water requirements and information should be provided on the pollution hazard level for different areas of the site (for example material handing storage and handling areas, working yard areas, roads, carparking) clearly demonstrating that suitable treatment is provided.*<br><br>*If there is the potential for oil contamination, then oil interceptors should be include as part of the design. Consideration should also be given to drainage from accidents and how that will be captured.*<br><br>*Note that under PPC we do not control the quantity of discharge of surface water. However section 2.6 of the previous Flood Risk Assessment did identify a potential groundwater flooding issue and should the foot print of this development overlap with the area of potential flood risk shown in the previously submitted Flood Risk Assessment then information should be provided on how drainage will be designed to address the issue.'* | Details of the surface water drainage are included in the DIA (Technical Appendix 7.2) and follow best practice.<br><br>Not applicable as the Applicant has plentiful existing water supply to meet overall water requirements.<br><br>Pollution hazard indices have been calculated in accordance with CIRIA C753 (The SuDS Manual). Details are included in the DIA. Bypass Separators are included as part of the design in relevant locations, details of which can be found in the DIA.<br><br>Groundwater flooding is addressed in the Flood Risk Assessment (FRA), included as Technical Appendix 7.1 and considered in the drainage design. |

## 7.4 Assessment Methodology and Significance Criteria

7.4.1 The assessment has been undertaken using qualitative and quantitative analyses and is based on professional judgement and statutory and general guidance. Relevant legislation, policies and best practice guidance is used in the assessment and development of mitigation measures.

### *Consultation*

7.4.2 A screening opinion has been submitted to SEPA (dated 30/11/2020) and a response received (dated 10/12/2020). Relevant aspects of this response to hydrology and hydrogeology are set out in section 7.3.

7.4.3 A Freedom of Information (FOI) data request has been submitted to THC (dated 12/01/2021). In the response (dated 22/01/2021) THC provided details of nearby flood defence measures, details on historic flooding events in the area, details of nearby Private Water Supply (PWS) and locations of historic landfills. THC also confirmed that they do not hold any information regarding surface water levels and water quality information and recommend SEPA are contacted regarding this. Where relevant, the details provided have been used to establish the hydrological and hydrogeological baseline and sensitivity of receptors.

7.4.4 A FOI data request has been made to SEPA (dated 12/01/2021) requesting any information SEPA holds regarding Controlled Activity Regulation Authorisations, surface water levels, quality and quantity, groundwater levels, quality and quantity, and rainfall data. Due to the ongoing current situation with cyber-hacking of SEPA, a response to this FOI request had not been received at the time of this assessment.

7.4.5 A Pre-Development Enquiry (PDE) has been made to Scottish Water (dated 19/01/2021). The response (dated 05/02/21) confirmed that there is sufficient capacity in nearby water treatment works to service the development and that there are no issues within the water or wastewater networks which will affect the demands of the development. It also confirmed access and stand-off distances as 6 m and 7.5 m respectively

### *Study Area*

7.4.6 The Study Area incorporates the area within the site boundary and any watercourses and private water supplies (PWS) within 1km of the site boundary (refer to Drawing 7.1).

7.4.7 The wider surface water catchments relevant to the Proposed Development have been reviewed, as shown on Drawing 7.2 (Hydrological Overview). Associated land / water designations are shown on Drawing 7.3 (Relevant Environmental Designations).

### *Desk Study*

7.4.8 Data has been collected from the following sources in order to establish the catchment characteristics and baseline hydrogeological conditions beneath the site:

- British Geological Survey (BGS) geological and hydrogeological online mapping of the area;
- Current Ordnance Survey 1:25,000 and 1:50,000 scale mapping;
- Available aerial and topographical mapping;
- British Geological Survey 1:50,000 scale geological maps (Scotland, Bedrock and Superficial Deposits) to understand hydrogeological conditions;
- Online Hydrogeological Map of Scotland (British Geological Survey);
- ES/EIA Report chapters, appendices and reports relating to the previously consented Alloy Wheel Plant (AWP);

- Ecology survey findings and mapping, in particular NVC survey to identify potential Groundwater Dependent Terrestrial Ecosystem (GWDTE);
- THC data on locations of PWS via Highland Council Open Data;
- SEPA website, for information on aquifer status and water quality (groundwater and surface water);
- SEPA open data listings of regulated sites and review of regulated sites identified by previous EIA Report;
- SEPA online Flood Map;
- SEPA RBMP Interactive Map; and
- Flood Estimation Handbook (FEH) Version 3 (Institute of Hydrology, 2021).

### *Site Visit*

7.4.9 A site walkover was undertaken in January 2021 to inform the production of this chapter, FRA, DIA and overall design. The aim of the site visit was to assess the existing hydrological regime and gain information on existing ground conditions, likely discharge locations and any other relevant constraints.

### *Assessment of Potential Effect Significance*

7.4.10 The assessment of effects considered impacts to hydrology and hydrogeology receptors due to construction and operation of the Proposed Development.

7.4.11 The assessment of effects will consider the sensitivity of the receptors (refer to Table 7.2) in combination with the magnitude of the impact (refer to Table 7.3) which together give rise to the significance of the effect (refer to Table 7.4), as shown below.

***Table 7.2 Sensitivity of Receptor***

| Sensitivity | Description |
|---|---|
| High | Areas containing geomorphological or hydrological features considered to be of national interest, for example Aquatic Natura 2000 sites, SACs, SSSIs, RAMSARs.<br><br>Highly permeable superficial deposits allowing free transport of contaminants to groundwater and surrounding surface waters.<br><br>Wetland/watercourse of High or Good Ecological Potential.<br><br>Raised or blanket bog.<br><br>High risk of flooding.<br><br>Remote PWS source within 250 m of any development. |
| Medium | Moderately permeable superficial deposits allowing some limited transport of contaminants to groundwater and surrounding surface waters.<br><br>Wetland/watercourse of Moderate Ecological Potential. Moderate risk of flooding.<br><br>Remote PWS source within 500 m of any development. |
| Low | Low permeability superficial deposits likely to inhibit the transport of contaminants. |

| Sensitivity | Description |
|---|---|
| | Wetland/watercourse of Poor or Bad Ecological Potential or no WFD classification.<br><br>Low risk of flooding.<br><br>Remote PWS source within 1000 m of any development. |

7.4.12 The criteria for sensitivity have been developed based on a hierarchy of factors relating to quality of the aquatic and hydrogeological environment including international and national designations, water quality information, watercourse status from the WFD review work undertaken to date by SEPA, consultations, Site visits and the professional judgement of the assessment team.

7.4.13 The prediction and assessment of effects on hydrology and hydrogeology will be undertaken using a series of tables to document the various potential impacts from aspects of the construction works and operations. Effects will be predicted for the Proposed Development based on the guideline criteria for impact magnitudes set out in Table 7.3.

***Table 7.3 Impact Magnitude***

| Impact Magnitude | Guideline Criteria |
|---|---|
| High | Total loss of, or alteration to, key features of the baseline resource such that post development characteristics or quality would be fundamentally and irreversibly changed e.g. development resulting in increased flood risk, PWS source pollution (during and post construction), groundwater or surface water quality or permanent changes to local surface and groundwater flow regimes. |
| Medium | Loss of, or alteration to, key features of the baseline resource such that post development characteristics or quality would be partially changed e.g. instream permanent bridge supports, temporary or non-material changes to local surface / groundwater flow regime, increased pollution potential / alteration of source volumes to remote PWS during construction only and localised change in groundwater or surface water quality. |
| Low | Small changes to the baseline resource, which are detectable but the underlying characteristics or quality of the baseline situation would be similar to pre-development conditions e.g. culverting of very small (unmapped) watercourses / drains, temporary and / or very localised change in local surface / groundwater flow regime, very localised and temporary change in groundwater and surface water quality and. Possible although very remote potential for change in PWS source quality / quantity. |
| Negligible | A very slight change from baseline conditions, which is barely distinguishable, and approximates to the 'no-change' situation e.g. new site drainage discharge from developed SuDS scheme to receiving watercourse, new land drainage measures to maintain hydraulic continuity between upgradient and downgradient of development site and no / negligible development in PWS source catchment. |

7.4.14 The significance of the predicted effects has been assessed in relation to the sensitivities of the baseline resource. A matrix of significance has been developed to provide a consistent framework for evaluation and is presented in Table 7.4.

*Table 7.4 Effect Significance Matrix*

| | | Sensitivity of Receptor / Receiving Environment to change | | | |
|---|---|---|---|---|---|
| | | High | Medium | Low | Negligible |
| Magnitude of Impact | High | Major | Moderate to Major | Minor to Moderate | Minor to Negligible |
| | Medium | Moderate to Major | Moderate | Minor | Negligible |
| | Low | Minor to Moderate | Minor | Negligible to Minor | Negligible |
| | Negligible | Minor to Negligible | Negligible | Negligible | Negligible |

7.4.15 For the purposes of this assessment, those effects identified as being major or moderate have been evaluated as significant environmental effects (refer to chapter 2).

### *Requirements for Mitigation*

7.4.16 Committed mitigation measures are presented within this chapter where the potential to affect sensitive hydrological or hydrogeological receptors has been predicted. These may include temporary effects from construction or permanent/long-term effects associated with the operational phase of the Proposed Development.

### *Assessment of Residual Effect Significance*

7.4.17 An assessment of predicted significant residual effects on sensitive hydrological or hydrogeological receptors is presented within this chapter.

### *Limitations to Assessment*

7.4.18 The Flood Estimation Handbook (FEH) Web service, used for determining catchment characteristics, only analyses catchments greater than 0.5 km$^2$ and does not account for any in-channel artificial modifications to watercourses (i.e. culverting, weirs etc).

7.4.19 No additional site investigation has been carried out to inform this assessment however recent (detailed) site investigation reports carried out in 2017 and 2019 have been referred to establish the baseline and provide a detailed assessment of the site.

7.4.20 A Freedom of Information (FOI) data request was submitted to SEPA (email sent on 12/01/2021) with a request for any details regarding Controlled Activity Regulation Authorisations, surface water levels, quality and quantity, groundwater levels, quality and quantity, and rainfall data within a 2.5 km radius if the site centre. Due to the ongoing situation with cyber-hacking of SEPA, a response to this FOI request had not been received at the time of this assessment. Although details from SEPA open data relating to licensing sites have been used to inform this report where possible, the open data may lack some of the detail that would be received in the FOI data request. Additionally, licensing sites identified in the previous EIA report have been included in this chapter however, it is noted these may not be fully up to date.

## 7.5 Baseline Conditions

### *Environmental Designations*

7.5.1 A review of environmental constraints relevant to this chapter highlighted the Ben Nevis Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), which is located is approximately 410m from the site boundary. The designated boundaries are shown on Drawing 7.3. The sensitivity of this receptor is considered to be high. However, it is located upgradient approximately 33 m above ordnance datum (AOD) above the site and therefore there is no potential impact to these features from the development.

7.5.2 The Ben Nevis and Allt a'Mhuilinn Geological Conservation Review site is over 1.8 km from the site, upgradient of the site and out with the study area.

### *Hydrology*

#### Hydrological Characteristics

7.5.3 A hydrological summary and characteristics of the site are shown in Table 7.5 below. The data is taken form the FEH Web Service and the point of the site has been delineated from NGR: NN 12195 74835.

*Table 7.5 Hydrological Summary*

| Point Location (NGR) | BFIHOST[1] | BFIHOST19[2] | PROPWET[3] | SAAR[4] |
|---|---|---|---|---|
| NN 12195 74835 | 0.332 | 0.315 | 0.810 | 1916 mm |

*[1]BFIHOST= Base Flow Index derived using the UK Hydrology of Soil Types (Host) classification (released 1999)*
*[2]BFIHOST19 = Base Flow Index derived using the UK Hydrology of Soil Types (Host) classification (released 2019)*
*[3]PROPWET = Proportion of Time the Soil Moisture Deficit (SMD) was equal to, or below, 6mm during 1961-1990*
*[4]SAAR= Standard Annual Average Rainfall*

From the FEH Web Service point data it is shown that the site has a relatively high standard annual average rainfall value.

#### Watercourses and Waterbodies

7.5.4 Drawing 7.2 shows the location of watercourses, drains and waterbodies within the 1 km study area, as identified using 1:25,000 mapping.

7.5.5 There are no major surface watercourses on the site or in its immediate surroundings.

7.5.6 Within the wider study area Allt Garb flows north-west down the slopes of Ben Nevis to a flat boggy area south-west of the site before continuing to flow south-west of the site before merging with Caochan Dubhaig. This then discharges into the River Nevis which itself flows west before discharging to Loch Linhe. Loch Linhe (North) is a transitional water body with a Good overall condition.

7.5.7 Minor drainage channels collect overland flow in the north of the site and discharge to a mapped ditch flowing adjacent to the railway line. This watercourse eventually discharges to the "Tail Race", a man-made channel collecting water from the adjacent smelter powerhouse, which itself discharges to the River Lochy. The Tail Race flows beneath the railway line at two locations, the A82 and a minor road accessing Inverlochy Castle.

7.5.8 The FEH Web Service mapping information indicates that a portion (approximately ¼) of the site boundary drains to the convergence of the Allt Garbh and the Caochan Dubhaig and subsequently the River Nevis. The River Nevis is included within the study area and classed as having a Good ecological potential. The other ¾ of the site boundary drains to the Tail Race, which discharges to the River Lochy. The River Lochy is also classed as having a Good ecological potential. It should be noted that the proposed built development footprint itself drains entirely to the north towards the

River Lochy, despite part of the site boundary and study area being within the River Nevis catchment as above.

7.5.9 The Allt a Mhuilinn is included within the study area and discharges to the River Lochy approximately 800 m north-east of the site. The Allt a Mhuilinn is classed as having a Bad ecological potential attributed to its waterflows and levels as a result of water abstraction for Hydroelectricity generation. It is considered that this watercourse will not be affected by the Proposed Development as a result of its upstream location to the site and is therefore scoped out of further assessment.

7.5.10 There are a number of additional minor watercourses within the study area including the Cam Allt and additional unnamed tributaries to the River Nevis and the Allt Cas in the north of the study area. It is considered that these minor watercourses will not be impacted by the Proposed Development due to their distance from the site and/or lack of hydrological connection to the site and are therefore scoped out of further assessment.

### Surface Water Protected Areas

7.5.11 No Drinking Water Protected Areas (Surface) are located within the Proposed Development. However, Drinking Water Protected Areas (Surface) are located within the study area to the north and east of the Proposed Development. Included within the protected area is the Allt a' Mhulinn and the River Lochy and upstream tributaries. The location of the Drinking Water Protected Areas (Surface) is shown on Drawing 7.2.

7.5.12 The previous EIA reports that the River Nevis and River Lochy are designated under the Fresh Water Fish Directive as Salmonid Waters. These are stretches of water that support, or may support, species such as salmon, trout and whitefish.

### SEPA Licenses

7.5.13 Review of SEPA public data regarding licensed sites identified multiple licensed sites within the study area and is summarised in Table 7.6 below.

7.5.14 Cross referencing the publicly available SEPA data with the consultation carried out in the previous EIA report identifies CAR/L/1012344 registered to the Lochaber Smelter being a surface water abstraction and having four abstraction locations, as described in the previous EIA report:

- Two of these abstraction points are located downstream of the site where the Tail Race discharges to the River Lochy;
- The third abstraction point is located on the east side of the smelter adjacent to the powerhouse; and,
- The fourth abstraction point is located on the southside of the Fort William Golf course on a surface watercourse that discharges into the River Lochy which is out with the study area for this assessment.

7.5.15 Additionally, CAR/L/1011006 registered to the Ben Nevis Distillery has two surface water abstraction points, both located north-east of the Proposed Development on a surface watercourse that flows to the west and passes the Ben Nevis distillery and discharges to the River Lochy, approximately 770 m north-east and upstream of the Proposed Development.

7.5.16 CAR/L/1002904 relates to the leachate discharge to the Tail Race.

7.5.17 Ben Nevis Motor is registered as CAR/R/1172567 and is located approximately 100 m west of the site on the other site of the railway line that runs adjacent to the northern site boundary. This site is not within hydraulic continuity of the Proposed Development. This site was registered in 2018 and so was not identified in the previous EIA report. As such details relating to the nature of the regulation can only be based on the SEPA open data.

*Table 7.6 Licensed Sites within Study Area (based on SEPA open data)*

| License Number | NGR (SEPA open data) | Site Name | Additional details from open data | Additional Details from Previous EIA |
|---|---|---|---|---|
| CAR/L/1011006 | NN 12516 75751 | Ben Nevis Distillery, Lochy Bridge. | Manufacturing of food and beverages | Surface water abstraction, cooling water discharge to River Lochy |
| CAR/L/1002904 | NN 12646 74920 | Liberty Lochaber Aluminium, Lochaber Smelter | Manufacturing of basic metals | Leachate discharge to tail race |
| CAR/L/1012344 | NN 12420 74960 | Lochaber Smelter | Electricity, gas, steam and hot water supply | Surface water abstraction |
| CAR/R/1023241 | NN 12530 75780 | Alt a Mhuilian Bridge Crossing, Inverlochy | Other business activities | - |
| CAR/R/1032360 | NN 12088 73885 | Glencoe Mains Water Main Out | Electricity, gas, steam and hot water supply | - |
| CAR/R/1031422 | NN 12230 74021 | Tigh an Allt, Achintee, Fort WIlliam | - | Septic tank to soakaway (ground) |
| CAR/R/1045643 | NN 12088 73885 | Glencoe Mains Water Main Out | Electricity, gas, steam and hot water supply | - |
| CAR/R/1059312 | NN 12183 74061 | The Roaring Mill & Claggan Cottage, Achintee | - | Septic tank to River Nevis |
| CAR/R/1094595 | NN 11981 75405 | Old Inverlochy Cottage, Fort William | - | Septic tank to soakaway (ground) |
| CAR/R/1098085 | NN 12250 74260 | Caochan Dubhaig Burn, Fort William | Electricity, gas, steam and hot water supply | - |
| CAR/R/1139782 | NN 12270 74030 | New House, Burnbrae, Achintee, Fort William | - | - |
| CAR/R/1146270 | NN 11782 75681 | Hawthorn, Lochyside, Fort William | Other business activities | Septic tank to River Lochy |
| CAR/R/1163961 | NN 12390 74246 | FFE/FFW Overhead Power Line, Invergarry | Other business activities | - |
| CAR/R/1163980 | NN 12390 74246 | FFE/FFW Ovehead Power Line, Fort Augustus to Fort William | Other business activities | - |

| License Number | NGR (SEPA open data) | Site Name | Additional details from open data | Additional Details from Previous EIA |
|---|---|---|---|---|
| CAR/R/1163692 | NN 12390 74246 | Fort William to Fort Augustus OHL | Other business activities | - |
| CAR/R/1164981 | NN 12390 74246 | FFE/FFW Overhead Power Line, Invergarry | Other business activities | - |
| CAR/R/1172567 | NN 11902 74909 | Ben Nevis Motors, North Road, Fort William | - | - |

#### Overall Sensitivity

7.5.18 For the purposes of this assessment the overall sensitivity of the baseline hydrological receptors at the Proposed Development is considered to be High, reflecting the Good classification of the River Nevis, the River Lochy and Loch Linhe (North) downstream of the Proposed Development. Additionally, surface water drinking water protected areas are included within the study area.

### *Hydrogeology*

7.5.19 A comprehensive site investigation was undertaken in 2019 to inform the previously Proposed Development at the site. The intrusive site works comprised 55 rotary boreholes and 60 trial pits, providing an extensive overview of the underlying geology at the proposed site location and wider local area.

#### Superficial

7.5.20 Review of BGS maps indicates that the Proposed Development is underlain by peat and hummocky (moundy) glacial deposits. Deposits of peat are located in the centre of the Proposed Development and areas to the east and south. The glacial deposits are found in the north and north-west of the Proposed Development and in the east and south-east corner.

7.5.21 The results of the site investigation broadly concur with the published geology from BGS. Made ground was encountered to depths between 0.20 m and 6.00 m in several of the exploratory holes primarily in the western extents of the Proposed Development area. This was seen to comprise a mix of ash, soil, concrete and brick fragments, although other materials were also identified. Where made ground was not observed pseudo-fibrous peat was encountered from ground levels to depths between 0.20 m and 6.00 m. The made ground and / or peat was observed to the underlain by granular deposits comprising primarily cobbly fine to coarse sand, or sand and gravel with low to medium boulder content.

7.5.22 Peat would be expected to have low permeability and inhibit groundwater flow. BGS (2004) indicates that superficial deposits of hummocky moraine or sandy/gravelly till are likely to have low productivity (i.e. 0.1 l/s to 1 l/s) however it is anticipated that these deposits will have variable permeability with clays inhibiting groundwater flows but pockets and lenses of sands and gravels likely more readily transmitting groundwater.

7.5.23 During the site investigation, groundwater was encountered in 35 of the 60 trial pits undertaken. The depth to water in these trial pits was variable and groundwater encountered in both the made ground and underlying superficial deposits. Due to the groundwater elevation variability, it is deduced that groundwater is both perched within the made ground deposits overlying impermeable peat, and small quantities partially confined within the sandy / granular glacial deposits underlying the peat, likely to fed by the local surface water catchment.

### Bedrock

7.5.24 Review of BGS maps indicates that the underlying bedrock geology at the Proposed Development comprises micaceous psammite and pelite of the Fort William Formation. During the site investigation the solid bedrock geology was observed to comprise weak to medium strong schist, pelite, semipelite and psammite. Solid geology was proven to a maximum depth of 15.00 m.

7.5.25 The BGS 1:625,000 hydrogeology map shows the Proposed Development as being Grampian Group (refer to Drawing 7.5). This is also classed as a low productivity aquifer with small amounts of groundwater in near surface weather zones and secondary fractures.

7.5.26 Within the study area to the south-east of the Proposed Development, the rock unit is classed as an unnamed igneous intrusion, late Silurian to early Devonian. This is also classed as a low productivity aquifer with small amounts of groundwater in near surface weather zones and secondary fractures. Rare springs may also be found within this aquifer.

7.5.27 Given the nature of the bedrock geology, any groundwater within the superficial deposits is unlikely to be in continuity with deeper groundwater.

7.5.28 SEPA's Water Classification Hub identifies groundwater in the area as the Fort William groundwater body, with an overall condition of Good.

### Overall Sensitivity

7.5.29 For the purpose of this assessment the overall sensitivity of the baseline groundwater receptor at the Proposed Development is considered to be low. This reflects the low productivity superficial and bedrock aquifers. Furthermore, although the Proposed Development is within a drinking water protected area, no existing abstractions have been identified to be present.

## *GWDTE*

7.5.30 A Phase 1 Habitat and NVC survey was conducted in 2017 as part of the previously Proposed Development Environmental Impact Assessment. This report included the identification of potential GWDTEs within the Proposed Development boundary. An extended Phase 1 habitat survey has been carried out in January 2021 which also ground-truthed the 2017 NVC mapping. For the updated survey, the study area encompassed the footprint of the Proposed Development and up to a 250 m buffer to provide updated information on habitats within the potential zone of influence of the Proposed Development. Refer to chapter 8 for full details.

7.5.31 NVC communities within the ecology study area considered to be potentially groundwater dependent, based on SEPA Guidance, are listed below.

- W4: *Betula pubescens – Molinia caerulea* woodland, considered to be potentially highly groundwater dependent;
- M15: *Trichophorum cespitosum – Erica tetralix* wet dwarf-shrub heath, considered to be potentially moderately groundwater dependent;
- M23: *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, considered to be potentially highly groundwater dependent;
- M25: *Molinia caerulea – Potentilla erecta* mire; considered to be potentially moderately groundwater dependent;
- MG9: *Holcus lanatus - Deschampsia cespitosa* grassland considered to be potentially moderately groundwater dependent;
- W6: *Alnus glutinosa – Urtica dioica* woodland, considered to be potentially moderately groundwater dependent; and
- W7: *Alnus glutinosa – Fraxinus excelsior* woodland, considered to be potentially highly groundwater dependent.

7.5.32 Areas in the north and south of the Proposed Development are located on land that is considered to be potentially groundwater dependent. However, bedrock across the Proposed Development comprises a low productivity aquifer, and superficial geology across much of the Proposed Development likely to inhibit groundwater flow in the case of Peat or likely to have a low productivity in the case of the hummocky (moundy) glacial deposits. Therefore, it is considered that there is limited potential for substantial groundwater to be present near the surface, feeding the observed habitats.

7.5.33 Additionally, many of the potentially groundwater dependent habitats recorded in the 2017 survey were often found in association with a watercourse or a surface drained plantation forestry.

7.5.34 It is considered that the peat deposits are fed by direct rainfall or by surface water run-off from the slopes of Ben Nevis to the east and south-east of the Proposed Development.

7.5.35 As discussed in chapter 8 (Ecology and Biodiversity), SEPA has confirmed that information submitted with the previously consented AWP development demonstrated that peatland habitats within the site are not significantly groundwater dependent.

7.5.36 It is also noted that a significant proportion of the Proposed Development footprint is on previously developed land (e.g. existing hardstanding), which further reduces the potential impact on possible GWTDEs.

7.5.37 Taking into account of the above, it is therefore considered that potential GWDTEs at the Proposed Development are not dependent on groundwater and instead are fed by surface water runoff and incident rainfall. As GWDTE are not present at the Proposed Development, impacts on GWDTE are not considered further.

### *Public and Private Water Supplies*

7.5.38 A data request response from THC (email dated the 22 January 2021) identified no PWS records within the study area or within hydrological or hydrogeological connection to the Proposed Development. Furthermore, it is likely that with the largely urban nature of the study area, mains supply is most likely. As a result of this PWS have been scoped out of further assessment.

7.5.39 An existing on-site fire main and on-site potable water infrastructure run through the site, both owned by the Applicant.

7.5.40 An existing Scottish Water Supply Main runs south-north to the immediate west of the Proposed Development area (within the wider Smelter site boundary) – it is understood this is the principal public water supply for the Fort William area. Implementation of the site Construction Environmental Management Plan (CEMP), and focussed liaison with Scottish Water at the pre-construction stage will ensure the strategic water mains is protected throughout the construction phase (there is no risk to the asset during the operational phase). As such, there is no requirement to consider this any further.

### *Flooding*

7.5.41 A FRA has been undertaken and is reproduced in Technical Appendix 7.1.

7.5.42 A Freedom of Information data request response from THC (email dated the 22 January 2021) confirmed that THC had no records of flooding at the Proposed Development or immediately outside the Proposed Development. Several records of flooding have been recorded within the study area and are summarised in Table 7.5. The majority of these flooding locations are within the residential area of Inverlochy or at the lower reaches of the Allt a' Mhuilinn near Ben Nevis Distillery and Carrs Corner Industrial Estate. None of the flooding incidents recorded are considered to be hydrologically linked to the Proposed Development (they are downgradient, localised and downstream of the site). Within the surrounding area, the closest record of historic flooding to the Proposed Development is located at the mouth of the River Lochy (X 211949 Y 775528), over 475 m north of the Proposed Development boundary. Locations of the recorded flooding can be viewed in Drawing 7.2.

*Table 7.7 Incidents of Flooding within the Study Area recorded by THC*

| THC ID | X Coordinate | Y Coordinate | Year | Location |
|---|---|---|---|---|
| 359 | 212580 | 775690 | 1892 | Approximately 710m north-east of the site boundary. |
| 1054 | 211126 | 774383 | 1920 | Approximately 990m west of the site boundary. |
| 1057 | 211949 | 775528 | 1920 | Approximately 475m north of the site boundary. |
| 1017 | 212692 | 775789 | 1966 | Approximately 810m north-east of the site boundary. |
| 65 | 211500 | 774500 | 2001 | Approximately 610m west of the site boundary. |
| 408 | 211279 | 774857 | 2002 | Approximately 715m west of the site boundary. |
| 410 | 211436 | 774938 | 2002 | Approximately 565m west of the site boundary. |
| 1177 | 211159 | 774570 | 2009 | Approximately 900m west of the site boundary. |
| 1184 | 211261 | 774465 | 2009 | Approximately 850m west of the site boundary. |
| 1218 | 211518 | 774672 | 2011 | Approximately 520m west of the site boundary. |

7.5.43 Potential flood sources affecting the Proposed Development are summarised in Table 7.6 and explained in more detail in the FRA. The FRA demonstrates that the Proposed Development is at no significant flood risk from all sources.

*Table 7.8 Pre-Development potential flood risk from all sources of flooding*

| Flood Source | Potential Risk | Description |
|---|---|---|
| Fluvial | No Risk | The River Nevis is included within SEPA's fluvial flood mapping, but any associated flooding potential is suitably down gradient of the application site. The flooding extent is appropriately 55 m from the site boundary and approximately 330 m from any proposed infrastructure. The proposed infrastructure is also approximately 8 m AOD above the indicative flood extent. |
| Surface water | Low Risk | Review of SEPA's Surface Water Flood Map shows isolated accumulations of high risk surface water flooding / ponding within the site boundary in the south-west corner of the site, the north of the site and the east of the site. Surface water flooding is shown at and around the proposed infrastructure in the northern areas of the development. |

| Flood Source | Potential Risk | Description |
|---|---|---|
| | | The isolated incidents of Surface Water Flood Risk at the site are due to local topographic depressions / pathways for 'uncontrolled' surface water runoff to accumulate / flow. Site observations confirm areas of standing water, informal preferential surface water flow paths and the presences of land drainage ditches, which ultimately drain the site to the minor watercourse to the north (see Drawing FRA-002).<br><br>Development of the site will inherently 'design out' the current informal surface water runoff at site via implementation of a formal surface water drainage system designed to current industry standards, and incorporate an upgradient 'cut off' drain around the site, to intercept minor catchment flows to the south. Full details of the proposed site drainage measures are presented in Technical Appendix 7.2. |
| Coastal | No risk | Review of SEPA's Flood Map confirms that the site is not at risk of coastal / tidal flooding as it is located approximately 250 m inland from the coastal flooding extent at the "Tail Race" and therefore, is designated as 'No Risk' to the site. |
| Groundwater | Low Risk | Review of SEPA's Groundwater Flood Map shows that the site is not located in an area potentially at risk of groundwater flooding. Review of the local site geology / hydrogeology confirms that the site is widely underlain with Peat which inhibits the vertical movement of any groundwater. Furthermore, the bedrock at the site is classed as a low productivity aquifer.<br><br>Groundwater was encountered in the detailed site investigations at varying elevations. Due to the groundwater elevation variability, it is deduced that groundwater is both perched within the made ground deposits overlying impermeable peat, and small quantities partially confined within the sandy / granular glacial deposits underlying the peat.<br><br>The proposed surface water drainage design for the site (and upgradient cut off drain) as outlined in Technical Appendix 7.2 will provide inherent mitigation and create a natural pathway for any accumulations of groundwater upgradient of the site, to flow around / through in a controlled manner.<br><br>The groundwater table in the superficial deposits is not a homogenous unit and likely to be in small / isolated quantities, and thus the ability for groundwater to periodically rise and flood the site is considered highly unlikely. |
| Sewers/ Drainage Systems | Low risk | Review of Scottish Water asset plans shows that foul sewers run approximately 60m north of the site and 130 m west of the site, serving the residential area of Inverlochy, both downgradient of the site elevation. |

| Flood Source | Potential Risk | Description |
|---|---|---|
| | | The development is to be served by an appropriately designed sustainable drainage system in accordance with industry best practice (i.e. the SuDS Manual – CIRIA Report C753) and Sewers for Scotland 4th Edition. The drainage systems will be designed as such that the development is not at risk of flooding for up to the standard design events required.<br><br>A bespoke drainage maintenance and management plan will be developed for the site and incorporated into the site operating plan to ensure continued effectiveness and design performance of the proposed site drainage system. |
| Infrastructure | No Risk | Review of the SEPA reservoir inundation map indicates the possible flood risk to the area north-west of the site from Loch Treig, Loch Lochy, Quoich Reservoir and Loch Laggan with the closest extent to the site coming from Loch Treig. This shows the "indicative area that may flood from an uncontrolled release of water from all possible dam failure scenarios". The site boundary is adjacent to the extent of this possible flood risk. However, the infrastructure of the Proposed Development is over 200 m from the flooding extent of Loch Trieg and approximately 5mOAD above the flood risk.<br><br>An existing Scottish Water supply main runs adjacent to the western site boundary and an existing on-site fire main and on-site potable water infrastructure also runs through the site. With regards to the former, failure of this asset would result is a sudden surge of pressurised potable water being released, however resulting flows would be time limited and northwards away from the development area. With respect to the latter, this asset would be integrated into the design of the site, likely within a formal services trench along the main E-W site access road. Failure of this water main would also result in a time-limited sudden release of pressurised water, which would be readily captured by the onsite drainage system and discharged northwards.<br><br>There are no other significant infrastructure i.e. canals, pumping stations, aqueducts etc located upstream or in hydraulic continuity / proximity to the site which may pose a flood risk during a failure scenario. |

### Overall Sensitivity

7.5.44 For the purpose of this assessment the overall sensitivity of the Proposed Development with respect to flooding is considered to be negligible and therefore not considered further - Refer to Technical Appendix 7.1 for full details.

## 7.6 Receptors Brought Forward for Assessment

7.6.1 The following receptors are being brought forward for assessment

- Hydrology (surface water) considered to have a sensitivity of high reflecting the Good quality of the River Nevis, River Lochy and Loch Linhe which are located downstream of the Proposed Development. Additionally, surface water drinking water protected areas are included within the study area; and
- Hydrogeology (groundwater) considered to have a sensitivity of low reflecting the low productivity aquifers in both the bedrock and superficial deposits. Furthermore, although the Proposed Development is within a drinking water protected zone, as is the whole of Scotland, no abstractions have been identified.

7.6.2 As discussed in Section 7.5, the following receptors have been scoped out for further assessment

- Ben Nevis SAC and SSSI Designated site is scoped out as the site is suitably upgradient from the Proposed Development and no source of impact is predicted;
- Existing License Surface Water abstractions considered to have a sensitivity of low reflecting supplied of local importance. The Lochaber Smelter abstraction (CAR/L/1012344) is unaffected by the development (as confirmed by the client) and the Ben Nevis Distillery abstraction (CAR/L/1011006) is considered to be suitably distanced and upstream of the Proposed Development and further assessment is not required;
- The Proposed Development with respect to flooding is considered have a negligible sensitivity and is therefore not considered further;
- Private Water Supplies are scoped out as no PWS are recorded within the study area or within hydrological or hydrogeological connection to the Proposed Development. The public supply water mains running south-north through the site will be protected during the construction phase via standard measures and in liaison with Scottish Water, and is therefore not considered further at this stage; and
- GWDTE are scoped out as the potentially groundwater dependent GWDTE habitats have been shown to be instead primarily surface water runoff / rainfall fed, and thus is not considered further.

## 7.7 Standard Mitigation

7.7.1 The following considerations have been taken into account in the iterative design of the Proposed Development, considered as embedded mitigation (mitigation by design):

- A 50 m buffer has been maintained around all surface watercourses.
- The proposed foul and surface water drainage designs outlined in the Drainage Impact Assessment – see Technical Appendix 7.2.

7.7.2 In undertaking this assessment of effects, the following standard good practice measures are assumed to be incorporated as embedded mitigation:

- Requirements for pre-development, construction and post-development groundwater sampling and monitoring will be agreed with SEPA at the post-planning stage via PPC pre-application consultation.
- A Construction Environmental Management Plan (CEMP) will be in place to control potentially polluting activities to prevent adverse impact to downstream persons, properties and environment during the construction phase. An outline CEMP is provided in Technical Appendix 3.1 of this EIA Report. The purpose of this document is to provide an overview of how the site preparation and construction process will be undertaken to afford protection to the environment and the residents and businesses within Fort William. It should be noted that the outline CEMP is a “live” document and will be subject to periodic review and updating. Relevant mitigation measures to be

implemented during construction to control water quality impacts as part of the outline CEMP are given below in paragraphs 7.7.3 to 7.7.10.

- All earthmoving works or similar operations will be carried out in accordance with BSI Code of Practice for Earth Works BS6031:2009.
- The drainage design outlined in the DIA (Technical Appendix 7.2) details the Proposed Development drainage design mitigating increased discharge rates and flood risk, as well as enhancing the water quality. A summary of the drainage design is outlined below in paragraphs 7.7.11 to 7.7.16.
- All site discharges and temporary water abstraction will be regulated under the CAR licensing regime and all necessary licenses sought from SEPA prior to the commencement of an operations on-site.
- While it is acknowledged that best practice to minimise run-off would be to undertake construction and dismantling during the driest period of the year, given the high annual rainfall averages there is likely to be periods of rainfall likely to generate surface water runoff during the construction phase. Therefore, site management will check the local weather forecast daily and prime all site staff to ensure that everyone is aware of their responsibilities to maintain the pollution control system during wet weather or suspend sensitive operations during adverse weather conditions.

### CEMP

7.7.3 Outlined below are recommendations for mitigation measures to be implemented during construction to control water quality impacts. These mitigation measures take due cognisance of the relevant policy, legislation and guidance outlined in Section 7.2 previously.

7.7.4 Good practice measures set out in the relevant Pollution Prevention Guidance (PPGs) or Guidance for Pollution Prevention (GPPs) have been followed. A review plan for Pollution Prevention Guidance documents (PPGs) is currently underway by the Scottish Environment Protection Agency (SEPA), Natural Resources Wales (NRW), and the Northern Ireland Environment Agency (NIEA), replacing them with a new series of guidance: Guidance for Pollution Prevention (GPPs). GPPs provide environmental good practice guidance for the whole UK, and environmental regulatory guidance directly to Scotland, Northern Ireland and Wales. The relevant guidance includes:

- PPG1: General guide to the prevention of pollution
- GPP2: Above ground oil storage tanks;
- GPP5: Works and maintenance in or near water ;
- PPG6: Working at construction and demolition sites; and
- GPP21: Pollution incidence response planning.

7.7.5 General Mitigation:

- Undertake a pollution risk assessment of the site and the proposed activities;
- Identify all Controlled Waters that may be affected by the works and temporary discharge points to the on-site drainage ditches and the marine environment;
- Implement a pollution control system during earthworks and construction; and
- Monitor construction procedures to ensure management of risk is maintained.

7.7.6 Proposed Mitigation for Excavations:

- Take relevant precautions to ensure no services are struck during excavations. Ensure relevant emergency response and contacts are in place in the event services are stuck which could impact the water environment, e.g. oil line, water main, sewer;

- Scan excavation areas for potential unrecorded culverts/field drains. De-watering measures to be present in the event of a leak;
- Existing culverts/field drains to be protected to prevent potentially polluted site run-off discharging to them prior to treatment;
- Plan and design dewatering activities to minimise the local drawdown of perched groundwater in peatland habitat, and maintain the hydrology of identified sensitive habitats;
- Prevent site run-off entering excavations and regular de-water to prevent infiltration to groundwater. Ensure that dewatering of excavations is directed away from drainage ditches and the marine environment; and
- Any deep excavations (e.g. boreholes, piled foundations) must be protected to prevent infiltration of site run-off and a direct pathway to groundwater.

7.7.7 Proposed Mitigation for Concrete Works:

- If concrete is brought to site, dedicated concrete washout skip/basin to be provided to prevent any uncontrolled spilling of material on-site or nearby public roads;
- Concrete washout facilities to be regularly maintained and solids to be disposed of safely;
- If on-site concrete batching is needed, ensure necessary containment measures are in place and suitable disposal and cleaning methods;
- Robust emergency response in place for any concrete spillage on-site;
- Correct disposal of any waste or surplus concrete in agreed suitable locations both on-site and off-site;
- Where applicable, shuttered pours should be used to prevent on concrete losses to ground;
- Ensure excavations ae sufficiently dewatered before concreting begins and that dewatering continues while concrete sets; and
- Cover freshly poured concrete surfaces to prevent any polluted run-off attributed with wet weather.

7.7.8 Fuel and Chemical Storage Measures

- Follow measures set out in the ‘Outline Pollution Prevention Management Plan’ section 11.1 of the outline CEMP;
- Maintain oil booms and absorbent pads within all work areas;
- Fuel and oil deliveries to take place on an impermeable transfer area with a bunding facility capable of handling a major spill;
- Assign designated refuelling areas where appropriate and site them as far as practicably possible and at least 20 m from adjacent field drains and public sewers; and
- Install operational drainage as early as possible with the inclusion of oil separators.

7.7.9 Proposed Mitigation for Sediment Management

- Control and divert surface water entering site from surrounding land (via cut-off drains) to reduce potential impacted water volumes;
- Minimise use of stockpiles and/or cover and contain stockpiles and provide sediment interception measures at their bases, e.g. silt fencing or cut-off drains and check dams;

- If topsoil is to be stored, avoid constructing stockpiles more than 2 m high. This will ensure anaerobic conditions do not occur and that the soil will remain fertile and capable of being re-seeded. It will also be less susceptible to erosion;
- Temporary drainage measures to be installed which provide filtration (filter drains or filter strips) and settlement (ponds/basins) to collect sediments prior to off-site discharge;
- Avoid mass overburden stripping on the site, expose parts of the site only when essential for operation;
- Temporary drainage measures and silt fencing to be installed around large areas of exposed soils;
- Ensure a robust site traffic management plan is in place to reduce sediment run-off risks. Good practices include; minimise turning of tracked vehicles where possible and manage dedicated turning areas appropriately (hard surfacing, silt fencing etc.), avoid unnecessary turning of large site plant and minimise overall routes on-site to better manage sediment run-off;
- Prevent/reduce off-site sediment impacts to public roads. Good practices include; wheel wash facilities, site-road sweeping, vehicles only permitted on-site not to use public roads, formally surfaced site car park and separate access points for cars and plant/deliveries;
- Bowsers to be used to keep exposed earth and soils damp preventing dust generation reaching nearby watercourses (sediment build-up can be managed on-site); and
- Dedicated plant washing areas to control sediment run-off.

7.7.10 Contingency Planning and Emergency Procedures

- All pollution prevention consumables and plant to be made readily available at all times. Keep spill kits in all vehicles to enable a rapid and effective response to any accidental spillage or discharge; and
- Train all construction staff in the effective use of spill kits and raise awareness of all preventative measures for water pollution.

### Flood Risk Mitigation

7.7.11 The management of surface water drainage from developed areas (positive runoff) of the site will comprise the conveyance of runoff through a combination of conventional roof drainage, linear drains and filter drains. Collected runoff in catchment to the west of the railway line will drain to a formal constructed (SuDS) wetland feature prior to controlled discharge to the existing ditch located to the north of the site (via a short section of proposed swale). Collected runoff from the catchment to the east of the railway line (comprising the weighbridge) will drain to a SuDs pond prior to discharge to the existing drainage infrastructure within the access road. Both proposed discharge locations take flows north and eventually discharge to the tail race which in turn discharges to the River Lochy.

7.7.12 In addition to the above, interception drainage has been proposed to collect and convey upgradient catchment ’run-on’ to the site. These upgradient catchment areas will be managed by a perimeter cut-off drain, independent of the development drainage and discharged to land north of the development maintaining the current baseline hydrological continuity.

7.7.13 It is proposed to limit surface water discharge from the developed site area to the mean annual peak flood (Qbar) rate of runoff thus controlling the ‘peak’ discharge and discharge volume for all storm events up to and including the design 1:200-year plus climate change event. It is noted that this proposal is more conservative than the discharge limit criteria set out in Highland Council’s Flood Risk and Drainage Guidance which only requires the 1:30-year event to be limited to the greenfield runoff rate (Section 6.18 of the Guidance) and as much of the site is considered ‘brownfield’, limiting to Qbar for all return period design events is significant betterment to the current hydrological baseline context at site.

7.7.14 Full details of the drainage design mitigating flood risk to the Proposed Development and downstream receptors are included in Technical Appendix 7.2.

#### Water Quality Mitigation

7.7.15 In accordance with CIRIA Report C753 it is necessary to undertake a ‘Water Quality Risk Management’ assessment to determine the suitability of SuDS methods from a water quality perspective. Based on the application of filter drains, swales, a wetland feature and a SuDs basin to manage post development runoff from the site and the Pollution Hazard of the existing industrial roofs and site, the SuDS Mitigation Index offered by the proposed SuDS is ≥ Pollution Hazard Index therefore the water quality assessment criteria is considered to be satisfied. Full details of the water quality design criteria can be found in Technical Appendix 7.2.

7.7.16 In addition, proprietary pollution prevention infrastructure is proposed for the more heavily trafficked storage areas to the south of the Recycling and Billet Casting Facility. Surface runoff from these areas will pass through a bypass separator (Klargester NSBE010 or similar approved) prior to discharge to the constructed wetland.

## 7.8 Potential Effects

### *Construction*

#### Changes to Groundwater Flow

7.8.1 Excavation depths across the extent of the Proposed Development area to establish / expose a suitable load bearing strata for foundations will vary considerably – approximately 1m to 6.5m, which reflects the varying depth of underlying peat, glacial deposits and isolated areas of shallow bedrock. These excavations may result in temporary localised changes to groundwater conditions. The area of the Proposed Development is mostly underlain by peat, which has low / localised permeability and inhibits groundwater flow. Localised pockets of groundwater may be present in the more granular based glacial hummock deposits and within the surface made ground layers.

7.8.2 Regarding the groundwater receptor, the magnitude of change, prior to any additional mitigation, is considered to be low, on a low sensitivity receptor. Therefore, there is potential for a direct, temporary, short-term effect of **negligible to minor adverse** significance prior to the implementation of any additional mitigation measures.

#### Pollution Impact from Sediment Run-off/Transport or Chemical Contaminated Run-off

7.8.3 Surface run-off containing silt and other sediments, particularly during and after rainfall events, has the potential to enter the watercourses and drains on and adjacent to the Proposed Development. Silt and sediment laden surface water run-off is predicted to arise from excavations, exposed ground and any temporary stockpiles. This has the potential to temporarily impact on the water quality and hydrological and ecological function of the receiving watercourse at and downstream of the works in the absence of any mitigation. Additionally, pollutants such as oils, fuel and cement may be mobilised through mechanical leaks or spillage and carried in surface drainage.

7.8.4 As noted in Section 7, a minimum buffer of 50 m around all watercourses has been maintained in siting all infrastructure. Furthermore, as noted in Section 7.6.1, standard construction practice measures will be set out in a CEMP and fully implemented to minimise the risk of pollution to surface watercourses.

7.8.5 The magnitude of change regarding surface water receptors, prior to any additional mitigation, is considered to be negligible, on a high sensitivity receptor. Therefore, there is potential for a direct, temporary, short-term effect of **minor to negligible adverse** significance prior to the implementation of any additional mitigation measures.

7.8.6 Regarding the groundwater receptor, the magnitude of change, prior to any additional mitigation, is considered to be negligible, on a low sensitivity receptor. Therefore, there is potential for a direct, temporary, short-term effect of **negligible** significance prior to the implementation of any additional mitigation measures.

### *Operation*

#### Surface Water Drainage (Increased Rate of Surface Water Run-off)

7.8.7 The Proposed Development could result in an increased rate of surface water run-off from the Proposed Development, increasing downstream flood risk and potentially resulting in soil erosion and silt-laden run-off, which could pollute watercourses, ditches and ponds. However, as set out in Section 7.7, the detailed drainage design ensures that run-off from hard surfaces will be appropriately controlled and limit the development discharge to the required greenfield run-off rates. As much of the site is considered 'brownfield', limiting to the required greenfield runoff rate for all return period design events is significant betterment to the current hydrological baseline context at site.

7.8.8 The magnitude of change, prior to any additional mitigation, is therefore low, on a high sensitivity receptor (local watercourses). Therefore, there is potential for an indirect, long-term effect of **minor to moderate beneficial** significance.

#### Long-term Changes to Groundwater Flow Regime

The presence of building foundations has the potential to interrupt groundwater flow for examples, impermeable foundations can act as barriers to flow. However, given the nature of the superficial geology at the Proposed Development, groundwater is expected to be limited to localised near-surface made ground deposits and glacial deposits. Upon completion of construction, upgradient groundwater will establish a natural pathway locally around the development formation / foundation and continue in the natural (pre-development) flow regime northwards towards the River Lochy.

The magnitude of impact is therefore low on a low sensitivity receptor. Therefore, there is potential for an indirect, long-term effect of **negligible to minor adverse** significance.

## 7.9 Additional Mitigation

7.9.1 During construction, as outlined in the CEMP environmental monitoring will be undertaken during construction works to check compliance with the planning conditions, environmental legislation, environmental policies, CEMP and mitigation contained within the EIA Report. Should deficiencies or opportunities for improvement be identified, the Principal Contractor will agree the actions required with the responsible staff, record the incident, and report to the Applicant and statutory bodies as required. Work will be stopped immediately if a potential breach of environmental mitigation or legislation is identified.

7.9.2 To ensure the proposed surface water management strategy remains operational and capable of managing large storm events, drainage components should be inspected and maintained throughout the life of the development. Regular inspection / maintenance will ensure efficient operation and prevent failure / loss of performance of drainage system. Monitoring and maintenance of the drainage strategy measures have been recommended and set out in Technical Appendix 7.2. The maintenance plan has been developed from best practice guidance, information provided in the CIRIA Report C753 and manufacturer's guidelines. The maintenance plan provides maintenance and remedial actions, as well as their frequency, for each of the components of the drainage strategy including wetlands, SuDS pond, filter drains, swales and ditches, bypass separator and linear drains.

7.9.3 A Draft Peat Management Plan (PMP) is included as Technical Appendix 8.2 to chapter 8: Ecology and Biodiversity. This has been developed to set out the approach to the management of the peat resource during construction of the facility. Of relevance to this chapter are the following;

- The design and location of stockpiles, including incorporated drainage elements, will be agreed with the ECoW and Geotechnical Consultant / Geotechnical Clerk of Works prior to excavation works commencing.
- Temporary peat storage areas will be located such that erosion and run off is limited, leachate from the material is controlled, and stability of the existing peatland in the vicinity is not affected.
- Excavated material will be stockpiled at least 150 m away from the nearest watercourse. This will ensure that any wetting required on stored peat does not runoff and discharge into watercourses.

## 7.10 Residual Effects

### *Construction*

7.10.1 No significant potential effects on hydrological and hydrogeological receptors have been predicted during the construction phase of the Proposed Development when taking account of mitigation by design and embedded mitigation (i.e. implementation of the CEMP) set out in Section 7.6. Furthermore, some additional mitigation measures are proposed as described in Section 7.9 referring to the implementation and identification of any improvements of the embedded mitigation (i.e. the CEMP).

7.10.2 Taking account of the above-noted mitigation commitments, the residual effect on hydrological and hydrogeological receptors is assessed as being **negligible to minor**, and not significant.

### *Operation*

7.10.3 No significant potential effects on hydrological and hydrogeological receptors have been predicted during the operational phase of the Proposed Development when taking account of mitigation by design and embedded mitigation (i.e. drainage design) set out in Section 7.6. Furthermore, some additional mitigation measures are proposed as described in Section 7.9 referring to the maintenance and monitoring of the embedded mitigation (i.e. the drainage design).

7.10.4 Taking account of the above-noted mitigation commitments, the residual effect on hydrological and hydrogeological receptors is assessed as being **negligible to minor** and not significant, and **minor to moderate** and significant

## 7.11 Cumulative Assessment

7.11.1 A new Water Canning Plant on the Smelter site is proposed which will be covered by a separate planning application. It is anticipated that the building will be approximately 66 m length by 24 m width. The Water Canning Plant will be subject to a standalone Drainage Impact Assessment and Flood Risk Assessment (as applicable) as part of the separate planning application.

## 7.12 Summary

7.12.1 There are no major surface watercourses on the site or in its immediate surroundings. Within the wider study area Allt Garb flows north-west down the slopes of Ben Nevis to a flat boggy area south-west of the Site before continuing to flow south-west of the site before merging with Caochan Dubhaig. This then discharges into the River Nevis which itself flows west before discharging to Loch Linhe. Loch Linhe (North) is a transitional water body with a Good overall condition. Minor drainage channels collect overland flow in the north of the site and discharge to a mapped ditch flowing adjacent to the railway line. This watercourse eventually discharges to the "Tail Race", a man-made channel collecting water from the adjacent smelter powerhouse, which itself discharges to the River Lochy. The Tail Race flows beneath the railway line at two locations, the A82 and a minor road accessing Inverlochy Castle.

7.12.2 The Lochaber Smelter abstraction (CAR/L/1012344) is unaffected by the development (as confirmed by the client) and the Ben Nevis Distillery abstraction (CAR/L/1011006) is approximately 770m north-east and upstream of the Proposed Development. CAR/L/1002904 relates to the leachate discharge to the Tail Race. Ben Nevis Motor is registered as CAR/R/1172567 and is not within hydraulic continuity of the Proposed Development

7.12.3 The superficial deposits of Peat and hummocky (moundy) glacial deposits are expected to have low permeability, with the Peat likely to inhibit groundwater flow. The underlying bedrock geology at the Proposed Development comprises micaceous psammite and pelite and classed as a low productivity aquifer. Given the nature of the bedrock geology, any groundwater within the superficial deposits is unlikely to be in hydrological continuity with deeper groundwater. Fort William groundwater body at the Proposed Development is classed as having an overall condition of Good.

7.12.4 It is considered that the potential GWDTE identified at the Proposed Development are fed by direct rainfall or by surface water run-off from the slopes of Ben Nevis to the east and south-east of the Proposed Development and are not dependent on groundwater.

7.12.5 No PWS have been identified within the study area.

7.12.6 The FRA carried out demonstrates the Proposed Development is no significant flood risk from all sources.

7.12.7 Potential construction and operational effects include changes to the groundwater flow regime, the risk of siltation and pollution of watercourses resulting in adverse effects on water quality, increased rate of surface water run-off and impact on flood risk on-site and downstream.

7.12.8 Embedded mitigation including buffering of watercourses, outline and implementation of a CEMP, design of a drainage strategy mitigating increased surface run-off, flood risk and impact on water quality will be in place to mitigate the effects of the Proposed Development during operation and construction.

7.12.9 Potential effects on hydrological, geological and hydrogeological receptors, taking account of the above-noted embedded mitigation, have been assessed as **negligible to minor adverse** and not significant, and **minor to moderate beneficial** and significant.

7.12.10 Additional mitigation has been set out, including monitoring of CEMP measures during construction and monitoring and maintenance of the drainage components during operation.

7.12.11 The significance of residual effects on hydrological, geological and hydrogeological receptors is considered to be **negligible to minor adverse** and not significant**,** and **minor to moderate beneficial** and significant.

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# Chapter 8 Ecology and Biodiversity

# 8. Ecology and Biodiversity

# 8. Ecology and Biodiversity

## 8.1 Introduction

8.1.1 This chapter considers the likely effects on ecology from the construction and operation of the Proposed Development, with a particular focus on Important Ecological Features (IEFs). The Ecology chapter should be read with reference to the scheme description in chapter 3 (Proposed Development), as well as other chapters as referenced throughout.

8.1.2 The Proposed Development planning application boundary area is centred on national grid reference (NGR) 212289 774767 and covers an area of 25.9 ha, closely overlapping the boundary of the previously consented AWP, albeit with significantly smaller development footprint (approximately 4.95). As such baseline information contained within the following documents, produced in relation to the AWP, are considered relevant to this assessment:

- Environmental Impact Assessment (EIA) Report for the AWP (specifically Technical Appendices 12.1 to 12.4 (Golder, 2017);
- Geophysical survey report (Golder, 2019a);
- Ground investigation report (Soil Engineering Ltd (SEGL), 2019); and
- Geotechnical report (Golder, 2019b).

8.1.3 This Ecology chapter is informed by, and should be read in conjunction with, the following Drawings and Technical Appendices:

- Drawing 8.1: Site Plan and Study Area;
- Drawing 8.2: Nature Conservation Designations within 5 km;
- Drawing 8.3: Phase 1 Habitats;
- Drawing 8.4: National Vegetation Communities;
- Technical Appendix 8.1: Extended Phase 1 Habitat Survey Report; and
- Technical Appendix 8.2: Draft Peat Management Plan.

## 8.2 Legislation, Policy and Guidelines

8.2.1 The ecology assessment has been written with reference to relevant legislation, policy and guidance, notably the following:

### *Legislation*

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (i.e. the “Habitats Directive”)[1];
- Council Directive 2009/147/EC on the conservation of wild birds (i.e. the “Birds Directive”);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);

[1] As the UK has now left the European Union, the Habitats and Birds Directives are considered of relevance mainly as having informed national legislation. As such, reference is not made in this chapter to habitats and species listed on the various annexes of the directives, but instead to UK counterparts, e.g. habitats and species listed on the Scottish Biodiversity List.

- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland) (i.e. the "Habitats Regulations");
- The Wildlife and Natural Environment (Scotland) Act 2011 (as amended) (WANE Act);
- Nature Conservation (Scotland) Act 2004 (as amended) (NCA); and
- The Protection of Badgers Act 1992 (as amended).

### *Planning Policy*

- Scottish Planning Policy (SPP) (Scottish Government, 2014a);
- National Planning Framework (NPF) 3 (Scottish Government, 2014b);
- West Highland and Islands Local Development Plan (WestPlan) (THC, 2019);
- The Highland-wide Local Development Plan (HwLDP) (THC, 2012); and
- HwLDP2 Strategic Environmental Assessment. Environmental Report (THC, 2016).

### *Guidance*

8.2.2 Planning Advice Note (PAN) 60: Planning for Natural Heritage (Scottish Government, 2000) provides guidance relevant to this assessment and the Proposed Development.

8.2.3 Further key guidance documents relating to the assessment of the effects of the Proposed Development on terrestrial ecological receptors that have been referenced include the following:

- The Scottish Biodiversity List (SBL) (Scottish Government, 2013). The SBL is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in a Scottish context. Scientific and social criteria have been used to define the species and habitats included on the SBL. Scientific criteria include all Priority Species and Priority Habitats included in the now superseded UK Biodiversity Action Plan (BAP) (UK Biodiversity Partnership, 2007 *et seq*.), which occur in Scotland. This chapter only considers those listed using scientific criteria;
- The Highland Biodiversity Action Plan (Highland Environment Forum 2015):
- Birds of Conservation Concern 4 (BoCC). The leading government (Joint Nature Conservation Committee, JNCC) and non-government conservation organisations in the UK jointly reviewed the population status of the 246 bird species that are regularly found within the United Kingdom, using data from national monitoring schemes. This was most recently done in 2015 (Eaton *et al*., 2015). On the basis of seven quantitative criteria, each species has been placed on one of three lists, these being:
    - Red – red-listed species are those that are globally threatened, have had an historical population decline in the UK from 1800 -1995, a rapid (> or = 50%) decline in UK breeding population over the past 25 years, or a rapid (> or = 50%) contraction of UK breeding range over the past 25 years;
    - Amber – amber-listed species have had a historical population decline from 1800-1995 but are recovering; population size has more than doubled over the past 25 years, a moderate (25-49%) decline in UK breeding population over the past 25 years, a moderate (25-49%) contraction of UK breeding range over the past 25 years, a moderate (25-49%) decline in UK non-breeding population over the past 25 years, or species with unfavourable conservation status in Europe also known as Species of European Conservation Concern (SPEC); and
    - Green – green-listed species have no identified threat to their population status.

- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018); and
- Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (SEPA, 2017).

8.2.4 Specific consideration is made within this Ecology chapter with regards to the NatureScot (formerly Scottish Natural Heritage, SNH) Guidance: Instruction Note: Advising on carbon-rich soils, deep peat and priority peatland habitat in Development Management (SNH 2018a, last reviewed by NatureScot August 2020).

8.2.5 Where appropriate, more detail relating to specific legislation, guidance or policy is provided in the corresponding Technical Appendix for each specialist input supporting this chapter (i.e. Technical Appendices 8.1 and 8.2).

## 8.3 Consultation

### *Scoping*

8.3.1 In undertaking the ecological baseline and impact assessments, consideration has been given to ecological-specific consultee EIA Scoping Opinion responses. Table 8.1 details those consultation responses that have been provided with regards to terrestrial ecology (including peat issues) and outlines how they have been addressed.

***Table 8.1: Ecological Consultation Responses***

| Consultee | Responses of Relevance to Ecology | Applicant Action |
|---|---|---|
| Scottish Environment Protection Agency (SEPA) | **Disturbance and re-use of excavated peat and other carbon-rich soils:** Peat disturbance to be minimised. SEPA have confirmed that sufficient survey information was collected for the previous consented application and no further survey is required. A revised Peat Management Plan is to be produced which includes:<br>- A layout plan overlain with peat survey results;<br>- Justification of the location of development in relation to the areas of peat on site;<br>- Measures to be taken to minimise peat disturbance;<br>- Estimated volume of peat that will be disturbed by the development broken down into acrotelmic and catotelmic;<br>- Proposed re-uses of disturbed peat - including detailed restoration plan (as proposed in screening report); and<br>- Proposed locations for temporary peat storage areas. | Detailed consideration is made in relation to peat and its management within this chapter and the accompanying Draft Peat Management Plan (Technical Appendix 8.2). |

| Consultee | Responses of Relevance to Ecology | Applicant Action |
|---|---|---|
| | **Ground Water Dependant Terrestrial Ecosystems:** SEPA have confirmed that they are content that information submitted with the previously consented AWP development demonstrated that peatland habitats within the Site are not significantly groundwater dependent and as a result require no further consideration. | No further consideration required. |
| | **Pollution prevention and environmental management:** A schedule of mitigation must be submitted which outlines the measures to be taken to limit the impacts on the environment during the construction period. These must include reference to best practice pollution prevention and construction techniques and regulatory requirements. | Details of pollution prevention measures, site management plans and associated mitigation are presented in Technical Appendix 3.1: Outline Construction Environmental Management Plan (CEMP). Additional best practice and mitigation measures pertinent to ecological receptors are presented in Section 8.7 of this chapter. |
| NatureScot | Response received 17.02.2021. NatureScot have confirmed that an appropriate approach will be to use the baseline ecological data from the 2017 surveys (completed to inform the AWP EIA Report), supplemented with the 2021 update extended Phase 1 survey results, to inform the Ecology chapter. The draft Peat Management Plan (PMP) produced for the AWP is to be revised to be specific to the Proposed Development. | Extended Phase 1 habitat survey report presented as Technical Appendix 8.1.<br><br>Assessment completed using 2017 baseline and 2021 habitat and species data.<br><br>Draft Peat Management Plan included as Technical Appendix 8.2. |

## 8.4 Assessment Methodology and Significance Criteria

### *Ecological Desk Study*

8.4.1 The following documents were reviewed to gather relevant baseline ecological and peat data for the Site:

- The Environmental Impact Assessment (EIA) Report for the AWP (Golder, 2017), specifically the following documents:
    - AWP Technical Appendix 12.1 – Natural Heritage Information Desk Study;
    - Technical Appendix 12.2 – Phase 1 Habitat Survey, National Vegetation Classification Survey (NVC) and Groundwater Dependent Terrestrial Ecosystems Report;
    - AWP Technical Appendix 12.3 – Protected Terrestrial Mammal Survey Report; and

- AWP Technical Appendix 12.4 – Fisheries Assessment.

- Ground investigations relating to peat, specifically the following documents:
  - Geophysical survey report (Golder, 2019a);
  - Ground investigation report (Soil Engineering Ltd (SEGL), 2019); and
  - Geotechnical report (Golder, 2019b).

This data was used to confirm the presence of any statutory or non-statutory nature conservation sites, areas of ancient woodland and legally protected, or otherwise notable species (i.e. those species of conservation concern, either nationally or within THC LBAP), ranging up to 5 km from the Proposed Development.

Baseline data from the Phase 1 habitat and NVC survey were used to inform the assessment of habitats within the Proposed Development area.

### *Field Studies*

8.4.2 An extended Phase 1 habitat and protected terrestrial mammal survey was undertaken in January 2021. The aim of the survey was to highlight any changes to habitats within the Proposed Development as a result of recent felling and ground investigation works and update the findings of the 2017 mammal surveys. The study area encompassed the Proposed Development and a 100 m buffer. Details of the extent of the survey area are further described and presented in the corresponding Technical Appendix 8.1 and associated Drawings as referenced in paragraph 8.1.3 above.

### *Evaluation Methods for Ecological Features*

8.4.3 Table 8.2 below, lists the criteria used to determine the value of ecological features in a geographical context.

*Table 8.1: Geographical Evaluation Criteria*

| Value | Criteria | Examples |
|---|---|---|
| International | Nature conservation resource, i.e. designated nature conservation area, habitat or populations of species, of international importance. N.B. For designations, such as a Special Area of Conservation (SAC) or a Special Protection Area (SPA), this may also include off-site features on which the qualifying population(s) or habitat(s) are considered, from the best available evidence, to depend. | International nature conservation areas:<br>- any SAC or SPA;<br>- any candidate SAC (cSAC) or potential SPA (pSPA); and<br>- any Ramsar wetland.<br>Significant numbers of a designated population outside the designated area.<br>A site supporting more than 1% of the EU population of a species. |
| National (i.e. Scotland) | Nature conservation resource, i.e. designated nature conservation area, habitat or populations of species, of national importance. N.B. For designations, such as a Site of Special Scientific Interest (SSSI) or a National Nature Reserve (NNR), this may also include off-site features on which the qualifying population(s) or habitat(s) are | National nature conservation areas:<br>- any SSSI or NNR designated for biological feature(s).<br>A site supporting more than 1% of the UK population of a species.<br>Nationally important population/assemblage of a European Protected Species |

| Value | Criteria | Examples |
|---|---|---|
| | considered, from the best available evidence, to depend. | (EPS) or species listed on Schedule 5 of the Wildlife Countryside Act 1981 (WCA). |
| Regional (Lochaber) | Nature conservation resource, i.e. nature conservation designation, habitat or species, of importance on a regional scale. | Statutory and non-statutory nature conservation designations:<br>- any Local Nature Reserve (LNR);<br>- any Scottish Wildlife Trust (SWT) reserve;<br>- any Local Biodiversity Site (LBS); and<br>- Ancient Woodland listed on the Ancient Woodland Inventory (SNH, 2010).<br>A Council-scale important population / area of a species or habitat listed on the Scottish Biodiversity List (SBL) (Scottish Government, 2013) as requiring conservation action.<br>A regional-scale important population/area of a species or habitat listed on the Local Biodiversity Action Plan (LBAP).<br>A regional-scale important population / assemblage of European Protected Species (EPS) or species listed on Schedule 5 of the WCA. |
| Local (i.e. within 2 km of the site) | Nature conservation resource, e.g. a habitat or species of importance in the context of the local district. | A breeding population of a species on the SBL.<br>A breeding population of a species or a viable area of a habitat that is listed in a Local BAP because of its rarity in the locality.<br>An area supporting 0.05%-0.5% of the UK population of a species. |
| Less than local | Unremarkable, common and widespread habitats and species of little/no intrinsic nature conservation value. | Common, widespread, agricultural and/or exotic species (such as escapees). |

8.4.4 Where a feature qualifies under two or more criteria, the higher value is applied to the feature.

8.4.5 Within this chapter, any ecological feature of local or higher value is considered an Important Ecological Feature (IEF).

### *Impact Assessment Methods*

8.4.6 The approach to the Ecological Impact Assessment (EcIA) follows the Chartered Institute of Ecology and Environmental Management guidelines (CIEEM, 2018), which prescribe an industry-standard method to define, predict and assess potential ecological effects to a given proposed development. Starting with establishing the baseline through a mix of desk study and field survey, important ecological features (the IEFs) are identified and those requiring assessment established through a reasoned process of valuation and consideration of factors, such as statutory requirements, policy objectives for biodiversity, conservation status of the IEF (habitat or species), habitat connectivity and spatial separation from the Proposed Development. From this stage, these features are assessed for impacts with the assumption of this being in the presence of construction industry-standard mitigations to ameliorate impacts as far as practicably possible. Additional mitigation strategies can then be determined to minimise any residual impacts that would otherwise be experienced by the IEF and any opportunities for enhancement identified.

8.4.7 In summary, the impact assessment process (CIEEM, 2018) involves:

- Identifying and characterising impacts and their effects;
- Incorporating measures to avoid and mitigate negative effects;
- Assessing the significance of any residual effects after mitigation;
- Identifying the appropriate compensation methods to offset significant residual effects; and
- Identifying opportunities for ecological enhancement.

### *Ecological Zone of Influence*

8.4.8 The Ecological Zone of Influence (EZoI) is defined as the area within which there may be ecological features subject to effects from the Proposed Development. Such effects can be direct (e.g. habitat loss resulting from land-take or removal of a building occupied by bats) or indirect (e.g. noise or visual disturbance causing a species to move out of the EZoI. The EZoI was determined through:

- Review of the existing baseline conditions based on desk study results, field surveys and information supplied by the consultees;
- Identification of sensitivities of ecological features, where known;
- The outline design of the Proposed Development and approach to construction; and
- Through liaison with other technical specialists involved in the assessment (e.g. hydrologists and noise specialists).

### *Characterising Ecological Impacts and Effects*

8.4.9 In accordance with the CIEEM guidelines, the following definitions are used for the terms ‘impact’ and ‘effect’.

- Impact – Actions resulting in changes to an ecological feature. For example, the construction activities of a development removing a hedgerow; and
- Effect – Outcome to an ecological feature from an impact. For example, the effects on a species population from the loss of a hedgerow.

8.4.10 In accordance with the CIEEM guidelines, when determining impacts on IEFs, reference is made to the following:

- Beneficial or adverse – i.e. whether the impact has a beneficial or adverse effect in terms of nature conservation objectives and policy;
- Magnitude – i.e. the size of an impact, in quantitative terms where possible;

- Extent – i.e. the area over which an impact occurs;
- Duration – i.e. the time for which an impact is expected to last;
- Timing and frequency – i.e. whether impacts occur during critical life stages or seasons; and
- Reversibility – i.e. a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A temporary impact is one from which a spontaneous recovery is possible.

8.4.11 Both direct and indirect impacts are considered. Direct ecological impacts are changes that are directly attributable to a defined action (e.g. the physical loss of habitat occupied by a species during the construction process). Indirect ecological impacts are attributable to an action but affect ecological resources through effects on an intermediary ecosystem, process or feature (e.g. fencing of a development site may cause scrub to invade marshy grassland).

8.4.12 The CIEEM guidelines state that impacts should be quantified, if possible, and expressed in absolute or relative terms (e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population). That approach has been followed here, where possible. However, following in the language of other chapters in the EIA Report, impact magnitude has also been characterised with reference to the definitions in Table 8.3.

*Table 8.3: Level of Impact*

| Level of Impact | Definition |
|---|---|
| No impact | No detectable impacts on the ecological resource, even in the immediate term. |
| Negligible | Detectable impact but reversible within 12 months. Not expected to affect the conservation status of the nature conservation designation, habitat or species under consideration. |
| Low | Detectable impacts, and may be irreversible, but either of sufficiently small-scale or of short-term duration to have no material impact on the conservation status of the nature conservation designation, habitat or species population. |
| Medium | Detectable impact on the status of the nature conservation designation, habitat or species population in the medium term but is reversible / replaceable given time, and not a threat to the long-term integrity of the feature. |
| High | Irreversible impact on the status of the nature conservation designation, habitat or species and likely to threaten the long-term integrity of the feature. Not reversible or replaceable. Will remain detectable in the medium and long term. |
| The following definitions have been applied in respect to timescales:<br>Immediate: Within approximately 12 months;<br>Short term: Within approximately 1-5 years;<br>Medium term: Within approximately 6-15 years; and<br>Long term: More than 15 years. | |

### *Determining Ecologically Significant Effects*

8.4.13 An EcIA is undertaken in relation to the baseline conditions that would be expected to occur in the absence of a Proposed Development and, therefore, may include possible predictions of future changes to the baseline conditions, such as environmental trends and other completed or planned development. Both adverse and beneficial impacts/effects are possible.

8.4.14 A significant effect, in ecological terms, is defined as an effect (whether adverse or beneficial) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area, including cumulative and in-combination impacts.

8.4.15 In accordance with the CIEEM guidelines, the approach in this chapter aims to determine if the effect of an impact is significant or not based on a discussion of the factors that characterise it (i.e. the ecological significance of an effect is not dependent on the value of the feature in question). Rather, the value of a feature that will be significantly affected is used to determine the geographical scale at which the effect is significant.

8.4.16 In accordance with the current CIEEM guidelines, effects of impacts are assessed in the presence of standard mitigation measures. Additional mitigation may be identified where it is required to reduce a significant effect.

8.4.17 Any significant effect remaining post-mitigation (the residual effect); together with an assessment of the likelihood of success of the mitigation, are the factors to be considered against legislation, policy and development control in determining the application.

8.4.18 In addition to determining the significance of effects on valued ecological features, this chapter also identifies any legal requirements in relation to wildlife.

### *Survey Limitations*

8.4.19 The extended Phase 1 habitat survey was undertaken in January 2020 outwith the optimal survey period for botanical survey (April to September). However, the data collected was reviewed in conjunction with the 2017 habitat survey results and this limitation is not considered to have affected the correct classification of habitat types. It should also be noted that woodland on the site was cleared in the winter of 2018-19 and that the ongoing vegetation re-establishment means that the species composition is likely to be in flux.

## 8.5 Baseline Conditions

8.5.1 This section of the report details the results the desk study and field surveys conducted across the site and respective study areas, which provides the baseline conditions from which the impact assessment is based. This includes:

- Designated sites and desk study/external data;
- Habitats and vegetative communities; and
- Protected or otherwise notable species.

### *Current Baseline*

#### Desk Study

8.5.2 A summary of the baseline information for the site based on the sources detailed in 8.4.1 is provided below.

#### Designated Sites

8.5.3 Two nature conservation designations (including overlapping designations) are present within 5 km of the Proposed Development. Designated site details are summarised in Table 8.4 and presented in Drawing 8.2. Sites designated for non-ecological features only are excluded from this table and not considered in this chapter of the EIA report.

***Table 8.4: Designated sites within 5 km of the Proposed Development***

| Site Name | Designation | Distance from Site | Qualifying Features |
|---|---|---|---|
| Ben Nevis | Special Area of Conservation (SAC) | 0.42 km east | Annex I habitats that are a primary reason for selection of this site:<br>○ Siliceous alpine and boreal grasslands<br>○ Alpine and subalpine calcareous grasslands<br>○ Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)<br>○ Calcareous rocky slopes with chasmophytic vegetation<br>○ Siliceous rocky slopes with chasmophytic vegetation<br>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:<br>○ Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*<br>○ Northern Atlantic wet heaths with *Erica tetralix*<br>○ European dry heaths<br>○ Alpine and boreal heaths<br>○ Sub-Arctic *Salix* spp. scrub<br>○ Species-rich *Nardus* grasslands, on silicious substrates in mountain areas*<br>○ Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels<br>○ Blanket bogs (* if active bog)<br>○ Alpine pioneer formations of the *Caricion bicoloris-atrofuscae* *<br>○ Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*)<br>○ Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles<br>○ Caledonian forest*<br>* Priority feature |
| Ben Nevis | Site of Special Scientific Interest (SSSI) | 0.42 km east | Designated for the following features:<br>○ Upland assemblage |

| Site Name | Designation | Distance from Site | Qualifying Features |
|---|---|---|---|
| | | | ○ Native pinewood<br>○ Upland oak woodland<br>○ Vascular plant assemblage<br>○ Bryophyte assemblage<br>○ Breeding bird assemblage<br>○ Small mountain ringlet butterfly (*Erebia epiphron*)<br>○ Fly assemblage |
| Ach an Todhair | SSSI | 3.3 km SW | Designated for the following features:<br>○ Upland mixed ash woodland<br>○ Upland habitat assemblage |

8.5.4 Additionally, three areas of ancient woodland were identified within 2 km of the planning application boundary, the closest being located c.0.28 km south-west, beyond Claggan.

Protected or Otherwise Notable Species Records – External Data

8.5.5 Table 8.5 summarises baseline ecology data from the 2017 and 2021 desk studies and field surveys for otter (*Lutra lutra*), badger (*Meles meles*), Scottish wildcat (*Felis silvestris silvestris*), pine marten (*Martes martes*), water vole (*Arvicola amphibius*) and red squirrel (*Sciurus vulgaris*) undertaken in 2017. The 2017 survey area included the site of the Proposed Development and up to a 250m buffer.

***Table 8.5: Protected or Otherwise Notable Species Historical Records within 5km of the Site – External Data***

| Common Name | Scientific Name | Legal/Conservation Status | Summary of Baseline Data |
|---|---|---|---|
| **Mammals** | | | |
| Otter | *Lutra lutra* | Fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).<br>SBL priority species*<br>HBAP Priority Species. | The 2017 and 2021 desk study found records of this species within 5 km of the site. No evidence of otter was recorded in the 2017 surveys. |
| Badger | *Meles meles* | Fully protected under the Protection of Badgers Act 1992 as amended by the Wildlife and Natural Environment (Scotland) Act 2011. | The 2017 desk study found no records of this species within 5 km of the site and no evidence of badger was recorded in the 2017 surveys. The 2021 desk study found records of badger within 5 km of the site. |
| Scottish wildcat | *Felis silvestris silvestris* | Fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).<br>SBL priority species.<br>HBAP Priority Species. | The 2017 desk study found no records of this species within 5 km of the site and no evidence of wildcat was recorded in the 2017 surveys. |

| Common Name | Scientific Name | Legal/Conservation Status | Summary of Baseline Data |
|---|---|---|---|
| | | | The 2021 desk study found one record pf Scottish wildcat within 5 km of the site. |
| Water vole | *Arvicola amphibius* | Partially protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). SBL priority species. HBAP Priority Species. | The 2017 and 2021 desk study found no records of this species within 5 km of the site and no evidence of water vole was recorded in the 2017 surveys. |
| Pine marten | *Martes martes* | Fully protected under Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended). Partial protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). SBL priority species. HBAP Priority Species. | The 2017 and 2021 desk study found records of this species within 5 km of the Site. No evidence of pine marten was recorded in the 2017 surveys. |
| Red squirrel | *Sciurus vulgaris* | Red squirrels and their dreys are fully protected under Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended). SBL priority species. HBAP Priority Species. | The 2017 and 2021 desk study found records of this species within 5 km of the Site. No evidence of red squirrel was recorded in the 2017 surveys. |
| Common pipistrelle | *Pipistrellus pipistrellus* | Fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)<br>SBL priority species | The 2021 desk study found records of this species within 5 km of the Site. |
| Soprano pipistrelle | *Pipistrellus pygmaeus* | Fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)<br>SBL priority species.<br>HBAP Priority Species. | The 2021 desk study found records of this species within 5 km of the Site. |
| Brown long-eared bat | *Plecotus auritus* | Fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) | The 2021 desk study found records of this species within 5 km of the Site. |

| Common Name | Scientific Name | Legal/Conservation Status | Summary of Baseline Data |
|---|---|---|---|
| | | SBL priority species.<br>HBAP Priority Species. | |
| Hedgehog | *Erinaceus europaeus* | Partially protected under the Wildlife and Countryside Act 1981 (as amended)<br>SBL priority species.<br>HBAP Priority Species. | The 2021 desk study found records of this species within 5 km of the Site. |
| Reptiles and Amphibians | | | |
| Slow-worm | *Anguis fragilis* | Partially protected under the Wildlife and Countryside Act 1981 (as amended)<br>SBL priority species.<br>HBAP Priority Species. | The 2021 desk study found records of this species within 5 km of the Site. |
| Common lizard | *Zootoca vivipara* | Partially protected under the Wildlife and Countryside Act 1981 (as amended)<br>SBL priority species.<br>HBAP Priority Species. | The 2021 desk study found records of this species within 5 km of the Site. |
| Common toad | *Bufo bufo* | Partially protected under the Wildlife and Countryside Act 1981 (as amended)<br>SBL priority species.<br>HBAP Priority Species. | The 2021 desk study found records of this species within 5 km of the Site. |
| Palmate newt | *Lissotriton helveticus* | Partially protected under the Wildlife and Countryside Act 1981 (as amended) | The 2021 desk study found records of this species within 5 km of the Site. |
| Common frog | *Rana temporaria* | Partially protected under the Wildlife and Countryside Act 1981 (as amended) | The 2021 desk study found records of this species within 5 km of the Site. |

*SBL priority species: an SBL-listed species for which conservation action is needed.

8.5.6 The 2021 desk study identified 150 bird species within 5 km of the Site boundary. Of these species 27 are listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), 16 are listed in Annex 1 of the EU Birds Directive and 53 are listed in the SBL. Additionally, of the bird species records returned by the desk study, 39 are BoCC Red-listed and 51 are Amber-listed. For the full list refer to Technical Appendix 8.1. Table 8.6 below lists species recorded within 5 km of the site that are known to associate with habitats similar to those present in the study area.

*Table 8.6: Protected or Otherwise Notable Bird Species recorded within 5 km of the Proposed Development*

| Common Name | Scientific Name | Legal / Conservation Status |
|---|---|---|
| Cuckoo | *Cuculus canorus* | SBL, Red Listed, HBAP |
| Curlew | *Numenius arquata* | SBL, Red Listed, HBAP |
| Dunlin (schinzii race) | *Calidris alpina schinzii* | Annex 1, Amber Listed |
| Golden plover | *Pluvialis apricaria* | Annex 1, SBL, Green Listed |
| Grasshopper warbler | *Locustella naevia* | SBL, Red Listed, HBAP |
| Greenshank | *Tringa nebularia* | Schedule 1, Amber Listed |
| Hen harrier | *Circus cyaneus* | Annex 1, Schedule 1, SBL, Red Listed |
| Hooded crow | *Corvus cornix* | SBL, Green Listed |
| Kestrel | *Falco tinnunculus* | SBL, Amber Listed |
| Lesser redpoll | *Acanthis cabaret* | SBL, Red Listed, HBAP |
| Linnet | *Linaria cannabina* | SBL, Red Listed, HBAP |
| Peregrine | *Falco peregrinus* | Annex 1, Schedule 1, SBL, Green Listed |
| Ptarmigan | *Lagopus muta* | Annex 1, Green Listed |
| Red grouse | *Lagopus lagopus* | Amber Listed, HBAP |
| Red kite | *Milvus milvus* | Annex 1, Schedule 1, SBL, Green Listed |
| Ring ouzel | *Turdus torquatus* | SBL, Red Listed, HBAP |
| Skylark | *Alauda arvensis* | SBL, Red Listed, HBAP |
| Snipe | *Gallinago gallinago* | Amber Listed |
| Snow bunting | *Plectrophenax nivalis* | Schedule 1, SBL, Amber Listed |
| Tree pipit | *Anthus trivialis* | SBL, Red Listed, HBAP |
| Twite | *Linaria flavirostris* | SBL, Red Listed, HBAP |
| Whimbrel | *Numenius phaeopus* | Schedule 1, Red Listed |
| Whinchat | *Saxicola rubetra* | Red Listed |
| Meadow pipit | *Anthus pratensis* | Amber Listed |

### Peat

8.5.7 A geophysical investigation of the area proposed for the AWP and associated infrastructure was undertaken by Golder Associates Limited (Golder) in 2018 (Golder, 2019a), and a geotechnical site investigation was undertaken in 2019 by Soil Engineering Limited (SEGL) (SEGL, 2019) with an interpretive report subsequently produced by Golder (2019b). The following summarises the key peat results for the footprint of the AWP, and is therefore also relevant for the Proposed Development:

- Deep (more than two metres) peat was found to dominate the north-eastern half of the footprint of the AWP, extending to six metres in depth, corresponding to a hollow in that area. The Proposed Development footprint partly extends into this area of deep peat. Shallower (less than two metres) peat was found to dominate the rest of the footprint. However, it should be noted that made ground was identified in areas west and north of the footprint of the Proposed Development.

### Field Surveys

8.5.8 Specific details relating to the 2017 NVC survey methodology are contained within Golder (2017; AWP Technical Appendix 12.2) and 2021 field survey methodologies are included within Technical Appendix 8.1. The following sections summarise the baseline conditions following these ecological surveys.

#### Vegetation

8.5.9 In 2017, the Habitats study area for the consented AWP development comprised the original AWP planning application boundary, 24 ha in area, as shown in Golder (2017; AWP Technical Appendix 12.2, drawings 12.2 and 12.3). The Proposed Development has a reduced building footprint of approximately 12,600 $m^{2,}$ within a development footprint of 5.4 ha including SUDs drainage areas. For the update surveys in 2021 the study area encompassed the footprint of the Proposed Development and up to a 250 m buffer to provide updated information on habitats within the potential zone of influence of the Proposed Development (as shown on Drawing 8.1 and described in Technical Appendix 8.1).

8.5.10 The Phase 1 habitat survey results are shown on Drawing 8.3 and summarised in Table 8.7, which also lists the constituent NVC communities, where relevant. NVC communities are shown on Drawing 8.4. The Phase 1 analysis was informed by peat mapping data and an extended Phase 1 habitat survey in January 2021 which also ground-truthed the 2017 NVC mapping. Where NVC polygons were found to consist of mosaic NVC communities, these areas were assigned a single Phase 1 classification based on the dominant NVC type. In addition to summarising Phase 1 habitats and NVC communities within the application boundary, Table 8.7 also shows those specifically present within potential works areas and a 250m buffer. Technical Appendix 8.1 and Golder (2017) should be consulted for full descriptions of each of the NVC communities, non-NVC communities and associated Phase 1 habitats found within the study area.

***Table 8.7: Phase 1/NVC community equivalents within the study area***

| Phase 1 Habitat Code | Phase 1 Habitat Name | Corresponding NVC Community Equivalent & non-NVC types | Extent in Planning Application Boundary (ha) | Extent in study area (potential works areas and a 250 m buffer) (ha) | % of study area |
|---|---|---|---|---|---|
| A1.1.1 | Semi-natural broadleaved woodland | W4b *Betula pubescens – Molinia caerulea* woodland, *Juncus effusus* sub-community | 1.92 | 2.20 | 5.28 |
| | | W4c *Betula pubescens – Molinia caerulea* woodland, *Sphagnum* sub-community | 1.85 | 2.47 | 5.93 |
| | | W4c associated with M17a | 1.40 | 1.27 | 3.05 |

| Phase 1 Habitat Code | Phase 1 Habitat Name | Corresponding NVC Community Equivalent & non-NVC types | Extent in Planning Application Boundary (ha) | Extent in study area (potential works areas and a 250 m buffer) (ha) | % of study area |
|---|---|---|---|---|---|
| | | W6d *Alnus glutinosa – Urtica dioica* woodland, *Sambucus nigra* sub-community | 0.42 | 0.48 | 1.15 |
| | | W7c *Alnus glutinosa – Fraxinus excelsior* woodland, *Deschampsia cespitosa* sub-community | 0.03 | 0.76 | 1.82 |
| | | A1.1.1 non-NVC community / transitional vegetation | 0.03 | 4.61 | 11.07 |
| A1.1.2 | Broadleaved plantation woodland | N/A | 0.14 | 0.14 | 0.34 |
| A1.2.2 | Coniferous plantation woodland | N/A | 2.09 | 2.36 | 5.67 |
| A4.1 | Recently felled broadleaved woodland | N/A | 0.95 | 0.95 | 2.28 |
| A4.2 | Recently felled, coniferous woodland | N/A | 1.58 | 1.58 | 3.79 |
| A2.1 | Scrub (dense) | W23 *Ulex europaeus – Rubus fruticosus* agg. scrub | 0.15 | 0.28 | 0.67 |
| | | A2.1 non-NVC community / transitional vegetation | 0.99 | 1.03 | 2.47 |
| B2.2 | Semi-improved neutral grassland | MG9b *Holcus lanatus – Deschampsia cespitosa* grassland, *Arrhenatherum elatius* sub-community | 1.15 | 1.46 | 3.51 |

| Phase 1 Habitat Code | Phase 1 Habitat Name | Corresponding NVC Community Equivalent & non-NVC types | Extent in Planning Application Boundary (ha) | Extent in study area (potential works areas and a 250 m buffer) (ha) | % of study area |
|---|---|---|---|---|---|
| B5 | Marshy grassland | M23b *Juncus effusus/acutiflorus – Gallium palustre* rush-pasture, *Juncus effusus* sub-community | 0.13 | 0.27 | 0.65 |
| | | B5 non-NVC community / transitional vegetation | 1.31 | 0.20 | 0.48 |
| C1.1 | Bracken | U20c *Pteridium aquilinum – Galium saxatile* community, species-poor sub-community | 0 | 0.18 | 0.43 |
| D1.1 | Dry dwarf shrub heath - acid | H10a *Calluna vulgaris – Erica cinerea* heath, typical sub-community | 0.51 | 0.61 | 1.46 |
| | | H12a *Calluna vulgaris – Vaccinium myrtillus* heath, *Calluna vulgaris* sub-community | 0.13 | 0.42 | 1.01 |
| D2 | Wet dwarf shrub heath | M15b *Trichophorum cespitosum – Erica tetralix* wet heath, typical sub-community | 0.30 | 0.31 | 0.74 |
| E1.6.1 | Unmodified blanket bog | M17a *Trichophorum cespitosum – Eriophorum vaginatum* blanket mire, *Drosera rotundifolia – Sphagnum* spp. sub-community | 0.46 | 1.39 | 3.34 |
| E1.7 | Wet modified bog | E1.7 Formerly W4c, felled | 6.72 | 7.49 | 17.98 |

| Phase 1 Habitat Code | Phase 1 Habitat Name | Corresponding NVC Community Equivalent & non-NVC types | Extent in Planning Application Boundary (ha) | Extent in study area (potential works areas and a 250 m buffer) (ha) | % of study area |
|---|---|---|---|---|---|
| | | transitional vegetation | | | |
| | | M25 *Molinia caerulea – Potentilla erecta* mire | 0.60 | 0.72 | 1.73 |
| J1.2 | Amenity grassland | N/A | 0.27 | 0.38 | 0.91 |
| J3.6 | Buildings | N/A | 3.08 | 4.33 | 10.40 |
| J5 | Other (hardstanding, bare and disturbed ground) | N/A | 5.76 | 5.76 | 13.83 |
| **Total** | | | **35.28** | **41.65** | **100** |

8.5.11 A brief description of the associated Phase 1 habitats and associated NVC types is presented below. For full descriptions please refer to Technical Appendix 8.1, Drawings 8.3 and 8.4, as well as Golder (2017; AWP Technical Appendix 12.2).

*Semi-natural broadleaved woodland*

8.5.12 Semi-natural broadleaved woodland (A1.1.1) is present within the northern and north-western reaches of the study area and is largely dominated by downy birch (*Betula pubescens*), with small amounts of grey willow (*Salix cinerea)* and some silver birch (*Betula pendula*). In some areas alder (*Alnus glutinosa*) and grey willow are more prominent. The ground flora contains purple moor-grass (*Molinia caerulea*) throughout, often the dominant species. Other species which form the ground flora are bog-mosses such as red bog-moss (*Sphagnum capillifolium*) and papillose bog-moss (*Sphagnum papillosum*). Yorkshire-fog (*Holcus lanatus*) and tormentil (*Potentilla erecta*) are frequent in some areas. The woodland habitat is categorised as having four NVC communities: W4b; W4c; W6d; and W7c. It should be noted that in 2017, W4c was the dominant community type within the study area, extending south over much of the central area of the site. However, felling works in 2018-19 removed large swathes of this habitat, the majority of which is now classified as either wet modified bog (E1.7) or recently felled broadleaved woodland (A1.4) (see below).

8.5.13 W4b *Betula pubescens – Molinia caerulea* woodland, *Juncus effusus* sub-community is located at the north of the Study area. Similar to W4c in terms of tree species composition, but with higher amounts of grey willow. Ground flora lacks bog-mosses and has a mix of grassy species including purple moor-grass, tufted hair-grass (*Deschampsia cespitosa*) with some soft-rush (*Juncus effusus*) and tormentil also recorded.

8.5.14 W4c *Betula pubescens – Molinia caerulea* woodland, *Sphagnum* sub-community is located at the north of the study area adjacent to W4b and to the south and south-east. The understorey has a general abundance of bog-moss species such as blunt-leaved bog-moss (*Sphagnum palustre*) and red bog-moss indicative of the wetter conditions.

8.5.15 Within the north-western reaches there are small areas of W6d *Alnus glutinosa – Urtica dioica* woodland*, Sambucus nigra* sub-community dominated by alder and silver birch, with small amounts of downy birch, crack willow (*Salix fragilis*) and sycamore (*Acer pseudoplatanus*).

8.5.16 Within the north-western reaches of the study area, beyond the railway corridor, and at the far south-east of the study area there are some stands of W7c *Alnus glutinosa – Fraxinus excelsior* woodland*, Deschampsia cespitosa* sub-community dominated by goat willow (*Salix caprea*) and downy birch with small amounts of wild cherry (*Prunus avium*) and sessile oak (*Quercus petraea*).

*Coniferous plantation woodland*

8.5.17 In 2017, coniferous plantation was present within the central and eastern reaches of the study area; however, the majority of this habitat has since been felled (now defined as recently felled coniferous woodland A4.2) with only a small remnant areas present within the southern reaches of the study area. Tree species recorded in these areas include mature Scots pine (*Pinus sylvestris*), European larch (*Larix decidua*) and Sitka spruce (*Picea sitchensis*), bordered with silver and downy birch.

*Marshy grassland*

8.5.18 This habitat was recorded in a number of areas within the study area in 2017 associated with watercourse edges, woodland rides and occasionally in more open areas. The ground flora of some areas of semi-natural broadleaved woodland was also considered to be marshy grassland. During the 2021 survey, two areas of marshy grassland were defined within the study area, the first within an area of felled broadleaved woodland within the central area of the study area and the second within the eastern reaches. Of these the former is in flux; it is species poor and dominated by soft-rush. The 2017 survey defined two NVC communities associated with this habitat type: M23b and M25. A third NVC community, MG10b, associated with the Allt Garbh watercourse was also noted however this lies outwith the study area for the Proposed Development.

8.5.19 M23b *Juncus effusus/acutiflorus – Gallium palustre* rush-pasture, *Juncus effusus* sub-community is found within the eastern reaches of the study area. Dominated by soft-rush with smaller amounts of sharp-flowered rush (*Juncus acutiflorus*) and occasional bog-mosses. Creeping thistle (*Cirsium arvense*) and ragwort (*Senecio jacobaea*) frequently recorded with occasional spear thistle (*Cirsium vulgare*) and foxglove (*Digitalis purpurea*).

*Semi-improved neutral grassland*

8.5.20 Semi-improved neutral grassland: this habitat was recorded in 2017 within the north-western reaches of the study area and was noted to extend into areas of semi-natural broadleaved woodland. In 2021, areas of semi-improved neutral grassland were recorded bordering the southern and eastern edge of semi-natural broadleaved woodland within the north of the study area. This habitat is defined as MG9b *Holcus lanatus – Deschampsia cespitosa, Arrhenatherum elatius* sub-community. Dominated by Yorkshire-fog and tufted hair-grass, with some common sedge in wetter areas.

*Unmodified blanket bog*

8.5.21 Small areas of unmodified blanket bog were identified during the 2017 NVC survey within the southern and far eastern reaches of the study area for the AWP. Within the Proposed Development study area this habitat is less extensive and confined to the south-west. Defined as NVC community M17a *Trichophorum cespitosum – Eriophorum vaginatum* blanket mire, *Drosera rotundifolia – Sphagnum* spp. sub-community this habitat is dominated by hare's-tail bog-cotton (*Eriophorum vaginatum*) with variable amounts of cross-leaved heath and deergrass (*Trichophorum cespitosum*). There is a high abundance of bog-mosses, dominated by red bog-moss and papillose bog-moss.

*Wet modified bog*

8.5.22 M25 *Molinia caerulea – Potentilla erecta* mire is present within the southern and south-western reaches of the study area and is dominated by purple moor-grass. Associates include tormentil, cross-leaved heath (*Erica tetralix*) and Yorkshire-fog with occasional patches of bog-mosses. The 2017 NVC survey classified this as marshy grassland; however, further to ground investigation works (Golder, 2019b) it is considered likely that this habitat more closely aligns with wet modified bog due to peat depths being greater than 1m within this area.

8.5.23 Areas of felled W4c woodland within the Proposed Development footprint and extending south within the study area is defined as E1.7 wet modified bog due to peat depths in this area being mainly greater than 2m. Due to the ground being highly disturbed, the vegetation does not currently align with a NVC community. Since tree felling in 2018-19 soft-rush has locally become the community dominant, but the vegetation remains in flux.

*Dry dwarf shrub heath - acid*

*8.5.24* Small areas of dry shrub heath were recorded within the study area, within the deer fenced area at the south-east of the study area this habitat was defined as H10a *Calluna vulgaris – Erica cinerea* heath, typical sub-community and was usually associated with raised hummocks within blanket bog, Outwith the deer fenced area, where present, it is defined as H12a *Calluna vulgaris – Vaccinium myrtillus* heath*, Calluna vulgaris* sub-community. H12a was usually found on small hummocks within wet heath and blanket bog.

*Wet dwarf shrub heath*

8.5.25 Within the eastern and southern reaches of the study area are small extents of wet dwarf shrub heath dominated by ling heather with some cross-leaved heath. Peat depth was estimated to be less than 0.5m which differentiated this habitat from areas of blanket bog and wet modified bog which occurs elsewhere in the study area. One NVC community was defined within this habitat as M15b *Trichophorum cespitosum – Erica tetralix* wet heath, typical sub-community.

*Scrub*

8.5.26 Scrub habitat defined as W23 *Ulex europaeus – Rubus fruticosus* agg. scrub is generally associated with heaps of earth and rubble spoil within the study area especially on steep slopes. The habitat was dominated by gorse (*Ulex europaeus*) with bramble (*Rubus fruticosus* agg.) and some regenerating downy birch. Ground flora included bent-grasses and Yorkshire-fog.

*Other (hardstanding, bare and disturbed ground)*

*8.5.27* The northern part of the site is dominated by hardstanding and recently disturbed ground associated with a former Carbon Plant and infrastructure at that location. Spoil heaps towards the north-western edge of the study area are becoming colonised with pioneer species such as gorse, creeping thistle, broad-leaved dock (*Rumex obtusifolius*), ragwort and foxglove. Alder saplings are also beginning to colonise the heaps.

*Buildings*

8.5.28 Buildings associated with Lochaber Smelter are present in the north-east of the study area. Additionally, North Road Retail Park is present in the north of the study area and several industrial buildings/office are present along the western survey buffer including Lochaber Mountain Rescue, Marine Harvest Scotland and New Co.

8.5.29 All other habitat/community types present within the study area make up a very small proportion of the overall site, covering less than 1% of the total area (Table 8.7). Further details of these habitat types can be found within Technical Appendix 8.1.

Groundwater Dependent Terrestrial Ecosystems (GWDTEs)

8.5.30 As per table 8.2 SEPA have confirmed that information submitted with the previously consented AWP development demonstrated that peatland habitats within the Site are not significantly groundwater dependent. Therefore, GWDTEs are not discussed any further.

Protected or Otherwise Notable Species

8.5.31 Full details of the survey methods and results are included in Technical Appendix 8.1, with a brief summary provided below.

*Otter*

8.5.32 Similar to the 2017 surveys, no evidence of otter was recorded in the study area in 2021. A small watercourse and drainage channels within the northern reaches of the study area provide suitable foraging and commuting habitat and connectivity to the River Lochy, north-east of the site, and it is possible that otters could be present in the future.

*Scottish wildcat*

8.5.33 Similar to the 2017 surveys, no evidence of wildcat was recorded in the study area in 2021. Habitats within the Proposed Development area are considered suboptimal with no suitable denning habitat identified. Felling works since 2017 have removed large swathes of woodland habitat and the remaining stands are highly fragmented with limited connectivity to the wider landscape.

*Water vole*

8.5.34 Similar to the 2017 surveys, no evidence of water vole was recorded in the study area in 2021. Although the watercourse and drainage channels within the northern reaches of the site include potentially suitable habitat, such as slow-flowing water and suitable bank structure, the surrounding vegetation is considered suboptimal for the species.

*Badger*

8.5.35 Similar to the 2017 surveys, no evidence of badger was recorded in the study area in 2021. The water table within the study area was generally at, or above, ground level, making it unsuitable for sett building. Some areas of woodland in the north of the Site could be used where the ground is sloped. Suitable foraging and commuting habitat is limited to areas of grassland and woodland habitats within the north of the Site.

*Red squirrel*

8.5.36 Similar to the 2017 surveys, no evidence of red squirrel was recorded in the study area in 2021. Felling works since the 2017 surveys have further reduced the area of potentially suitable habitat within the Proposed Development footprint. The remaining areas of woodland are fragmented and lack connectivity to the wider landscape.

*Pine marten*

8.5.37 Similar to the 2017 surveys, no evidence of pine marten was recorded in the study area in 2021. Generally, habitats within the Proposed Development area are considered suboptimal with no suitable denning habitat identified. Felling works since 2017 have removed large swathes of woodland habitat and the remaining stands are highly fragmented with limited connectivity to the wider landscape.

*Bats*

8.5.38 The 2021 desk study found records of common pipistrelle, soprano pipistrelle and brown long-eared bats within 5 km of the site. During the 2021 surveys habitats within the study area were assessed for potential suitability for use by bats (e.g. roosting, foraging, and commuting). No potential roost features were identified within the study area. The habitats were considered to have Moderate suitability for use by foraging and commuting bats with woodland edges, the stream corridor and railway corridors within the northern reaches of the Study area providing linear features that could be utilised by bats.

*Reptiles*

8.5.39 Reptiles were not considered within the AWP EIA. Although a dedicated reptile survey was not undertaken in 2021, the surveyor assessed the potential for reptile presence. The majority of the habitat within the site is very wet and/or disturbed, and vegetation considered suitable for supporting reptiles is limited, particularly within the Proposed Development footprint. Some sections in the wider study area could be suitable in the drier summer period, including areas of wet and dry shrub heath to the south; however, these areas are being avoided by all Proposed Development infrastructure. No incidental evidence of reptiles, such as adder or common lizard, were recorded during the field survey.

*Birds*

8.5.40 A review of the 2021 desk study information has determined that habitats within the study area have the potential to support several of the protected or otherwise notable bird species listed in Table 8.6 (Holden and Cleeves, 2010). These include cuckoo, curlew, grasshopper warbler, greenshank, hooded crow, lesser redpoll, linnet, skylark, snipe, tree pipit, twite, whinchat and meadow pipit. However, this is mainly likely to apply to the undisturbed peatland south and east of the site as well as scrub and woodland habitat in the wider area; the small size and recent disturbance of the site itself means that it is unlikely to support breeding bird species of conservation interest.

*Invertebrates*

8.5.41 Ben Nevis SSSI is designated for its small mountain ringlet (*Erebia epiphron*) population (listed on the SBL and HBAP priority species). In Scotland the species occurs at elevations between 350m and 900m. The caterpillars' main food plant is considered to be mat-grass (*Nardus stricta*) and adults prefer damp grassland habitats feeding on heath bedstraw and tormentil (www.butterfly-conservation.org). Habitats within the study area which contain these plant species, and therefore may be important to this butterfly, include marshy grassland (M23b), semi-improved grassland (MG9b),wet modified bog (M25), blanket bog (M17a), dry dwarf shrub heath (H10a and H12a). However, as the site lies below 100m if is considered unlikely to support this species, which is therefore not considered any further. Ben Nevis SSSI is also designated for its fly assemblage which includes the following species:

- *Dolichopus maculipennis* – montane species found between 600 m and 900 m in calcareous rich grasslands (JNCC, 2005);
- *Cheilosia sahlbergi* – montane species restricted to altitudes above 750 m (JNCC, 2014);
- *Platycheirus melanopsis* – montane species restricted to altitudes above 250m (JNCC, 2014);
- *Calliphora stelviana* (formerly Calliphora alpine) – high altitude montane species (Falk & Pont, 2017);
- *Delia caledonica* (now known as *Heterostylodes caledonicus* (Littlewood, 2017)) – high altitude montane species (Falk & Pont, 2017); and
- *Spilogona alpica* – high altitude montane species (Falk & Pont, 2017).

As these fly species are all only encountered at higher elevations than the study area, they are not considered any further.

*Fisheries*

A fish habitat and electric fishing survey was undertaken as part of baseline surveys in 2017 and reported upon within Golder (2017; AWP Technical Appendix 12.4). The survey related to the Allt Garbh watercourse which lies within the southern boundary of the larger AWP study area. Atlantic salmon (*Salmo salar*), brown trout (*Salmo trutta*) and European eel (*Anguilla Anguilla*) were recorded within the watercourse. As the planning boundary for the Proposed Development is smaller, this watercourse now lies outwith the southern boundary and 350m south of the Proposed Development footprint. Therefore, fish are not considered any further.

## *Evaluation of Baseline Features*

### Nature Conservation Designations

8.5.42 The value assigned to a nature conservation area corresponds to its level of designation, and where two or more designations overlapping the higher level applies. As such, Ben Nevis SAC and SSSI has international value, Ach an Todhair SSSI has national value, and areas of ancient woodland, which are not statutory designations, are considered to be of regional value.

### Habitats

8.5.43 The vegetation types are evaluated in **Error! Reference source not found.**, below, with reference to their extent and condition and potential fit with nature conservation priorities, including the SBL which is, in part, based on the former UK Biodiversity Action Plan (including the Maddock (2011) review used here) and the Highland BAP.

***Table 8.8: Habitats Evaluation Summary***

| Phase 1 Habitat / NVC Community | | Potential Conservation Status | Comments | Value |
|---|---|---|---|---|
| Semi-natural broadleaved woodland | W4b *Betula pubescens – Molinia caerulea* woodland, *Juncus effusus* sub-community | **SBL**: Upland birchwoods | Locally extensive in the north of the study area, largely outwith the footprint of the Proposed Development | Local |
| | W4c *Betula pubescens – Molinia caerulea* woodland, *Sphagnum* sub-community | **SBL**: Wet woodlands<br><br>**HBAP**: Wet woodland | Locally extensive with stands within the northern and southern reaches of the study area, largely outwith the footprint of the Proposed Development | Local |
| | W6d *Alnus glutinosa – Urtica dioica* woodland, *Sambucus nigra* sub-community | **SBL**: Upland birchwoods | Small, immature stands of W6d are present north-west of the Proposed Development footprint | Less than Local |
| | W7c *Alnus glutinosa – Fraxinus excelsior* woodland, *Deschampsia cespitosa* sub-community | **SBL**: W7c is described within the priority habitat description for upland mixed ashwoods | A small area is present in the northeast of the study area, beyond the railway line and outwith the Proposed | Local |

| Phase 1 Habitat / NVC Community | | Potential Conservation Status | Comments | Value |
|---|---|---|---|---|
| | | (Maddock, 2011)<br><br>**HBAP**: Upland mixed ashwoods | Development footprint | |
| Coniferous plantation woodland | - | - | Limited diversity and not a conservation priority | Less than Local |
| Recently felled broadleaved woodland | - | - | Not a conservation priority | Less than Local |
| Recently felled, coniferous woodland | - | - | Not a conservation priority | Less than Local |
| Scrub | W23 *Ulex europaeus – Rubus fruticosus* agg. scrub | - | Limited diversity and not a conservation priority | Less than Local |
| Semi-improved neutral grassland | MG9b *Holcus lanatus – Deschampsia cespitosa* grassland, *Arrhenatherum elatius* sub-community | - | Limited diversity and not a conservation priority | Less than Local |
| Marshy grassland | M23b *Juncus effusus/acutiflorus – Gallium palustre* rush-pasture, *Juncus effusus* sub-community | **HBAP**: Purple moor-grass and rush-pastures are priority habitats | A species poor version occurs within the clear-felled area on site. M23b occurs in mosaic with M25 within the southern reaches of the study area, outwith the Proposed Development footprint | Within site: Less than local<br><br>Elsewhere: Local |
| Bracken | U20c *Pteridium aquilinum – Galium saxatile* community, species-poor sub-community | - | Limited diversity and not a conservation priority | Less than Local |
| Dry dwarf shrub heath - acid | H10a *Calluna vulgaris – Erica* | **SBL:** Included in the priority habitat | Present in small areas southeast of the Proposed | Local |

| Phase 1 Habitat / NVC Community | | Potential Conservation Status | Comments | Value |
|---|---|---|---|---|
| | *cinerea* heath, typical sub-community | description for lowland heathland (Maddock, 2011)<br><br>**HBAP**: Lowland heathland | Development footprint. Only occurs where deer pressures have been reduced through deer fencing | |
| | H12a *Calluna vulgaris – Vaccinium myrtillus* heath, *Calluna vulgaris* sub-community | **HBAP**: Lowland heathland | Present in small areas southwest of the Proposed Development footprint | Local |
| Wet dwarf shrub heath | M15b *Trichophorum cespitosum – Erica tetralix* wet heath, typical sub-community | **SBL**: Included in the priority habitat description for blanket bog (Maddock, 2011).<br><br>**HBAP**: Blanket bog | Present in small areas south of the Proposed Development footprint. Relatively species poor | Local |
| Unmodified blanket bog | M17a *Trichophorum cespitosum – Eriophorum vaginatum* blanket mire, *Drosera rotundifolia – Sphagnum* spp. sub-community | **SBL**: Blanket bog.<br><br>**HBAP**: Blanket bogs. | Small areas of unmodified blanket bog are present southwest of the Proposed Development footprint | Regional |
| Wet modified bog | Formerly W4c which was felled in 2018-19 | - | Dominates the footprint of the Proposed Development. Highly disturbed and dominated by transitional vegetation. Discernible as modified bog mainly because of the deep peat | Local |
| | M25 *Molinia caerulea – Potentilla erecta* mire | **SBL**: Included in the priority habitat description for blanket mire | Small areas are present south of the Proposed Development footprint | Local |

| Phase 1 Habitat / NVC Community | | Potential Conservation Status | Comments | Value |
|---|---|---|---|---|
| | | (Maddock, 2011) | | |
| Amenity grassland | N/A | - | Limited diversity and not a conservation priority | Less than Local |
| Other (hardstanding, bare and disturbed ground) | N/A | - | Limited diversity and not a conservation priority | Less than Local |
| Buildings | N/A | - | Not a conservation priority | Less than Local |
| **Key Potential Conservation Priority:**<br><br>SBL – Potential Scottish Biodiversity List priority habitat<br>Highland Biodiversity Action Plan habitat | | | | |

### Protected Species and Species Groups

8.5.44 Table 8.9 presents a summary of each species or species group, their conservation priority, a brief summary of condition and an evaluation in terms of ecological value.

***Table 8.9: Species Evaluation Summary***

| Species / Species Group | Legal / Conservation Status | Comments | Ecological Value |
|---|---|---|---|
| Otter | European Protected Species<br>Schedule 5 WCA<br>SBL listed<br>HBAP listed | No evidence of presence in the study area | Less than Local |
| Scottish wildcat | European Protected Species<br>Schedule 5 WCA<br>SBL listed<br>HBAP listed | No evidence of presence in the study area | Less than Local |
| Water vole | Schedule 5 WCA<br>SBL listed<br>HBAP listed | No evidence of presence in the study area | Less than Local |
| Badger | Protection of Badgers Act 1992 (amended by the WANE Act in Scotland) | No evidence of presence in the study area | Less than Local |

| Species / Species Group | Legal / Conservation Status | Comments | Ecological Value |
|---|---|---|---|
| Pine marten | Schedules 5 and 6 WCA<br>SBL listed<br>HBAP listed | No evidence of presence in the study area | Less than Local |
| Red squirrel | Schedules 5 and 6 WCA<br>SBL listed<br>HBAP listed | No evidence of presence in the study area | Less than Local |
| Bats | European Protected Species<br>SBL listed<br>HBAP listed | No suitable roost features within study area. Suitable habitat features (woodland edge, stream corridor, railway corridor) limited to the northern reaches, outwith the footprint of the Proposed Development. | Less than Local |
| Birds, including cuckoo, curlew, grasshopper warbler, greenshank, hooded crow, lesser redpoll, linnet, skylark, snipe, tree pipit, twite, whinchat and meadow pipit | Various - refer to Table 8.6. All breeding birds are protected under the Wildlife and Countryside Act 1981 (as amended) | Birds of conservation interest are unlikely to breed within the site. If works are undertaken within the breeding season, a suitably qualified ecologists should check works areas for any breeding birds; any nests identified should be protected until the young have fledged | Less than Local |
| Reptiles (adder, common lizard, slow-worm) | Limited protection under the WCA<br>SBL listed<br>HBAP listed | Lack of suitable habitat and limited food resources within the footprint of the Proposed Development. Limited and localised potential in areas south of the Proposed Development | Less than Local |

### *Future Baseline*

8.5.45 The site is currently in flux owing to the recent felling of bog woodland. In the absence of any development it is likely that peatland vegetation will re-develop, most likely bog woodland dominated by birch similar to what originally occupied the site. However, this is likely to take a long time (>20 years) to mature and develop any significant nature conservation interest.

8.5.46 Other changes over time may occur as a result of climatic change; these are difficult to predict but are likely to involve increased precipitation and gradual increases in average temperatures. Some change in the vegetation assemblage is likely to occur as a result of these changes.

## 8.6 Receptors Brought Forward for Assessment

### *IEFs Scoped out of the Assessment*

8.6.1 Following the collation of the baseline data, including desk study and field survey data, and following the embedded mitigation measures described in Section 8.7, several potential effects on ecological features can be scoped out of further assessment, as described below. This is based on professional judgement and experience from other relevant projects in the region.

#### Designated Sites

8.6.2 The Ben Nevis SAC and SSSI is approximately 0.42 km east of the Proposed Development. The SAC is designated for bog, woodland, heath, upland and freshwater habitats. The SSSI is designated for its upland and woodland habitats, igneous geology, invertebrates, bryophytes, and breeding bird assemblage. The Proposed Development will not involve any direct impact on the designated area. chapter 11 Air Quality includes Predicted Environmental Concentration (PEC) calculations relevant to Ben Nevis SAC. The predicted annual mean PECs of Nitrogen Oxide, Nutrient Nitrogen deposition, Sulphur Dioxide as well as the weekly and daily mean PECs of Hydrogen Fluoride are all significantly below the Critical Level at Ben Nevis SAC. Therefore, no further assessment is needed.

8.6.3 With regard to acid deposition, the potential for likely significant effects has been identified at four sensitive receptors within the Ben Nevis SAC, namely:

- Eco12 - Siliceous rocky slopes with chasmophytic vegetation (H8220);
- Eco14 - Species-rich *Nardus grasslands*, on silicious substrates in mountain areas (and submountain areas in Continental Europe) (H6230);
- Eco16 - Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles (H91A0); and
- Eco17 - Northern Atlantic wet heaths with *Erica tetralix* (H4010).

8.6.4 As shown in Table 10 of Technical Appendix 11.1 Air Quality Impact Assessment, the baseline (current load) of acid deposition is >70% of the Critical Load Function at each receptor which would indicate that the potential for likely significant effects already exists. While the Proposed Development contributions are predicted to exceed the 1% criterion at Eco12, 14, 16 and 17, the potential for likely significant effects at these receptors is not caused by the small incremental change in acid deposition predicted at these locations due to the operation of the Proposed Development alone (3.32% of the Critical Load Function), or in conjunction with the generators operating at their maximum permitted hours (5.82% of the Critical Load Function) at Eco12. It should also be noted that, as shown in Table 12 of Technical Appendix 11.1 Air Quality Impact Assessment, the total area of the SAC qualifying habitat features for which the Proposed Development has a predicted acid deposition of >1% of the relevant Critical Load Function is less than 1% for Eco12, Eco16 and Eco17 and only 4.2% for Eco16. Overall, therefore, the Proposed Development is not likely to result in measurable effects upon qualifying features of the Ben Nevis SAC.

8.6.5 The Ben Nevis SAC and SSSI is up-gradient from the Proposed Development; this and the distance between the Proposed Development and the designated area means that hydrological impacts on wetlands are also very unlikely. Upland bird species for which the SSSI is designated could be encountered within the study area, but it is unlikely that these species are present within the EZoI of the Proposed Development. Invertebrates for which the SSSI is designated are only encountered within higher elevations and are therefore also unlikely to be encountered within the study area. As such, Ben Nevis SAC and SSSI is scoped out of the assessment.

8.6.6 The Ach an Todhair SSSI is approximately 3.3 km south-west of the Proposed Development designated for its upland mixed ash woodland and upland habitat assemblage. Due to the separation distance from the site, no pathway for effects from the Proposed Development on the SSSI has been identified, and this SSSI is therefore scoped out of the assessment.

8.6.7 The two areas of ancient woodland are both separated from the Proposed Development. Although the nearest area is located c.0.28 km south-west of the application boundary, it is located c.0.50 km from the proposed works areas, beyond Claggan. It is therefore not likely to experience any impacts from the Proposed Development.

### Habitats

8.6.8 The habitats present and their respective areas are presented in Table 8.7. Estimates of direct and indirect habitat losses from the Proposed Development are presented in Table 8.11. An estimated total of 5.34 ha will be directly lost due to the Proposed Development.

8.6.9 Semi-natural broadleaved woodland abuts the northern edge of the development footprint. Within this habitat are four NVC communities: W4b, W4c and W7c which, by aligning with SBL priority and HBAP habitat descriptions, are defined as being of local importance. However, even though W4 overlaps slightly (247 $m^2$) with the northern site boundary, direct or indirect effects on the habitats are not likely to be significant. These habitats are therefore scoped out of this assessment.

8.6.10 M23b marshy grassland south and east of the site are over 150 m from potential works areas and are therefore unlikely to be affected; as such, marshy grassland IEFs are scoped out of the assessment.

8.6.11 Dry heath areas south and east of the site are over 100 m from potential works areas and are therefore unlikely to be affected; as such, dry heath is scoped out of the assessment.

8.6.12 Wet heath areas south of the site are over 90 m from potential works areas and are therefore unlikely to be affected; as such, wet heath is scoped out of the assessment.

8.6.13 Blanket bog south of the site is over 170 m from potential works areas and is therefore unlikely to be affected; as such, blanket bog is scoped out of the assessment.

## *IEFs Scoped In*

8.6.14 As listed in Table 8.10 the assessment of effects will be applied to IEFs that are known to be present within the site or surrounding area (as confirmed through survey results and consultations outlined above) and which could be susceptible to impacts from the Proposed Development. Wet modified bog is brought forward for assessment due to the extent and nature of the habitat to be impacted.

***Table 8.10: IEFs Brought Forward for Assessment***

| IEF | Value | Comments |
|---|---|---|
| Wet modified bog (M25) | Local | Wet modified bog is present within some areas of the study area where woodland was cleared in 2018-19. The ongoing vegetation re-establishment in these areas following disturbance means that species composition in a state of flux. Although the area of modified bog that will be directly or indirectly impacted by the Proposed Development is highly disturbed and less species rich than an established M25 community, it is likely that diverse peatland vegetation could develop on the peat substrate over time.<br>It should be noted that undisturbed areas of M25, often forming a mosaic with M23b, occur in the southern reaches of the study area. These areas lie outwith the EZoI of the Proposed Development and have been scoped out of the assessment. |

## 8.7 Standard Mitigation

### *Design and Layout Considerations*

8.7.1 The ecological baseline has been considered throughout the design process for the Proposed Development (see chapter 4: Site Selection, Design Iteration and Alternatives). This was with an aim to either eliminate or reduce the potential for any significant effects on receptors and following the "*mitigation hierarchy*" as described in CIEEM guidance (CIEEM 2018). The mitigation hierarchy follows a sequence of avoidance, mitigation, compensation and enhancement measures to be identified as part of any EcIA project. Ecological and hydrogeological factors taken into account throughout the design process for the Proposed Development included the following:

- A minimum 50 m buffer for any infrastructure or construction activity around all watercourses. No watercourse crossings are anticipated; and
- Avoidance of areas of deeper peats (i.e. areas of >1 m depth), habitats of significant conservation value and consideration of areas with the potential to support protected species in relation to the Proposed Development, as far as practicable.

### *Other Mitigation*

8.7.2 In line with the current CIEEM guidelines, the assessment of likely effects is carried out in the presence of standard mitigation measures. The following good practice and mitigation measures will be applied to the project during construction to ensure that any effects on IEFs are reduced:

- Design mitigation has included the following measures:
  - Existing tracks have been used where possible, in order to reduce the footprint of the Proposed Development;
  - Areas of disturbed ground have been priorities over intact peatland; and
  - Infrastructure has been sited at least 50 m from any areas of standing water and watercourses.
- The Applicant will appoint a suitably qualified Ecological Clerk of Works (ECoW) prior to the commencement of any construction activities take place. The ECoW will be present and oversee all construction activities as well as providing toolbox talks to all site personnel with regards to priority species and habitats, as well as undertaking monitoring works, oversee the relocation of any significant stands of nationally important species of plants and briefings to relevant staff and contractors as appropriate.
- A Peat Management Plan (PMP) will be implemented to minimise excavation of peat and to ensure the re-use of excavated peat within the site for biodiversity benefits. A Draft PMP is included as Technical Appendix 8.2.
- A pre-construction survey for protected species will be carried out. If evidence of protected species presence is identified, additional mitigation may be identified and implemented to prevent impacts on individuals.
- In order to prevent pollution of watercourses within the site (with particulate matter or other pollutants such as fuel), best practice techniques will be employed. These are outlined in chapter 7: Hydrology and Hydrogeology.
- Full details of construction mitigation measures will be provided in a Construction Environment Management Plan (CEMP) to be agreed with THC, in consultation with

NatureScot and SEPA, post-consent but prior to the development commencing. An Outline CEMP is provided as Technical Appendix 2.1.

## 8.8 Potential Effects

8.8.1 This section provides an assessment of the likely effects of the Proposed Development on the IEF brought forward. The assessment of effects is based on the development description outlined in chapter 2: Proposed Development and is structured as follows:

- Construction effects;
- Operational effects; and
- Cumulative effects.

### *Construction*

8.8.2 This section provides an assessment of the likely effects of construction of the Proposed Development upon the scoped-in IEF.

#### Habitat Losses

8.8.3 Impacts on habitats may include direct losses e.g. permanent land-take for the building and other infrastructure, SuDS wetland creation, temporary land-take for laydown areas and a construction site compound, as well as temporary disturbance of habitats within and adjacent to (up to ten metre) works areas. Negative impacts on habitats can also be indirect e.g. through changes in hydrological conditions and habitat fragmentation. Much of these losses will be permanent, though laydown and site compound areas will be restored at the end of the construction period. Despite the restoration, and taking a precautionary approach, it is assumed for the purposes of this assessment that the areas of land-take for infrastructure also present permanent losses of habitat due to the complexities and timescales in recreating habitat types such as wet modified bog which rely on a high water table.

8.8.4 For the purposes of this assessment it is assumed that wetland habitat losses due to indirect drainage effects may extend out to ten metres from infrastructure (i.e. in keeping with indirect drainage assumptions within the carbon calculator). It is expected that any indirect drainage effects will only impact wetland habitats at the site, including wet modified bog.

8.8.5 All habitat loss calculations are presented in Table 8.10, with the habitat IEF brought forward for assessment shown in bold. Please note that a Phase 1 habitat can be a grouping of two or more NVC communities, therefore where loss is predicted of a Phase 1 habitat, it does not necessarily mean that all its constituent NVC communities will experience loss. Please therefore also refer to Table 8.11 which details the areas lost by NVC communities for each habitat IEF brought forward to the assessment. Note that the figures in the tables have been rounded to the nearest two digits but calculations have been completed using the unrounded figures.

***Table 8.11: Estimated Loss of Habitat from Proposed development Infrastructure***

| Phase 1 Habitat | Constituent NVC Community (if Applicable) | Total Phase 1 Extent | Direct Habitat Loss (ha) | Direct Habitat Loss (% of Total Extent) | Area of Direct & Indirect Loss (ha) | Direct & Indirect Loss (% of Total Extent) |
|---|---|---|---|---|---|---|
| Semi-natural broadleaved woodland | W4b, W4c, W7c | 11.33 | 0.04 | 0.49 | 0.26 | 1.32 |
| | W6d | 0.48 | 0.06 | 52.35 | 0.08 | 70.83 |

| Phase 1 Habitat | Constituent NVC Community (if Applicable) | Total Phase 1 Extent | Direct Habitat Loss (ha) | Direct Habitat Loss (% of Total Extent) | Area of Direct & Indirect Loss (ha) | Direct & Indirect Loss (% of Total Extent) |
|---|---|---|---|---|---|---|
| Broadleaved plantation woodland | N/A | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 |
| Coniferous plantation woodland | N/A | 2.36 | 0.00 | 0.00 | 0.00 | 0.00 |
| Recently felled broadleaved woodland | N/A | 0.95 | 0.95 | 100.00 | 0.95 | 100.00 |
| Recently felled, coniferous woodland | N/A | 1.58 | 0.26 | 16.45 | 0.40 | 22.15 |
| Scrub | W23 | 1.32 | 0.05 | 3.78 | 0.16 | 22.73 |
| Semi-improved neutral grassland | MG9b | 1.46 | 0.53 | 36.3 | 0.64 | 58.23 |
| Marshy grassland | M23b | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bracken | U20c | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dry dwarf shrub heath - acid | H10a, H12a | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| Wet dwarf shrub heath | M15b | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 |
| Unmodified blanket bog | M17a | 1.39 | 0.00 | 0.00 | 0.00 | 0.00 |
| Wet modified bog | M25 | 8.21 | 2.51 | 30.57 | 2.78 | 36.29 |
| Amenity grassland | N/A | 0.38 | 0.07 | 18.42 | 1.42 | 0.00 |
| Hardstanding, bare and disturbed ground | N/A | 5.76 | 0.87 | 15.10 | 1.45 | 28.65 |
| Buildings | N/A | 4.33 | 0.00 | 0.00 | 0.02 | 0.00 |
| Total | | 41.67 | 5.34 | | 7.57 | |

### Wet Modified Bog

Nature Conservation Value and Conservation Status

8.8.6 As shown in Table 8.11, wet modified bog is the second most prevalent vegetation community within the study area. It is highly disturbed but has the potential to develop nature conservation value over time, e.g. as blanket mire. In the 4th UK Habitats Directive Report (JNCC, 2019a) the conservation status of blanket bogs is listed as 'Unfavourable - Bad' but 'Stable' at the UK level. The corresponding Scottish report (JNCC, 2019b) does not include an overall assessment specifically for Scotland, although the status trend is noted as being of "No change". The corresponding Scottish report (SNH, 2013) does not include an assessment specifically for Scotland.

Impact

8.8.7 Both direct and indirect negative effects are likely on wet modified bog during the construction phase. There will be a direct loss of habitat during construction of the Proposed Development and indirect losses (through potential drying effect upon neighbouring bog habitats occurring from the construction period into the operational period).

Magnitude

8.8.8 Scotland has an estimated 1,759,000 ha of blanket bog (JNCC, 2019b). Wet modified bog accounts for 8.21 ha of the habitat within the study area, comprising degraded M25 mire.

8.8.9 A total of 2.51 ha will be directly lost to the Proposed Development infrastructure (Table 8.11). In addition to direct loss, there may be indirect losses associated with the zone of drainage around infrastructure. If, as a worst-case scenario, indirect drainage impacts were fully realised out to 10 m in all areas of wet modified bog, this will result in an additional loss of 0.27 ha of wet modified bog, increasing the predicted loss to 2.78 ha of this habitat within the study area. Despite the degraded nature of the habitat, in the absence of further mitigation or compensation these permanent losses are considered significant .

Significance of Effect

8.8.10 Given the above consideration of sensitivity and magnitude, the effect significance is considered to be **medium adverse** and **significant** under the terms of the EIA Regulations.

### Proposed Mitigation and Enhancement

8.8.11 A Peat Management Plan (PMP) will be implemented during the construction and operation phases that will focus on the enhancement and restoration of blanket bog within former areas of conifer plantation through the re-use of excavated peat from the Proposed Development. A Draft PMP is presented in Technical Appendix 8.2 and includes detail on proposed peat reinstatement areas that will occupy up to 4.61 ha of plantation. This is therefore 1.83 ha more than the 2.78 ha bog habitat being lost.

8.8.12 The work will include re-instating excavated peat within suitable depressions in the former plantation, in order to tie in the created peatland to the surrounding topography. Peat will be e-instated in the correct sequence, which means that vegetated acrotelmic turves will be placed on top.

8.8.13 It is intended that the PMP will be finalised post consent, in agreement with THC, NatureScot and SEPA.

### Residual Construction Effects

8.8.14 With implementation of the PMP, peatland habitats on site and thus within the wider Natural Heritage Zone (NHZ) 13 Lochaber are predicted to increase in extent by 1.83 ha which represents a **low positive** and **significant** effect under the terms of the EIA Regulations.

### Summary

8.8.15 Table 8.12 below summarises the significance of construction effects on wet modified bog and the residual significance after mitigation and enhancement measures are considered.

***Table 8.12: Summary of Predicted Construction Effects***

| Predicted construction effect | Significance | Mitigation and Compensation | Significance of Residual Construction Effect |
|---|---|---|---|
| Habitat loss – wet modified bog | Medium adverse | PMP to use excavated peat for peatland restoration elsewhere on site | Low beneficial |

### *Likely Operational effects*

8.8.16 **No further effects** on the habitat IEF brought forward for assessment are predicted during the operational phase, during which the peatland restoration works proposed in the Draft PMP will be completed.

#### Proposed Mitigation and Enhancement

8.8.17 Given that no significant effects are anticipated as a result of the operational phase of the Proposed Development, no further mitigation is required.

8.8.18 As described in Technical Appendix 8.2, monitoring will be carried out in years one, two, three and five post peat reinstatement after which the requirement for further monitoring will be reviewed. It will comprise a walkover survey to note vegetation recovery, as well as noting the cover of *Sphagnum* mosses and other peatland species, within 25 permanent plots spread across the receptor areas. This will be done to identify any additional treatment works that might be required to restore the peat receptor areas to active peatland, such as one or more of the following:

- Flattening of the re-instated surfaces to reduce the degree to which local surface drawdown in the summer will lead to local oxidative wastage of placed peat;
- Compacting the peat in places where there is a high degree of void spaces, if evident;
- Tapering of the peat masses at its edges;
- Re-seeding; and
- Temporarily fencing off of areas where peat has been re-used, to prevent grazing of young vegetation and enable heath/ bog vegetation to establish as necessary.

8.8.19 The implementation of these additional treatments and their timing will be subject to ongoing discussions between the Contractor, SEPA and THC, as necessary.

#### Residual Operational Effects

8.8.20 Given that no significant effects are anticipated as a result of the operational phase of the Proposed Development, no mitigation is required and therefore there is no change in terms of residual effects.

## 8.9 Cumulative Assessment

8.9.1 The development of canning plant immediately to the west of the Proposed Development forms part of the cumulative assessment. A separate full planning application will be submitted for the canning plant in due course.

#### Habitats

8.9.2 The net benefit of 1.83 ha peatland from the Proposed Development is assessed as low beneficial and significant. The canning plant will occupy an area for which no further peat extraction will be necessary. Cumulative impacts on wet modified bog are therefore considered to be negligible and not significant in the context of the EIA Regulations.

## 8.10 Summary

8.10.1 The Proposed Development does not overlap any nature conservation designation, although it is located adjacent to the Ben Nevis SAC and SSSI. The SAC is designated for bog, woodland, heath, upland and freshwater habitats. The SSSI is designated for its upland and woodland habitats, igneous geology, invertebrates, bryophytes, and breeding bird assemblage. One other SSSI (Ach an Todhair) lies within five kilometres of the site boundary. Due to the nature of the designated features or lack of potential connectivity, only impacts on the Ben Nevis SAC and SSSI are considered in this EcIA report chapter. However, the Proposed Development is not likely to result in significant effects upon features of these designations, because of the separation distance, or because deposition impacts on habitats are below Critical Load thresholds or, where they exceed these, only represent a slight increase to existing exceedances. As such, measurable effects are unlikely and not considered significant.

8.10.2 The Proposed Development area was surveyed in 2017 for the consented AWP development, with update surveys completed in 2021. The baseline surveys in 2017 included extended NVC survey (with NVC communities back-worked to Phase 1 habitat categories), protected mammal survey and fish survey. Update surveys in 2021 included an extended Phase 1 habitat survey and protected mammal survey. The baseline data were further complimented by a thorough desk study for historical and noteworthy records of priority species within a defined search area beyond the site boundary.

8.10.3 Although a number of Important Ecological features have been identified, most have been scoped out of the assessment because they are not vulnerable to significant effects. Only wet modified bog habitat has been brought forward to impact assessment. The Proposed Development will cause a loss of 2.78 ha of this habitat. However, excavated peat will be used in habitat restoration elsewhere on site, where plantation woodland will be removed to restore peatland habitat. These proposed works were previously proposed as part of the consented AWP in consultation with SEPA and NatureScot, both of whom supported these principles of the works. However, the alloy wheel scheme will now not be implemented. As a result, an overall increase in peatland habitat is predicted as a result of the Proposed Development.

8.10.4 A protected mammal survey found no evidence of protected mammals within the study area. Although no impacts are anticipated on protected mammals, appropriate mitigation and best practice construction methods are proposed in order to ensure no impacts are experienced by these species.

8.10.5 A cumulative impact assessment has included a future proposed Water Canning Plant which will be covered by a separate planning application. It is anticipated that the building will be approximately 66 m length by 24 m width and height of 7 m to the eaves and 11 m to the ridgeline. This potential development would require no further excavation of peat and no significant cumulative impacts on IEFs are therefore likely.

8.10.6 Residual effects are summarised in Table 8.13**Error! Reference source not found.**.

***Table 8.13: Summary Table***

| *Description of Effect* | *Significance of Potential Effect* | | *Mitigation Measure* | *Significance of Residual Effect* | |
|---|---|---|---|---|---|
| | *Significance* | *Beneficial / Adverse* | | *Significance* | *Beneficial / Adverse* |
| *During Construction* | | | | | |
| Loss/Drying effect on habitat: wet modified bog | Medium and significant | Adverse | PMP will be implemented during the construction phase that will focus on restoration of blanket bog and will increase peatland habitat by 1.83 ha. | Low and significant | Beneficial |
| *During Operation* | | | | | |
| Habitats: wet modified bog | N/A | N/A | PMP will remain in place during the operational phase | N/A | N/A |

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# Chapter 9 Access, Traffic and Transport

# 9. Access, Traffic & Transport

# 9. Access, Traffic & Transport

## 9.1 Introduction

9.1.1 This chapter considers the potential effects on the surrounding road network and nearby sensitive receptors as a result of the construction and operation of the Proposed Development. The key objectives of the chapter are to:

- describe the assessment methodology and significance criteria used in completing the assessment;
- describe the study area and existing local and strategic road networks;
- identify and assess the likely impact of increased traffic levels and associated environmental effects;
- identify and describe the mitigation measures proposed to address any significant effects; and
- assess any residual effects post mitigation implementation.

9.1.2 Planning policies of relevance to this assessment are provided in chapter 5.

9.1.3 This chapter, and the associated Transport Assessment, included as Technical Appendix 9.1, have been prepared by SYSTRA Ltd.

## 9.2 Legislation, Policy and Guidelines

9.2.1 This chapter has been prepared taking cognisance of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (hereafter referred to as the '*EIA Regulations*'). The following data sources and guidelines have been used to inform this assessment.

- Institute of Highways and Transportation (IHT) publications – "Guidelines for Traffic Impact Assessment", 1998 (IHT, 1998).
- Institute of Environmental Management and Assessment (IEMA) publication – "Guidelines for the Environmental Assessment of Road Traffic", 1993 (IEMA, 1993).
- Department for Transport (DfT) publication "Design Manual for Roads and Bridges" (DfT, 2021).
- DfT 2019 Average Annual Daily Traffic (AADT) flows for four locations within the study area (DfT, 2019).
- National Road Traffic Forecast (NRTF) traffic growth factors (NRTF, 2021).

## 9.3 Consultation

9.3.1 In undertaking the assessment, consideration has been given to the scoping responses from The Highland Council (THC). Transport Scotland (TS) has also been afforded an opportunity to comment on the scope of the Access, Traffic & Transport EIA Report chapter given that the Proposed Development is located in proximity to the trunk road network and access is taken directly from the A82(T). No comments were provided by TS in relation to the scoping study submitted.

## 9.4 Assessment Methodology and Significance Criteria

9.4.1 The assessment is made with reference to the Proposed Development, as described in chapter 3. Within the study area (as described below), the traffic and transport effects on the road network as a result of traffic generated by the construction phase and operation of the Proposed Development have been considered, with particular attention paid to heavy goods vehicle (HGV) movements.

9.4.2 During the construction phase, HGVs will be used to establish the site and to transport construction materials to the site. In addition, there will be a maximum of 50 – 60 staff working on-site at any one time. Traffic associated with the operation of the Proposed Development will comprise HGVs transporting the materials off-site and staff travel movements to and from the Proposed Development.

9.4.3 The parameters and assumptions used to inform this chapter have been designed to represent a robust (worst-case) scenario, where practical.

### *Scope of Assessment*

9.4.4 The assessment is structured around the consideration of the potential environmental effects related to traffic and transport as identified by the IEMA Guidelines:

- severance;
- driver delay;
- pedestrian delay;
- pedestrian amenity;
- accidents and safety; and
- dust and dirt.

9.4.5 The significance of the traffic and transport impact on each effect is considered against the criteria within the guidelines where possible, however the guidelines state that:

*"For many effects there are no simple rules or formulae which define the thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed-up by data or quantified information wherever possible. Such judgements will include the assessment of the numbers of people experiencing a change in environmental impact as well as the assessment of the damage to various natural resources."*

### *Effects Scoped Out*

9.4.6 The IEMA Guidelines also refer to the following effects which can be attributed to traffic and transport:

- visual effects;
- noise; and
- hazardous loads.

9.4.7 Visual effects and noise are covered in separate chapters respectively within this EIA Report and have therefore been scoped out of this Traffic and Transport chapter. No hazardous loads are associated with the Proposed Development; therefore, this effect has not been assessed.

### *Study Area & Sensitive Receptors*

9.4.8 The study area for the traffic and transport assessment has been predicated on the location of the access point to the Proposed Development from the external road network (the A82 'North Road'), the potential routes for HGVs distributing the materials (utilising the A82 routing south through Fort William), and the potential routes taken by staff. The study area is shown on Drawing 9.1 and comprises:

- the existing smelter access road;
- the A82 in the vicinity of the Proposed Development; and
- the A830 link between the A82 and Corpach.

9.4.9 The IEMA guidelines identify groups, locations and special interests which may be sensitive to changes in traffic conditions as follows:

- people at home;
- people in workplaces;
- sensitive groups including children, elderly and disabled;
- sensitive locations, e.g. hospitals, churches, schools, historic buildings;
- people walking or cycling;
- open spaces, recreational sites, shopping areas; and
- sites of ecological / nature conservation value tourist attractions.

9.4.10 Based on the descriptions above from the IEMA guidelines and professional judgement, this assessment considers Fort William, Banavie and Corpach as sensitive receptors.

9.4.11 It is considered highly unlikely that there will be a significant effect on the road network outside of the study area identified above as traffic associated with the Proposed Development will be diluted across the public road network.

### *Desk Study*

9.4.12 The traffic and transport study area characteristics have been determined by a desk-based assessment, publicly available Annual Average Daily Flow (AADF) data for the trunk road network (A82) and traffic surveys commissioned by SYSTRA. AADF traffic data has been sourced from the DfT website (DfT, 2019) which is the most up-to-date data publicly available. Described below is the source of the traffic count information for each road link within the study area. The locations of traffic counters is also indicated by Drawing 9.2.

- Automatic traffic count (ATC) survey undertaken from Thursday 21st September – Wednesday 27th September 2017 represents traffic flows for the existing smelter access road.
- Junction Turning Count (JTC) Survey undertaken on Thursday 21st September 2017 during the AM and PM peak periods (factored up to 24-hour flows) represents traffic flows for Ben Nevis Drive which provides access into Ben Nevis Industrial Estate (hereafter referred to as ‘Ben Nevis Drive’).
- ATC survey undertaken from Thursday 21st September – Wednesday 27th September 2017 represents traffic flows for the A82 adjacent to the Ben Nevis Industrial Estate and in the vicinity of the site access points (hereafter referred to as ‘A82 Industrial Estate’).
- ATC survey undertaken from Thursday 21st September – Wednesday 27th September 2017 represents the traffic flows for the A830 road link which routes to the residential areas of Caol and Lochyside (hereafter referred to as ‘A830’).
- ATC survey undertaken from Thursday 21st September – Wednesday 27th September 2017 represents the traffic flows for the A82 within Fort William (hereafter referred to as ‘A82 Fort William’).
- AADF available from DfT website (DfT, 2019) – counter number 759 represents the traffic flows for the A82 to the North of the site access and Fort William (hereafter referred to as ‘A82 North’).
- AADF available from DfT website (DfT, 2019) – counter number 40763 represents the traffic flows for the A82 road link to the south of Fort William (hereafter referred to as ‘A82 South’).

### *Site Visit*

9.4.13 Several site visits have been made to inform the assessment process and have included visits to each road link within the study area.

### *Assessment of Potential Effect Significance*

9.4.14 The significance of potential effects shall be assessed at locations along the routes within the study area where total traffic levels or the level of HGV traffic exceeds the screening thresholds set out by IEMA (depending on the sensitivity of the receptor) described in section 9.6.

9.4.15 The following assessment criteria shall be used to assess the significance of potential effects:

- Sensitivity – The sensitivity to change in traffic levels of any given road link or junction.
- Magnitude of impact – The magnitude of traffic impacts is a function of the existing traffic volumes, the percentage increase and change due to a development, the changes in type of traffic, and the temporal distribution of traffic (day of the week, time of day).
- Significance of effect – The combined significance that a potential effect will exert upon a receptor is a function of a criteria matrix of sensitivity and magnitude.

### *Requirements for Mitigation*

9.4.16 If, through the assessment of potential effects, it is determined that any road link within the study area will be subject to a significant effect resulting either from the construction or operational phases, then a strategy of mitigation will be required to reduce this potential effect so that it is not significant.

9.4.17 Notwithstanding the outcome of the assessment of potential effects, it is noted that a Construction Traffic Management Plan (CTMP) and a Travel Plan (TP) will be produced for the Proposed Development. Both documents can be considered as mitigation measures with the purpose of reducing the respective impacts of construction and operation of the Proposed Development.

### *Assessment of Residual Effect Significance*

9.4.18 The assessment of residual effects is to determine whether there exists any remaining potential significant effects once mitigation has been introduced.

## 9.5 Baseline Conditions

### *Description of Existing Conditions*

#### Lochaber Smelter Site Access

9.5.1 Vehicular access to the Proposed Development will be provided from a link to the existing Lochaber Smelter. The access road to the existing Smelter meets the A82 at a 4-arm roundabout which also provides access to the North Road Retail Park.

9.5.2 The existing smelter access road is single carriageway with a speed limit of 20 mph and there are traffic calming measures in place in the form of speed tables. The road crosses railway lines at two points, one which forms an over-bridge while the other cuts across the road to form a level crossing. Street lighting and a footway is provided on the northern side of the carriageway. It is noted that there is a track that leads off the Smelter access road, however, it is gated and not recognised as a Core Path in THC's Core Path Plan or as a walking route on any popular walking websites.

9.5.3 All HGV and staff vehicle movements associated with the Proposed Development will enter and exit the site from the A82 using this access road from the roundabout on the A82.

9.5.4 Pedestrians / cyclists will be able to enter and exit the Proposed Development via this access road.

**A830**

9.5.5 The A830 provides a connection from Fort William to the Port of Mallaig. The A830 is generally a good standard single carriageway road with a speed limit of 30 mph through built up areas and 40 mph or the National Speed Limit (60 mph) at other more rural sections.

9.5.6 It is not anticipated that any HGVs associated with the Proposed Development will utilise the A830, however, it is likely that a proportion of staff will originate from residential areas to the west, including Lochyside, Caol Banavie and Corpach.

**A82**

9.5.7 The A82 is a major road (mostly trunk road) in Scotland running between Glasgow and Inverness via Fort William. In the vicinity of the Proposed Development, the A82 is a generally good standard single carriageway road with a 40 mph speed limit which reduces to 30 mph through Fort William and is subject to the National Speed Limit (60 mph) along rural sections. Along the A82 from the Smelter access point into Fort William there is street lighting and a footway on at least one side of the road. The A82 links to the A830 at Lochybridge which continues west.

9.5.8 It is understood that all of the HGV traffic associated with the Proposed Development will route south along the A82 and through Fort William. A large proportion of staff are likely to reside in Fort William therefore, they will also utilise the A82 to route to / from the Proposed Development if driving to the site.

### *Baseline Traffic Flows*

9.5.9 The year of opening for the Proposed Development is expected to be 2022. Given that the ATC data was obtained in 2017 and the DfT data was obtained for 2019 (DfT, 2019), a National Road Traffic Forecast (NRTF, 2021) growth factor has been applied to all of the data to provide traffic flows which are representative of the baseline at the year of opening. Through consultation with THC, it was agreed that "high" growth is suitable to apply to the traffic flows on the A82 while "central" growth is suitable for the A830 and the Smelter access road.

9.5.10 Table 9.1 indicates the future baseline two-way AADF for the road links within the study area and the percentage of traffic which is classified as HGVs during the year of opening. The source of the data is described in Section 9.4.

***Table 9.1 2022 Baseline Traffic Flows***

| Counter Location | 2019 Base Year AADF | 2019 Base Year HGVs | NRTF Growth Factor | 2022 Projected AADF | 2022 Projected HGVs | Percentage HGVs |
|---|---|---|---|---|---|---|
| 1. Smelter Access Road | 437 | 33 | 1.057 | 462 | 35 | 8% |
| 2. A82 Industrial Estate | 17,944 | 1,692 | 1.074 | 19,272 | 1,788 | 9% |
| 3. A830 | 10,516 | 1,236 | 1.057 | 11,115 | 1,306 | 12% |
| 4. A82 Fort William | 19,826 | 1,745 | 1.074 | 21,293 | 1,844 | 9% |
| 5. A82 North | 5,811 | 417 | 1.074 | 6,241 | 441 | 7% |
| 6. A82 South | 8,300 | 411 | 1.074 | 8,914 | 434 | 5% |

### *Road Safety*

9.5.11 Data on road traffic collisions has been provided by Transport Scotland's accident data request service. Data has been provided for the trunk road network in the vicinity of the Proposed Development (A82 and A830) for the five-year period between 2016 and 2020 inclusive (up to October 2020).

*9.5.12* The Crash Map website (Crash Map, 2021) has been utilised for comparison purposes against the number of accidents that have occurred in the four-year period between 2016 and 2019 inclusive. It is noted that data for 2020 has not yet been made available on the Crash Map website. Details of the review of accidents within the study area (generally a 1 km radius from each counter location) are indicated by Table 9.2, with additional commentary provided on serious or fatal accidents.

*Table 9.2 Accident Statistics*

| Location | Slight | Serious | Fatal | Comment |
|---|---|---|---|---|
| 1. Smelter Access Road | 1 | - | - | - |
| 2. A82 Industrial Estate | 2 | - | 1 | The fatal accident occurred in August 2016 on the A82 between the smelter access road and the A830 |
| 3. A830 | 4 | - | 1 | The fatal accident occurred in August 2019 on the A830 between southbound carriageway between Kilmallie Road and the Blar Mhor Roundabout. |
| 4. A82 Fort William | 7 | - | - | It is noted that 2 of the accidents occurred in subsequent months during 2018 (October and November) at the exit arm onto Belford Road at the A82 / Belford Road roundabout |
| 5. A82 North | 1 | 1 | - | The serious accident occurred in December 2019 on the A82 north of Torlundy. |
| 6. A82 South | 4 | - | - | - |
| **Total** | **19** | **1** | **2** | **-** |

9.5.13 Table 9.2 indicates that 19 slight, one serious and two fatal accident have occurred in the study area within the vicinity of the traffic counter locations during the five-year period reviewed (2016 – 2020 inclusive). It is noted that there does not appear to be any noticeable 'clusters' of collisions at any one location suggesting that there is no significant accident 'hot spots' within the study area.

## 9.6 Method of Prediction of Impact

9.6.1 The methodology used in this assessment adheres to that set out in the IEMA Guidelines. The guidelines suggest that to determine the scale and extent of the assessment and the level of effect the development will have on the surrounding road network, the following two 'rules' should be followed:

- Rule 1 - Include road links where flows are predicted to increase by more than 30% or where the number of HGVs is predicted to increase by more than 30%.
- Rule 2 - Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

9.6.2 Rules 1 and 2 are used as a screening tool to determine whether or not a full assessment of effects on routes within the study area is required as a result of intensification of road traffic. Therefore, it should be noted that an increase in total traffic or HGV levels of more than 30% (or 10% depending on the sensitivity of the area) does not necessarily equate to a significant effect. The process for determining significance where Rules 1 or 2 are triggered is undertaken on a site-specific basis utilising the evaluation criteria detailed in Section 9.7 below.

## 9.7 Evaluation Criteria

### *Assessment of Significance*

9.7.1 The following paragraphs set out the methodology used to assess the significance of effects at locations along the routes within the study area where total traffic levels or the level of HGV traffic exceeds the screening thresholds set out by IEMA Rules 1 or 2 (depending on the sensitivity of the receptor) described in Section 9.4.

### *Sensitivity*

9.7.2 The sensitivity to change in traffic levels of any given road segment or junction is generally assessed by considering the residual capacity of the network under existing conditions. Where there is a high degree of residual capacity, the network may readily accept and absorb an increase in traffic and therefore the sensitivity is considered to be low. Conversely, where the existing traffic levels are high compared to the road capacity, there is little spare capacity and the sensitivity to any change in traffic levels is considered high.

9.7.3 The criteria that has been used to make judgements on the importance / sensitivity of the receptor(s) is presented in Table 9.3.

***Table 9.3 Receptor Sensitivity***

| Sensitivity | Description |
|---|---|
| High | People whose livelihood depends upon unrestricted movement within their environment; this includes commercial drivers and the companies who employ them.<br>Residents whose daily activities depend upon unrestricted movement within their environment.<br>Receptors such as schools, colleges and accident hotspots. |
| Medium | People who pass through or habitually use the area but whose livelihood is not wholly dependent on free access.<br>Receptors such as congested junctions, hospitals, cemeteries and conservation areas. |
| Low | Occasional users of the road network. Receptors such as public open space and residential areas.<br>Areas with trunk road or A class roads constructed to accommodate significant HGV volumes. |
| Negligible | Users not sensitive to transport effects. Includes very small settlements and roads with no significant settlements including new strategic trunk roads or motorways. |

### *Magnitude of Impact*

9.7.4 The magnitude of traffic impacts is a function of the existing traffic volumes, the percentage increase and change due to a development, the changes in type of traffic, and the temporal distribution of traffic (day of the week, time of day). The determination of magnitude has been undertaken by reviewing the Proposal, establishing parameters of the road that may be affected and quantifying these effects utilising IEMA Guidelines and professional judgement.

9.7.5 The criteria that has been used to make judgement on the magnitude of the effect on the receptor(s) is presented in Table 9.4.

*Table 9.4 Magnitude of Impact*

| Sensitivity | Description |
|---|---|
| Substantial | The proposals could result in a significant change in terms of length and / or duration to the present traffic routes or schedules or activities, which may result in hardship.<br><br>Generally regarded as a change in traffic flow above 90% on any given road link. |
| Moderate | The proposals could result in changes to the existing traffic routes or activities such that some delays or rescheduling could be required, which cause inconvenience.<br><br>Generally regarded as a change in traffic flow between 60% and 90% any given road link. |
| Slight | The proposals could occasionally cause a minor modification to routes, or a very slight delay in present schedules, or on activities in the short term.<br><br>Generally regarded as a change in traffic flow between 30% and 60% any given road link. |
| Negligible | No effect on movement of road traffic above normal level.<br><br>Generally regarded as a change in traffic flow below 30% any given road link. |

## *Significance*

9.7.6 As a guide to inform the assessment, but not as a substitute for professional judgement, criteria for determining the significance of traffic related effects are set out in the matrix in Table 9.5. This is based on combining the magnitude of the effect with the receptor sensitivity.

*Table 9.5 Significance Criteria Matrix*

| | | Sensitivity of Receptor | | | |
|---|---|---|---|---|---|
| | | High | Medium | Low | Negligible |
| Magnitude of Impact / change | Substantial | Major | Major | Moderate | Minor |
| | Moderate | Major | Moderate | Minor | Negligible |
| | Slight | Moderate | Minor | Negligible | None |
| | Negligible | Minor | Minor | Negligible | None |

9.7.7 The significance falls into two categories: significant and not significant. The latter corresponding to significant effects in accordance with the EIA Regulations (Scottish Government, 2017). Effects judged to be major or moderate are considered to be significant in accordance with the EIA Regulations. Effects judged to be of minor or negligible significance are considered not significant.

## 9.8 Prediction of Impact & Evaluation of Effects

### *Construction Traffic Impact*

#### HGV Trips

9.8.1 It is understood that the construction phase of the Proposed Development will take a total of approximately 60 weeks to complete, including site establishment and demobilisation. During this time, it has been estimated that 1,235 HGV loads will be required to transport construction materials to the site, equating to 2,470 two-way HGV movements. Assuming a 30-week Civils stage to be robust and a five-day working week, this equates to approximately 8 loads per day (16 two-way HGV movements) associated with transporting construction materials to the site.

9.8.2 The site of the Proposed Development will also require significant earthworks prior to Civils activities commencing in the form of backfilling of quarry material. It has been estimated that the earthworks operations will require a total of approximately 2,720 total loads (5,440 HGV movements) over the course of the backfilling activities.

9.8.3 Approximately 40,000 $m^3$ of quarry material is to be brought to the site of the Proposed Development. This activity has been programmed for an 11-week period with a 5.5-day working week (10 hours per day). Assuming eight-wheel tippers are used with a carrying capacity of approximately 15 $m^3$ per tipper and a maximum structural fill quantity of 675 $m^3$ per day, this equates to 45 HGV loads per day (90 two-way HGV movements) for 11 weeks. This level of HGV traffic has therefore been assessed as the worst-case day in which the assessment of construction effects has been predicated on.

#### Staff Trips

9.8.4 It is understood that the maximum number of staff on-site at any one time during the construction phase will be approximately 50 – 60. If all staff were to travel by private car (single occupancy) this will equate to a maximum of 120 two-way trips during the construction phase. However, it is likely that staff travelling from the same areas will car share (assuming COVID-19 restrictions allow this at the time of construction) or be transported by a works mini-bus. This could therefore significantly reduce the number of vehicle movements associated with staff trips. Nevertheless, this assessment assesses a robust and worst-case scenario whereby all staff travel to and from the Proposed Development by private car.

#### Construction Traffic Distribution

9.8.5 To assess the impact of construction traffic within the study area it is necessary to determine the distribution of trips generated. At present the origin of construction materials and the destination of HGVs leaving site is undetermined. In addition, it is not yet known where construction staff will originate from.

9.8.6 As a result, a worst-case scenario has been adopted for each road link whereby 75% of all HGV and staff trips is distributed over the road link with the exception of the existing smelter access road as all traffic will utilise this access point. The construction traffic distribution applied in this assessment is indicated by Table 9.6.

9.8.7 It is important to note that the scenario assessed is a worst-case for each road link and these traffic impacts will not all occur at maximum levels as the total traffic cannot exceed 100%. It is reiterated that the data presented in Table 9.6 is for the removal of peat from the site (which results in the most onerous combined daily traffic generation).

*Table 9.6 Construction Stage Vehicle Trip Distribution*

| Counter Location | HGV Distribution | No. HGV Trips | Staff Distribution | No. Staff Trips | Total Daily Vehicle Trips |
|---|---|---|---|---|---|
| 1. Smelter Access Road | 100% | 90 | 100% | 120 | 210 |
| 2. A82 Industrial Estate | 75% | 68 | 75% | 90 | 158 |
| 3. A830 | 75% | 68 | 75% | 90 | 158 |
| 4. A82 Fort William | 75% | 68 | 75% | 90 | 158 |
| 5. A82 North | 75% | 68 | 75% | 90 | 158 |
| 6. A82 South | 75% | 68 | 75% | 90 | 158 |

## *Construction Traffic Effects*

9.8.8 Table 9.7 details the maximum daily percentage increases in traffic levels along the road links within the study area during the construction of the Proposed Development, based upon the distribution demonstrated in Table 9.6.

*Table 9.7 Construction Traffic Impact on Routes within the Study Area*

| | 1. Smelter Access | 2. A82 Industrial Estate | 3. A830 | 4. A82 Fort William | 5. A82 North | 6. A82 South |
|---|---|---|---|---|---|---|
| Baseline AADF | 462 | 19,272 | 11,115 | 21,293 | 6,241 | 8,914 |
| Baseline HGV Count | 35 | 1,788 | 1,306 | 1,844 | 441 | 434 |
| Baseline HGV % | 7.6% | 9.3% | 11.8% | 8.7% | 7.1% | 4.9% |
| Worst-Case Daily HGV Trip generation | 90 | 68 | 68 | 68 | 68 | 68 |
| Worst-Case Daily Staff Trip Generation | 120 | 90 | 90 | 90 | 90 | 90 |
| Baseline HGV Count + Development HGV Count | 125 | 1,856 | 1,374 | 1,912 | 508 | 502 |
| Baseline AADF + Development Staff Trips + Development HGV Trips | 672 | 19,429 | 11,273 | 21,451 | 6,399 | 9,072 |
| **% Increase in HGV Traffic** | **258.0%** | **3.8%** | **5.2%** | **3.7%** | **15.3%** | **15.5%** |
| **% Increase in TOTAL Traffic** | **45.5%** | **0.8%** | **1.4%** | **0.7%** | **2.5%** | **1.8%** |

9.8.9 Table 9.7 indicates that the increase in HGVs associated with the construction phase of the Proposed Development will be 258% along the existing Smelter access road, while the increase in total traffic (including staff movements) could be up to 45.5%. This is to be expected given that this road has a low baseline AADF as it only provides access to the Lochaber Smelter and is not part of the public road network. Nevertheless, a full assessment of effects has been undertaken for this road link as the impact will exceed the IEMA "Rule 1" of a 30% threshold.

9.8.10 Table 9.7 indicates that along the A82 at the industrial estate and within Fort William, there will be a minimal increase in HGV traffic levels of less than 4%. Similarly, the percentage increase in total traffic is minimal at less than 1% at both A82 receptors at the industrial estate and within Fort William. As a result, a full assessment is not required for these road links in accordance with the IEMA Guidelines as the impact does not exceed “Rule 2” (10% threshold).

9.8.11 Along the A830 as a worst-case scenario the level of HGV traffic will increase by around 5% and the level of total traffic by less than 2%. It is noted that this level of impact is negligible, and a full assessment of effect is not required in accordance with the IEMA Guidelines as it does not exceed the IEMA “Rule 1” (30% threshold).

9.8.12 Table 9.7 indicates that along the A82 to the north and south of Fort William, HGV traffic levels could increase by around 15% to 16% as a result of the construction phase of the Proposed Development. As indicated in Section 7 of this chapter, these road links are subject to IEMA “Rule 1” whereby a full assessment is only required if the increase exceeds the 30% threshold. Similarly, the increase in total traffic does not exceed 30% (less than 3% and 2% increase in traffic along the A82 to the north and south of Fort William respectively).

9.8.13 It should be reiterated that Table 9.7 and the percentage increases in traffic as a result of the Proposed Development demonstrate the worst-case scenario for each road link that the traffic counters represent. The assessment is therefore considered to be suitably robust.

9.8.14 The following paragraphs detail a full assessment of environmental effects for the smelter access road (traffic counter location 1). The assessment utilises the sensitivity and magnitude tables (Table 9.3 and Table 9.4 respectively) and the significance criteria matrix (Table 9.5) to determine the significance of the effect of increased traffic levels as a result of the Proposed Development.

### *Evaluation of Construction Traffic Effects*

#### Severance

9.8.15 The IEMA Guidelines advise that “*severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery*”.

9.8.16 The potential for traffic associated with the Development to cause severance is assessed on a case by case basis using professional judgement where non negligible traffic increases are predicted on roads through residential settlements.

9.8.17 Increased severance can result in the isolation of areas of a settlement or individual properties. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself. Severance effects could equally be applied to residents, motorists or pedestrians.

9.8.18 In accordance with Table 9.4, the magnitude of impact in vehicle flows along the smelter access road is considered to be substantial as it exceeds a 90% increase. The sensitivity of the smelter access road to severance is considered to be negligible given that the road only leads to the existing Lochaber Smelter and thus use of the road by motorists (other than for gaining access to the Smelter or Proposed Development) or pedestrians is unlikely. When the magnitude of impact is combined with the sensitivity of the receptor road link in accordance with Table 9.5, it can be concluded that the effect will be of **minor adverse** significance, which is considered **not significant** in accordance with the EIA regulations (Scottish Government, 2017).

#### Driver Delay

9.8.19 Driver delay may be experienced when construction traffic is accessing the site. The IEMA Guidelines advise “*delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system*”.

9.8.20 Traffic delay to non-development traffic may occur at several points on the network surrounding the development site including:

- At the development entrances where there will be additional turning movements.

- At intersections along the local road network which might be affected by increased traffic.
- At side roads where the ability to find gaps in traffic may be reduced, thereby lengthening delays.

9.8.21 In accordance with Table 9.4, the magnitude of impact in vehicle flows along the smelter access road is considered to be substantial as it exceeds a 90% increase. It is understood that the current traffic levels on the smelter access road are low at this location, therefore, it must be acknowledged that the high percentage impact predicted for Proposed Development traffic is as a result of the baseline flow being inherently low. Furthermore, the road is fit-for-purpose of accessing the existing Smelter and the effects experienced during the construction phase will only be temporary, therefore, the sensitivity to a driver delay effect on the public is negligible. When the magnitude of impact is combined with the sensitivity of the receptor road link in accordance with Table 9.5, it can be concluded that the effect will be of **minor adverse** significance, which is considered **not significant** in accordance with the EIA regulations (Scottish Government, 2017).

### Pedestrian Delay & Amenity

9.8.22 Traffic volumes, traffic composition, traffic speed, the existence of pedestrian footways and the existence of pedestrian crossings all contribute to the level of general pleasantness, fear, intimidation and delay experienced by pedestrians and other vulnerable road users.

9.8.23 In accordance with, the magnitude of impact in vehicle levels along the smelter access road is substantial for the construction stage of the Proposed Development. As with severance, the sensitivity of the road is considered to be negligible in accordance with the descriptions in Table 9.3, given that the road is not readily used by pedestrians as it only leads to the Smelter. When the substantial magnitude of impact is combined with the negligible sensitivity of the road link, in accordance with Table 9.5 it can be concluded that the effect will be of **minor adverse** significance, which is considered **not significant** in accordance with the EIA regulations (Scottish Government, 2017).

### Accidents & Safety

9.8.24 As Table 9.2 demonstrates, there have been no accidents recorded in the last five years on the existing smelter access road. It is noted that one slight and one fatal accident have occurred within a one kilometre radius of the smelter access road counter location. However, the fatal accident (2016) occurred approximately 400 m northeast of the smelter access road on the A82 between the access roundabout and the A830. The slight accident (2018) occurred further north at the roundabout between the A82 and the A830. The magnitude of impact is considered to be substantial in accordance with Table 9.5, however, the sensitivity of the receptor is considered to be negligible in accordance with Table 9.4 given no accidents have occurred on the link itself in recent years and that development-only traffic is expected to utilise this road (i.e. no members of the public).

9.8.25 Combining the substantial magnitude with negligible sensitivity in accordance with Table 9.5, it can be concluded that the effect will be of **minor adverse** significance, which is considered **not significant** in accordance with the EIA Regulations (Scottish Government, 2017).

### Dust & Dirt

9.8.26 IEMA Guidelines acknowledge that it is not practical to quantify the level of dust and dirt that can be anticipated from development traffic. Therefore, a quantitative description of dust and dirt effects from construction traffic is not provided here.

9.8.27 In accordance with Table 9.4, the magnitude of impact in vehicle levels along the smelter access road is substantial for the construction stage of the Proposed Development. It is acknowledged that HGVs have the potential to collect debris on their tyres when accessing the Proposed Development. This could be transferred to the road surface when vehicles travel away from the development and can be deposited on the road in the form of either dust or mud depending on weather conditions, however, as a good practice measure wheel washing facilities and road sweeping operations will be in place to combat this effect, therefore, the sensitivity is considered to be negligible. Overall, it is concluded that the effect will be of **minor adverse** significance, which is considered **not significant** in accordance with the EIA Regulations (Scottish Government, 2017).

### *Operational Traffic Impact*

#### Operational Traffic Generation

9.8.28 Operational traffic associated with the Proposed Development will comprise staff travelling to and from the site, predominantly in private cars, and goods vehicles transporting scrap material to the site and billet away from the site. For the purposes of providing a robust and worst-case assessment, this Traffic and Transport chapter assumes that all materials associated with the Proposed Development will be transported in HGVs.

#### HGV Trips

9.8.29 The numbers of HGV trips likely to be generated by the Proposed Development has been estimated based on the anticipated maximum operational use. It is pertinent to consider that the nature of the Proposed Development requires input of new and scrap material. The new aluminium will be supplied as an output of the existing Smelter, which currently exports aluminium off site. The import of aluminium by road will therefore be limited to scrap material, which is anticipated to be transported to the site by sea (to Corpach and onwards by road); or 100% by road via the A82.

9.8.30 It is understood that currently the Lochaber Smelter generates 12 HGV trips in and out of site (24 two-way HGV trips) per day. These HGV trips are already included in the baseline traffic flows.

9.8.31 It has been estimated that the Proposed Development will generate an absolute maximum of 31 inbound and 31 outbound (62 two-way) HGV movements per day associated with the import and export of scrap aluminium and billet respectively (if transporting 100% of material by road).

9.8.32 Whilst it is noted that the eventual HGV generation could be substantially less than 62 two-way movements depending upon how the material is transported to and from the site, for the purposes of a robust assessment, it has been assumed that all import and export material will be transported by road. This chapter therefore assesses the impact of 31 additional HGVs trips in and out of the Proposed Development (62 two-way HGV trips), i.e. does not account for any reductions in HGV trips as a result of re-use of materials / alternate transportation methods / shared-trips between the Proposed Development and the existing Smelter.

#### Staff Trips

9.8.33 As an extension of the existing Lochaber Smelter offering, the Proposed Development will adopt the same shift patterns and operating hours currently in place across the wider Smelter site. The Proposed Development will therefore be operational 24 hours a day and staff shift times will be split into two 12-hour shifts: 07:00 to 19:00 (day shift) and 19:00 to 07:00 (night shift). It is noted that staff will therefore typically arrive and depart outside the peak hours associated with the surrounding road network (typically 08:00 to 09:00 and 17:00 to 18:00), based on these shift times.

9.8.34 The Proposed Development is expected to employ approximately 70 members of staff in total and these will include both new and existing members of staff (from the adjacent Smelter). The majority of staff employed at the Proposed Development will be existing smelter staff (40). The remaining 30 employees will be new staff, and therefore represent an additional trip to and from the site.

9.8.35 Staff of the Proposed Development will be split across five shift patterns. This generally equates to "groups" of 14 staff working in one shift. Notwithstanding that the majority of these members of staff will be existing employees (approximately 8 per shift on average), it is also acknowledged that new staff may not necessarily be split evenly across the various shifts (equating to 6 new staff per shift on average).

9.8.36 However, in that respect, it is pertinent to consider that the re-allocation of existing smelter staff to the Proposed Development will result in a reduction in trip generation associated with the Smelter. Therefore, it is reasonable to assume that the worst-case scenario for operational staff trips will be an additional 6 trips per shift.

9.8.37 As a worst-case scenario, this assessment therefore assumes that 12 additional staff trips will be generated to and from the development (24 two-way vehicle trips) in a private car over a 24-hour period. It is noted that currently the Lochaber Smelter has an approximate car mode share of 67% (see Technical Appendix 9.1), but this assessment is assuming a 100% car mode share to be robust.

## *Operational Traffic Distribution*

### HGV Trips

9.8.38 It is understood that all HGVs associated with transporting materials during operation of the Proposed Development will route south on the A82. As discussed, all HGV movements will access and egress via the existing smelter access. Notwithstanding this, a worst-case scenario has been adopted for each road link whereby 100% of all HGV trips is distributed over each the road link.

9.8.39 It is important to note that the scenario assessed is a worst-case for each road link and these traffic impacts may not occur simultaneously, i.e. an increase in construction traffic on one road link results in an equivalent decrease in road traffic on the other road links.

### Staff Trips

9.8.40 To assess the impact of additional staff trips on the road links within the study area it is necessary to determine an appropriate distribution of staff trips. Therefore, to allow for uncertainties, as with the construction stage staff trips these have been distributed as 75% across all road links within the study area.

9.8.41 Table 9.8 demonstrates the operational HGV and staff vehicle traffic distribution which has been applied in this assessment.

*Table 9.8 Operational Vehicle Trip Distribution*

| Counter Location | HGV Distribution | No. HGV Trips | Staff Distribution | No. Staff Trips | Total Daily Vehicle Trips |
|---|---|---|---|---|---|
| 1. Smelter Access Road | 100% | 62 | 100% | 24 | 86 |
| 2. A82 Industrial Estate | 100% | 62 | 75% | 18 | 80 |
| 3. A830 | 100% | 62 | 75% | 18 | 80 |
| 4. A82 Fort William | 100% | 62 | 75% | 18 | 80 |
| 5. A82 North | 100% | 62 | 75% | 18 | 80 |
| 6. A82 South | 100% | 62 | 75% | 18 | 80 |

## *Operational Traffic Effects*

9.8.42 Table 9.9 details the maximum daily percentage increases in traffic levels along the road links within the study area during the operation of the Proposed Development, based upon the distribution demonstrated in Table 9.8.

*Table 9.9 Operational Traffic Impact on Routes within the Study Area*

| | 1. Smelter Access | 2. A82 Industrial Estate | 3. A830 | 4. A82 Fort William | 5. A82 North | **6. A82 South** |
|---|---|---|---|---|---|---|
| Baseline AADF | 462 | 19,272 | 11,115 | 21,293 | 6,241 | 8,914 |
| Baseline HGV Count | 35 | 1,788 | 1,306 | 1,844 | 441 | 434 |
| Baseline HGV % | 7.6% | 9.3% | 11.8% | 8.7% | 7.1% | 4.9% |
| Worst-Case Daily HGV Trip generation | 62 | 62 | 62 | 62 | 62 | 62 |
| Worst-Case Daily Staff Trip Generation | 56 | 42 | 42 | 42 | 42 | 42 |
| Baseline HGV Count + Development HGV Count | 97 | 1,850 | 1,368 | 1,906 | 503 | 496 |
| Baseline AADF + Development Staff Trips + Development HGV Trips | 548 | 19,352 | 11,195 | 21,373 | 6,321 | 8,994 |
| **% Increase in HGV Traffic** | **177.7**% | **3.5**% | **4.7**% | **3.4**% | **14.1**% | 14.3% |
| **% Increase in TOTAL Traffic** | **18.6**% | **0.4**% | **0.7**% | **0.4**% | **1.3**% | 0.9% |

9.8.43 Table 9.9 indicates that the increase in HGVs associated with the operational phase of the Proposed Development will be approximately 178% along the existing smelter access road, while the increase in total traffic (including staff movements) could be up to around 18.6%. This is to be expected given that this road has a low baseline AADF as it only provides access to the Lochaber Smelter and not part of the public road network. Nevertheless, a full assessment of effects has been undertaken for this road link as the impact will exceed the IEMA "Rule 1" of a 30% threshold (for increased HGV traffic).

9.8.44 Table 9.9 indicates that along the A82 at the industrial estate and within Fort William there will be minimal increase in HGV traffic levels of less than 4%. Similarly, the percentage increase in total traffic is minimal at less than 1% at both A82 receptors at the industrial estate and within Fort William. As a result, a full assessment is not required for these road links in accordance with the IEMA Guidelines as the impact does not exceed "Rule 2" (10% threshold).

9.8.45 Along the A830 as a worst-case scenario the level of HGV traffic will increase by around 5% and the level of total traffic by less than 1%. It is noted that this level of impact is negligible, and a full assessment of effect is not required in accordance with the IEMA Guidelines as it does not exceed the IEMA "Rule 1" (30% threshold). Table 9.9 indicates that along the A82 to the north and south of Fort William HGV traffic levels could increase by around 14% as a result of the construction phase of the Proposed Development. As indicated in Section 7 of this chapter, these road links are subject to IEMA "Rule 1" whereby a full assessment is only required if the increase exceeds the 30% threshold. Similarly, the increase in total traffic does not exceed 30% (around 1% increase in traffic at each receptor).

9.8.46 It is reiterated that Table 9.9 and the percentage increases in traffic as a result of the Proposed Development demonstrate the worst-case scenario for each road link that the traffic counters represent. The following paragraphs detail a full assessment of environmental effects for the smelter access road (traffic counter location 1). The assessment utilises the sensitivity and magnitude tables (Table 9.3 and Table 9.4 respectively) and the significance criteria matrix (Table 9.5) to determine the significance of the effect of increased traffic levels as a result of the Proposed Development.

### *Evaluation of Operational Traffic Effects*

#### Severance

9.8.47 In accordance with Table 9.5, the magnitude of impact in HGV flows along the smelter access road is considered to be substantial. However, it should be noted that the magnitude of change in HGV levels will be considered as slight and the substantial impact is attributable to staff vehicle movements only. The sensitivity of the smelter access road to severance is considered to be negligible in accordance with the descriptions provided in Table 9.3, given that the road only leads to the existing Lochaber Smelter. Thus, pedestrian activity (especially by members of the public) or use by motorists other than staff / HGVs associated with either the smelter of Proposed Development is minimal. When the magnitude of impact is combined with the sensitivity of the receptor road link in accordance with Table 9.5, it can be concluded that the effect will be of **minor adverse** significance, which is considered **not significant** in accordance with the EIA regulations (Scottish Government, 2017).

#### Driver Delay

9.8.48 In accordance with Table 9.5, the magnitude of impact in HGV flows along the smelter access road during the operational phase is considered to be substantial as it exceeds a 90% increase. The existing HGV traffic levels on the smelter access road are low at this location (35 vehicles per day), therefore, it must be acknowledged that the high percentage impact (178%) predicted for development HGV traffic is as a result of the baseline flow being inherently low. The road is fit for purpose of accessing the existing smelter and not generally used by the public, therefore, the sensitivity to a driver delay effect on the public is negligible in accordance with Table 9.3. When the magnitude of impact is combined with the sensitivity of the receptor road link in accordance with Table 9.5, it can be concluded that the effect will be of **minor adverse** significance, which is considered **not significant** in accordance with the EIA regulations (Scottish Government, 2017).

#### Pedestrian Delay & Amenity

9.8.49 In accordance with Table 9.5, the magnitude of impact in HGV levels along the smelter access road is substantial for the operational stage of the development. As with severance, the sensitivity of the road is considered to be negligible in accordance with Table 9.3 given that the road is not heavily used by pedestrians as it only leads to the Smelter. When the substantial magnitude of impact is combined with the negligible sensitivity of the road link, in accordance with Table 9.5, it can be concluded that the effect will be of **minor adverse** significance, which is considered **not significant** in accordance with the EIA regulations (Scottish Government, 2017).

#### Accidents & Safety

9.8.50 As Table 9.2 demonstrates, there have been no accidents recorded in the last five years on the existing smelter access road. It is noted that one slight and one fatal accident have occurred within a one kilometre radius of the smelter access road counter location. However, the fatal accident (2016) occurred approximately 400 m northeast of the smelter access road on the A82 between the access roundabout and the A830. The slight accident (2018) occurred further north at the roundabout between the A82 and the A830. The magnitude of impact is considered to be substantial in accordance with Table 9.5, however, the sensitivity of the receptor is considered to be negligible in accordance with Table 9.4, given no accidents have occurred on the link itself in recent years and that development-only traffic is expected to utilise this road (i.e. no members of the public). Combining the substantial magnitude with negligible sensitivity in accordance with Table 9.5, it can be concluded that the effect will be of **minor adverse** significance, which is considered **not significant** in accordance with the EIA Regulations (Scottish Government, 2017).

#### Dust & Dirt

9.8.51 IEMA Guidelines acknowledge that it is not practical to quantify the level of dust and dirt that can be anticipated from Proposed Development traffic. Therefore, a quantitative description of dust and dirt effects from operational traffic is not provided here. Although the magnitude of the impact is considered to be substantial in accordance with Table 9.5, it is noted that the access roads to / from the Proposed Development is surfaced and there is very limited scope for dust and dirt to be deposited onto the public road network as a result of operational traffic. Therefore, the sensitivity of the receptor is considered to be negligible. Combining a substantial magnitude with a negligible sensitivity, it is concluded that the effect will be of **minor adverse** significance, which is considered **not significant** in accordance with the EIA Regulations (Scottish Government, 2017).

## 9.9 Mitigation Measures

9.9.1 The assessment of both the construction and operational phases does not predict any significant effects prior to mitigation. As a result, no mitigation is required to address predicted environmental effects associated with increased traffic in accordance with the EIA Regulations (Scottish Government, 2017). Nevertheless, a Construction Traffic Management Plan (CTMP) is proposed as a good practice measure for ensuring minimum impact within the study area during the construction phase.

9.9.2 Furthermore, a TP is in place for the existing Smelter operations and this will be updated to encompass the Proposed Development.

### *Construction Traffic Management Plan (CTMP)*

9.9.3 Mitigation is proposed in the form of a CTMP to monitor and manage the impact of HGV traffic on the local road network. The CTMP will identify measures to reduce the number of construction vehicles as well as seeking to reduce or avoid the impact of vehicles through construction programming / routing and identification of an individual with responsibilities for managing traffic and transport effects. The CTMP will also identify measures to reduce and manage construction staff travel by private car, particularly single occupancy trips. The CTMP will be developed during the detailed design phase of the project. The framework CTMP will include measures to manage traffic movements such as the following:

- The main contractor will develop a logistics plan highlighting the access point for the project, loading bays, pedestrian / vehicular segregation, welfare, storage, security and material handling.
- Staff will be provided with a site induction pack containing information on preferred delivery routes and any restrictions on routes.
- HGV movements can be restricted during the network peak hours which are generally 08:00 – 09:00 and 17:00 – 18:00 Monday to Friday and will not occur during unsociable hours (i.e. before 06:00 or after 22:00).
- A construction traffic speed limit (for example, 20mph) could be imposed through the sensitive areas such as Fort William.
- Signage could be erected at appropriate locations on the A82 to make other road users aware of the construction activities and associated construction vehicles.
- Under no circumstances will HGVs be allowed to lay-up on surrounding roads.
- Roads in the vicinity of the Proposed Development will be maintained in a clean and safe condition.
- A wheel washing facility will be present on-site in order to reduce mud and debris being deposited onto the local road network. This will be supported by road sweeping operations at key intervals.

### *Travel Plan (TP)*

9.9.4 Post consent, it is envisaged that the existing TP for Lochaber Smelter will be updated with the focus on reducing car-based travel to/from the site by the expanded workforce. The updated TP will put forward a number of measures and actions which will seek to encourage the use of sustainable transport modes while reducing reliance on private car journeys (and the associated environmental effects thereof).

## 9.10 Residual Effects

9.10.1 Subject to the successful implementation and monitoring of a CTMP, it is considered that any residual effects associated with the construction will be negligible given that prior to mitigation, all effects are considered to be minor and not significant. Similarly, subject to the update and implementation of measures of the TP, any residual operational effects will be negligible given that prior to mitigation, all effects are considered to be minor and not significant .

9.10.2 As a result, the residual effects after implementation of the CTMP and TP will also be classed as **not significant**.

## 9.11 Cumulative Effects

9.11.1 A new Water Canning Plant on the Smelter site is proposed which will be covered by a separate planning application. As it is possible that this will be constructed before the Proposed Development, it has been included as part of the cumulative assessment.

9.11.2 It is not anticipated that the construction stages of the Proposed Development and Water Canning Plant will overlap. It is noted that the potential Water Canning Plant will be a much smaller facility than the Proposed Development. In that respect and considering that the construction stage effects of the Proposed Development have been determined as being not significant, it therefore follows that the construction stage effects associated with any future Water Canning Plant on the site will also be considered **not significant** in accordance with the EIA regulations (Scottish Government, 2017).

9.11.3 In terms of operational traffic associated with the Water Canning Plant, this will similarly comprise staff vehicle movements and a very small number of daily HGV traffic. It is understood that the Water Canning Plant will employ approximately 25 new staff. As per the Proposed Development, it is assumed that these additional members of staff will be employed as part of the existing shift patterns which are in operation at the Smelter. This would therefore equate to a maximum of 5 additional employees per shift (10 two-way trips).

9.11.4 As a worst-case scenario, this assessment therefore assumes that 10 additional staff trips (over and above those identified for the Proposed Development) will be generated to and from the site in a private car (20 two-way vehicle trips) over a 24-hour period associated with the Water Canning Plant. It is reiterated that currently the Lochaber Smelter has an approximate car mode share of 67%, but this assessment is assuming a 100% car mode share to be robust.

9.11.5 If brought forward, the Water Canning Plant will generate a very low level of daily HGV trips to transport the output products from the site. The applicant has provided an estimation that in an absolute worst-case scenario, up to five HGVs could travel to and from the development (10 two-way movements) to export products from the Water Canning Plant. This level of HGV trip generation has an impact of less than 2% (of HGV traffic) across all receptors within the public road network. At the existing smelter access road, the impact will be approximately 10%. However, it is again noted that this is due to the inherently low baseline flows. On that basis, it is considered that the potential environmental effects identified for the Proposed Development will not be exacerbated by up to 10 additional two-way HGV movements per day which are anticipated if the Water Canning Plant is brought forward.

9.11.6 Assessed cumulatively with the Proposed Development traffic (HGV and staff movements), all receptors remain within the thresholds for which they have been assessed for environmental effects and therefore there are no changes to the classifications of any road link within the significance criteria matrix (Table 9.5). It can therefore be concluded that the cumulative effects of the Proposed Development and Water Canning Plant are **not significant** in accordance with the EIA regulations (Scottish Government, 2017).

## 9.12 Summary of Effects

### *Construction Effects*

9.12.1 The construction programme of the proposed development is anticipated to cover approximately 60 weeks including site establishment and demobilisation. During this time, the greatest HGV traffic generating activity will be the removal of peat from the site which will require a maximum of 90 two-way HGV trips daily for approximately 6 weeks. In addition, there will be a maximum of 50 – 60 construction staff on-site at any one time. This level of daily traffic generation has therefore been used to present a robust and worst-case assessment for the construction phase. Furthermore, the staff vehicle numbers assessed assume that all staff travel by private car (single occupancy) while it is anticipated that this will be significantly reduced by measures such as car share.

9.12.2 Applying the worst-case level of traffic generation during the construction phase to the baseline traffic flows for the road links within the study area will see the greatest impact on the existing smelter access road. It is predicted that the percentage increase in HGV traffic along this road link will be 258% while the increase in total traffic will be 45.5%.

9.12.3 Elsewhere within the study area traffic associated with the construction of the Proposed Development will not exceed a 30% increase to the baseline AADF, while the traffic within Fort William will not exceed 10%.

9.12.4 A full assessment of effects has been undertaken for the smelter access road and concludes that as a worst-case, effects during the construction phase will be of **minor adverse** significance, which is concluded as **not significant** in accordance with the EIA Regulations (Scottish Government, 2017). Nevertheless, a Construction Traffic Management Plan is proposed as a good practice measure to ensure HGV movements are managed effectively and minimised where possible.

### *Operational Effects*

9.12.5 The Proposed Development is expected to be operational in 2023. Operational traffic will comprise HGVs transporting materials to and from site and staff travel movements to and from the Proposed Development. It is understood that as a worst-case scenario, up to 62 two-way HGV trips will be generated by the Proposed Development and this assessment assumes that 28 staff will make a trip to and from the Proposed Development (56 two-way vehicle trips) by private car in a 24-hour period. This is a robust assumption as it assumes that all staff are travelling by single-occupancy private car.

9.12.6 Applying the worst-case level of traffic generation during the operational stage to the future baseline traffic flows for the road links within the study area will see the greatest impact on the existing smelter access road. It is predicted that HGV levels will increase by 178% and total traffic levels by 25.5%.

9.12.7 Elsewhere within the study area traffic associated with the operation of the Proposed Development will not exceed a 30% increase to the baseline AADF, while the traffic within Fort William will not exceed 10%.

9.12.8 A full assessment of effects has been undertaken for the smelter access road and concludes that as a worst-case, effects during operation will be of **minor adverse** significance, which is concluded as **not significant** in accordance with the EIA Regulations (Scottish Government, 2017).

9.12.9 In addition, a TP has been prepared for staff aimed at reducing the number of single-occupancy car trips which, if successful, will significantly reduce the overall traffic impact during operation of the Proposed Development.

## 9.13 Future Monitoring

9.13.1 No further surveying or monitoring will be required in relation to traffic and transport once construction of the Proposed Development is complete and operation has commenced.

## 9.14 References

Scottish Government (2017) *The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations* 2017, Scottish Statutory Instruments, 2017 No. 102

[Online] Available at: www.legislation.gov.uk/ssi/2017/102

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# Chapter 10 Noise and Vibration

# 10. Noise and Vibration

# 10. Noise and Vibration

## 10.1 Introduction

10.1.1 This chapter considers the potential noise and vibration effects associated with the construction and operation of the Proposed Development.

10.1.2 Details of the processes associated with the Proposed Development and a process flow diagram are provided in chapter 3; however, a brief summary of the process describing identified potential noise sources is provided below:

- The process will comprise mixing of molten aluminium from the existing Smelter with melted scrap aluminium followed by casting of the metal to form billet.
- Molten aluminium from the Smelter will enter the Proposed Development through an entry point in the north-eastern façade of the building in a ladle pulled by a tractor vehicle.
- Scrap aluminium will enter the Proposed Development via the south-western corner of the building.
- Scrap and waste products will be stored in bays in the southern end of the building, and materials will be moved around in this area by a shovel.
- Scrap and molten aluminium will be combined within furnaces in the central area of the building, then transferred to casting and pressing processes in the central and southern areas of the building.
- Billet will leave the building via an exit point in the north-western corner and be transferred to an adjacent external storage area by fork lift truck.
- Ancillary processes with components external to the building will comprise an oxygen and process gas plant and cast pit steam handling.

10.1.3 The process will operate continuously, day and night, however, deliveries will typically be scheduled within the daytime period.

10.1.4 This assessment draws on methods used in the EIA of an Alloy Wheel Plant (AWP) previously proposed for the site of the Proposed Development. The AWP was consented but has not been constructed. The Proposed Development supersedes and replaces the AWP application.

### *Scope of Assessment*

10.1.5 The scope of this assessment comprises the following:

- Consultation with statutory consultees;
- Baseline noise survey;
- Evaluation of construction noise;
- Evaluation of road traffic noise;
- Modelling and evaluation of operational noise;
- Evaluation and interpretation of modelling results; and
- Specification of appropriate mitigation.

10.1.6 Vibration effects associated with the construction phase will be highly localised, limited to construction hours and can be controlled by implementation of best practice techniques. Vibration effects associated with the operational phase will be highly localised and are considered to be negligible at human receptor locations. The evaluation of vibration effects has therefore been scoped out of this assessment.

### *Glossary of Acoustics Terms*

10.1.7 Acoustics and vibration are necessarily highly technical disciplines, and as such there are numerous specific terms which are used within this assessment. The terms are defined here to aid the lay reader.

- **Noise** – unwanted sound.
- **A-weighting** – an electronic filter applied to measured sound levels to approximate the hearing response of humans to different frequencies, denoted 'A' in noise indices.
- **Ambient level, $L_{eq,T}$** – the equivalent continuous sound pressure level ($L_{eq}$) of the totally encompassing sound in a given situation at a given time at the assessment location over a given time interval, T. Denoted $L_{Aeq,T}$ when A-weighted.
- **Background level, $L_{A90,T}$** - the A-weighted sound pressure level that is exceeded for 90 percent of a given time interval, T.
- **Maximum level, $L_{Amax}$** – the A-weighted maximum instantaneous sound level during a measurement period or noise 'event', recorded during a time interval, T.

## 10.2 Legislation, Policy and Guidelines

10.2.1 A short summary of relevant legislation, policy and guidelines that have been taken into consideration in this assessment is provided below.

#### Control of Pollution Act, 1974

10.2.2 The Control of Pollution Act (CoPA) gives local authorities powers for controlling noise and vibration from construction works and other similar sites.

### *Planning Policy*

#### Planning Advice Note PAN1/2011

10.2.3 PAN1/2011 (Scottish Government, 2011), sets out a series of noise issues for planning authorities to consider when making decisions on planning applications. A Technical Advice Note (TAN) on Assessment of Noise (Scottish Government, 2011) has been published to accompany PAN 1/2011. In Appendix 1 of the TAN are codes of practice for the assessment of various sources of noise. It identifies British Standard BS 5228 for guidance on construction site noise control, and as a method of prediction of noise from construction sites and BS4142 as appropriate guidance for the evaluation of noise from industrial developments.

10.2.4 The TAN recommends that the daytime period includes the hours 07:00 – 23:00 and the night-time period 23:00 – 07:00.

10.2.5 The TAN suggests that equivalent continuous noise level over a time period, T ($L_{Aeq,T}$), is a good general purpose index for environmental noise; this index is commonly referred to as the "ambient" noise level. It further notes that road traffic noise is commonly evaluated using the $L_{A10,18hr}$ level, and the $L_{A90,T}$ index is used to describe the "background" noise level.

10.2.6 Table 3.4 of the TAN (reproduced here as Table 10.1) provides an example method for determining the magnitude of noise impacts at proposed noise sensitive developments.

*Table 10.1 - PAN1/2011 TAN Example of associating changes in noise levels with magnitudes of impacts for a new industrial development*

| Magnitude | Change in noise level, $dBL_{Aeq,T}$ (after minus before) |
|---|---|
| x = 5 | Major adverse |
| 3 = x < 5 | Moderate adverse |
| 1 = x < 3 | Minor adverse |
| 0 < x < 1 | Negligible adverse |
| x = 0 | No change / None |

10.2.7 Table 2.6 of the TAN (reproduced here as Table 10.2) provides a matrix for determining the level of impact significance dependent on the sensitivity of the receptor.

*Table 10.2 - PAN1/2011 TAN Significance of effects*

| Magnitude of impact | Level of significance relative to sensitivity of receptor | | |
|---|---|---|---|
| | Low | Medium | High |
| Major | Slight/Moderate | Moderate/Large | Large/Very Large |
| Moderate | Slight | Moderate | Moderate/Large |
| Minor | Neutral/Slight | Slight | Slight/Moderate |
| Negligible | Neutral/Slight | Neutral/Slight | Slight |
| No change | Neutral | Neutral | Neutral |

10.2.8 Table 2.1 of the TAN (reproduced below as Table 10.3) provides the criteria to define levels of sensitivity for each type of Noise Sensitive Receptor (NSR).

*Table 10.3 - PAN1/2011 TAN Level of Noise Sensitivity for Different Types of NSR*

| Sensitivity | Description | Example of NSR |
|---|---|---|
| High | Receptors where people or operations are particularly susceptible to noise | • Residential, including private gardens where appropriate<br>• Quiet outdoor areas used for recreation<br>• Conference facilities<br>• Theatres/Auditoria/Studios<br>• Schools during the daytime<br>• Hospitals/residential care homes<br>• Places of worship |
| Medium | Receptors moderately sensitive to noise, where it may cause some distraction or disturbance | • Offices<br>• Bars/Cafes/Restaurants where external noise may be intrusive<br>• Sports grounds when spectator noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf, bowls) |

| Sensitivity | Description | Example of NSR |
|---|---|---|
| Low | Receptors where distraction or disturbance from noise is minimal | • Buildings not occupied during working hours<br>• Factories and working environments with existing high noise levels<br>• Sports grounds when spectator noise is a normal part for the event<br>• Night clubs |

#### West Highland and Islands Local Development Plan 2019

10.2.9 The Local Development Plan (LDP) refers to the area of the Proposed Development (FW25: aluminium smelter and adjoining land) noting that it is scheduled for industrial use, with development in accordance with planning permission 17/05202/FUL, or alternative or additional proposals which must address a list of environmental and planning requirements.

10.2.10 The LDP further notes in the Placemaking Priorities section that diversification of the range of industrial processes at the Smelter and increased loading capacity at the Corpach quayside are critical components of the LDP.

10.2.11 Potential noise and vibration from the Smelter or future development opportunities associated with the Smelter are not specifically addressed within the LDP.

### *Guidance*

#### British Standard BS4142:2014+A1:2019

10.2.12 BS 4142 (BSI, 2019) describes methods for rating and assessing sound [1] from industrial or commercial premises. The methods detailed in BS4142 use outdoor sound levels to assess the likely effects on people inside or outside a residential dwelling upon which sound is incident.

10.2.13 The Standard provides methods for determining the following:

- rating levels for sources of industrial and commercial sound; and
- ambient, background and residual sound levels.

10.2.14 These may be used for assessing sound from proposed, new, modified or additional sources of sound of a commercial or industrial nature.

10.2.15 The Standard makes use of the following terms:

- **Ambient sound level, $L_a$ = $L_{Aeq,T}$** – the equivalent continuous sound pressure level of the totally encompassing sound in a given situation at a given time, usually from multiple sources, at the assessment location over a given time interval, T;
- **Background sound level, $L_{A90,T}$** – the A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90 percent of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels;
- **Specific sound level, $L_s$ = $L_{Aeq,T}$** – the equivalent continuous sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T;
- **Rating level, $L_{Ar,Tr}$** – the specific sound level plus any adjustment for the characteristic features of the sound; and

[1] The Standard refers to sound levels, rather than noise levels, however, these terms can be used interchangeably, as noise is defined as “unwanted sound”. This assessment uses the term “noise”.

- **Residual sound level, $L_{r = LAeq,T}$** – the equivalent continuous sound pressure level at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound, over a given reference time interval, T.

10.2.16 The Standard determines the degree of noise impact by comparison of the background noise level at noise sensitive receptors (NSR) in the absence of the industrial facility (the specific source) with the ambient sound level when the specific source is operational.

10.2.17 Where particular characteristics, such as tonality, intermittency or impulsivity are present in the noise emissions of the specific source, the Standard requires that "penalties" be added to the specific sound level to derive the rating level, to account for the increased annoyance that these can cause. Where no such characteristics are present, or where they are inaudible at the receptor locations then no penalties apply, and the rating level is the same as the specific level.

10.2.18 The following evaluation impact significance identifiers are provided in the Standard, in which the difference between the rating level and measured background level are considered:

- the greater the difference, the greater the magnitude of impact;
- a difference of around +10 dB or more is likely to be an indication of a significant adverse impact;
- a difference of around +5 dB is likely to be an indication of an adverse impact;
- the lower the rating level, relative to the measured background level, the less likely that the specific sound source will have an adverse (or significant adverse) impact; and
- where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

10.2.19 Finally, the Standard notes that where an initial estimate of the impact needs to be modified due to the context, pertinent factors to be considered include the absolute level of the sound. Where background and rating levels are low, absolute noise levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is noted to be especially true during the night-time.

**BS 7445 BS 7445-1:2003 Description and Measurement of Environmental Noise. Guide to quantities and procedures**

10.2.20 BS7445 provides guidance on appropriate environmental noise monitoring, including specification of equipment, suitable weather conditions and observations to note regarding the nature of the noise environment.

**BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites, Parts 1 and 2.**

10.2.21 BS5228 provides prediction methods for the estimation of noise (Part 1) and vibration (Part 2) levels from construction works, and threshold criteria for the evaluation of the significance of predicted levels.

**Calculation of Road Traffic Noise (CRTN)**

10.2.22 CRTN (Department of Transport, 1988) provides a method for the prediction of noise levels due to road traffic based on traffic flows, average speed, road type and geometry.

**Design Manual for Roads and Bridges (DMRB)**

10.2.23 DMRB provides standards and advice regarding the assessment, design and operation of roads in the UK and provides significance criteria by which the percentage of people adversely affected by traffic noise can be related to the total noise level due to road traffic, or the increase over existing levels.

10.2.24 Significance criteria are provided in DMRB for evaluating the impact of changes in road traffic noise associated with construction works; the criteria refer to the 'Significant Observed Adverse Effect Level' (SOAEL) and the 'Lowest Observed Adverse Effect Level' (LOAEL) with reference to the Basic Noise Level (BNL) of the roads affected. The significance criteria provided in DMRB for determining impact magnitude are provided in Table 10.4.

***Table 10.4 Magnitude of impact at receptors (reproduction of Table 3.17 in Ch. LA 111 of DMRB)***

| Magnitude of impact | Increase in BNL of closest public road used for construction traffic, dB |
|---|---|
| Major | ≥5 |
| Moderate | ≥3, <5 |
| Minor | ≥1, <3 |
| Negligible | <1 |

10.2.25 For the evaluation of noise from operational phase traffic, DMRB provides the following scoping criteria:

- Is the project likely to cause a change in the BNL of 1dBL$_{A10,18hr}$ in the do-minimum opening year (DMOY) compared to the do-something opening year (DSOY)?
- Is the project likely to cause a change in the BNL of 3dBL$_{A10,18hr}$ in the do-something future year (DSFY) compared to the DMOY?
- Does the project involve the construction of new road links within 600 m of noise sensitive receptors?
- Would there be a reasonable stakeholder expectation that an assessment would be undertaken?

10.2.26 DMRB notes that an example of reasonable stakeholder expectation that an operational noise assessment would be required is where works involve changes to infrastructure but are not expected to give rise to significant environment effect, such as smart motorway projects.

10.2.27 Where the response to one or more of the scoping assessment questions is 'yes', the scoping assessment shall make a recommendation on the scope of further assessment.

10.2.28 A previous version to the current iteration of DMRB states:

*"In the period following a change in traffic flow, people may find benefits or disadvantages when the noise changes are as small as 1 dB(A) – equivalent to an increase in traffic flow of 25% or a decrease in flow of 20%. These effects last for a number of years."*

10.2.29 This text is not provided in the current version of DMRB, however, the relationship between the increase in noise for a given increase in traffic flows is assumed to remain correct.

### ISO 9613: Attenuation of sound during propagation outdoors, Part 1 and Part 2

10.2.30 ISO 9613 provides a calculation method for determining the attenuation of sound during propagation outdoors to predict the levels of environmental noise from a variety of sources.

## 10.3 Consultation

10.3.1 Details of consultations undertaken with the relevant regulatory bodies, together with the action taken in response to consultation feedback is provided in Table 10.5. Copies of consultation correspondence are included in Technical Appendix 10.1.

*Table 10.5 Record of Consultation*

| Consultee | Consultation sent/response | Action taken |
|---|---|---|
| Scottish Environmental Protection Agency (SEPA) | Email sent 7th January 2021 setting out proposed scope and approach to assessment, including baseline monitoring strategy. | Al White from SEPA acknowledged receipt of consultation email in a phone call on 19th February 2021, noting that, due to an email hack affecting SEPA he would not be able to respond in writing. The approach to the assessment was discussed and Al accepted it seemed appropriate and had no specific additional requests or comments with regard to the noise and vibration assessment. |
| The Highland Council (THC) | THC were included in the consultation sent to SEPA, and responded to confirm that SEPA were the regulator in this instance, and THC would have no further comment | None required |

10.3.2 Given the email hack affecting SEPA, and the resultant delay in receiving a response to our consultation request, our assessment was undertaken in accordance with SEPA's response to the Screening request and following the approach agreed between ITPEnergised and SEPA for the consented AWP.

10.3.3 SEPA's response to ITPEnergised's consultation noted that:

"*We* [SEPA] *would welcome a design that will not lead to any increase in rated ambient sound levels."*

10.3.4 Given the delayed response to our consultation email we made assumptions regarding the approach described and referred to SEPA's comments on the AWP application. The process is described in 10.4.29.

## 10.4 Assessment Methodology and Significance Criteria

### *Study Area*

10.4.1 For a new development, a study area may be chosen based on the number of receptors at which the development may be audible or has the potential to exceed a particular noise threshold. A sample of the closest or most-affected noise-sensitive receptors (NSRs) would then be selected for the detailed evaluation of impacts, with impacts at more distant receptors considered to be lesser. Determining an acceptable level of impact at the closest NSRs is assumed to entail an acceptable level of impact at all receptors within the wider study area.

10.4.2 The study area for this assessment has been informed by maps and aerial images of the Proposed Development area and its surroundings, as well as site visits undertaken during the baseline noise survey and previous surveys relating to the consented AWP. A study area comprising a buffer of one kilometre from the boundary of the Proposed Development has been chosen for the consideration of noise effects. This study area includes all identified representative Noise Sensitive Receptors (NSRs) and roads affected by changing traffic flows. Noise effects may occur beyond this buffer; however, potential effects will be most significant within. The study area is shown in Drawing 10.1.

10.4.3 A sample of the closest, and therefore potentially worst-affected, NSRs to the Proposed Development have been identified and adopted for the evaluation of noise impacts. These are shown in Drawing 10.1 and listed in Table 10.6.

***Table 10.6 Identified representative NSRs***

| NMP ID | NMP name | Rationale |
|---|---|---|
| NSR1 | Glen Mhor | Characterisation of baseline noise environment at closest NSR to the north of the Smelter |
| NSR2 | Ben Nevis Hotel | Characterisation of baseline noise environment at closest NSR to the west of the Smelter |
| NSR3 | Telford Place | Characterisation of baseline noise environment at closest NSR to the south-west of the Smelter |

10.4.4 While vibration impacts have been scoped out of this assessment on the basis that vibration effects will be negligible, we note that the NSRs identified will also be the closest Vibration Sensitive Receptors (VSRs).

10.4.5 NSRs are typically considered to include residential buildings, such as private dwellings or hotels, as well as institutional and cultural buildings, such as schools, hospitals, churches and museums. Of these types of potential NSR, only residential buildings have been identified within the adopted study area.

### *Site Visit and Baseline Noise Survey*

10.4.6 ITPEnergised undertook a baseline noise survey in the vicinity of the Proposed Development on 19th and 20th January 2021. Monitoring was undertaken in accordance with the methods outlined in BS7445 and BS4142.

10.4.7 Noise Monitoring Positions (NMPs) were selected such that the baseline noise environment, including noise from the Smelter, could be characterised. The NMPs used in the baseline survey and the rationale for their selection are provided in Table 10.7. The NMPs are shown in Drawing 10.1.

***Table 10.7 Baseline survey NMPs***

| NMP ID | NMP name | Rationale |
|---|---|---|
| NMP1 | Glen Mhor | Characterisation of baseline noise environment at closest NSR to the north of the Smelter |
| NMP2 | Smelter car park | Characterisation of noise from the Smelter (on-site location) |
| NMP3 | Mountain Rescue Team (MRT) station | Characterisation of noise from the Smelter (off-site location) |
| NMP4 | Ben Nevis Hotel | Characterisation of baseline noise environment at closest NSR to the west of the Smelter |

| NMP ID | NMP name | Rationale |
|---|---|---|
| NMP5 | Inverlochy | Characterisation of baseline noise environment at representative proxy location where noise from the Smelter is not present or suppressed such that it is barely audible |
| NMP6 | Telford Place | Characterisation of baseline noise environment at closest NSR to the south-west of the Smelter |

10.4.8 Measurements were undertaken using Rion NL-52 Class I sound level meters (SLMs). The SLMs and calibrator were within their laboratory calibration period, and field calibration checks were performed before and after every measurement. No significant drifts in calibration were noted. A 1-minute averaging period was used for measurements, and the SLMs were set to A-weighting and fast averaging.

10.4.9 A single measurement of approximately 24 hours was undertaken at a residential property at Glen Mhor (NMP1), and supplementary measurements of shorter durations were undertaken at locations representative of residential properties close to proposed infrastructure associated with the Proposed Development, and for the purposes of characterising noise from operation of the existing Smelter, both during the daytime period (07:00 – 23:00) and the night-time period (23:00 – 07:00), as defined in PAN1/2011 TAN.

10.4.10 Measurements were undertaken in accordance with the requirements of BS4142, with low wind speeds (<5 m/s) and no rain. Records of the baseline survey are provided in Technical Appendix 10.2.

### *Prediction method*

#### Construction phase

10.4.11 Full details are not currently available for construction plant or activities at the Proposed Development. This assessment has therefore drawn on currently available information, with supplementary assumptions regarding representative assemblages of plant for stages of construction works agreed with Alvance.

10.4.12 An indicative construction schedule provided to ITPEnergised by Alvance comprises the following stages of work:

- Mobilisation;
- Earthworks;
- Excavation;
- Shaft excavation;
- Backfilling;
- Soil management;
- Civil works;
- Building foundation;
- Tech foundation;
- Elevations;
- Paving;
- Steel building;
- Erection;
- Cladding and roofing;

- Finishing; and
- Demobilisation.

10.4.13 This assessment draws on ITPEnergised's experience of construction noise and condenses the above stages into three representative stages of works comprising: groundworks, foundations and buildings.

10.4.14 An indicative list of plant for the groundworks stage has been provided by Alvance for the groundworks stage. ITPEnergised has assumed a representative assemblage of plant for the remaining two stages and agreed this with Alvance. The assumed plant is considered to represent a likely worst-case scenario of noisy plant items which may operate simultaneously. All modelled plant and activities have been modelled with an on-time of 100% (i.e. operating continuously throughout the working day); in reality most items of plant will operate at on-times substantially lower than 100%.

10.4.15 Alvance has confirmed that construction activities will be confined to the 'weekday daytime' period, as defined in BS5228; Monday to Friday 07:00 – 19:00 and Saturday mornings 07:00 – 13:00.

10.4.16 Noise levels arising from construction have been predicted using noise modelling software CadnaA, using the BS5228 prediction method. Sound power levels for items of plant have been obtained from the plant library in annexes to BS5228. Items of plant have been placed within the noise model at locations representative of the assumed activities. The assumed list of plant for each stage of the construction phase, and the BS5228 references for the plant sound power data are provided in Technical Appendix 10.3.

### Operational Phase

10.4.17 The prediction of operational noise has been undertaken within noise modelling software CadnaA, in accordance with the method provided in ISO9613. The model considers propagation in atmospheric conditions of 10$^{o}$C and 70% relative humidity. Ground absorption within the immediate vicinity of the Proposed Development has been modelled as G=0 (acoustically reflective, hard surfaces). Ground absorption in the wider study area has been modelled as G=1.0 (acoustically absorptive surfaces).

10.4.18 The noise model includes the screening effect of local topography and existing buildings of the Smelter and nearby off-site buildings.

10.4.19 Information provided by Alvance has been interpreted and assumed noise sources modelled accordingly. A summary of the modelled noise sources is provided as follows:

- **Noise breakout through the building envelope**; assumed internal ambient level of 90 dB(A) within Proposed Development (as measured during occupational health survey of another Alvance billet plant elsewhere) with transmission via cladding forming the walls and roof of the proposed steel-framed structure used to model walls and roof as radiating area and vertical area sources. Sources have been constructed within the model using the proposed dimensions of the building. Cladding material has been confirmed to have a minimum sound reduction index of 30 dB $R_w$. These sources have been modelled as operating continuously throughout the daytime and night-time periods.
- **Vehicle movements - deliveries**; deliveries by Heavy Goods Vehicles (HGVs) have been modelled as moving point sources, using the sound power level of a lorry provided in the annex to BS5228. These sources assume daytime operation only (960 minutes), with an average of 2.3 vehicle movements per hour. The moving point source considers a path from the A82 to the building entry point on the western façade of the Proposed Development at an effective height of 1.5 m above ground level.

- **Vehicle movements - metal from Smelter**; movement of a 'ladle' of molten aluminium has been modelled as a moving point source, using the sound power level of a tractor provided in BS5228. This source assumes operation throughout the daytime and night-time period, with an average of 3.3 vehicle movements per hour. The moving point source considers a path from the Smelter to the building entry point on the northern façade of the Proposed Development at an effective height of 1.5 m above ground level.
- **Vehicle movements – fork lift trucks (FLTs)**; movement of finished billet by FLTs to the storage area has been modelled as a moving point source using the sound power level of a diesel lift provided in BS5228. This is considered a robust assumption, as Alvance proposes to use electric FLTs where possible, and even conventional power FLTs will be quieter than the assumed sound power level. This source assumes operation throughout the daytime and night-time period, with an average of 4 vehicle movements per hour. The moving point source considers a path from the building entry point on the western façade of the Proposed Development to the storage area to the south, at an effective height of 1.5 m above ground level.
- **Flues**; all three proposed flues have been modelled as directional point sources with a representative sound power level of 95 dB(A), using the heights provided by Alvance. Directivity has been modelled using the exit velocity and gas temperature of the flue provided by Alvance. Flues have been placed at their proposed locations, as provided by Alvance.
- **External services**; Gas services and external fans have modelled as a point source with a sound power level of 86 dB(A), based on research of similar equipment, placed at the proposed location on the eastern façade of the proposed Proposed Development.

10.4.20 The modelled noise sources are shown in Drawing 10.2.

#### Road traffic

10.4.21 Projected changes to vehicle movements on public roads arising due to the construction and operational phases of the Proposed Development are provided in the Traffic Assessment (refer to chapter 9). Project changes in road traffic flows have been evaluated against screening criteria in DMRB (refer to Table 10.4 and para. 10.2.25) to determine the requirement for detailed modelling. Where projected flows allow detailed evaluation of road traffic noise to be screened out, road traffic noise effects are considered not significant. Where road traffic noise is screened in, the significance of effects has been evaluated in accordance with PAN1/2011 (refer to Table 10.2).

10.4.22 The modelling of additional HGV movements on the Smelter access road during the operational phase is discussed in 10.4.19.

### *Assessment of Potential Effect Significance*

#### Receptor Sensitivity

10.4.23 The guidance contained within the Technical Advice Note to PAN 1/2011 has been drawn upon in the generation of an appropriate set of significance criteria. The receptor sensitivity criteria are the same for the construction, operational and decommissioning phases of the Proposed Development and are presented within Table 10.8.

*Table 10.8 NSR sensitivity criteria*

| Receptor Sensitivity | Description | Examples |
|---|---|---|
| High | Receptors where people or operations are particularly susceptible to noise and/or vibration. | Residential, quiet outdoor recreational areas, schools and hospitals. |
| Medium | Receptors moderately sensitive to noise and/or vibration, where it may cause some distraction or disturbance. | Offices and restaurants. |
| Low | Receptors where distraction or disturbance from noise and/or vibration is minimal. | Buildings not occupied, factories and working environments with existing levels of noise. |

### Impact Magnitude Criteria

10.4.24 Threshold noise levels have been defined for the construction and operational phases of the Proposed Development. The derivation of threshold levels is described in subsequent sections, however, the general approach to deriving the magnitude of noise impacts for different aspects of the project is provided below.

#### Construction Phase

10.4.25 The construction noise impact magnitude has been determined according to the threshold levels provided in Table 10.9.

*Table 10.9 Construction noise impact magnitude criteria*

| Difference (d) between predicted construction noise level and BS5228 threshold level, dB | Impact magnitude |
|---|---|
| $d \geq +5$ | High |
| $0 \leq d < +5$ | Medium |
| $-10 \leq d < 0$ | Low |
| $<-10$ | Negligible |

#### Road traffic

10.4.26 Projected changes in road traffic flows have been evaluated against the screening and significance criteria provided in DMRB (refer to Table 10.4 and para. 10.2.25) to determine the resultant magnitude of noise impacts.

#### Operational Noise

10.4.27 Noise from operation of the Proposed Development has been considered in a two-stage approach, as described below.

10.4.28 Firstly, noise from operational has been considered based on the guidance contained within BS4142, i.e. by consideration of the difference between the rating level from the plant noise and the prevailing background sound levels, making reference to appropriate proxy background levels, where existing noise from the Smelter is suppressed such that it provides little or no contribution to overall levels.

10.4.29 For the Proposed Development to result in no increase to the rating level of the Smelter complex, noise levels should be 10 dB below the existing noise level attributable to the Smelter. In reality, achieving 10 dB below existing noise levels may not be achievable, particularly where noise levels are objectively very low. The magnitude of noise impacts has therefore been determined using a secondary approach, with respect to context and the resulting change in sound levels in absolute terms. SEPA's guidance provided in the Screening Response recommended a design objective for the Proposed Development, which should not result in an increase to the rated level of the Smelter complex as a whole.

10.4.30 In a similar approach to that undertaken in the 2018 assessment of the consented AWP, Noise from the Smelter has been characterised at the closest receptors using the background level measured at NMPs at which continuous noise from the Smelter was the dominant noise source. This process is explained in greater detail in Section 10.5.

10.4.31 The impact magnitude scale for noise from operational activities adopts the approach provided in PAN1/2011 as presented in Table 10.1, in which the change relates to the rated level of the Smelter at each NSR, as per SEPA's consultation response, whereby a change of 0 dB equates to 'no change', a change of up to 1 dB is 'negligible adverse' and a change of between 1 and 3 dB equates to a 'minor adverse' impact.

#### Effect significance

10.4.32 This assessment determines the significance of effects drawing on the example criteria provided in DMRB (refer to Table 10.4) for road traffic noise effects and PAN1/2011 (refer to Table 10.1) for non-traffic noise. The adopted criteria are provided for a range of NSR sensitivities in Table 10.10.

*Table 10.10 Effect significance criteria*

| Impact magnitude | Effect significance | | |
|---|---|---|---|
| | Low | Medium | High |
| High | Slight / Moderate | Moderate / Large | Large |
| Medium | Slight | Slight / Moderate | Moderate |
| Low | Neutral / Slight | Slight | Slight |
| Negligible / None | Neutral | Neutral | Neutral |

10.4.33 This assessment considers effects with a significance of 'moderate' and above are significant and effects with a significance of 'slight' or below are considered not significant.

10.4.34 All noise sensitive receptors (NSRs) considered in this assessment are considered to have a high sensitivity to noise.

### Requirements for Mitigation

10.4.35 Where significant effects are identified mitigation will be specified, where practicable, such that residual effects are not significant (effect significance of slight or lesser).

### Assessment of Residual Effect Significance

10.4.36 Residual effects have been evaluated using the methods and criteria provided for pre-mitigation effects.

### Limitations to Assessment

10.4.37 The baseline survey was undertaken (as essential work) during the Covid-19 lockdown. Potential limitations associated with lockdown effects on the baseline are considered in Section 10.5.

10.4.38 This assessment relies on information provided by the Applicant and their suppliers and technical advisors regarding proposed activities and plant to be undertaken/installed at the site. Some of this information is necessarily preliminary at this stage of the application, however, appropriate assumptions have been made such that the scenarios considered are representative of the worst-case. Actual impacts are therefore anticipated to be lesser than those evaluated.

## 10.5 Baseline Conditions

10.5.1 As noted in paragraph 10.4.37the baseline survey was undertaken at during a period of strict Covid-19 lockdown, when only essential travel and activities were permitted. As a result of the lockdown, road traffic flows are anticipated to be substantially reduced compared with pre-COVID-19 levels.

10.5.2 While lockdown conditions are anticipated to have reduced noise from sources not related to existing activities at the Smelter, the Smelter itself remained operational throughout. This therefore presented an opportunity to characterise existing noise from the Smelter while other sources were reduced.

10.5.3 A summary of measured baseline noise levels is provided in Table 10.11. Charts showing the 1-minute averaged values are provided in Technical Appendix 10.4. In accordance with BS4142 we have evaluated measured background values to determine whether the mode or mean or other value is most representative.

*Table 10.11 Summary of measured baseline noise levels*

| Monitoring position / period | Monitoring duration, T | Measured level, dB(A) | | | |
|---|---|---|---|---|---|
| | | Ambient, $L_{Aeq,T}$ | Background, $L_{A90,T}$ | Maximum, $L_{Amax,T}$ | $10^{th}$ percentile, $L_{A10,T}$ |
| **Daytime period** | | | | | |
| NMP1 | 16 hr | 52.6 | 45.8 | 84.2 | 54.4 |
| NMP2 | 1 hr | 50.0 | 46.1 | 65.8 | 50.7 |
| NMP3 | 1 hr | 45.5 | 41.0 | 64.1 | 46.0 |
| NMP4 | 1 hr | 64.7 | 56.2 | 76.7 | 67.7 |
| NMP5 | 1 hr | 53.8 | 39.2 | 87.8 | 68.4 |
| NMP6 | 1 hr | 47.0 | 39.5 | 68.6 | 48.7 |
| **Night-time period** | | | | | |
| NMP1 | 8 hr | 44.4 | 37.0 | 63.2 | 44.1 |
| NMP2 | 15 min[2] | 46.5 | 45.1 | 63.4 | 47.2 |
| NMP3 | 30 min | 41.1 | 36.0 | 62.7 | 41.0 |
| NMP4 | 30 min | 52.0 | 35.0 | 70.5 | 46.8 |
| NMP5 | 30 min | 30.7 | 28.7 | 49.2 | 30.9 |
| NMP6 | 30 min | 36.0 | 35.3 | 54.8 | 36.5 |

[2] Measurement cut short; worker started car in car park and left engine on to defrost windscreen. Noise from car screened out of reported data.

10.5.4 The noise environment at the closest NMPs to the Smelter was dominated by a continuous broad-band droning noise from the Smelter extract system fans. This was particularly apparent at NMP2 (Smelter car park) and NMP3 (MRT station), both during the daytime and the night-time period. With reference to Chart 2 and Chart 3 in Technical Appendix 10.4 this is evident as a very consistent background level at NMP2, both during the daytime and the night-time. At NMP3 the background level is more variable, with consistent levels evident for specific periods in Chart 4 and Chart 5. The change from one consistent level to a lower level (daytime) or higher level (night-time) is attributed to other (unidentified) noise sources, unrelated to Smelter activity.

10.5.5 At NMP1 and NMP4 the dominant noise source during the daytime period was road traffic on the A82. This is evident in the decline in the background level through the evening and in the early morning in Chart 1. In Chart 6 the variable background level is attributed to variable traffic flows. During the night-time period, when road traffic flows were greatly reduced, the background level at NMP1 and NMP4 were much more consistent, indicative of the increased relative prominence of fan noise from the Smelter.

10.5.6 At NMP6 the background level was broadly consistent during the daytime period (refer to Chart 10), however, noise from construction works at a nearby substation compound resulted in some variability. During the night-time period (refer to Chart 11) the background level was consistent and was attributable to running water (the River Nevis), buzzing from the substation and a low-level broad-band drone from the Smelter.

10.5.7 At NMP5 the background level was highly consistent both during the daytime and the night-time period (refer to Chart 8 and Chart 9, respectively). The dominant noise source during the daytime was distant traffic and occasional nearby vehicle movements. During the night-time period fan noise from the Smelter was very distantly audible at a low level.

### *Derivation of noise limits – Construction phase*

10.5.8 With reference to Table 10.11, measured baseline ambient noise levels in the vicinity of the Proposed Development were below 65 dB during the daytime period, except at NMP4, which was affected by road traffic. During the night-time period ambient noise levels at NMPs least exposed to road traffic noise and noise from the Smelter were below 45 dB.

10.5.9 Noise levels during the evening period, measured at NMP1, were below 55 dB.

10.5.10 Using the 'ABC method' provided in BS5228, the resultant threshold noise levels are as follows:

- Weekday daytimes (weekdays 07:00 – 19:00 and Saturdays 07:00 – 13:00) – 65 dB;
- Evenings and weekends (weekdays 19:00 – 23:00, Saturdays 13:00 – 23:00 and, Sundays 07:00 – 23:00) – 55 dB; and
- Night-time (23:00 – 07:00) – 45 dB

### *Derivation of noise limits – Operational phase*

10.5.11 Criteria for the evaluation of likely operational noise effects have been derived from measured baseline noise levels, in accordance with SEPA's requirements that the Proposed Development should not result in an increase to the rated noise level of the Smelter. The method of derivation of noise limits based on measured baseline levels is provided below:

- Noise from the Smelter at off-site baseline monitoring locations NMP1, NMP4, NMP5 and NMP6 was audible as a continuous, broad-band droning, attributed to fans driving the extraction system and the flues of the Smelter Fume Treatment Plant (FTP).
- The fans run continuously, and the Smelter has confirmed that the fans were running at their typical rate throughout the survey.
- Given the continuous nature of the fan operation, the specific noise level attributable to the Smelter at off-site locations may be characterised using the $L_{A90}$ (background) index.
- Given the continuous, non-tonal and non-impulsive character of noise from the Smelter, no corrections apply to the specific noise level to determine the rating level for these features.
- A correction of +3 dB for a characteristic which does not fit these three categories, but which is otherwise readily distinctive against the residual acoustic environment has been applied to the specific level at all NSRs during the night-time period, when the drone from the fans was subjectively more audible, as a result of the reduced prominence of road traffic noise.
- During the daytime period no such correction has been applied as noise from road traffic and other sources resulted in noise from the Smelter being less prominent.
- Given the atypical quietness of the baseline environment due to lockdown restrictions arising from the COVID-19 pandemic, this assessment considers that deriving target maximum noise levels from measured baseline levels will result in a highly robust approach.

10.5.12 Measured noise levels have been used to determine representative rated levels for the evaluation of impacts arising from the Proposed Development in accordance with the method outlined above and are presented in Table 10.12. In accordance with BS4142, the rated levels have been rounded to the nearest integer.

*Table 10.12 Derivation of operational phase target maximum cumulative noise levels*

| Monitoring position (representative NMP) | Reference period, T | Measured specific level attributed to the Smelter, $L_{A90,T}$ | Rating correction applied, dB | Rated level, $dBL_{Aeq,T}$ |
|---|---|---|---|---|
| **Daytime period** | | | | |
| NSR1 (NMP1) | 1 hr | 45.8 | 0 | 46 |
| NSR2 (NMP4) | 1 hr | 56.2 | 0 | 56 |
| NSR3 (NMP6) | 1 hr | 39.5 | 0 | 40 |
| **Night-time period** | | | | |
| NSR1 (NMP1) | 15 min | 37.0 | +3 | 40 |
| NSR2 (NMP4) | 15 min | 35.0 | +3 | 38 |
| NSR3 (NMP6) | 15 min | 35.3 | +3 | 38 |

10.5.13 In accordance with BS4142 a correction of +3 dB has been applied to the specific level during the night-time period, to account for noise of the Smelter FTP, which is discernible against the residual night-time noise environment.

## 10.6 Receptors Brought Forward for Assessment

10.6.1 NSRs considered in this assessment comprise a representative sample of the closest inhabited dwellings to the Proposed Development. These are shown in Drawing 10.1 and listed in Table 10.6. No NSRs have been identified to the east or south-east of the Proposed Development.

## 10.7 Standard Mitigation

### *Construction Phase Standard Mitigation*

10.7.1 The following standard mitigation will be employed during the construction phase:

- Proposed working hours are weekdays 07:00 – 19:00 and Saturday mornings 07:00 – 13:00, corresponding to the 'weekdays' period defined in BS5228;
- A Construction Environmental Management Plan (CEMP) will be produced and implemented to minimise unnecessary disruption associated with construction works;
- The CEMP will provide contact details for the contractor undertaking the works, name the personnel responsible for communication with residents and set out a complaints procedure such that noise complaints are handled appropriately;
- Where reasonably practicable, quiet working methods will be employed, including the use of the most suitable plant, reasonable hours of work for noisy operations, and economy and speed of operations;
- Where possible, deliveries to site by HGVs will be scheduled to minimise disruption during sensitive times;
- Plant will be switched off when not in use; and
- Unavoidably noisy works may be screened using mobile screens to reduce noise propagation towards neighbouring properties.

10.7.2 Further details of construction phase standard mitigation are provided in the CEMP and incorporate the best practicable means and good practice measures set out in BS5228.

### *Operational Phase Standard Mitigation*

10.7.3 Alvance has provided a schematic showing likely noise levels within the Proposed Development, based on measured levels at other facilities they operate. Areas of the building used for handling of input scrap aluminium will be the noisiest, with noise from material handling by the shovel. Noise levels within the remainder of the building will be substantially lower. The following standard mitigation has been specified in the design of the Proposed Development:

- All of the processes will be contained within the building and noise will therefore be attenuated across the building envelope. The proposed exterior cladding will provide a minimum sound reduction index of 30 dB;
- The building materials have been specified such that noise transmission through the walls and roof will be minimised, including an internal concrete baffle wall;
- Noise breakout via building access points will be minimised using fast-closing shutters and noisy internal process (e.g. unloading of scrap from HGVs and loading of scrap into the furnace) will only be undertaken when the shutters are closed;
- HGV movements associated with the Proposed Development will be restricted to the daytime period only;
- All mobile plant (fork lift trucks and tractor) will be fitted with non-tonal (i.e. broad-band) reversing alarms;

- Noise from external services, such as the oxygen and process gas plant and the roof-mounted stacks will be controlled at source by selection of quiet plant; and
- Potentially noisy external services and activities, including transporting finished billet to a storage area, have been sited such that proposed buildings will screen noise transmission towards the closest NSRs.

## 10.8 Potential Effects

### *Construction*

10.8.1 The predicted worst-case noise level at NSRs during construction works are provided in Table 10.13.

*Table 10.13 - Predicted worst-case construction phase noise levels by stage of works*

| Stage of works | NSR | Predicted level, dB$L_{Aeq,1hr}$ |
|---|---|---|
| Groundworks | NSR1 | 49 |
| | NSR2 | 53 |
| | NSR3 | 51 |
| Foundations | NSR1 | 40 |
| | NSR2 | 44 |
| | NSR3 | 42 |
| Steel works and cladding | NSR1 | 43 |
| | NSR2 | 47 |
| | NSR3 | 44 |

10.8.2 Predicted worst-case construction phase noise levels are evaluated against the adopted threshold noise levels and used to derive the impact magnitude (refer to Table 10.9) and effect significance (refer to Table 10.10) in Table 10.14.

*Table 10.14 - Evaluation of construction noise impacts – daytime period*

| Stage of works | NSR | Difference (predicted level minus threshold), dB | Resultant impact magnitude | Resultant effect significance |
|---|---|---|---|---|
| Groundworks | NSR1 | -17 | None | Neutral |
| | NSR2 | -12 | None | Neutral |
| | NSR3 | -14 | None | Neutral |
| Foundations | NSR1 | -25 | None | Neutral |
| | NSR2 | -21 | None | Neutral |
| | NSR3 | -23 | None | Neutral |

| Stage of works | NSR | Difference (predicted level minus threshold), dB | Resultant impact magnitude | Resultant effect significance |
|---|---|---|---|---|
| Steel works and cladding | NSR1 | -22 | None | Neutral |
| | NSR2 | -18 | None | Neutral |
| | NSR3 | -21 | None | Neutral |

10.8.3 The noise impact magnitude during each stage of construction works has been assessed as **none,** with resultant **neutral** effect significance. Noise effects from the construction phase are therefore **not significant**.

## *Operation*

### BS4142 assessment

10.8.4 The Proposed Development is evaluated in accordance with BS4142 at each of the closest NSRs in Table 10.15, Table 10.16 and Table 10.17. We note that a compliance monitoring survey of the Smelter, undertaken in December 2019 (provided in Technical Appendix 10.5) recorded noise levels which will be more representative of typical pre-COVID-19 conditions. The location 'BNL 2' in the compliance study is considered more representative of background noise levels at NSR1 during the night-time period than levels measured at NMP1 in the recent baseline survey, given its closer proximity to the A82.

*Table 10.15 - BS4142 evaluation of Proposed Development at NSR1*

| NSR1 | Level, dB | Commentary |
|---|---|---|
| **Daytime period (07:00 – 23:00)** | | |
| Daytime period background level | 46 $dBL_{A90,1hr}$ | Background level at proxy location BNL2 consistent throughout measurement period.<br>Monitoring position representative of location a similar distance from the A82 as NSR1, monitored during pre-COVID-19 conditions.<br>Reported level matches measured background level at NSR during recent background survey when road traffic likely substantially reduced compared to pre-COVID-19 situation, in a location where road traffic is the dominant noise source.<br>High level of confidence it is representative.<br>Rounded to nearest integer dB. |
| Predicted specific level | 35 $dBL_{Aeq,1hr}$ | Predicted level at NSR due to full/maximum daytime operation |
| Rating correction | 0 dB | No tonal or impulsive elements anticipated.<br>Intermittent and low-level engine noise from HGV and mobile plant movement will not be readily distinguishable against noise from road traffic on the A82.<br>Noise from Smelter FTP and road traffic on A82 will mask noise from Proposed Development |
| Rated level | 35 $dBL_{Ar,Tr}$ | - |

| NSR1 | Level, dB | Commentary |
|---|---|---|
| Excess of rating level over daytime background | -11 dB | Rated level substantially below background level representative of pre-COVID-19 noise levels at proxy location. Rated level also 5 dB below daytime background level measured at NMP5 during COVID-19 lockdown conditions.<br>Unlikely that Proposed Development will be audible. |
| Uncertainty | - | Reported background level measured under appropriate conditions and showed a high level of consistency. Proxy background level matches background level measured at NMP1 during exceptional conditions (COVID-19 lockdown) over a period considerably longer than the 1 hr reference period set out in BS4142.<br><br>Prediction uncertainty associated with ISO9613 method limited given comparatively small distance of propagation and limited influence of topography. Predicted levels at 4 m above ground level a conservative approach.<br>Uncertainty will not affect findings of assessment. |
| Significance | - | Low/very low impact during daytime period |
| **Night-time period (23:00 – 07:00)** | | |
| Night-time period background level | 34 $dBL_{A90,1hr}$ | Background level at proxy location BNL2 consistent throughout measurement period.<br>Monitoring position representative of location a similar distance from the A82 as NSR1, monitored during pre-COVID-19 conditions.<br>High level of confidence it is representative.<br>Rounded to nearest integer dB. |
| Predicted specific level | 34 dB | Predicted level due to full/maximum operation during night-time period (i.e. excluding HGV and fork lift movements which will occur during daytime period only). |
| Rating correction | 0 dB | No tonal or impulsive elements anticipated.<br>Noise from Smelter FTP and road traffic on A82 will mask noise from Proposed Development |
| Rated level | 34 $dBL_{Ar,Tr}$ | - |
| Excess of rating level over daytime background | 0 dB | Rated level equal to representative background level and substantially below 'background +5 dB' at which potentially significant adverse impacts may occur. |
| Uncertainty | - | Reported background level measured under appropriate conditions and showed a high level of consistency. Proxy background level is 3 dB below background level measured at NSR during exceptional conditions (COVID-19 lockdown) over a period considerably longer than the 15 min reference period set out in BS4142.<br>Prediction uncertainty associated with ISO9613 method limited given comparatively small distance of propagation and limited |

| NSR1 | Level, dB | Commentary |
|---|---|---|
| | | influence of topography. Predicted levels at 4 m above ground level a conservative approach.<br>Uncertainty will not affect findings of assessment. |
| Significance | - | Low impact during night-time period |

10.8.5 Noise impacts at NSR1 when evaluated in accordance with BS4142 are very low during the daytime and low during the night-time period.

*Table 10.16 - BS4142 evaluation of Proposed Development at NSR2*

| NSR2 | Level, dB | Commentary |
|---|---|---|
| **Daytime period (07:00 – 23:00)** | | |
| Daytime period background level | 39 $dBL_{A90,1hr}$ | Background level at proxy location NMP5 consistent throughout measurement period. NMP5 representative of location a similar distance from the A82 as NSR2, excluding contribution of the Smelter. High level of confidence it is representative.<br>Rounded to nearest integer dB. |
| Predicted specific level | 34 $dBL_{Aeq,1hr}$ | Predicted level at NSR due to full/maximum daytime operation. |
| Rating correction | 0 dB | No tonal or impulsive elements anticipated.<br>Intermittent and low-level engine noise from HGV and mobile plant movement will not be readily distinguishable against noise from road traffic on the A82.<br>Noise from Smelter FTP and road traffic on A82 will mask noise from Proposed Development |
| Rated level | 34 $dBL_{Ar,Tr}$ | - |
| Excess of rating level over daytime background | -5 dB | Rated level substantially below daytime background level measured at NMP5 during COVID-19 lockdown conditions. Background level likely to be higher outside of lockdown conditions.<br>Unlikely that Proposed Development will be audible. |
| Uncertainty | - | Reported background level measured under appropriate weather conditions and showed a high level of consistency. Prediction uncertainty associated with ISO9613 method limited given comparatively small distance of propagation and limited influence of topography. Predicted levels at 4 m above ground level a conservative approach. Rated level substantially below background level.<br>Uncertainty will not affect findings of assessment. |
| Significance | - | Low/very low impact during daytime period |
| **Night-time period (23:00 – 07:00)** | | |
| Night-time period | 29 $dBL_{A90,1hr}$ | Background level at proxy location NMP5 consistent throughout measurement period. High level of confidence it is representative. |

| NSR2 | Level, dB | Commentary |
|---|---|---|
| background level | | Rounded to nearest integer dB. |
| Predicted specific level | 32 dB | Predicted level due to full/maximum operation during night-time period (i.e. excluding HGV and forklift movements which will occur during daytime period only). |
| Rating correction | 0 dB | No tonal or impulsive elements anticipated.<br>Noise from Smelter FTP and road traffic on A82 will mask noise from Proposed Development |
| Rated level | 32 $dBL_{Ar,Tr}$ | - |
| Excess of rating level over daytime background | +3 dB | Rated level is above representative background level but substantially below 'background +5 dB' at which potentially significant adverse impacts may occur. |
| Uncertainty | - | Reported background level measured under appropriate conditions and showed a high level of consistency. Proxy background level is 6 dB below background level measured at NSR during exceptional conditions (COVID-19 lockdown). Prediction uncertainty associated with ISO9613 method limited given comparatively small distance of propagation and limited influence of topography. Predicted levels at 4 m above ground level a conservative approach.<br>Uncertainty will not affect findings of assessment. |
| Significance | | Low impact during night-time period |

10.8.6 Noise impacts at NSR2 when evaluated in accordance with BS4142 are very low during the daytime and low during the night-time period.

*Table 10.17 - BS4142 evaluation of Proposed Development at NSR3*

| NSR3 | Level, dB | Commentary |
|---|---|---|
| **Daytime period (07:00 – 23:00)** | | |
| Daytime period background level | 39 $dBL_{A90,1hr}$ | Background level at proxy location NMP5 consistent throughout measurement period. NMP5 representative of location a similar distance from the A82 as NSR3, excluding contribution of the Smelter. High level of confidence it is representative of quietest likely noise environment at NSR3, given noted contributions from other nearby industrial uses and infrastructure (substation) during baseline survey.<br>Rounded to nearest integer dB. |
| Predicted specific level | 32 $dBL_{Aeq,1hr}$ | Predicted level at NSR due to full/maximum daytime operation. |
| Rating correction | 0 dB | No tonal or impulsive elements anticipated. |

| NSR3 | Level, dB | Commentary |
|---|---|---|
| | | Intermittent and low-level engine noise from HGV and mobile plant movement will not be readily distinguishable against noise from road traffic on the A82.<br>Noise from Smelter FTP, road traffic and nearby industry and infrastructure will mask noise from Proposed Development |
| Rated level | 32 $dBL_{Ar,Tr}$ | - |
| Excess of rating level over daytime background | -7 dB | Rated level substantially below daytime background level measured at NMP5 during COVID-19 lockdown conditions. Background level likely to be higher outside of lockdown conditions.<br>Unlikely that Proposed Development will be audible. |
| Uncertainty | - | Reported background level measured under appropriate weather conditions and showed a high level of consistency. Prediction uncertainty associated with ISO9613 method limited given comparatively small distance of propagation and limited influence of topography. Predicted levels at 4 m above ground level a conservative approach. Rated level substantially below background level.<br>Uncertainty will not affect findings of assessment. |
| Significance | - | Low/very low impact during daytime period |
| **Night-time period (23:00 – 07:00)** | | |
| Night-time period background level | 29 $dBL_{A90,1hr}$ | Background level at proxy location NMP5 consistent throughout measurement period. High level of confidence it is representative.<br>Rounded to nearest integer dB. |
| Predicted specific level | 30 dB | Predicted level due to full/maximum operation during night-time period (i.e. excluding HGV and fork lift movements which will occur during daytime period only). |
| Rating correction | 0 dB | No tonal or impulsive elements anticipated.<br>Noise from Smelter FTP and River Nevis will mask noise from Proposed Development |
| Rated level | 30 $dBL_{Ar,Tr}$ | - |
| Excess of rating level over daytime background | +1 dB | Rated level marginally above background level and substantially below 'background +5 dB' at which potentially significant adverse impacts may occur. |

| NSR3 | Level, dB | Commentary |
|---|---|---|
| Uncertainty | - | Reported background level measured under appropriate conditions and showed a high level of consistency. Proxy background level is 6 dB below background level measured at NSR during exceptional conditions (COVID-19 lockdown). Prediction uncertainty associated with ISO9613 method limited given comparatively small distance of propagation and limited influence of topography. Predicted levels at 4 m above ground level a conservative approach.<br>Uncertainty will not affect findings of assessment. |
| Significance | - | Low impact during night-time period |

10.8.7 Noise impacts at NSR3 when evaluated in accordance with BS4142 are very low during the daytime and low during the night-time period.

10.8.8 We further note that predicted rated levels at NSRs are low in absolute terms. This is relevant with reference to the note in BS4142 which states that where both rated and background levels are low, the absolute level is of greater relevance than the difference between the two levels.

### Evaluation of change in rated level of Smelter complex as a whole

10.8.9 The potential increase in the rated level of Proposed Development combined with the Smelter is evaluated at the closest representative NSRs in Table 10.18, using PAN1/2011 impact magnitude criteria provided in Table 10.1.

*Table 10.18 - Evaluation of increase in rated level*

| NSR | Rated level of Smelter, $dBL_{Ar,Tr}$ | Predicted specific level of Proposed Dev't, $dBL_{Aeq,T}$ | Resultant cumulative rated level, $dBL_{Ar,Tr}$ | Increase in rated level due to Proposed Development, $dBL_{Ar,Tr}$ | Resultant impact magnitude as per PAN1/2011 | Resultant effect significance for high sensitivity receptors |
|---|---|---|---|---|---|---|
| **Daytime period** | | | | | | |
| NSR1 | 45.8 | 35.0 | 46.1 | 0.3 | Negligible | Slight |
| NSR2 | 56.2 | 33.8 | 56.2 | 0.0 | No change | Neutral |
| NSR3 | 39.5 | 31.9 | 40.2 | 0.7 | Negligible | Slight |
| **Night-time period** | | | | | | |
| NSR1 | 40.0 | 33.6 | 40.9 | 0.9 | Negligible | Slight |
| NSR2 | 38.0 | 31.5 | 38.9 | 0.9 | Negligible | Slight |
| NSR3 | 38.3 | 30.4 | 39.0 | 0.7 | Negligible | Slight |

10.8.10 The magnitude of impact of operational noise from the Proposed Development at the closest representative NSRs ranges from **negligible** to **minor** and the resultant significance of effect ranges from **neutral** to **slight**. Noise effects associated with operation of the Proposed Development are therefore **not significant**.

## *Road Traffic*

### Construction Phase Road Traffic Noise

10.8.11 Projected road traffic movements during the construction phase are provided in the Traffic and Transport Assessment (chapter 9). An excerpt from the Traffic Assessment of the projected changes to road traffic flows on public roads arising due to construction of the Proposed Development is provided in Table 10.19.

*Table 10.19 – Projected increases in total traffic on affected roads, construction phase*

| | Smelter Access | A82 Industrial Estate | A830 | A82 Fort William | A82 North | A82 South |
|---|---|---|---|---|---|---|
| Increase in total traffic | 45.5% | 0.8% | 1.4% | 0.7% | 2.5% | 1.8% |

10.8.12 With the exception of the Smelter access, which is not a public road, and from which identified NSRs are remote, projected increases in traffic flows are below 3%. This is substantially below 20% (highest increase in total traffic movements is <3%), therefore the increase in the BNL will be substantially below 1 dB, and with reference to Table 10.4 the resultant impact magnitude at all NSRs is **negligible**. With reference to Table 10.2 the resultant significance of effect at all NSRs is neutral. Noise effects associated with road traffic movements due to the construction phase of the Proposed Development are therefore **not significant**.

### Operational Phase Road Traffic Noise

10.8.13 Projected road traffic movements during the operational phase are provided in the Traffic Assessment. An excerpt from the Traffic Assessment of the projected changes to road traffic flows arising on roads due to operation of the Proposed Development is provided in Table 10.19.

*Table 10.20 – Projected increases in total traffic on affected roads, operational phase*

| | Smelter Access | A82 Industrial Estate | A830 | A82 Fort William | A82 North | A82 South |
|---|---|---|---|---|---|---|
| Increase in total traffic | 18.6% | 0.4% | 0.7% | 0.4% | 1.3% | 0.9% |

10.8.14 Projected increases in traffic flows on public roads are below 2%; the Smelter access is not a public road and is considered separately in the prediction of operational noise. The projected increases are substantially below 20%, therefore the increase in the BNL will be substantially below 1 dB, and with reference to criteria provided in para. 10.2.25, the changes are below the scoping criteria. The impact magnitude at all NSRs is therefore **negligible**. With reference to Table 10.2 the resultant significance of effect at all NSRs is neutral. Noise effects associated with road traffic movements due to the construction phase of the Proposed Development are therefore **not significant**.

## *Decommissioning*

10.8.15 Noise associated with decommissioning is anticipated to be similar in character to noise from construction, however, decommissioning activities are likely to be shorter in duration than construction, and are unlikely to be time-sensitive, therefore weekend, evening and night-time works will not be required. Noise from decommissioning activities has therefore been assessed as **not significant.**

## 10.9 Additional Mitigation

10.9.1.1 This assessment has determined that noise impacts associated with the construction and operation of the Proposed Development will be not significant at all identified representative NSRs. No additional mitigation beyond the assumptions and commitments by the Applicant provided in Section 10.4 is therefore proposed.

## 10.10 Residual Effects

### *Construction*

10.10.1 Noise effects during construction, including construction phase road traffic noise, have been determined to be not significant. No additional mitigation is therefore proposed, and residual effects will remain **not significant**.

### *Operation*

10.10.2 Noise effects during operation, including operational phase road traffic noise, have been determined to be not significant. No additional mitigation is therefore proposed, and residual effects will remain **not significant**.

### *Decommissioning*

10.10.3 Noise effects during decommissioning have been determined to be not significant. No additional mitigation is therefore proposed, and residual effects will remain **not significant**.

## 10.11 Cumulative Assessment

### *Construction*

10.11.1 A new Water Canning Plant on the Smelter site is proposed which will be covered by a separate planning application. It is anticipated that the building will be approximately 66 m length by 24 m width and height of 7 m to the eaves and 11 m to the ridgeline. As it is possible that this will be constructed before the Proposed Development, it has been included as part of the cumulative assessment.

10.11.2 Given that the nature of activities at the Water Canning Plant site would likely be very similar to those at the Proposed Development site, noise emissions are anticipated to be similar between the two developments. Whilst it is not anticipated that the construction stages of the Proposed Development and Water Canning Plant will overlap, it is noted that the robust assumptions made in the predictions of construction phase noise for the Proposed Development, and the substantial margin of predicted compliance with the threshold noise levels are a positive indication that simultaneous construction activity would not result in the threshold levels being exceeded.

10.11.3 The magnitude of potential cumulative impacts has therefore been evaluated as **negligible**, with a resultant **slight** effect significance. Cumulative impacts during the construction phase are therefore **not significant**.

### *Operation*

10.11.4 Potential cumulative effects with existing Smelter operations have been considered within the course of this assessment, both in the characterisation of the baseline environment and the setting of operational phase noise limits. Cumulative effects between the Smelter and the operational phase of the Proposed Development will therefore be as reported above.

10.11.5 Operation of the proposed Water Canning Plant is anticipated to be quiet; it is not a noisy process and we understand that all processes, including unloading of HGVs, will occur within the canning plant building. Road traffic movements associated with the potential Water Canning Plant are considered within the Traffic Assessment of the Proposed Development, and cumulative traffic noise is therefore inherently considered as part of the operational traffic noise assessment.

10.11.6 Potential cumulative effects arising from operation of the potential Water Canning Plant will therefore be limited. The magnitude of potential cumulative impacts has therefore been evaluated as **negligible**, with a resultant **slight** effect significance. Cumulative impacts during the construction phase are therefore **not significant**.

## 10.12 Summary

10.12.1 ITPEnergised has undertaken a noise assessment of the Proposed Development. In the course of the assessment we consulted with SEPA to agree the scope and approach to the assessment and it was agreed that the design of the Proposed Development should seek to not increase operational noise levels at noise-sensitive receptors (NSRs) above exceed the existing rated noise level of the Smelter. Our assessment therefore evaluates noise from the Proposed Development in accordance with BS4142, and also considers the increase to existing noise levels from the wider Smelter complex.

10.12.2 As part of the assessment ITPEnergised undertook a baseline noise survey at representative locations, under appropriate weather conditions. It is noted that a baseline noise survey undertaken during COVID-19 lockdown, whilst potentially not representative of 'typical' conditions, given the reduction in road traffic and economic activity resulting in lower ambient noise levels, results in measured levels representative of a 'worst-case' against which operational noise from the Proposed Development is then assessed. Our assessment has also made reference to previous compliance measurements of the Smelter.

10.12.3 Baseline noise levels were found to be dominated by road traffic across much of the study area, with continuous broadband droning from the Smelter Fume Treatment Plant (FTP) audible at the closest monitoring locations.

10.12.4 Baseline noise levels have been used to derive thresholds for the evaluation of noise impacts during the construction phase. Predicted construction phase noise levels at NSRs meet the threshold noise levels. Noise impacts are therefore negligible and noise effects have been evaluated as 'not significant'. No significant sources of vibration (e.g. piling) have been identified during the construction phase, therefore vibration impacts have been scoped out.

10.12.5 Projected construction and operational phase road traffic increases associated with the Proposed Development have been screened against existing flows and found to be **not significant**, therefore detailed evaluation of noise from road traffic has been scoped out.

10.12.6 Predicted operational noise from the Proposed Development results in low/very low impacts when evaluated in accordance with BS4142. Increases over the rated level of the Smelter at NSRs arising due to the Proposed Development range are minimal (less than 1 dB at the most-affected NSR). Noise impacts arising from operation of the Proposed Development are therefore **negligible**, and noise effects have therefore been evaluated as '**not significant**'.

10.12.7 Mitigation has been specified for the construction phase; a CEMP will be produced which will set out methods by which unnecessary noise from the works will be minimised. Operational phase noise mitigation enables noise levels to be controlled both by design and by management; building materials and plant items have been selected which will limit noise emission at source, and deliveries of materials and potentially noisy activities will be scheduled to occur during the daytime period only.

## 10.14 References


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# Chapter 11 Air Quality

# 11. Air Quality

# 11. Air Quality

## 11.1 Introduction

11.1.1 This chapter assesses potential air quality impacts and the resulting significance of effects associated with the construction and operational phases of the Proposed Development on sensitive receptors and the wider local air quality.

11.1.2 Impacts associated with the decommissioning phase of the Proposed Development will be similar to those assessed for the construction phase.

11.1.3 This chapter considers potential impacts upon both human and designated ecological receptors.

11.1.4 Potential impacts have been assessed within defined study areas for the construction and operational phases of the Proposed Development.

11.1.5 The Proposed Development assessed in this chapter is as described in chapter 3.

11.1.6 This chapter must be read in conjunction with the detailed Air Quality Impact Assessment (AQIA) in Technical Appendix 11.1.

11.1.7 The AQIA has included:

- A desktop review of the local baseline air quality;
- Qualitative assessment of construction phase dust impacts in accordance with the Institute of Air Quality Management (IAQM) Assessment of Dust from Demolition and Construction Guidance (IAQM, 2014);
- Screening assessment of construction and operational phase traffic in accordance with the IAQM/Environmental Protection UK (EPUK) Guidance on Land-use Planning and Development Control: Planning for Air Quality (EPUK & IAQM, 2017);
- Air quality impact assessment of the Proposed Development upon human receptors in accordance with IAQM/Environmental Protection UK (EPUK) Guidance on Land-use Planning and Development Control: Planning for Air Quality (EPUK & IAQM, 2017); and
- Critical level, nutrient nitrogen deposition and acid deposition impact assessments of the Proposed Development upon designated ecological receptors in accordance with:
  - Habitats Directive AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air (Air Quality Advisory Group, 2014);
  - Habitats Directive AQTAG21 Likely significant effect – use of 1% and 4% long-term thresholds and 10% short-term threshold (Air Quality Advisory Group, 2015);

The methodology used in the AQIA is consistent with the used in the EIA of an Alloy Wheel Plant (AWP) previously proposed for the site of the Proposed Development (Planning Reference: 17/05202/FUL). The AWP was consented but has not been constructed. The Proposed Development supersedes and replaces the AWP application.

11.1.8 The AQIA in Technical Appendix 11.1 and this chapter has been prepared by air quality and dispersion modelling specialist Jonas Beaugas, Senior Consultant at ITPEnergised with over six years of experience; and reviewed and managed by ITPEnergised Air Quality Lead and dispersion modelling specialist Annie Danskin, Associate Consultant and Chartered Environmentalist (CEnv), with over 21 years of experience.

## 11.2 Legislation, Policy and Guidelines

11.2.1 The following legislation, planning policy and guidance documents have been considered in the preparation of the AQIA and this chapter.

### *Legislation*

11.2.2 The UK's legislation and regulatory regime, along with national, regional and local planning policy play a key role in the prevention, control and minimisation of atmospheric emissions that are potentially harmful to human health and the environment. Air Quality Standards (AQS)[1] are used as assessment criteria for determining the significance of any potential changes in local air quality resulting from development proposals.

#### European Legislation Transposed into UK Law

11.2.3 The EU has published a Directive on Ambient Air Quality Assessment and Management which came into force in September 1996 (Council of the European Union, 1996). This Directive was intended as a strategic framework for tackling air quality consistently, through setting European wide air quality limit values in a series of daughter directives, superseding and extending existing European legislation. The first four daughter directives were placed into national legislation. A new EU air quality directive (European Parliament and the Council of the European Union, 2008) came into force in June 2008 and was transposed into The Air Quality Standards Regulations in England, Wales, Scotland and Northern Ireland in June 2010 (HM Government, 2010).The directive merged the four daughter directives and one Council decision into a single directive on air quality.

#### National Legislation Transposed into UK Law

11.2.4 The Environment Act 1995 (HM Government, 1995) required the preparation of a national air quality strategy setting Air Quality Objectives (AQOs) for specified pollutants and outlining measures to be taken by local authorities through the system of Local Air Quality Management (LAQM) and by others to work in pursuit of the achievement of these objectives. A National Air Quality Strategy (NAQS) was published in 1997 and subsequently reviewed and revised in 2000, and an addendum to the Strategy published in 2002. The current Strategy was published in July 2007 (Welsh Assembly Government, Scottish Executive, Department of the Environment, Department for Environment Food and Rural Affairs, 2007).

11.2.5 The AQOs which are relevant to LAQM have been set into Regulations namely Air Quality (Scotland) Regulations 2000, Air Quality (Scotland) Amendment Regulations 2002 and Air Quality (Scotland) Amendment Regulations 2016 (Scottish Executive, 2016), the latter of which introduces an additional statutory obligation for Scottish Local Authorities to comply with an annual mean standard for $PM_{2.5}$ to align with the World Health Organisation (WHO) guideline value (WHO, 2005).

11.2.6 The AQSs are set for the purpose of protecting human health, vegetation and ecosystems from certain harmful atmospheric pollutants. The Scottish standards take account of the EU objective values and are either effectively identical, or more stringent.

11.2.7 The standards applicable to the AQIA are presented in Table 11.1.

[1] Air Quality Standards are concentrations recorded over a given time period, which are considered to be acceptable in terms of what is scientifically known about the effects of each pollutant on health and on the environment. They can also be used as a benchmark to indicate whether air pollution is getting better or worse.

*Table 11.1 AQS for Scotland Applicable to this Assessment*

| Pollutant | Concentration | Measured as |
|---|---|---|
| **Human Receptors** | | |
| Nitrogen dioxide ($NO_2$) | 200 µg/m$^3$ not to be exceeded more than 18 times a year | 1-hour mean |
| | 40 µg/m$^3$ | Annual mean |
| Particulate material ($PM_{10}$) | 50 µg/m$^3$, not to be exceeded more than 7 times a year | 24-hour mean |
| | 18 µg/m$^3$ | Annual mean |
| Sulphur Dioxide ($SO_2$) | 266 µg/m$^3$, not to be exceeded more than 35 times a year | 15-min mean |
| | 350 µg/m$^3$, not to be exceeded more than 24 times a year | 1-hour mean |
| | 125 µg/m$^3$, not to be exceeded more than 3 times a year | 24-hour mean |
| Benzene ($C_6H_6$)* | 3.25 µg/m$^3$ | Running annual mean |
| Carbon Monoxide (CO) | 10 mg/m$^3$ | Running 8-hour mean |
| **Ecological Receptors** | | |
| Nitrogen Oxides ($NO_x$) | 30 µg/m$^3$ | Annual mean |
| Sulphur Dioxide ($SO_2$) | 20 µg/m$^3$ | Annual mean |

* Note: Based on consultation with Scottish Environment Protection Agency (SEPA), the predicted total TVOCs have been assessed against the annual mean AQS for benzene as an extreme worst case, and against a value of 0.3 mg/m$^3$ which is considered to be a low level of concern for human health for TVOCs in air (TECAM Group, 2019) (Appendix 11.1 Section 3.5.9 and Annex 1).

11.2.8 The Department for Environment and Rural affairs LAQM Technical Guidance, LAQM TG(16) (DEFRA, 2018) provides advice on where the AQS for pollutants considered in this study apply. These are summarised in Table 11.2.

*Table 11.2 Examples of where the AQS Apply*

| Averaging Period | Standards Should Apply to | Standards Should Not Apply to |
|---|---|---|
| 8-hour and 24-hour Means | All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties. | Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term. |
| 1-hour Mean | All locations where the annual mean, 24-hour mean and 8-hour mean apply plus: Kerbside sites of busy shopping streets; Parts of car parks, bus and railway stations, etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more;<br><br>Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer. | Kerbside sites where the public would not be expected to have regular access. |
| 15-min | All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer. | - |

### The Scottish Government Cleaner Air for Scotland Strategy

11.2.9 The Scottish Government Cleaner Air for Scotland (CAFS) Strategy – The Road to a Healthier Future (Scottish Government, 2015), is a national strategy that sets out how the Scottish Government will deliver its commitment to further improving air quality to protect human health.

11.2.10 The CAFS strategy aims to help the Scottish Government achieve the ambitious goal “to have the best air quality in Europe”. A National Modelling Framework (NMF) and National Low Emission Framework (NLEF) has been developed to provide the tools and mechanism to put in place measures to improve air quality.

11.2.11 The majority of the 40 actions included in the CAFS strategy have now been completed or are ongoing and will be taken forward in parallel with new actions outlined in the updated CAFS2 due for publication before the end of 2021.

### Environmental Protection Act

11.2.12 Section 79, subsection (1)(d) of the Environmental Protection Act 1990 (UK Parliament, 1990) gives the following definitions of statutory nuisance relevant to odour:

11.2.13 “Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance”

11.2.14 Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

11.2.15 If the activity is regulated under the Pollution Prevention and Control (PPC) regulations, Scottish Environment Protection Agency (SEPA) may deal with nuisance issues arising if the nuisance relates to the regulated emissions.

### National Planning Framework 3

11.2.16 The National Planning Framework 3 (NPF3) was published in June 2014 (Scottish Government, 2014) and sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland.

11.2.17 The NPF3 sets out the Scottish Government's development priorities and identifies national developments which support the development strategy.

11.2.18 The key planning outcomes for Scotland set out in the NPF3 are the following:

- "A successful sustainable place – supporting economic growth, regeneration and the creation of well-designed places;
- A low carbon place – reducing our carbon emissions and adapting to climate change;
- A natural resilient place – helping to protect and enhance our natural cultural assets and facilitating their sustainable use; and
- A connected place – supporting better transport and digital connectivity."

11.2.19 Preparation of The National Planning Framework 4 (NPF4) is currently underway and is planned to be finalised for review in Parliament in 2021.

### Pan 51 – Planning, environmental Protection and Regulation

11.2.20 Planning Advice Note (PAN) 51: Planning, Environmental Protection and Regulation (Scottish Executive, 2006) supports existing policy on the role of the planning system in relation to the environmental protection regimes and summarises the responsibilities of the environmental protection bodies.

11.2.21 With regard to air quality, PAN51 recognises that where proposals are within an Air Quality Management Area (AQMA) or adjacent to them, air quality is likely to be:

*"a material consideration for large scale proposals or if they are to be occupied by sensitive groups such as the elderly or young children or are likely to have cumulative effects"*

11.2.22 For proposals that are likely to yield a significant effect on local air quality, a detailed assessment of air quality impacts will be warranted. PAN 51 also states that:

*"it may be necessary to consider the cumulative effect of developments on air quality leading to a gradual deterioration".*

### Local Air Quality Management

11.2.23 Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of administration under the system LAQM. This review and assessment of air quality involves considering present and likely future air quality against the objectives and reporting to the Scottish Government by means of an Annual Progress Report (APR). If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the objectives.

11.2.24 There is currently a single AQMA within the Highland Council (THC) administrative area; Inverness City Centre AQMA declared in 2014 due to the exceedance of $NO_2$ annual mean AQO.

11.2.25 The latest publicly available APR at the time of writing is the 2020 APR (THC, 2020).

## Planning Policy

11.2.26 THC Local Development Plan (THC, 2012) includes three policies which make direct reference to air quality; namely:

- Policy 28 Sustainable Design
- Policy 72 Pollution
- Policy 73 Air Quality

11.2.27 The above planning policies have been considered as part of this assessment.

## Guidance

11.2.28 The AQIA undertaken to inform this chapters is based on the following guidance documents:

- IAQM Assessment of Dust from Demolition and Construction Guidance (IAQM, 2014);
- IAQM/EPUK Guidance on Land-use Planning and Development Control: Planning for Air Quality (EPUK & IAQM, 2017);
- EPS/RTPI Delivering Cleaner Air for Scotland: Development Planning & Development Management (EPS & RTPI, 2017);
- EA Air Emissions Risk Assessment for your Environmental Permit (EA, 2020);
- EA H1 Environmental Risk Assessment for Permits - Annex F: Air Emissions[2] (EA et Al, 2003);
- Habitats Directive AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air (Air Quality Advisory Group, 2014);
- Habitats Directive AQTAG21 Likely significant effect – use of 1% and 4% long-term thresholds and 10% short-term threshold (Air Quality Advisory Group, 2015);
- DEFRA LAQM Technical Guidance, LAQM TG(16) (DEFRA, 2018); and
- Air Pollution Information System (APIS) Critical Load Function Tool – Guidance (APIS, 2016).

11.2.29 For pollutants not included in the NAQS, the assessment has used Environmental Assessment Levels (EALs) from the H1 guidance (EA et Al, 2003). The EALs used in this assessment are provided in Table 11.3.

*Table 11.3 EALs Used in this Assessment*

| Pollutant | Concentration | Measured as |
|---|---|---|
| **Human Receptors** | | |
| Hydrogen Fluoride (HF) | 250 µg/m$^3$ | 1-hour mean |
| Hydrogen Chloride (HCl) | 20 µg/m$^3$ | Annual mean |

[2] The 2010 H1 guidance has been withdrawn by the EA, however the 2003 guidance is still referenced on the SEPA website and can therefore be used in Scotland.

| Pollutant | Concentration | Measured as |
|---|---|---|
| | 800 µg/$m^3$ | 1-hour mean |
| **Ecological Receptors** | | |
| Hydrogen Fluoride (HF) | 0.5 µg/$m^3$ | weekly mean |
| | 5 µg/$m^3$ | 24-hour mean |

11.2.30 For Dioxins/Furans, the Tolerable Daily Intake (TDI) of 2 pg/kg/day (picogramme as the World Health Organisation Toxic Equivalent per kilogram bodyweight per day) specified by the Committee on Toxicity (COT) (COT, 2001) was used as assessment criterion.

## 11.3 Consultation

11.3.1 Consultation with The Highland Council (THC), Scotland Environment Protection Agency (SEPA) and NatureScot officers has been undertaken throughout the preparation of this chapter.

11.3.2 A summary of the consultation exchanges is provided in Table 11.4.

*Table 11.4 Summary of Consultation*

| Consultee | Summary of Consultation Response | Action / Response |
|---|---|---|
| SEPA | SEPA provided their consultee response on the screening opinion to THC on 10th December 2020 which set out a description of matters to be addressed in an updated air quality impact assessment.<br><br>In February 2021 ITPEnergised issued a method statement for the AQIA to SEPA.<br><br>ITPEnergised engaged with SEPA throughout the process keeping the officer updated with findings and proposed approach including virtual meetings during which the method statement was confirmed as acceptable with the additional request to include a section on model uncertainty in the AQIA.<br><br>SEPA confirmed in their email of the 15th of March 2021 that "*the critical consideration* [for the Proposed Development] *is whether there has been any increase in impact at any of the designated areas above* [ecological | ITPEnergised used this response to prepare a method statement for the AQIA.<br><br>The Proposed Development design includes abatement plant such that impacts at ecological receptors are less than those predicted for the previously consented AWP.<br><br>The assessment of TVOC has been undertaken using both the Benzene AQS and an alternative EAL of 0.3 mg/$m^3$. Justification for this approach is provided in Technical Appendix 11.1 Section 3.4.9.2 and Annex 2.<br><br>The emission rates for the Smelter have been calculated from the current permitted ELVs. Existing Smelter sources have been modelled assuming continuous 24/7 operation as there are no restrictions on hours of operation in the permit. |

| Consultee | Summary of Consultation Response | Action / Response |
|---|---|---|
| | receptors] *what was predicted for the Alloy Wheel Plant."*<br><br>ITPEnergised queried the use of the Benzene AQS to assess impacts associated with TVOC emissions. On the 16th of March 2021 SEPA confirmed that "*The benzene air quality standard should be used for assessing TVOC impacts unless it can be demonstrated that there are more appropriate AQS/EALs. The use of benzene is considered to cover the worst-case scenario."*<br><br>SEPA also confirmed the following:<br><br>*"a) The emission rates should be set using the emission limit values in the smelter permit not the latest sample data.*<br><br>*b) The sulphur dioxide release rate can be determined from using the anode content specified in the permit and the work the HSE team at the smelter did in establishing its relationship to the associated BAT-AEL in the Non-Ferrous Metals BAT conclusions. This was undertaken as part of last year's permit review.*<br><br>*c) The biofuel generators will need to be added as specified in the permit and operating using 500 hours annually."*<br><br>The above emails are provided in Technical Appendix 11.1 Annex 1. | The sulphur dioxide release rate for the Smelter has been calculated based on the permitted maximum production value of 47,500 T per year and $SO_2$ permit limit of 15 kg/t (Refer to Technical Appendix 11.1 Annex 2).<br><br>The biofuel generators have been modelled at their permitted maximum number of hours of 500 hr/year and are modelled to reflect the permit restrictions to operate only between 0700-2300 hours. |
| NatureScot | In February 2021 ITPEnergised issued the method statement for the AQIA to NS.<br><br>ITPEnergised also sought to confirm that the list of ecological receptors used as part of the AQIA undertaken for the previously consented AWP remained appropriate and provided an updated table including receptor locations, baseline concentrations and critical loads. | Receptors Eco4 and Eco13 have been moved to the locations specified by NatureScot and NewEco18 and NewEco19 have been added to the list of sensitive receptors considered in the AQIA. |

| Consultee | Summary of Consultation Response | Action / Response |
|---|---|---|
| | NS confirmed their agreement with the proposed method and receptors list.<br><br>Following consultation with SEPA; ITPEnergised consulted with NatureScot to request the habitat dataset for the Ben Nevis Special Area of Conservation (SAC) and to confirm the location of the selected sensitive receptors.<br><br>NS provided a link to the Habitat Map of Scotland (HabMoS) and in April 2021 requested that two receptors be added:<br>- NewEco18 – Oceanic Montane Bryophyte (H4060)<br>- NewEco19 – Snowbed Communities (H6150)<br><br>And two receptors moved: Eco13 and Eco4.<br><br>The above emails are provided in Technical Appendix 1 Annex 11.1. | |
| THC | ITPEnergised issued the method statement to THC for comments; however, to date no response has been received. | - |

## 11.4 Assessment Methodology and Significance Criteria

11.4.1 Full details of the assessment methodology used to assess potential air quality impacts are provided in Technical Appendix 11.1, Section 3.

11.4.2 Emissions sources and buildings modelled as part of the AQIA are shown on Drawing 11.1 in Volume III of the EIA Report.

### *Scope of Work*

11.4.3 The scope of work undertaken as part of the AQIA which has informed this chapter is as follows:

- Review of Proposed Development proposal, compilation of emission information and development of emissions inventory for the Proposed Development sources and existing emission sources within the wider site;
- Consultation with NatureScot and submission of a method statement to THC, NatureScot and SEPA;
- Desktop review of baseline conditions and derivation of representative background concentrations at sensitive receptors;

- Desktop review of the study area and selection of sensitive receptors;
- Qualitative assessment of construction phase impacts;
- Screening assessment of road traffic impacts during both construction and operational phases;
- Detailed dispersion modelling of proposed and existing process emissions and assessment of impacts upon human and ecological receptors;
- Derivation of significance of predicted effects in accordance with relevant guidance.

11.4.4 The pollutants emitted by the existing Smelter and Generators and the emissions sources forming part of the Proposed Development considered in this assessment are listed below:

- $NO_x$ – Nitrogen Oxides;
- $NO_2$ – Nitrogen Dioxide;
- $SO_2$ – Sulphur Dioxide;
- CO – Carbon Monoxide;
- $PM_{10}$ – Particulate Matter ($\leq$10$\mu$m);
- HF – Hydrogen Fluoride;
- HCl – Hydrogen Chloride;
- Cl – Chlorine;
- TVOC (as Carbon) – Total Volatile Organic Compounds; and
- Dioxins/Furans.

11.4.5 Fine particulate matter ($PM_{2.5}$), are not included in the assessment as there are no monitoring data available or existing emission limit values (ELVs) for particle size fractions other than $PM_{10}$.

#### Consideration of Odour and Fugitive Dust

11.4.6 The potential for odour impacts due to the Proposed Development arises with the potential for emissions of VOCs. The emissions of VOCs are considered to be negligible (Refer to Technical Appendix 11.1) and therefore it is considered unlikely that there will be odour impacts associated with the Proposed Development. No odour assessment has been carried out as part of the AQIA.

11.4.7 The potential for fugitive dust impacts is considered to be low as the risk of fugitive dust emissions occurring is low. The recycled material is covered in transit, it is transferred and handled on-site indoors, and there are no shredding operations on-site. Although the process design and controls are not yet finalised, the proposed air handling systems will include bag filters and vessels to contain dust removed from the filters by compressed air. It is recognised that these control systems can fail and are acknowledged as a potential source of fugitive dust emission. Fugitive emissions from air handling systems will be assessed at permit application stage when the process design is finalised.

11.4.8 Odour and fugitive dust have not been considered further in this chapter.

### *Consultation*

11.4.9 Consultations have been undertaken as detailed in Section 11.3.

11.4.10 Key correspondence is provided in Technical Appendix 11.1, Annex 1.

### *Study Area*

#### Construction & Operational Phases – Traffic Emissions

11.4.11 The study area for traffic emissions has been derived in consultation with the appointed traffic consultant (Systra). The study area considered includes the A82 north and south of the Proposed Development site access, as shown on Drawing 11.2 in Volume III of the EIA Report.

#### Construction Phase – Dust

11.4.12 The study area for the construction phase dust risk assessment has been defined in accordance with the with the IAQM Assessment of Dust from Demolition and Construction Guidance (IAQM, 2014) which stipulates that "an assessment will normally be required where there is:

*11.4.13 "A 'human receptor' within:*

- *350 m of the boundary of the site; or*
- *50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).*

*11.4.14 A [designated] 'ecological receptor' within:*

- *50 m of the boundary of the site;*
- *50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s)."*

11.4.15 The study area considered as part of the construction phase assessment is shown on Drawing 11.2 in Volume III of the EIA Report.

#### Operational Phase Emissions to Air

11.4.16 The study area for the operational phase assessment of the Proposed Development emissions to air upon human receptors has been derived based on a review of the local area and professional judgment. The study area includes a 5 $km^2$ area centred on the Proposed Development site, within which a number of human receptors have been selected. These typically include the closest receptors to the Proposed Development in all directions.

11.4.17 The study area for the operational phase assessment of the Proposed Development emissions to air upon ecological receptors focuses on sensitive habitats within the Ben Nevis SAC.

### *Site Visit*

11.4.18 No site visit has been undertaken as part of this assessment.

### *Assessment of Potential Effect Significance*

#### Construction & Operational Phases – Traffic Emissions Screening

11.4.19 Construction phase and operational phase traffic generations have been screened against the EPUK and IAQM land-Use Planning & Development Control guidance Stage 2 criteria (EPUK & IAQM, 2017) of:

*"A change of Light Duty Vehicle (LDV) flows of:*

- *More than 100 Annual Average Daily Traffic (AADT) within or adjacent to an Air Quality Management Area (AQMA);*
- *More than 500 AADT elsewhere;*

*A change of Heavy Duty Vehicle (HDV) flows of:*

- *More than 25 AADT within or adjacent to an AQMA;*
- *More than 100 AADT elsewhere."*

11.4.20 If the Proposed Development construction phase and operational traffic generation do not exceed the above criteria, a detailed assessment of traffic emissions is not required.

### Construction Phase Dust

11.4.21 The IAQM guidance on the assessment of dust from demolition and construction (IAQM, 2014) was used in this assessment to determine the risk category due to dust arising from the construction phase of the Proposed Development upon human receptors.

11.4.22 The Proposed Development risk category (negligible, low, medium or high) has been allocated for each relevant activity (demolition, earthworks, construction and trackout) based on the following two factors:

- The scale and nature of the works, which determines the potential dust emission magnitude as small, medium or large; and
- The sensitivity of the area to dust impacts, which is defined as low, medium or high sensitivity.

11.4.23 These two factors were then combined to determine the risk category with no mitigation applied for each relevant activity.

### Operational Phase – Emissions to Air

#### Assessment of Impacts upon Human Receptors

11.4.24 The IAQM/EPUK Guidance on Land-use Planning and Development Control: Planning for Air Quality (EPUK & IAQM, 2017) provides a suggested framework of impact descriptors with respect to assessment of long-term (annual mean) and short-term (1-hour mean or less) air quality objectives. The guidance presents a practical way of assigning a meaningful description to the degree of an impact, by expressing the magnitude of incremental change as a proportion of a relevant assessment level which is summarised below.

11.4.25 The change in pollutant concentrations with respect to baseline concentrations has been assessed at selected representative receptors within the study area. The absolute magnitude of pollutant concentrations with the Proposed Development is also described, and this is used to consider the risk of the AQSs being exceeded in each scenario.

11.4.26 The criteria used to assess the significance of impact at long-term and short-term receptors are summarised in Table 11.5 and Table 11.6 respectively.

*Table 11.5 Impact Descriptors for Long-term Receptors*

| Long Term Average Concentrations at Receptor in Assessment Year | % Change in Concentration Relative to Air Quality Assessment Level (AQAL) | | | |
|---|---|---|---|---|
| | 1 | 2-5 | 6-10 | >10 |
| 75% or less of AQAL | Negligible | Negligible | Slight | Moderate |
| 76-94% of AQAL | Negligible | Slight | Moderate | Moderate |
| 95-102% of AQAL | Slight | Moderate | Moderate | Substantial |
| 103-109% of AQAL | Moderate | Moderate | Substantial | Substantial |
| 110% or more of AQAL | Moderate | Substantial | Substantial | Substantial |

Note: A change of less than 0.5% of the AQAL is described as Negligible. The EPUK and IAQM refer to the AQSs as AQAL.

11.4.27 The IAQM guidance specifies that when considering short-term concentrations, the study should consider the maximum predicted hourly concentration due to the process in any year and should be assessed "without the need to reference background or baseline concentrations".

*Table 11.6 Impact Descriptors for Short-term Receptors*

| Maximum Process Contribution Relative to AQAL | 11-20% | 21-50% | >51% |
|---|---|---|---|
| Magnitude | Small | Medium | Large |
| Impact Descriptor | Slight | Moderate | Substantial |

Note: A change of less than 10.5% of the AQAL is to be described as Negligible.

11.4.28 There are no available guidance or methods to assess impacts associated with AQSs with averaging periods between one hour and one year. For such AQSs the assessment is based on professional judgment and mainly refer to the achievement of the AQSs at relevant sensitive receptors.

Assessment of Impacts associated with Dioxins/Furans (Human Receptors)

11.4.29 Predicted annual mean concentrations of Dioxins/Furans from the Proposed Development have been converted to a daily intake by inhalation for assessment against the Tolerable Daily Intake (TDI) (COT, 2001).

Assessment of Impacts upon Ecological Receptors

11.4.30 There is no set method to derive impacts upon ecological receptors, rather AQTAG21 (Air Quality Advisory Group, 2015) provides a method to derive potential likely significant effect (Refer to Technical Appendix 11.1).

11.4.31 The predicted Process Contribution (PC) for the Proposed Development solely and the Predicted Environmental Concentration (PEC) for the Proposed Development cumulatively with the generators, have been calculated as a percentage of the critical levels, nutrient nitrogen critical loads, and the critical load function for total acid deposition at all selected ecological receptors.

11.4.32 The APIS critical load function guidance (JNCC Et Al., 2016) was used to determine the parameters to be used in the calculations to assess exceedance of the critical load function, and the PC and PEC as percentage of the critical load function at all selected ecological receptors.

### Assessment of Significance

Construction Phase (Human and Ecological Receptors) and Operational Phase (Human Receptors)

11.4.33 The derived IAQM risk categories (construction) and impact descriptors (operation) at individual receptors have also been considered for the Proposed Development in overall terms. The potential for the Proposed Development to contribute to or hinder the successful implementation of policies and strategies for the management of local air quality over a larger domain than at individual receptors, was considered if relevant and overall risk categories/impact descriptors derived.

11.4.34 IAQM Risk/Impact descriptors and resulting significance have then been translated in EIA Terminology.

11.4.35 Table 11.7 summarises how the significance of effects of the overall risk categories/impact descriptors have been derived and their translation in EIA terms.

*Table 11.7 IAQM Risk Categories / Impact Descriptors Significance and Translation into EIA Terminology*

| IAQM Risk/Impact Descriptor | Significance | EIA Terms |
|---|---|---|
| High/Substantial | A significant effect that is likely to be a material consideration in its own right. | Major Adverse/Beneficial |
| Medium/Moderate | A significant effect that may be a material consideration in combination with other significant effects but is unlikely to be a material consideration in its own right. | Moderate Adverse/Beneficial |
| Low/Slight | An effect that is not significant but that may be of local concern. | Minor Adverse/Beneficial |
| Negligible | An effect that is not significant. | Negligible Adverse/Beneficial |

<u>Assessment of Impacts associated with Dioxins/Furans (Human Receptors)</u>

11.4.36 For Dioxins/Furans, the assessment of significance has used the same criteria for the PC and PEC as for the ecological receptors (Table 11.8) using the TDI as the long-term benchmark.

### Operational Phase (Ecological Receptors)

11.4.37 The significance of effects at ecological receptors has used the criteria provided in Table 11.8.

*Table 11.8 Summary of 'Likely significant effect' Threshold for all Installations with the Exception of Intensive Farming*

| If PC… | Then… |
|---|---|
| < 1% long-term benchmark; critical level and load | Conclude 'no likely significant effect' alone or in-combination |
| > 1% long-term benchmark; critical level and/or load | There is a potential for a likely significant effect, consider the Predicted Environmental Concentration (PEC):<br>PEC: PC + background |
| < 10% short-term benchmark; critical level | Conclude 'no likely significant effect' alone or in-combination |
| > 10% short-term benchmark; critical level | Conclude potential for 'likely significant effect' alone and in-combination |
| **If PEC…** | **Then…** |
| < 70% long-term benchmark; critical level and load | Conclude 'no likely significant effect' alone and in- combination and proceed with permit determination. |
| > 70% long-term benchmark; critical level and/or load | Conclude potential for 'likely significant effect' alone and in-combination |

11.4.38 In accordance with AQTAG21 'long-term' relates to averaging period of 1 year and 'short-term' relates to averaging period of less than 1 year.

11.4.39 Where it is concluded that there is the potential for 'likely significant effect", engagement with NatureScot will be required and there may be a need for further assessment.

11.4.40 Professional judgement has been used to derive the significance of effects upon ecological receptors in EIA terms.

### *Requirements for Mitigation*

11.4.41 Where significant effects are identified mitigation will be specified, where practicable, such that residual effects are not significant.

### *Assessment of Residual Effect Significance*

11.4.42 Residual effects have been evaluated using the methods and criteria provided for pre-mitigation effects.

### *Limitations to Assessment & Conservative Assumptions*

11.4.43 The AQIA has been informed by the sensitivity analysis carried out in the 2017 AQIA for the previously consented AWP and the further analysis detailed in Technical Appendix 11.1, Annex 4 and therefore model uncertainties have been appropriately considered.

11.4.44 The AQIA is considered to be conservative for the following reasons:

- The AQIA is based on the highest predicted concentrations over the five years of meteorological data considered (2016-2020).
- The AQIA has used Tulloch Bridge World Meteorological Organisation (WMO) Station rather than Aonach Mor WMO Station resulting in the worst-case predicted concentrations at receptors within the Ben Nevis SAC being significantly higher. It can however be argued that Aonach Mor WMO Station is more representative of the meteorological conditions at some habitat locations at higher altitude on Ben Nevis, and therefore PCs will be lower than those included in the AQIA at some receptors.
- The AQIA has used conservative background concentrations in Fort William without any sector-removal (refer to Technical Appendix 11.1, Section **Error! Reference source not found.**), therefore the PECs will in some places double account for the contributions from the Smelter and/or Generators (Refer to Technical Appendix 11.1, Footnote **Error! Bookmark not defined.**).
- PEC concentrations include contributions from the generators operating at their permitted number of hours (500 hours per year), however, to date the generators have not operated for more than 50 hours per year. It should also be noted that the Applicant is currently considering decommissioning these generators.
- Emissions from the Smelter have been modelled at permitted ELVs, whereas, recent annual monitoring shows that the Smelter emissions concentrations are routinely lower than permitted ELVs .
- Emissions from the Smelter have been modelled as continuous 24/7 emissions, whereas, several sources routinely operate in day-shift hours only and for less than 7 days per week.
- Emissions from the Proposed Development have been modelled as continuous 24/7 emissions. It is likely that there will be periods when not all furnaces are operational simultaneously, depending on production rates.
- The emissions from the proposed development have been calculated assuming 100,000 tonnes of billet production per annum using 100% recycled material. In

reality, depending on the product specification and availability of recycled material, there will be a portion of primary aluminium from the existing Smelter used in the billet production, therefore reducing the emissions from the melting furnaces.

- The $SO_2$ release rate for the Smelter has been calculated based on the permitted maximum production value of 47,500 t/year and $SO_2$ permit limit of 15 kg/t (refer to Technical Appendix 11.1, Annex 2).
- Emissions of Dioxins/Furans and TVOCs from the Proposed Development have been included, modelled at Best available Technique (BAT) ELVs, and assessed against the most stringent criteria, however it is considered that the risk of these emissions arising from the process is low and the predicted effects are a significant over-estimate.

## 11.5 Baseline Conditions

### *Baseline Dust*

11.5.1 A background level of dust exists in all urban and rural locations in the UK. Dust can be generated on a local scale from vehicle movements and from the action of wind on exposed soils and surfaces. Dust levels can be affected by long-range transport of dust from distant sources into the local vicinity.

11.5.2 Residents within the study area currently experience dust deposition at a rate that is determined by the contributions of local and distant sources. This baseline rate of soiling is considered normal and varies dependent on prevailing climatic conditions. The tolerance of individuals to deposited dust is therefore shaped by their experience of baseline conditions.

11.5.3 Typical existing local sources of particulate matter includes wind-blown dust from agricultural land, exhaust emissions from energy plant, industry (including the Smelter and Generators) and road vehicles, brake and tyre wear from road vehicles and the long-range transport of material from outside the wider area.

11.5.4 There are no THC monitoring site measuring particulate matter within the study area. The baseline levels of dust within the study area have therefore been characterised using the 2018-base Scottish Air Quality $PM_{10}$ (Scottish Air Quality, 2020) background map concentrations for year 2019.

11.5.5 All potential sources of dust within the area have been present for a significant amount of time and are therefore captured within the background maps.

11.5.6 $PM_{10}$ background map concentrations for 2019 within the study area range between 6.48 to 7.03 $\mu g/m^3$ and are therefore significantly below the annual AQS of 18 $\mu g/m^3$ (<40% of the AQS).

### *Baseline Air Quality*

11.5.7 Due to the lack of THC monitoring sites, other than those monitoring $NO_2$, within the study area; baseline concentrations at receptors within the study area have been characterised using the same approach used to derive background concentrations at selected receptors (Refer to Technical Appendix 11.1, Section 3.5.8). Baseline concentrations are as follows:

- Human Receptors:
  - $NO_2$ – 8.1 to 22.0 $\mu g/m^3$ [3]
  - $SO_2$ – 1.41 to 3.69 $\mu g/m^3$
  - CO – 0.12 to 0.13 $mg/m^3$
  - $PM_{10}$ – 6.40 to 7.03 $\mu g/m^3$

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[3] $NO_2$ concentrations have been derived from THC 2020 Annual Progress Report (THC, 2020)

- HF – 0.003 μg/m$^3$
- HCL – 0.39 μg/m$^3$
- VOC – 0.09 to 0.12 μg/m$^3$
- Dioxins/Furans – Average daily intake of 0.03 pg ITEQ/kg-BW/day

➢ Ecological Receptors:

- $NO_x$ – 2.02 μg/m$^3$
- $SO_2$ – 0.53 μg/m$^3$
- HF – 0.003 μg/m$^3$

11.5.8 Baseline concentrations are significantly below the relevant standards and air quality within the study are is therefore good.

### Baseline Deposition

11.5.9 Baseline nutrient nitrogen and acid deposition at selected ecological receptors within the Ben Nevis SAC are provided in Technical Appendix 11.1, Annex 3.

11.5.10 Baseline nutrient nitrogen deposition is below the maximum critical load relevant for the sensitive habitat at all selected ecological receptors.

11.5.11 Baseline acid deposition is above the maximum critical load relevant for the sensitive habitat at 12 of the 17 selected receptors where sensitivity to acidity has been identified, and below the maximum critical load at 5 of the 17 selected receptors[4] (Refer to Technical Appendix 11.1 Annex 3).

## 11.6 Receptors Brought Forward for Assessment

### Construction & Operational Phases – Traffic Emissions

11.6.1 The receptors brought forward as part of the screening assessment of traffic emissions include sensitive receptors along the A82 north and south of the Proposed Development site access.

### Construction Phase – Dust

11.6.2 There are >100 human receptors and no designated ecological receptors within the buffers specified in Section 11.4.

11.6.3 On that basis; the receptors brought forward for the assessment of construction phase dust impacts are:

➢ human receptors (dust soiling); and

➢ human receptors (human health).

### Operational Phase Emissions to Air

11.6.4 Human receptors considered as part of the AQIA are consistent with those considered in the AQIA undertaken for the previously consented AWP, with the exception of R11 – North Road Retail Park which has been added to the list of receptors.

11.6.5 Ecological receptors considered in the AQIA include specific locations within the Ben Nevis Special Area of Conservation (SAC) which were specified by NatureScot (then Scottish Natural Heritage) for the assessments submitted for the previously consented AWP (Planning Reference: 17/05202/FUL).

[4] Of the 19 receptors selected one is not sensitive to acidification and another has a critical load of 0.

11.6.6 On the 20th of April 2021, NatureScot requested that two receptors be added, namely NewEco18 – Oceanic montane bryophyte (with Habitat code H4060) and NewEco19 – Snowbed communities (H6150), and two receptors be moved Eco4 (RevisedEco4) – Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) (H8120) and Eco13 (RevisedEco13) – Calcareous rocky slopes with chasmophytic vegetation (H8210) (Technical Appendix 11.1, Annex 1). The list of ecological receptors has therefore been amended accordingly from those set out in the method statement.

11.6.7 The receptors brought forward in the assessment are therefore as listed in Table 11.9 and shown in Drawing 11.3 in Volume III of the EIA Report.

*Table 11.9 Selected Receptors*

| ID on Drawing 11.3 | Description | Easting | Northing |
|---|---|---|---|
| **Human Receptors** | | | |
| R1 | Hotel near to the A82 | 211813 | 774897 |
| R2 | Residential Property on Grant Place | 211888 | 774499 |
| R3 | Residential Property on Telford Place | 211950 | 774438 |
| R4 | Inverlochy Nursery School | 211256 | 774458 |
| R5 | Residential Property on Lundy Gardens | 211531 | 774658 |
| R6 | Lochaber High School | 212408 | 775917 |
| R7 | Residential property on Glenmhor Terrace | 212414 | 775448 |
| R8 | Residential Property on Carrs Corner | 212859 | 775921 |
| ST1 | Fort William Football Pitch | 212123 | 774297 |
| R9 | Residential Houses on Achintee Road | 212236 | 774102 |
| R10 | Residential on Kilmallie Road | 211887 | 775617 |
| THC | Site of THC Monitor representative of sensitive receptors near Camanachd Crescent | 210853 | 774434 |
| R11 | North Road Retail Park | 211993 | 774957 |
| PR1* | Representative of land allocated for housing within THC LDP | 213125 | 775555 |
| PR2* | Representative of land allocated for housing within THC LDP | 213756 | 775952 |

| ID on Drawing 11.3 | Description | Easting | Northing |
|---|---|---|---|
| **Ecological Receptors** | | | |
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 214142 | 773275 |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 217892 | 773265 |
| Eco3 | H4060 - Alpine and Boreal heaths | 213371 | 773597 |
| RevisedEco4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 215347 | 772105 |
| Eco5 | H7130 - Blanket Bogs | 213766 | 774568 |
| Eco6 | H91C0 - Caledonian forest | 215764 | 769201 |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 214385 | 772763 |
| Eco8 | H4030 - European Dry heaths | 213527 | 774710 |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 218129 | 772837 |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 213518 | 773488 |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 218800 | 771050 |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 213111 | 774500 |
| RevisedEco13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 217619 | 769520 |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 213111 | 774500 |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 215473 | 772659 |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 213756 | 775360 |

| ID on Drawing 11.3 | Description | Easting | Northing |
|---|---|---|---|
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 213206 | 774811 |
| NewEco18 | H4060 - Oceanic Montane Bryophyte | 215573 | 772808 |
| NewEco19 | H6150 - Snowbed Communities | 217660 | 772808 |

*Included for consistency with the AWP AQIA as locations expected to be allocated for housing within THC LDP.

11.6.8 In addition to the selected receptors listed in Table 11.9, a detailed calculation grid was included in the model runs in order to calculate concentrations across the local area and determine the locations of maximum impact of emissions, ensuring no “hot-spot” locations were missed. The calculation grid was defined to provide a grid resolution of 25 m x 25 m spacing which enabled detailed contour plots of pollution concentration to be prepared.

## 11.7 Standard Mitigation

### *Operation*

11.7.1 The AQIA includes the assessment of the impact of emissions from the Proposed Development that can be achieved with abatement technologies applied (Technical Appendix 11.1 Annex 2) to reduce emission concentrations to significantly below the BAT ELVS.

11.7.2 The following emission reduction compared to BAT ELVs have been considered:

- 90% for HCl at BP2Large and Small;
- 81% for $NO_x$ at BP2Large and 80% at BP2Small;
- 33% for CO at BP2Large and 67% at BP2Small;
- 33% for TVOC at BP2Small.

11.7.3 Details regarding how the above emissions reduction are anticipated to be achieved are provided in Technical Appendix 11.1, Annex 2.

## 11.8 Potential Effects

### *Construction*

#### Construction Phase – Dust

11.8.1 The construction dust risk assessment detailed in Technical Appendix 11.1, Annex 6 concluded that without specific site mitigation there are human receptors with medium to high sensitivities subject to a low risk of dust soiling and low risk of impacts on human health during the earthworks, construction and track-out phases.

11.8.2 The risk of dust impacts associated with the Proposed Development construction activities will therefore be **minor adverse** and therefore **not significant**.

#### Construction Phase – Traffic

11.8.3 The construction phase of the Proposed Development will result in an increase in LDV and HDV of 120 and 90 AADT respectively. Construction traffic generation on the local road network is therefore below the EPUK & IAQM criteria of 500 and 100 AADT for LDV and HDV respectively. On that basis impacts on air quality associated with the change in traffic during the construction phase of the Proposed Development will be **negligible adverse** and therefore **not significant**.

### *Operation*

#### Operational Phase – Traffic

11.8.4 The operational phase of the Proposed Development will result in an increase in LDV and HDV of 22 and 62 AADT respectively. Operational phase traffic generation on the local road network is therefore below the EPUK & IAQM criteria of 500 and 100 AADT for LDV and HDV respectively. On that basis impacts on air quality associated with the change in traffic during the operational phase of the Proposed Development will be **negligible adverse** and therefore **not significant**.

#### Operational Phase – Emissions to Air (Human Receptors)

11.8.5 Full details of the assessment results are provided in Technical Appendix 11.1, Annex 5.

11.8.6 Contour plots of predicted PCs from the Proposed Development are provided in Technical Appendix 11.1.

Nitrogen Dioxide

11.8.7 The predicted annual mean PECs of $NO_2$ are significantly below the AQS level at all selected sensitive receptors assessed.

11.8.8 The maximum predicted annual mean PEC of $NO_2$ at a selected sensitive receptor is 21.1 µg/m$^3$ (53% of the AQS) and is predicted at R7, a residential property on Glenmhor Terrace.

11.8.9 The maximum predicted annual mean Proposed Development PC of $NO_2$ at a selected sensitive receptor is 0.9 µg/m$^3$ (2% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

11.8.10 Using the criteria in Table 11.5, the impact descriptor associated with the change in annual mean $NO_2$ concentrations at all selected sensitive receptors relevant for long-term exposure, has been assessed as **negligible adverse**.

11.8.11 Using the criteria in Table 11.7, the significance of effect associated with the change in annual mean $NO_2$ at all selected sensitive receptors is **not significant**.

11.8.12 The predicted hourly mean (99.79$^{th}$ percentile) PECs of $NO_2$ are significantly below the AQS level at all selected sensitive receptors assessed.

11.8.13 The maximum predicted hourly mean (99.79$^{th}$ percentile) PEC of $NO_2$ at a selected sensitive receptor is 72.8 µg/m$^3$ (36% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

11.8.14 The maximum predicted hourly mean (99.79$^{th}$ Percentile) Proposed Development PC of $NO_2$ at a selected sensitive receptor is 6.2 µg/m$^3$ (3% of the AQS) and is predicted at R11, a retail park on North Road.

11.8.15 The maximum predicted hourly mean (100$^{th}$ percentile) Proposed Development PC of $NO_2$ at a selected sensitive receptor is 15.6 µg/m$^3$ (8% of the AQS) and is predicted at R3, a residential property on Telford Place.

11.8.16 Using the criteria in Table 11.6, the impact descriptor associated with the change in hourly $NO_2$ concentrations (100$^{th}$ percentile) has been assessed as **negligible adverse** at all selected sensitive receptors.

11.8.17 Using the criteria in Table 11.7, the significance of effect associated with the change in hourly mean $NO_2$ at all selected sensitive receptors is **not significant**.

### Carbon Monoxide

11.8.18 The predicted running 8-hr mean PECs of CO are significantly below the AQS level at all selected sensitive receptors assessed.

11.8.19 The maximum predicted running 8-hr mean PEC of CO at a selected sensitive receptor is 0.14 mg/m$^3$ (1.4% of the AQS) and is predicted at R8, a residential property on Carrs Corner.

11.8.20 The maximum predicted running 8-hr mean Proposed Development PC of CO at a selected sensitive receptor is 0.004 mg/m$^3$ (0.04% of the AQS) and is predicted at R7, a residential property on Glenmhor Terrace.

11.8.21 Effects associated with the change in CO running 8-hr mean are assessed to be **negligible adverse** and **not significant**.

### Particulate Matter (≤10µm)

11.8.22 The predicted annual mean PECs of $PM_{10}$ are significantly below the AQS level at all selected sensitive receptors assessed.

11.8.23 The maximum predicted annual mean PEC of $PM_{10}$ at a selected sensitive receptor is 8.1 µg/m$^3$ (45% of the AQS), and is predicted at PR1 a site representative of land allocated for housing within THC LDP.

11.8.24 The maximum predicted annual mean Proposed Development PC of $PM_{10}$ at a selected sensitive receptor is 0.22 µg/m$^3$ (1% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

11.8.25 Using the criteria in Table 11.5, the impact descriptor associated with the change in annual mean $PM_{10}$ concentrations at all selected sensitive receptors relevant for long-term exposure, has been assessed as **negligible adverse**.

11.8.26 Using the criteria in Table 11.7, the significance of effect associated with the change in annual mean $PM_{10}$ at all selected sensitive receptors is **not significant**.

11.8.27 The predicted daily mean (98.08$^{th}$ percentile) PECs of $PM_{10}$ are significantly below the AQS level at all selected sensitive receptors assessed.

11.8.28 The maximum predicted daily mean (98.08$^{th}$ percentile) PEC of $PM_{10}$ at a selected sensitive receptor is 17.4 µg/m$^3$ (35% of the AQS) and is predicted at PR1 a site representative of land allocated for housing within THC LDP.

11.8.29 The maximum predicted daily mean (98.08$^{th}$ percentile) Proposed Development PC of $PM_{10}$ at a selected sensitive receptor is 0.8 µg/m$^3$ (2% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

11.8.30 Effects associated with the change in $PM_{10}$ daily mean are assessed to be **negligible adverse** and **not significant**.

### Hydrogen Fluoride

11.8.31 The predicted hourly mean PECs of HF are significantly below the AQS level at all selected sensitive receptors assessed.

11.8.32 The maximum predicted hourly mean PEC of HF at a selected sensitive receptor is 7.9 µg/m$^3$ (3% of the AQS) and is predicted at ST1, Fort William football pitch.

11.8.33 The maximum predicted hourly mean Proposed Development PC of HF at a selected sensitive receptor is 2.2 µg/m$^3$ (1% of the AQS) and is predicted at ST1 Fort William football pitch.

11.8.34 Using the criteria in Table 11.6, the impact descriptor associated with the change in hourly HF concentrations has been assessed as **negligible adverse** at all selected sensitive receptors.

11.8.35 Using the criteria in Table 11.7, the significance of effect associated with the change in hourly mean HF at all selected sensitive receptors is **not significant**.

### Hydrogen Chloride

11.8.36 The predicted annual mean PECs of HCl are significantly below the AQS level at all selected sensitive receptors assessed.

11.8.37 The maximum predicted annual mean PEC of HCl at a selected sensitive receptor is 0.477 µg/m$^3$ (2% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

11.8.38 The maximum predicted annual mean Proposed Development PC of HCl at a selected sensitive receptor is 0.05 µg/m$^3$ (0.23% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

11.8.39 Using the criteria in Table 11.5, the impact descriptor associated with the change in annual mean HCl concentrations at all selected sensitive receptors relevant for long-term exposure, has been assessed as **negligible adverse**.

11.8.40 Using the criteria in Table 11.7, the significance of effect associated with the change in annual mean HCl at all selected sensitive receptors is **not significant**.

11.8.41 The predicted hourly mean PECs of HCl are significantly below the AQS level at all selected sensitive receptors assessed.

11.8.42 The maximum predicted hourly mean PEC of HCl at a selected sensitive receptor is 7.8 µg/m$^3$ (1% of the AQS) and is predicted R11 retail park on North Road.

11.8.43 The maximum predicted hourly mean Proposed Development PC of HCl at a selected sensitive receptor is 2.2 µg/m$^3$ (0.3% of the AQS) and is predicted at ST1 Fort William football pitch.

11.8.44 Using the criteria in Table11.6, the impact descriptor associated with the change in hourly HCl concentrations has been assessed as **negligible adverse** at all selected sensitive receptors.

11.8.45 Using the criteria in Table 11.7, the significance of effect associated with the change in hourly mean HCl at all selected sensitive receptors is **not significant**.

### Volatile Organic Compound

*Using Benzene AQS*

11.8.46 The predicted annual mean PECs of TVOCs are significantly below the AQS level at all selected sensitive receptors assessed.

11.8.47 The maximum predicted annual mean PEC of TVOC at a selected sensitive receptor is 1.293 µg/m$^3$ (40% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

11.8.48 The maximum predicted annual mean Proposed Development PC of TVOC at a selected sensitive receptor is 1.174 µg/m$^3$ (36% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

11.8.49 Using the criteria in Table 11.5, the impact descriptor associated with the change in annual mean TVOC concentrations relevant for long-term exposure, has been assessed as negligible adverse at four receptors, slight adverse at three receptors, and **moderate adverse** at five receptors.

11.8.50 Using the criteria in Table 11.7, the significance of effect associated with the change in annual mean TVOC is **significant** at five of the selected sensitive receptors and **not significant** at all other selected sensitive receptors.

*Using EAL of 0.3mg/m³*

11.8.51 The predicted annual mean PECs of TVOC are significantly below the AQS level at all selected sensitive receptors assessed.

11.8.52 The maximum predicted annual mean PEC of TVOC at a selected sensitive receptor is 1.293 µg/m$^3$ (0.4% of the AQAL) and is predicted at R7 a residential property on Glenmhor Terrace.

11.8.53 The maximum predicted annual mean Proposed Development PC of TVOC at a selected sensitive receptor is 1.174 µg/m$^3$ (0.4% of the AQAL) and is predicted at R7 a residential property on Glenmhor Terrace.

11.8.54 Using the criteria in Table 11.5, the impact descriptor associated with the change in annual mean TVOC concentrations relevant for long-term exposure, has been assessed as **negligible adverse** at all selected sensitive receptors.

11.8.55 Using the criteria in Table 11.7, the significance of effect associated with the change in annual mean TVOC at all selected sensitive receptors is **not significant**.

11.8.56 Due to the predicted absence of TVOCs from the recycled material used in the Proposed Development it is considered that the latter approach is the most appropriate in the assessment of significance.

### Dioxins/Furans

11.8.57 The maximum predicted Proposed Development PC to $ADD_{inh}$ for an adult is 0.00123 pg I-TEQ/kgBW/day which is 0.06% of the TDI, and is predicted at R7, a residential property on Glenmhor Terrace.

11.8.58 The maximum predicted Proposed Development PC to $ADD_{inh}$ for a child is 0.00207 pg I-TEQ/kgBW/day which is 0.1% of the TDI, and is predicted at R7, a residential property on Glenmhor Terrace.

11.8.59 The maximum predicted total $ADD_{inh}$ for an adult is 0.03123 pg I-TEQ/kgBW/day which is 1.56% of the TDI, and is predicted at R7, a residential property on Glenmhor Terrace.

11.8.60 The maximum predicted total $ADD_{inh}$ for a child is 0.132 pg I-TEQ/kgBW/day which is 6.56% of the TDI and is predicted at R7 a residential property on Glenmhor Terrace.

11.8.61 The predicted Proposed Development PC to $ADD_{inh}$is less than 1% of the TDI for both adults and children at all receptors. The predicted significance of effect at all selected receptors is assessed to be **negligible adverse** and **not significant**.

### Operational Phase – Emissions to Air (Ecological Receptors)

11.8.62 Full details of the assessment results are provided in Technical Appendix 11.1, Annex 5.

11.8.63 Contour plots of predicted PCs from the Proposed Development are provided in Technical Appendix 11.1.

### Oxides of Nitrogen

11.8.64 The maximum predicted annual mean Proposed Development PC of $NO_x$ at a selected sensitive receptor is 1.3 µg/m$^3$ (4% of the Critical Level) and is predicted at Eco16.

11.8.65 The predicted annual mean Proposed Development PC of $NO_x$ is greater than 1% of the long-term benchmark or critical level at four of the selected sensitive receptors.

11.8.66 The predicted annual mean PECs of $NO_x$ are significantly below the Critical level at all selected sensitive receptors assessed.

11.8.67 The maximum predicted annual mean PEC of $NO_x$ at a selected sensitive receptor is 4.0 µg/m$^3$ (13% of the Critical Level) and is predicted at Eco16.

11.8.68 The predicted annual mean Proposed Development PEC of $NO_x$ is significantly lower than 70% of the long-term benchmark or critical level at all selected sensitive receptors.

### Hydrogen Fluoride[5]

*HF - Weekly Mean*

11.8.69 The predicted weekly mean PECs of HF are significantly below the Critical Level at all selected sensitive receptors assessed.

11.8.70 The maximum predicted weekly mean PEC of HF at a selected sensitive receptor is 0.05 µg/m$^3$ (9.8% of the Critical Level) and is predicted at Eco16.

11.8.71 The maximum predicted weekly mean Proposed Development PC of HF at a selected sensitive receptor is 0.05 µg/m$^3$ (9.8% of the Critical Level) and is predicted at Eco16.

11.8.72 The predicted weekly mean Proposed Development PC of HF is lower than 10% of the short-term benchmark; critical level at all selected sensitive receptors.

*HF - Hourly Mean*

11.8.73 The predicted hourly mean PECs of HF are significantly below the Critical Level at all selected sensitive receptors assessed.

11.8.74 The maximum predicted hourly mean PEC of HF at a selected sensitive receptor is 0.05 µg/m$^3$ (1% of the Critical Level) and is predicted at Eco16.

11.8.75 The maximum predicted hourly mean Proposed Development PC of HF at a selected sensitive receptor is 0.05 µg/m$^3$ (1% of the Critical Level) and is predicted at Eco16.

11.8.76 The predicted hourly mean Proposed Development PC of HF is lower than 10% of the short-term benchmark; critical level at all selected sensitive receptors.

### Nutrient Nitrogen Deposition

11.8.77 The maximum predicted Proposed Development PC of nutrient nitrogen deposition as a percentage of the Critical Load at a selected sensitive receptor is 0.88% and is predicted at Eco16.

11.8.78 The predicted Proposed Development PC of nutrient nitrogen deposition is lower than 1% of the long-term benchmark; critical load at all selected sensitive receptors.

11.8.79 The predicted PECs of nutrient nitrogen deposition are below the Critical Load at all selected sensitive receptors assessed.

11.8.80 The maximum predicted PEC of Nitrogen Nutrient as a percentage of the Critical Load at a selected sensitive receptor is 97.3% of the Critical Load and is predicted at Eco16.

11.8.81 The predicted PEC of Nitrogen Nutrient is greater than 70% of the long-term benchmark; critical load at seven selected sensitive receptors.

### Acid Deposition

11.8.82 The maximum predicted Proposed Development PC of acid deposition as a percentage of the Critical Load Function at a selected sensitive receptor is 3.32% and is predicted at Eco12.

[5] The generators do not emit any HF.

11.8.83 The predicted Proposed Development PC of acid deposition is greater than 1% of the long-term benchmark; critical load at four selected sensitive receptors.

11.8.84 The predicted PECs of Acid Deposition are above the Critical Load Function at 13 selected sensitive receptors.

11.8.85 The maximum predicted PEC of acid deposition as a percentage of the Critical Load Function at a selected sensitive receptor is 172.2% and is predicted at Eco12.

11.8.86 The predicted PEC of Nitrogen Nutrient is greater than 70% of the long-term benchmark; critical load at 15 selected sensitive receptors.

### Likely Significance of Effects at Ecological Receptors

11.8.87 The likely significance of effects at selected ecological receptors has been assessed using the criteria summarised in Table 11.8.

11.8.88 A summary table is provided in Technical Appendix 11.1 Annex 5.

11.8.89 The assessment of impacts at sensitive ecological receptors concludes that:

- The change in long-term critical level of $NO_x$ is predicted to be >1% at four selected receptors, therefore the PECs need to be considered. The PECs at these ecological receptors are predicted to be significantly below 70% of the $NO_x$ critical level and therefore it is concluded that there are no likely significant effects.
- The change in short-term critical levels of HF is predicted to be <10% at all selected receptors, therefore it is concluded that there are no likely significant effects.
- The change in long-term nutrient nitrogen deposition is predicted to be <1% at all selected receptors, therefore PECs do not need to be considered and it is concluded that there are no likely significant effects.
- The change in long-term acid deposition is predicted to be >1% at four selected receptors, therefore PECs need to be considered. PECs are predicted to be >70% of the relevant critical load for acid deposition at these four selected receptors.

11.8.90 With regard to acid deposition, the potential for likely significant effects has been identified at four sensitive receptors, namely:

- Eco12 - Siliceous rocky slopes with chasmophytic vegetation (H8220);
- Eco14 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) (H6230);
- Eco16 - Old sessile oak woods with Ilex and Blechnum in the British Isles (H91A0); and
- Eco17 - Northern Atlantic wet heaths with Erica tetralix (H4010).

11.8.91 As shown in Table 11.10, the baseline (current load) of acid deposition is >70% of the Critical Load Function at each receptor which indicates that the potential for likely significant effects already exists.

11.8.92 While the Proposed Development contributions are predicted to exceed the 1% criterion at Eco12, 14, 16 and 17, the potential for likely significant effects at these receptors is not caused by the small incremental change in acid deposition predicted at these locations due to the operation of the Proposed Development alone, (3.32% of the Critical Load Function), or in conjunction with the generators operating at their maximum permitted hours (5.82% of the Critical Load Function) at Eco12 (Refer to Technical Appendix 11.1 Annex 5).

*Table 11.10 Current Load and PEC as Percentage of Critical Load Function*

| Receptors ID | Current Load as Percentage of Critical Load Function | PEC as Percentage of Critical Load Function |
|---|---|---|
| Eco12 | 166.4% | 172.2% |
| Eco14 | 153.6% | 159.0% |
| Eco16 | 71.5% | 73.9% |
| Eco17 | 104.4% | 108.7% |

11.8.93 The PC acid deposition in keq/ha/year associated with the Proposed Development at these receptors has also been calculated to be between 2% and 45% lower than the acid deposition associated with the consented AWP as shown in Table 11.11. Overall, the Proposed Development will therefore result in a lesser effect at each receptor than that predicted for the previously consented AWP scheme.

*Table 11.11 AWP and Proposed Development: Comparison of Acid Deposition at Eco12, 14, 16, 17*

| Receptors ID | Consented AWP PC (keq/ha/year) | Proposed Development PC (keq/ha/year) |
|---|---|---|
| Eco12 | 0.0184 | 0.0179 (2% reduction) |
| Eco14 | 0.0184 | 0.0179 (2% reduction) |
| Eco16 | 0.0248 | 0.0208 (16% reduction) |
| Eco17 | 0.0306 | 0.0170 (45% reduction) |

11.8.94 Table 11.12 below provides the total area of H8220, H6230, H91A0 and H4010 habitats within the SAC and area where the Proposed Development Acid Deposition is greater than 1% of the relevant Critical Load Function.

*Table 11.12 Habitat Area Within the SAC where Proposed Development Acid Deposition are Greater than 1% of the Relevant Critical Load Function*

| Receptor | Total Area of the Habitat within the SAC (ha) | Total Area of the Habitat where Proposed Development Acid Deposition is >1% of Relevant CL Function (ha) | Total Area of the Habitat where Proposed Development Acid Deposition is >1% of Relevant CL Function as Percentage of the Total Area of the Habitat within the SAC |
|---|---|---|---|
| Eco12 - H8220 - Siliceous rocky slopes | 5,101.80 | 20.44 | 0.4% |
| Eco14 - H6230 - Species-rich Nardus grassland | 1,383.26 | 58.05 | 4.2% |
| Eco16 - H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | Unknown | Unknown | 0.02%<br>(7.85 ha)* |

| Receptor | Total Area of the Habitat within the SAC (ha) | Total Area of the Habitat where Proposed Development Acid Deposition is >1% of Relevant CL Function (ha) | Total Area of the Habitat where Proposed Development Acid Deposition is >1% of Relevant CL Function as Percentage of the Total Area of the Habitat within the SAC |
|---|---|---|---|
| | | | |
| Eco17 - H4010 - Wet heaths | 5,615.53 | 26.38 | 0.5% |

*The Habitat Map of Scotland (HabMoS) dataset does not include all areas of H91A0 and the location confirmed by NatureScot as Eco16 is not marked as H91A0 within the dataset. For Eco16 the percentage quoted above represents the total area of the SAC where the Proposed Development acid deposition is greater than 1% of the relevant critical load function.

11.8.95 It is therefore clear that the Proposed Development has the potential to only impact a small proportion of the H8220, H6230, H91A0 and H4010 habitats. This is further illustrated in Technical Appendix 11.1.

11.8.96 Based on the above analysis of potential ecological effects, the Proposed Development are not likely to result in measurable effects upon qualifying features of the Ben Nevis SAC. The effects of emissions associated with the Proposed Development are therefore assessed to be **minor adverse** and **not significant**.

### *Decommissioning*

11.8.97 Potential effects during decommissioning are the same as during constructions and are therefore as follows:

- Traffic generation: **negligible adverse** and **not significant**.
- Construction activities: **negligible adverse** and **not significant**.

## 11.9 Additional Mitigation

### *Construction*

11.9.1 A number of good practice and site-specific mitigation measures will be implemented during the construction phases to mitigate against potential dust nuisance and human health impacts. The good practice and site-specific mitigation measures are outlined in Technical Appendix 11.1, Annex 6.

11.9.2 These good practice and site-specific mitigation measures have been be included in the Construction Environmental Management Plan (Technical Appendix 3.1) and will be implemented during the construction phase.

### *Operation*

11.9.3 The AQIA includes the assessment of the impact of emissions from the Proposed Development that can be achieved with abatement technologies applied (Technical Appendix 11.1, Annex 2) to reduce emission concentrations to significantly below the BAT ELVS.

11.9.4 The potential for likely significant effects is predicted at four ecological receptors (Eco12, 14, 16 and 17) due to the predicted change in total acid deposition and the high baseline level of acid deposition, however, the predicted effects at these receptors are lower than those predicted for the consented AWP, even allowing all the conservative worst-case assumptions to be included.

11.9.5 Effects during the operational phase have been assessed to be negligible adverse at all selected human receptors and therefore no further mitigation measures are proposed.

## 11.10 Residual Effects

### *Construction & Decommissioning*

11.10.1 Experience in the UK is that good construction management is capable of mitigating the impact of fugitive emissions of particulate matter effectively. In all but the most exceptional circumstances, risk of dust impacts at receptors can be controlled to ensure that they are negligible or low at worst.

11.10.2 The risk of dust impacts associated with the Proposed Development construction and decommissioning activities once good practice and site-specific mitigation measures are implemented will therefore be **negligible adverse** and therefore **not significant**.

### *Operation*

11.10.3 Operational phase residual effects remain as described in Section 11.8.

## 11.11 Cumulative Assessment

### *Construction*

#### Construction Phase – Dust

11.11.1 A new Water Canning Plant on the Smelter site is proposed which will be covered by a separate planning application. It is anticipated that the building will be approximately 66 m length by 24 m width and height of 7 m to the eaves and 11 m to the ridgeline. As it is possible that this will be constructed before the Proposed Development, it has been included as part of the cumulative assessment.

11.11.2 Given that the nature of activities at the Water Canning Plant site would likely be very similar to those at the Proposed Development site, construction emissions are anticipated to be similar between the two developments. Whilst it is not anticipated that the construction stages of the Proposed Development and Water Canning Plant will overlap, it is noted that the robust assumptions made in the phase dust impact assessment are a positive indication that simultaneous construction activity would not result in significant emissions of dust.

#### Construction Phase – Traffic

11.11.3 Construction phase traffic numbers are below the IAQM & EUK criteria and therefore effects associated with the Proposed Development construction phase generated traffic will be **negligible adverse** and **not significant.**

Construction phase traffic numbers predicted for the potential Water Canning Plant are also below the IAQM & EUK criteria and therefore, in the unlikely event that the construction stages of the Proposed Development and Water Canning Plant overlapped, combined effects would remain negligible adverse and not significant.

### *Operation*

#### Operational Phase – Traffic

11.11.4 Operational phase traffic is below the IAQM & EUK criteria and therefore effects associated with the Proposed Development operational phase generated traffic will be **negligible adverse** and **not significant** when considered cumulatively with any other developments.

11.11.5 Road traffic movements associated with the potential Water Canning Plant are considered within the Traffic Assessment of the Proposed Development, and cumulative traffic emissions are therefore inherently considered as part of the operational traffic noise assessment.

### Operational Phase – Emissions to Air

11.11.6 The assessment has included contributions from existing sources by either modelling them explicitly (Smelter and Generators) or selecting conservative background concentrations to allow for process contributions from cumulative sources to be included in the calculations of the PEC.

11.11.7 The potential Water Canning Plant will not include any significant point source emissions to air and therefore cumulative effects arising from operation of the Water Canning Plant will be negligible.

11.11.8 Cumulative sources have therefore been considered as part of the assessment and assessment results are as reported in Section 11.9.3.

## 11.12 Summary

11.12.1 This chapter assesses the potential air quality impacts and resulting effects associated with the Proposed Development to be built and operated at the Applicant's Aluminium facility in Fort William within THC administrative area.

11.12.2 This chapter has been prepared with direct reference to an AQIA provided as Technical Appendix 11.1 which has included:

- A review of Proposed Development proposal, compilation of emission information and development of emissions inventories for the Proposed Development sources and existing emission sources within the wider site (Smelter and Generators);
- Consultation with SEPA and NatureScot and submission of a method statement to THC, SEPA and NS;
- Desktop review of baseline conditions and derivation of representative background concentrations at sensitive receptors;
- Desktop review of the study area and selection of sensitive receptors;
- Qualitative assessment of construction impacts;
- Screening assessment of road traffic impacts during both construction and operational phases;
- Detailed dispersion modelling of proposed and existing process emissions and assessment of impacts upon human and ecological receptors;
- Derivation of the significance of predicted effects in accordance with relevant guidance.

11.12.3 The AQIA has been undertaken to assess compliance with relevant EALs and assess the potential impacts associated with the change in pollutant concentrations. The AQIA has been undertaken in accordance with relevant guidance documents.

11.12.4 Detailed dispersion modelling using the ADMS5 modelling software was undertaken to predict pollutant concentrations due to emissions from the Proposed Development, Smelter, Generators, and existing background concentrations, at existing sensitive human and ecological receptor locations within the study area.

11.12.5 A number of sensitivity analyses have been undertaken to minimise modelling uncertainty and numerous conservative assumptions have been made to ensure that the AQIA is based on the worst-case scenario.

11.12.6 ADMS5 modelling results have also been compared to AERMOD modelling results and abnormal operations and their potential impacts have been considered.

11.12.7 A number of mitigation measures have been included in the Proposed Development design to minimise any potential impacts associated with construction and operational phases including:

- Emission reduction compared to BAT ELVs of:
  - 90% for HCl at BP2Large and Small;
  - 81% for $NO_x$ at BP2Large and 80% at BP2Small;
  - 33% for CO at BP2Large and 67% at BP2Small;
  - 33% for TVOC at BP2Small.
- Good-practice mitigation measures and site-specific mitigation measures outlined in Technical Appendix 11.1, Annex 6 to be adopted to minimise identified risks during the construction phase.

11.12.8 The AQIA was based on the following conservative assumptions:

- The AQIA is based on the highest predicted concentrations over the five years of meteorological data considered (2016-2020).
- The AQIA has used Tulloch Bridge WMO Station rather than Aonach Mor WMO Station resulting in the worst-case predicted concentrations at receptors within the Ben Nevis SAC being significantly higher. It can however be argued that Aonach Mor WMO Station is more representative of the meteorological conditions at some habitat locations at higher altitude on Ben Nevis, and therefore PCs will be lower than those included in the AQIA at some receptors.
- The AQIA has used conservative background concentrations in Fort William without any sector-removal, therefore the PECs will in some places double account for the contributions from the Smelter and/or Generators.
- PEC concentrations include contributions from the generators operating at their permitted number of hours (500 hours per year), however, to date, the generators have not operated for more than 50 hours per year. It should also be noted that the Applicant is currently considering decommissioning these generators.
- Emissions from the existing Smelter have been modelled at permitted ELVs whereas, recent monitoring shows that the Smelter emissions are routinely lower than permitted ELVs.
- Emissions from the Smelter have been modelled as continuous 24/7 emissions, whereas several sources operate in day-shift hours only and for less than 7 days per week.
- Emissions from the Proposed Development have been modelled as continuous 24/7 emissions. It is likely that there will be periods when not all furnaces are operational simultaneously, depending on production rates.
- The emissions from the proposed development have been calculated assuming 100,000 tonnes of billet production per annum using 100% recycled material. Depending on the product specification and availability of recycled material, there will be a portion of primary aluminium from the Smelter used in the billet production, therefore reducing the emissions from the melting furnaces.
- The $SO_2$ release rate for the Smelter has been calculated based on the permitted maximum production value of 47,500 T per year and $SO_2$ permit limit of 15 kg/t.
- Emissions of Dioxins/Furans and TVOCs from the Proposed Development have been included, modelled at BAT ELVs, and assessed against the most stringent criteria,

however it is considered that the risk of these emissions arising from the process is low and the predicted effects are a significant over-estimate.

11.12.9 The conclusions of this chapter are that:

- Impacts associated with the change in traffic flows associated with the Proposed Development construction and operational phases are **negligible adverse** and therefore **not significant**.
- Unmitigated construction phase dust impacts have been assessed as Low, resulting in minor adverse and therefore not significant effects. The good-practice mitigation measures and site-specific mitigation measures outlined in Technical Appendix 11.1, Annex 6 will be adopted to minimise identified risks such that the residual effect of dust is **negligible adverse** and therefore **not significant**. These will be included in a Construction Environmental Management Plan (CEMP) submitted by the contractor to the local authority for approval prior to the commencement of any works.
- PECs at human receptors are below the relevant EALs.
- The changes in pollutant concentrations at selected human receptors associated with the Proposed Development only are predicted to result in **negligible adverse** effects and are therefore concluded to be **not significant**.
- Potential effects of Dioxins/Furans have been compared with the TDI and are concluded to be **not significant.**
- The change in long-term critical level of $NO_x$ is predicted to be greater than 1% at four selected receptors, therefore the PECs need to be considered. The PECs at these ecological receptors are significantly below 70% of the $NO_x$ critical level and therefore it is concluded that there are **no likely significant effects** of airborne $NO_x$.
- The change in short-term concentration of HF is predicted to be <10% of the critical level at all selected receptors, therefore it is concluded that there are **no likely significant effects**.
- The change in long-term nutrient nitrogen deposition is predicted to be <1% of the critical load at all selected receptors, therefore PECs do not need to be considered and it is concluded that there are **no likely significant effects**.
- The change in long-term acid deposition is predicted to be >1% at four selected receptors, therefore PECs need to be considered. PECs are greater than 70% of the relevant critical load for acid deposition at these four selected receptors.
- For these four ecological receptors (Eco12, 14, 16 & 17), the calculated change in long-term acid deposition is predicted to result in the potential for likely significant effects.
- The PC acid deposition associated with the Proposed Development at these receptors is however between 2% and 45% lower than the PC acid deposition calculated for the previously consented AWP. Overall, even allowing for all the conservative assumptions, the Proposed Development is predicted to result in a lower impact compared to that calculated for the consented scheme.
- Where the potential for likely significant effect has been predicted, the area of the affected habitat is predicted to be small (between 0.02% and 4.2%).
- The Proposed Development contributions while exceeding the 1% criterion at Eco12, 14, 16 and 17 do not cause any exceedances of the critical load function or the 70% criterion. The baseline critical load is already >70% of the Critical Load Function at all four locations.
- Based on the detailed analysis of potential ecological effects, the Proposed Development is not likely to result in measurable effects upon the Ben Nevis SAC. The

effects of emissions associated with the Proposed Development are therefore assessed to be minor adverse and not significant.

## 11.13 References


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# Chapter 12 Climate Change

# 12. Climate Change

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## 12.1 Introduction

12.1.1 This chapter presents a Climate Change Impact Assessment (CCIA) through evaluating the potential impact of the construction and operation of the Proposed Development on climate change due to its greenhouse gas emissions (GHG), as well as assessing the vulnerability of the Proposed Development to climate change.

12.1.2 CCIA is a requirement of the European Commission (EC) Environmental Impact Assessment (EIA) Directive 2014/52/EU1 which was transposed into Scottish legislation through The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (Scottish Government, 2017) .

12.1.3 This assessment establishes the climate change baseline for the Fort William area by providing an overview of the 30-year climate averages for the period 1981-2010 from the Met Office Historic Climate Data service (Met Office, 2021)).

12.1.4 The climate resilience element of the assessment of potential effects considers the impact of climatic variables such as wind speed, precipitation and temperature and evaluates significant climate change risks on the construction and operation of the Proposed Development over its design life based on Met Office projections out to 2080.

12.1.5 An assessment of the potential effects of the Proposed Development has been carried out, in terms of the greenhouse gases which will be released with consequent impacts on global climate change. The construction and operational phases will have an impact on climate change due to GHG emissions resulting from the embodied carbon of construction materials, construction waste, transportation, and electricity and fuel consumption. A reasonable worst-case scenario for carbon emissions associated with the Proposed Development has been quantified through a greenhouse gas assessment.

12.1.6 Following the identification of potential effects, suitable mitigation measures have been proposed, and an assessment of residual effects on environmental receptors sensitive to climate change has been undertaken.

## 12.2 Legislation, Policy and Guidelines

### *Legislation*

12.2.1 Relevant legislation and guidance documents have been reviewed as part of this climate change assessment. Of particular relevance are:

**Climate change:**

- The Climate Change (Scotland) Act 2009 which required ministers to establish Scotland's programme for climate change adaptation (Scottish Government, 2009);
- The Paris Agreement 2015 which sets a target for net zero global carbon emissions in the second half of the 21st century to limit the global temperature increase to less than 2°C above pre-industrial levels. A key aim of this agreement is to strengthen national responses to combat climate change and adapt to its effects. The Paris Agreement was ratified by the UK in 2016 (UNFCCC, 2015);
- Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 which sets Scottish targets for the reduction of GHG emissions to deliver on the Paris Agreement, and makes provision about advice, plans and reports in relation to those

targets. The Act sets an interim 56% reduction target for 2020 and a Net Zero target for 2045 (Scottish Government, 2019); and,

- Scottish Government Climate Change Plan (CCP) (2018-2032) which is a roadmap for Scotland to transition to a low carbon economy. The plan sets out how Scotland will reduce emissions by 66% over the period to 2032 (Scottish Government, 2018).

**Environmental Impact Assessment:**

- The European Union Environmental Impact Assessment Directive which requires projects with the potential to significantly impact on the environment and communities to conduct a formal assessment of these effects (European Commission, 2011);
- The Environmental Impact Assessment (EIA) Directive (2014/52/EU) entered into force on 15th May 2015. This amendment broadened the scope of EIAs to encompass areas such as resource efficiency, climate change and disaster prevention. It requires that EIAs identify, describe and assess the direct and indirect significant effects of climate change relevant to the project (i.e. carbon, climate change resilience and in-combination climate change impacts) (European Commission, 2014)); and,
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 introduced the need to consider climate as part of EIAs in Scotland.

### *Planning policy*

12.2.2 The following policies have been taken into consideration:

- Scottish Government Climate Change Plan (CCP) (2018-2032) sets out how Scotland will continue to improve resilience to climate change and reduce emissions over the period to 2032;
- National Policy Framework 4 Position Statement (Scottish Government, 2020), which contains a raft of measures which will influence net-zero policymaking in the 2020s;
- The Highland-Wide Local Development Plan (The Highland Council , 2012), notably the climate chapter although focussed on renewable energy and energy from waste developments; and Policy 28 on Sustainable Design; and
- The West Highland Local Plan (WestPlan) (The Highland Council, 2019) was also reviewed, notably Section 2.1 on Fort William where the opportunity for diversification of activities at the smelter site are noted but no specific climate policies made.

### *Guidance*

12.2.3 The following guidance has also been consulted:

- 2015 IEMA guidance on Climate Resilience and Adaptation in EIA (IEMA, amended in 2020) provides a framework for the effective consideration of climate change resilience and adaptation through EIA procedures. It includes case studies of EIAs which have considered climate adaptation and resilience issues, reflecting legislative developments and evolving practice; and
- IEMA Principles Series – Climate Change Mitigation and EIA (IEMA, 2010).

## 12.3 Consultation

12.3.1 The proposed scope and methodology for this chapter has been presented to The Highland Council (THC) in February 2021 as part of pre-planning consultation.

## 12.4 Assessment Methodology and Significance Criteria

12.4.1 The following assessments have been undertaken as part of this CCIA in terms of the Proposed Development:

- GHG assessment to evaluate the potential effects of the Proposed Development on climate change;
- An assessment of potentially significant climate change variables on the Proposed Development; and,
- The residual effects on environmental receptors sensitive to climate change.

### *Study Area*

12.4.2 The study area for the assessment of the potential climate change effects on the Proposed Development is restricted to the Proposed Development boundary and the transport network utilised for the transport of large volume arisings. Adverse effects associated with climate change are likely to be in the medium to long term and so the focus will be on the operational stage.

12.4.3 The scope of the GHG assessment includes the boundary of the Proposed Development, the transport used for the disposal of spoil, and the embodied carbon associated with construction materials. GHG emissions arising throughout the construction programme have been estimated, as well as the emissions arising from an annual period of operation. The assessment of operational emissions of the Proposed Development includes emissions from activities powered by both natural gas and electricity.

12.4.4 Transport emissions from the delivery of materials during construction and from staff travel and product logistics during operation have not been assessed due to high uncertainties over travel distances. Previous experience with GHG assessments suggests that this contribution will be very small in the context of an operational industrial development with thermal processes.

### *Assessment Methodology*

#### Resilience

12.4.5 An assessment has been undertaken of current and future climate trends at the site of the Proposed Development, including mean air temperature, wind speed and precipitation rate. The following sources were used to characterise existing or future baseline conditions:

- Met Office UK Climate Averages (Met Office, 2021);
- UKCP18 Climate Projections (Met Office, 2018); and,
- UK local authority and regional carbon dioxide emissions national statistics (BEIS, 2019).

#### Mitigation

12.4.6 A further assessment has been made of the anticipated GHG emissions from the construction and operation of the proposed development.

12.4.7 The assessment methodology is a streamlined version of the World Bank Centre of Sustainable Development and Word Resource Institute Greenhouse Gas Project Protocol (referred to hereafter as the GHG Protocol) (WBCSD/WRI, 2003). An inventory of emissions for the construction phase was developed, focussing on historic embodied emissions from bulk construction materials;

accompanied by a corresponding inventory for the operational phase based on the annualised energy consumption estimates provided by Alvance.

12.4.8 The GHG Protocol classifies emissions into Scopes, which is a useful approach for this assessment:

- Scope 1 emissions are direct emissions of GHGs from the project, i.e. from combustion of fossil fuels such as natural gas and diesel;
- Scope 2 emissions are indirect emissions of GHG caused by the use of grid electricity by the project and hence necessitating combustion of fossil fuels by gas and coal-fired electricity generating installations outside the project's physical boundary; and
- Scope 3 emissions are from the supply chain; in this case the embodied emissions of GHG from the production of bulk building materials, particularly concrete and steel.

### Scope 1

12.4.9 Emissions from the combustion of fossil fuels during construction by plant and machinery have been estimated based on previous research undertaken by ITPEnergised.

12.4.10 Estimated emissions from the combustion of fossil fuels (exclusively fuel gas used by furnaces imported to site as Liquified Petroleum Gas (LPG) and subsequently aspirated to produce substitute natural gas (SNG) during the operation of the proposed development are included based on opening year (2022) and subsequent year production rates provided by the Applicant.

### Scope 2

12.4.11 Electricity usage estimates based on opening year (2022) and subsequent year production rates were also provided by the Applicant. The neighbouring smelter facility was originally established to take advantage of the reliable clean energy provided by the Lochaber Hydroelectricity Station which remains the case to the present day. The Applicant has estimated that on average 84% of the smelter electrical supply is from hydro with the remainder imported from the grid during low flow episodes following dry weather. The same proportion of hydro to grid electricity usage is assumed for the Proposed Development; there is generally spare capacity from the hydro plant which is otherwise exported to the grid and can be diverted to power the Proposed Development.

### Scope 3

12.4.12 Quantities of bulk materials were estimated from the dimensions of the proposed development. Embodied carbon data for the materials were taken from the Bath University Inventory of Carbon Emissions (Circular Ecology, 2019).

12.4.13 Structural steel quantities were based on the building footprint (12,600 $m^2$) and the high end of a ranges published in the public domain (Building.co.uk, 2011) of 50 kg per square metre of gross internal floor area (GIFA).

12.4.14 Cladding and roofing steel was estimated from building dimensions with an assumed 0.5 millimetre profile. Polyurethane foam insulation with a 110 mm profile is assumed for walls and 80mm for roofing.

12.4.15 Concrete pour was estimated based on the slab dimension (assumed identical with the building footprint at 12,600 $m^2$) and a 0.25 m slab thickness.

### Scenarios

12.4.16 Scope 1, 2 and 3 emissions were estimated for a base, do-nothing case where no GHG mitigation other than that afforded by national policy measures were included.

12.4.17 A do-something case was developed representing an inventory of Scope 1, 2 and 3 emissions following the adoption of primary mitigation measures.

### *Assessment of Potential Effect Significance*

12.4.18 For the purposes of this CCIA, two assessments of potential effect significance have been carried out, a GHG assessment to evaluate the potential effects of the Proposed Development on climate change and an assessment of potentially significant climate change impacts on the Proposed Development.

12.4.19 Under the EIA regulations, it is necessary to evaluate the sensitivity of the receptor, the significance of effect and the magnitude of the impact, based on the subjective judgement of the assessor. The terminology used in the CCIA is consistent with other chapters of the EIA Report and has been defined below.

#### Sensitivity

12.4.20 An evaluation of the sensitivity of the Proposed Development in terms of climate change and the sensitivity of the global atmospheric environment as the receiving body for GHG emissions, was undertaken using the following terminology:

- High Sensitivity - Absolutely reliant on specific climate/global atmospheric conditions prevailing;
- Medium Sensitivity - Affected by changes in climate/global atmospheric conditions but not dependent on specific conditions; and
- Low Sensitivity - Hardly influenced by climate/global atmospheric conditions at all.

12.4.21 The sensitivity of the receiving atmosphere is considered high on a precautionary basis. The sensitivity of the Proposed Development to climate change impacts is considered medium inasmuch as some adverse effects are possible but resilience can be managed by design.

### *Magnitude of impact*

12.4.22 The magnitude of the impacts on baseline conditions has been assessed in terms of resilience and GHG emissions, and the following terminology has been used to define magnitude:

- High - A fundamental change (positive or negative) to the baseline condition of the receptor, leading to total loss or major alteration of character. An impact on regional GHG emissions which causes a large net increase;
- Medium - A material change (positive or negative) leading to partial loss or alteration of character. An impact on regional GHG emissions which causes an appreciable net increase;
- Low - A slight, detectable, alteration of the baseline condition which may be positive or negative. An impact on regional GHG emissions which causes a measurable net increase; and
- Negligible - A barely distinguishable change from baseline conditions. Changes in GHG emissions so low as to not be practically measurable.

#### Significance of effect

12.4.23 Based on the sensitivity of receptors and magnitude of impact, the significance of effect has been evaluated in terms of resilience and GHG emissions using professional judgement. Under environmental impact assessment legislation, major and moderate impacts are to be considered as significant:

- Major - A significant effect that is likely to be a material consideration in its own right. GHG emissions which represent a major proportion of regional totals;
- Moderate - A significant effect that may be a material consideration in combination with other significant effects but is unlikely to be a material consideration in its own right. GHG emissions which represent a recognisable change in regional totals;

- Minor - An effect that is not significant but may be of local concern. GHG emissions which though measurable do not materially affect regional totals; and
- Negligible - An effect that would result in no change to the existing environment.

### *Requirements for Mitigation*

12.4.24 Standard mitigation measures must be implemented to lessen the impact of potentially significant climate effects on the Proposed Development, these have been outlined in Section 12.7.

12.4.25 IEMA best practice guidance considers all GHG emissions to be significant due to their contribution towards climate change. To mitigate against potential significant effects, a baseline GHG inventory should be developed and then used as a basis to reduce emissions. The specific interventions are described in Section 12.9.

### *Limitations to Assessment*

12.4.26 The principal limitations and sources of uncertainty are:

- Natural climate variability resulting from natural external influences on climate or changes in the energy received from the sun;
- Climate models which represent a developing but incomplete understanding of Earth system processes;
- Assumptions, estimates and exclusions arising from practicalities of data collection and analysis for the GHG emissions resulting from the construction phase; and
- Uncertainty in estimating the quantities of future GHG emissions resulting from the Proposed Development.

## 12.5 Baseline Conditions

#### Climatic conditions

12.5.1 The Tulloch Bridge meteorological observation station is located approximately 20 kilometres east of the Proposed Development site and is the geographically closest meteorological station for which suitable historic data exists. It is unlikely to be totally representative of conditions at the Proposed Development which is likely to be more influenced by maritime conditions. The best fit is considered to be Dunstaffnage, which although around 50 km southwest of the Proposed Development is situated on the west coast.

12.5.2 Dunstaffnage data from 1981-2010, which is the baseline period used by the Met Office for comparison with future predictions, is collected and discussed below.

- The Dunstaffnage observation station recorded an average annual maximum temperature of 12.4°C, 1.7°C higher than the average annual minimum temperature for Scotland (10.7°C).
- The average annual minimum temperature of 6.3°C was 2.1°C warmer than the average annual minimum temperature for Scotland (4.2°C).
- An annual average of 1,219.4 mm of rain was recorded by the Dunstaffnage observation station. This is significantly less than the average annual rainfall for Scotland between 1981-2010 which stands at 1,570.9 mm.
- The monthly mean wind speed at 10 m is 8.2 knots; there is no national comparator.

*Table 12.1 Climate averages 1981-2010 recorded by Tulloch Bridge Observation Station*

| Month | Maximum temperature (°C) | Minimum temperature (°C) | Days of air frost (days) | Rainfall (mm) | Days of rainfall ≥1 mm (days) | Monthly mean wind speed at 10 m (knots) |
|---|---|---|---|---|---|---|
| January | 5.5 | -0.3 | 14.3 | 248.3 | 19.5 | 8.5 |
| February | 5.7 | -0.5 | 14 | 174.8 | 15.9 | 7.8 |
| March | 7.4 | 0.9 | 11.5 | 183.7 | 19.7 | 7.8 |
| April | 10.3 | 2.3 | 7.6 | 96.8 | 14.7 | 6.5 |
| May | 13.8 | 4.4 | 3.7 | 84.6 | 14.6 | 6 |
| June | 15.7 | 7.4 | 0.4 | 77 | 13.6 | 5.9 |
| July | 17.4 | 9.7 | 0 | 88.5 | 15.6 | 5.5 |
| August | 16.9 | 9.3 | 0.1 | 107.4 | 15.4 | 5.3 |
| September | 14.5 | 7.2 | 1.2 | 140.1 | 16.5 | 5.8 |
| October | 11 | 4.8 | 3.9 | 201.5 | 20 | 6.6 |
| November | 7.8 | 2.1 | 9 | 205.5 | 19.3 | 6.4 |
| December | 5.6 | -0.7 | 14.8 | 201.2 | 16.8 | 6.6 |
| **Annual** | **11** | **3.9** | **80.5** | **1809.4** | **201.5** | **6.5** |

*Table 12.2 Climate averages 1981-2010 recorded by Dunstaffnage Observation Station*

| Month | Maximum temperature (°C) | Minimum temperature (°C) | Days of air frost (days) | Rainfall (mm) | Days of rainfall ≥1 mm (days) | Monthly mean wind speed at 10 m (knots) |
|---|---|---|---|---|---|---|
| January | 7.3 | 2.3 | 7.1 | 33.3 | 19.9 | 9.9 |
| February | 7.5 | 2.3 | 6.2 | 62 | 16 | 9.9 |
| March | 9 | 3.2 | 4 | 89.2 | 18.8 | 9.5 |
| April | 11.5 | 4.6 | 2 | 143.6 | 13 | 7.9 |
| May | 14.7 | 6.9 | 0.4 | 191 | 12.8 | 7.4 |
| June | 16.5 | 9.3 | 0 | 170.3 | 13 | 7 |
| July | 17.9 | 11.2 | 0 | 137.5 | 15.1 | 6.6 |
| August | 17.8 | 11.2 | 0 | 137.7 | 16.1 | 6.6 |
| September | 15.7 | 9.7 | 0 | 98 | 16.8 | 7.6 |
| October | 12.8 | 7.4 | 0.4 | 76.5 | 19.4 | 8.5 |

| Month | Maximum temperature (°C) | Minimum temperature (°C) | Days of air frost (days) | Rainfall (mm) | Days of rainfall ≥1 mm (days) | Monthly mean wind speed at 10 m (knots) |
|---|---|---|---|---|---|---|
| November | 9.8 | 4.7 | 2.8 | 45.9 | 19.1 | 9.3 |
| December | 7.7 | 2.6 | 7.5 | 34.4 | 17.7 | 8.8 |
| **Annual** | **12.4** | **6.3** | **30.4** | **1219.4** | **197.6** | **8.2** |

### 12.5.1 GHG Emissions Baseline

12.5.2 Local and Regional carbon dioxide ($CO_2$) emissions data tables published by the UK Government (BEIS, 2020) contain historic emissions data up to 2018 for all UK local authorities and councils. The total emissions and emissions per capita from the THC administrative area are 190,200 tonnes of $CO_2$ equivalent and 807 tonnes per person per year.

12.5.3 The emissions totals are comprised of subtotals for industrial and commercial, domestic, transport and land use. For context, the THC area has a strongly negative and much larger than average offset from land use and land use change factors (LULUCF), presumably as a result of afforestation and peat management programmes among other contributors. The LULUCF subtotal for 2018 was -1,550,100 tonnes of $CO_2$ equivalent; the three other subtotal areas amount to 1,740,300 tonnes. This gives an average of 7,390 tonnes per person per year which is much closer to the Scottish average of 6,000 tonnes without LULUCF and 5,300 tonnes with.

12.5.4 THC's high LULUCF offsetting means assessing emissions from the Proposed Development against the catchment total does not represent a fair comparison. The industrial and commercial sectors subtotal for 2018 is instead used as a measure of significance for emissions from the Proposed Development in this assessment; this is estimated by BEIS at 659,000 tonnes per year. This way a source of industrial emissions can be assessed in the context of the gross industrial emissions from the THC catchment area.

12.5.5 The site-specific baseline for the Proposed Development can currently be considered as zero as there are no sources of GHG emissions present.

### *Future baseline*

12.5.6 Climate projections for the period 2061-2080 have been analysed to account for changing conditions over period covering the potential later life of the Proposed Development.

12.5.7 Representative Concentration Pathway 8.5 (RCP 8.5) was utilised to capture the worst-case-scenario future trends. RCP 8.5 represents a pathway in which global population doubles to 12 billion, technology development and GDP growth is slow, and high fossil fuel consumption is sustained. This scenario assumes a culmination in radiative forcing levels of 8.5 $W/m^2$ by 2100.

12.5.8 The climate variables considered relevant to this assessment are mean air temperature, maximum air temperature, wind speed and precipitation.

12.5.9 The future baseline data is presented as a series of 12 thumbnail maps each representing a "member". Each member represents a plausible future climate scenario, with the ensemble members differing due to natural climate variability and uncertainty in global model physics. The 12 members therefore display the range of uncertainty in climate projections.

12.5.10 In general, the trends become more pronounced over time with more extreme trends arising by 2080.

### Air Temperature

12.5.11 According to the scenario modelled, there is predicted to be an increase in mean air temperature at the site of the Proposed Development. For the period 2061 - 80, the annual mean air temperature is projected to be up to 3°C - 4°C higher than the 1981-2010 average according to 75% of member scenarios. This is shown in Figure 12.1.

12.5.12 An identical trend is predicted for the maximum air temperature anomaly by the same proportion of the member scenarios as shown in Figure 12.2

The baseline mean maximum temperature recorded at Dunstaffnage is 17.9°C for the month of July (see Table 12.2 above). The average maximum temperature over the baseline period is slightly higher than the Scottish UK average maximum temperature of 16.6°C for the month of July, suggesting on the basis of the climate scenario modelled that maximum temperatures expected at the Proposed Development site will be correspondingly above the national average.

*Figure 12.1 Annual Average Mean Air Temperature Variation 2061-2080*

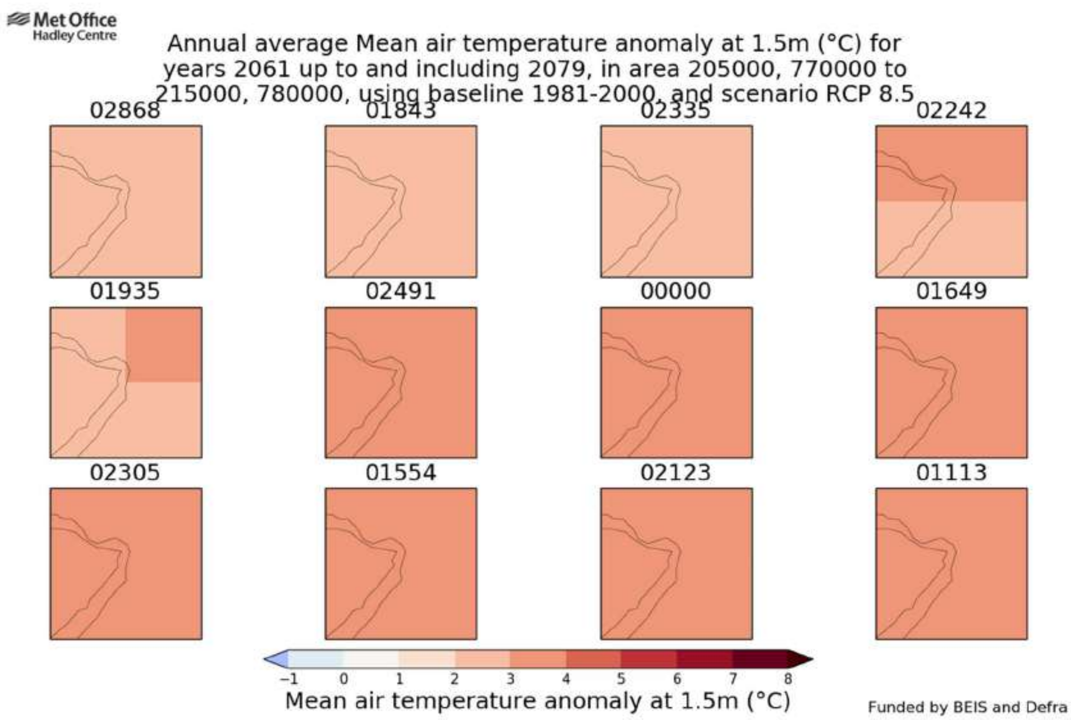
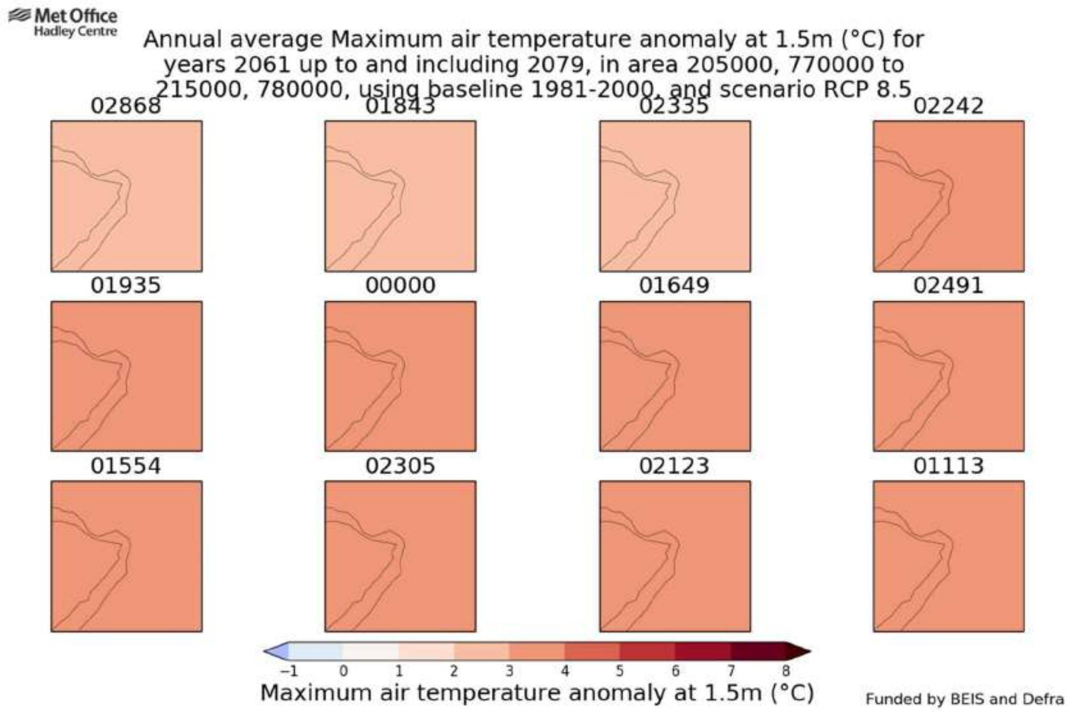


*Figure 12.2 Maximum Average Mean Air Temperature Variation 2061-2080*




### Wind Speed

12.5.13 In 10 of the 12 member scenarios covering the 2061-2080 periods the annual average wind speed is predicted to be between 0-0.5 m/s lower than the 1981-2010 baseline levels as shown in Figure 12.3.

12.5.14 The baseline monthly mean wind speed at 10 m at Dunstaffnage is 8.2 knots, which according to the modelled scenario results could decrease to as low as 7.2 knots (0.5 m/s is approximately one knot). No national data for comparison are available.

12.5.15 Gust speeds are generally expected to follow the same magnitude of slight decrease as shown in Figure 12.4.

*Figure 12.3 Annual Average Mean Wind Speed Variation 2061-2080*

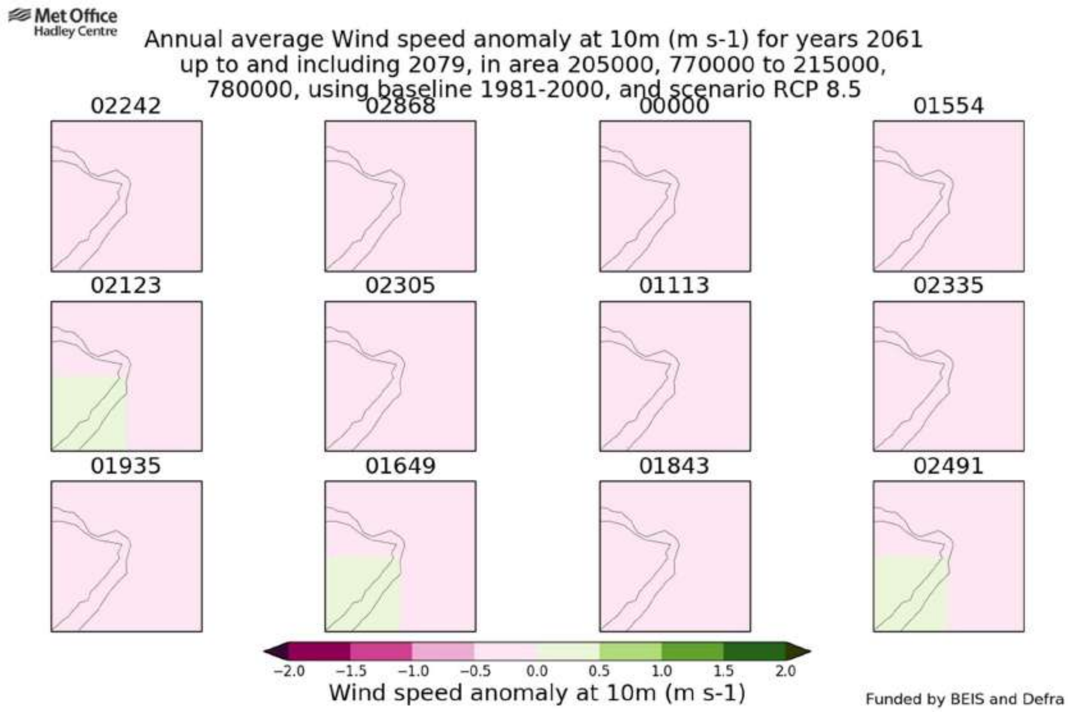
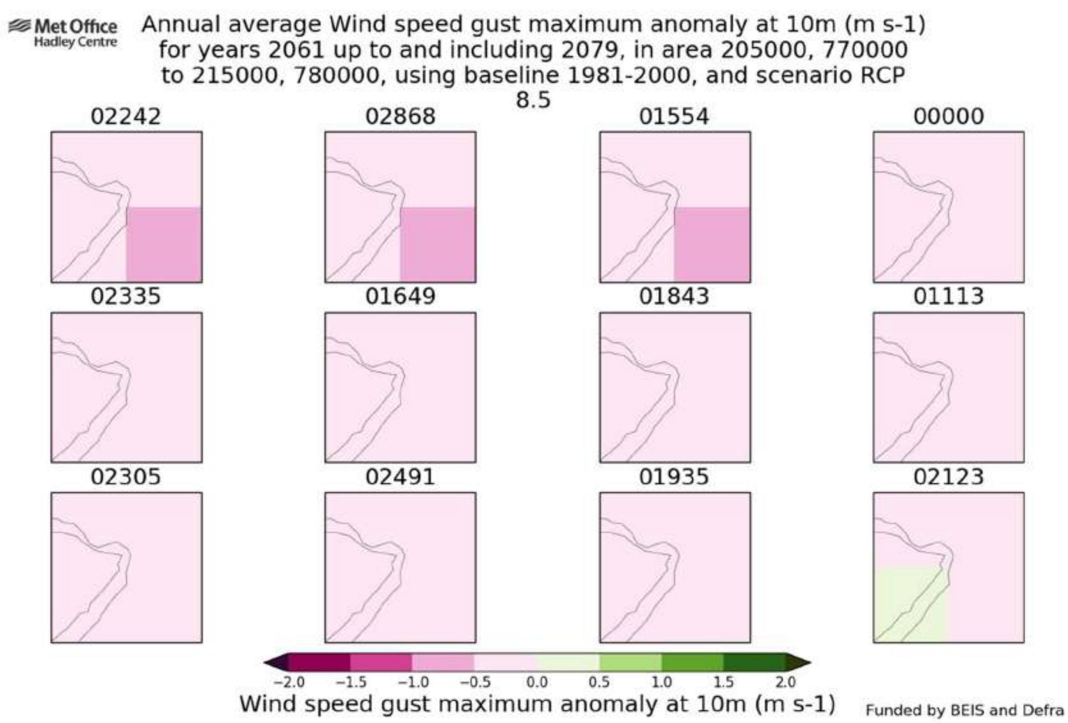



*Figure 12.4 Annual Average Maximum Gust Speed Variation 2061-2080*

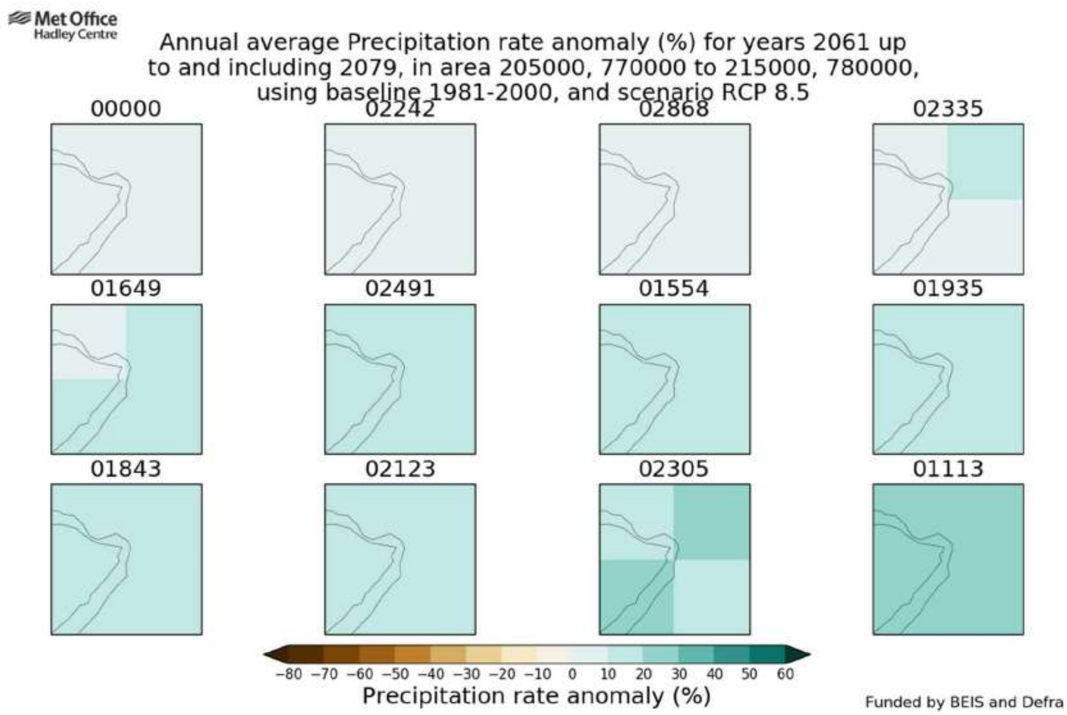


### Precipitation Rate

12.5.16 All member scenarios covering the 2061-2080 periods predict an increase in the annual average rainfall, with the majority returning an increase of 10-20% above the 1981-2010 baseline levels as shown in Figure 12.5.

12.5.17 The baseline annual mean rainfall rate at Dunstaffnage is 1787 mm, which according to the modelled scenario results could increase by up to a further 360 mm. The baseline rainfall at Dunstaffnage is above the Scottish national average of 1571 mm.

*Figure 12.5 Annual Average Mean Rainfall Variation 2061-2080*




## 12.6 Receptors Brought Forward for Assessment

12.6.1 The sensitive receptors in the instance of this climate change assessment are the Proposed Development itself in terms of climate vulnerability and the global atmospheric environment as the receiving body for GHG emissions. No individual receptors have been selected for assessment.

## 12.7 Standard Mitigation

### Resilience

12.7.1 The potential increases in temperature, wind speed and precipitation modelled under the conservative RCP 8.5 scenario are expected to be accommodated within the current structural tolerances of the Proposed Development's design.

12.7.2 A range of standard mitigation measures will be implemented to lessen the impact of potentially significant climate effects on the Proposed Development:

- Dust is likely to be generated during the construction phase and the magnitude will be exacerbated by hot and dry weather conditions, hence a Construction Dust Assessment has been carried out to determine the impact magnitude and sensitivity of receptors and to propose targeted mitigation recommendations.

- A comprehensive drainage system will be implemented to mitigate flood risk during the construction and operation of the Proposed Development.
- Site activities during the construction and operational phases will be suspended during extreme weather events to mitigate against health and safety risks for site personnel and potential damage to structures and equipment.
- Construction and site personnel must be provided with appropriate personal protective equipment (PPE) to mitigate against the health and safety risks posed by extreme weather. For example, eyewear to mitigate against the health effects of dust mobilisation in high winds.
- The Applicant is seeking to maximise the local economic impact of the Proposed Development whilst simultaneously reducing the GHG emissions by sourcing goods and services from local suppliers where possible. This measure will reduce GHG emissions resulting from the transportation of personnel and goods in the construction and operational phases.
- A Peat Management Plan has been developed to prevent any extracted peat from drying and degrading before re-use and hence emissions due to breakdown of organic matter from the extracted peat are expected to be minimal. The aim of the Peat Management Plan will be to improve the condition of damaged peatland within the Applicant's site ownership boundary and provide an improvement in comparison to the current baseline. Blanket mire restoration on the site of former conifer plantations will be the principal use.

#### Greenhouse gases

12.7.3 The UK Government's policies on grid electricity decarbonisation are expected to mean a reduction in GHG emissions intensity over the 2020s and 2030s, reducing to around 70g $CO_2e$/kWh by 2040 (BEIS, 2020). Indirect emissions from the import of grid electricity will reduce proportionately. Emissions from imported LNG are likely to remain at current intensity unless exporting nations adopt policies around biomethane and/or hydrogen blending.

12.7.4 GHG emissions from road transport will gradually reduce over the lifetime of the Proposed Development with increasing market penetration of battery electric and hydrogen fuel cell vehicles.

## 12.8 Potential Effects

### *Effects of climate change on the development*

#### Air temperature

12.8.1 The annual mean and maximum air temperature could increase by up to 4°C by 2080 under the climate scenarios assessed. This may have some effects on the operation of the plant but is unlikely to materially affect the building fabric, and is assessed as a **low** impact of **minor** significance

#### Wind speeds

12.8.2 Average wind and gust speeds are expected to reduce slightly by 2080 under the climate scenarios assessed. This is assessed as a **negligible** impact of **negligible** significance.

#### Precipitation

12.8.3 Precipitation is expected to increase slightly by 2080 under the climate scenarios assessed but not beyond the design capacity of the Proposed Development to receive and drain. This is assessed as a **low** impact of **negligible** significance

### *Influence of the development on climate change*

12.8.4 An assessment of the likely GHG emissions resulting from the Proposed Development has been undertaken in accordance with the methodology specified in Section 12.4 above.

12.8.5 A number of input parameters were required in order to quantify the carbon footprint, these are specified in Table 12.3.

12.8.6 Emissions factors were obtained primarily from two main sources, the UK Government GHG Conversion Factors for Company Reporting (Defra, 2020) and The Bath Inventory of Carbon and Energy (Uni. Bath, 2011). A full overview of the specific values and sources of emissions factors and benchmarks is provided in Technical Appendix 12.1.

*Table 12.3 GHG Assessment Boundaries*

| Source of GHG Emissions | Phase of Development | Input Data | Emissions Factor Source | Description |
|---|---|---|---|---|
| Embodied GHG emissions | Construction | Mass of construction material | The Bath Inventory of Carbon and Energy | GHG emissions emitted during the production of building materials |
| Waste Disposal | Construction | Mass of construction waste | UK Government GHG Conversion Factors for Company Reporting | GHG emissions caused by construction waste disposal |
| Construction machinery | Construction | Duration and construction footprint | ITPE research-based GHG emissions per unit area factor | GHG emissions from diesel powered plant and machinery during construction |
| On-site electricity and gas consumption | Operation | Projected usage advised by the Applicant | BEIS Energy and Emissions Projections 2019 | GHG emissions caused by electricity and gas consumption of buildings on site |
| Transport of spoil | Construction | Distance travelled by HGV | UK Government GHG Conversion Factors for Company Reporting | GHG emissions from vehicles transporting spoil from site |

12.8.7 Assumptions have been made to account for uncertainties when calculating the carbon footprint of the Proposed Development. The following emissions sources were excluded from the assessment due to high levels of uncertainty:

- The embodied carbon of construction materials other than bulk materials (concrete, steel and cladding materials);
- Transportation of the above to site due to significant uncertainty around source destinations.

### Construction

12.8.8 The greenhouse gas assessment calculated the embodied emissions of the most abundant materials used in the construction of the Proposed Development (including structural steel, cladding and concrete for footings and slab and quarried stone for backfill), the emissions associated with transportation of goods and personnel during the construction phase, and emissions generated by the collection, transportation and disposal of construction waste.

*Table 12.4 GHG Assessment of Construction Phase*

| Source of GHG Emissions | GHG Emissions ($tCO_2e$) from construction |
|---|---|
| Embodied carbon in materials (Scope 3) | 2040 |
| Spoil removal (Scope 1) | 165 |
| Movement of construction plant on-site (Scope 1) | 1320 |
| **Total** | **3525** |

12.8.9 GHG emissions from spoil removal were estimated on the basis of 990 loads being transported 50 kilometres from the Proposed Development, fully laden outbound and unladen inbound. Defra GHG conversion factors for generic laden and unladen articulated HDVs were assumed.

12.8.10 ITPEnergised has developed a very approximate emissions factor for construction operations covering site preparation and building works, based on detailed breakdowns of plant typology and usage patterns from historic projects. A factor of 400 kg $CO_2e$ per hectare per working day has been assumed. Using an assumed 10 hectare active construction footprint for the Proposed Development, the approximate duration of the construction period (60 weeks) and an assumption of a 5.5 day working week, overall GHG emissions can be estimated at 1320 $tCO_2e$.

12.8.11 It was identified that most emissions resulting from the construction phase will arise from the embodied carbon of construction materials.

12.8.12 Steel is notably the most GHG emissions intensive material used in construction of the Proposed Development.

**Table 12.5 Embodied Carbon of Construction Materials (Scope 3)**

| Material | Mass (Tonnes) | Embodied Carbon Emissions ($tCO_2e$) from Construction |
|---|---|---|
| Concrete | 7050 | 970 |
| Structural Steel | 610 | 1510 |
| Cladding Steel | 71 | 110 |
| Insulation | 3.5 | 15 |

12.8.13 Construction phase GHG emissions are assessed as a **low** impact of **minor** significance given that they are too large to be considered **negligible** but do not represent a significant proportion of regional emissions.

### Operation

12.8.14 The large majority of GHG emissions from the operational phase of the Proposed Development will be associated with the combustion of SNG in the melting, holding and homogenising furnaces, principally the melting furnace which is expected to account for over 70% of the total site SNG demand. LPG (from which SNG is derived) usage will represent approximately 82% of operational energy usage with the remainder being electrical energy.

12.8.15 Historic data from the Applicant suggests that most of the operational electrical energy requirements will be met directly by the Lochaber Hydroelectric plant with a GHG intensity of effectively zero. The hydro plant currently exports the balance of production not used by the existing smelter to the grid, and the electrical energy requirements for the Proposed Development are expected to be met from this balance.

12.8.16 The hydro plant does experience episodes of low production following dry periods. During these episodes, the smelter imports electrical energy from the grid. Around 16% of the Proposed Development's electrical energy demand is expected to be imported from the grid, as an annual average.

12.8.17 The British grid is expected to substantially decarbonise during the decades to 2050 by which point the carbon factor per kilowatt hour of electrical energy supplied to the grid will be effectively zero. The GHG impacts of imported electricity at the Proposed Development will hence decline over the course of the operating life.

*Table 12.6 GHG Assessment of Operational Phase (after installation of a permanent utility connection)*

| Source of GHG Emissions | GHG Emissions ($tCO_2e$) | | |
|---|---|---|---|
| | 2022 | 2023 | 2024 onward |
| Grid electricity (Scope 2) | 226 | 281 | <379 |
| LPG (imported) (Scope 1) | 11,695 | 15,291 | 19,115 |
| **Total** | 11,921 | 15,572 | up to 19,494 |

12.8.18 GHG emissions from grid electricity will gradually decline even as the rate of production remains constant post 2024.

12.8.19 GHG emissions from the operational phase are assessed as Medium Impacts of moderate significance, given that the quantity of GHGs released is a significant proportion of the current regional GHG totals.

### *Decommissioning*

12.8.20 Emissions from the demolition and redevelopment of the Proposed Development will be dependent on contemporary plant, machinery, vehicle and waste disposal technologies which by the latter half of the 21st century can reasonably be expected to have decarbonised. This phase of the Proposed Development is however vastly uncertain and has not been quantitatively evaluated.

## 12.9 Additional Mitigation

12.9.1 No additional mitigation for climate resilience effects is considered necessary.

12.9.2 The GHG emissions calculated for the construction and operational phases are conservative and based on standard specifications of bulk materials. As the terms for the materials procurement process are drawn up, the Applicant will look to substitute alternative materials of lower carbon intensity and the same engineering properties such as recycled steel and/or high PFA cement blends as applicable.

12.9.3 Electrical energy will largely be sourced from the nearby Lochaber hydroelectricity station.

12.9.4 Energy efficient options for the gas-fired furnaces will be selected where commercially available to offer the maximum production capacity for the lowest fuel input rate.

12.9.5 Investigation of green hydrogen blending into the LPG supply will be investigated as a future mitigation measure but is not currently thought to be economically viable.

## 12.10 Residual Effects

12.10.1 No significant residual effects have been identified following the implementation of mitigation measures for climate resilience.

## 12.11 Cumulative Assessment

12.11.1 The climate resilience risks identified are limited in their spatial extent to the Proposed Development boundary and therefore no cumulative effect with other committed developments is considered in this climate change impact assessment.

## 12.12 Summary

12.12.1 An assessment of the potential effects of GHG emissions associated with the Proposed Development on climate change has been undertaken.

12.12.2 The assessment considered emissions arising from the construction and operational phases of the Proposed Development including the following activities: the embodied carbon of construction materials, construction spoil removal and electricity and fuel consumption.

12.12.3 A climate resilience assessment has been carried out to assess the vulnerability of the Proposed Development to climate change.

12.12.4 The assessment evaluated the impact of climatic variables such as wind speed, precipitation and temperature on sensitive receptors associated with the Proposed Development in the operational phases.

12.12.5 The climate baseline was characterised using Met Office climate data for the period 1981-2001.

12.12.6 Potential climate change effects caused by GHG emissions associated with the Proposed Development have been assessed as **minor** for the construction phase and **moderate** for the operational phase.

12.12.7 Mitigation during the construction phase will include the investigation of alternative materials of lower carbon intensity and the same engineering properties such as recycled steel and/or high PFA cement blends as applicable.

12.12.8 Mitigation during the operational phase will include the use of hydroelectric power rather than grid electricity and the investigation of alternative gaseous fuels as the technology develops.

12.12.9 Climate resilience impacts on the Proposed Development associated with high temperatures are considered to be of **minor** significance.

12.12.10 Changes to wind speeds are predicted to have an effect of **negligible** significance on the Proposed Development.

12.12.11 The effects of heavy precipitation on the Proposed Development are considered to be of **negligible** significance.

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# Chapter 13 Major Accidents and Disasters

# 13. Major Accidents and Disasters

# 13. Major Accidents and Disasters

## 13.1 Introduction

13.1.1 This chapter considers the potential for activities at the Proposed Development to cause major accidents or be affected by natural disasters, in both cases focussing on where harm to the environment as a consequence could reasonably occur.

13.1.2 The assessment must be read in the context of an environmental impact assessment. It is intended to inform management and mitigation of risks to the environment by unplanned events and does not assess the individual or cumulative probability of any major accident or disaster.

13.1.3 The chapter considers major accidents and major effects of natural disasters, it does not represent an exhaustive treatment of every possible risk of environmental damage. "Major" is defined as having the potential to cause permanent or long-term damage to a receptor, including loss of life or permanent destruction of habitat.

13.1.4 The chapter considers environmental hazards inherent to the Proposed Development, the receptor groups likely to be affected in the event of an accident event, and the potential severity of the impact. The management of these risks by design or further mitigation is discussed.

13.1.5 The hazards were identified in collaboration with the Applicant and wider desktop research on records of accidents in the secondary aluminium industry (Aluminium Plant Safety, 2021)).

## 13.2 Legislation, Policy and Guidelines

### *Legislation*

13.2.1 The treatment of major accidents and disasters within an EIA is part of the prospective scope since the Town and Country Planning Act Environmental Impact Assessment (Scotland) Regulations 2017 (Scottish Government, 2017) were made.

13.2.2 The Regulations state in Part 1, (4): "*a description of the expected significant effects of the development on the environment deriving from the vulnerability of the proposed development to risks of major accidents and / or disasters which are relevant to the project concerned*".

13.2.3 The Proposed Development will be a workplace and The Health and Safety at Work Act (1974 (UK Government, 1974)) and Management of Health and Safety at Work Regulations (1999) (UK Government, 1999) will apply. The Act's position on controlling risks, as interpreted by the Health and Safety Executive, to a level "As Low as Reasonably Practical" (ALARP) informs the approach to mitigation in the EIA Report context.

13.2.4 The Control of Major Accident Hazards Regulations (2015) (COMAH)(UK Government, 2015) and the Town and Country Planning (Hazardous Substances)(Scotland) Regulations 2015 (Scottish Government, 2015) apply to the main smelter site.

### *Guidance*

13.2.5 Guidance for the production of Major Accident and Disaster chapters is currently limited. The Institute of Environmental Management and Assessment (IEMA) has shared a number of examples of current practice (IEMA, 2020) from around the environmental consulting industry but has to date published no definitive guidance. As with any environmental assessment discipline, the approach should be proportionate and defensible.

## 13.3 Consultation

13.3.1 No specific consultation on the scope of the methodology for this chapter has been undertaken.

## 13.4 Assessment Methodology and Significance Criteria

13.4.1 A list of potential major accident and disaster events has been drafted on the basis of the Proposed Development's potential vulnerabilities and a range of reasonably plausible accident scenarios. This longlist has been reviewed against the definition of major accident or disaster used for the assessment, and a number of events with lesser potential consequences were screened out accordingly.

13.4.2 The shorter list of events which could potentially meet the definition were considered in terms of the nature of the potential environmental effects, the potential severity and significance of the effect and the requirements for mitigation.

13.4.3 The meaning of "major" should be understood in the context of the Proposed Development. The "major" events assessed are expected to represent the potential events with the highest severity at a secondary aluminium production facility. These "major" events would not necessarily be considered as such in the context of a primary aluminium smelter or a facility which stored or used flammable materials in far greater quantities such as a petrochemical refinery or oil storage depot.

### *Study Area*

13.4.4 The Proposed Development site boundary is considered the practical limit for the potential effects of loss of containment and explosion events, since effects meeting the definition of a major accident or disaster would be unlikely beyond this distance.

### *Assessment of Potential Effect Significance*

13.4.5 Potential effect significance must be understood in the context of major accidents and disasters. These are inherently rare events and it is entirely plausible that no major accident or disaster befalls the Proposed Development during its operational life. Even if such an event took place, it is also plausible that there might be no effects beyond the built structure of the Proposed Development.

13.4.6 The terminology used in the assessment, to be consistent with other chapters of the EIA Report and, notwithstanding the caveat in the above paragraph, are as follows:

- Sensitivity – all potential human, wildlife and habitat receptors are assumed highly sensitive on a precautionary basis;
- Magnitude of impact –The usual terminology for the significance of effect is irrelevant in this case as only events with potential for high impacts (loss of life or permanent damage to habitats) are considered; and,
- Significance of effect – Although receptors are assumed to all be of high sensitivity and impacts inherently large and adverse, the significance will still vary depending on the nature of the effect, particularly in terms of duration and reversibility. For instance, a catastrophic release of molten metal could have a major effect on a human receptor, with the potential for fatality, but a moderate effect on a habitat which could readily regenerate following brief exposure. The scale of significance used, in descending order, is major, moderate, minor and negligible. There is no strict definition of these significance descriptors in this context, they are relative.

### *Requirements for Mitigation*

13.4.7 Mitigation incorporated into the emerging design for the Proposed Development is noted. Further mitigation measures to minimise the effects of accidents and disaster events on occupational groups will be documented in standard operating procedures as part of the the Applicant's existing integrated management system.

13.4.8 The current Major Accident Prevention Policy scope produced for the existing smelter as an upper tier COMAH site will be reviewed and extended to incorporate molten metal hazards from the Proposed Development where required under the COMAH regulations. Hazard and environmental incident identification exercises (HAZID and ENVID) will form part of this process and inform detailed mitigation measures at an operational level, iterating the outline requirements identified by this EIA Report.

### *Assessment of Residual Effect Significance*

13.4.9 The residual effects are intended to be the management of the risk of a major accident or disaster to a level that is ALARP, noting that this EIA Report represents a high level assessment of such risks for the primary purposes of considering environmental impact.

### *Limitations to Assessment*

13.4.10 The assessment is qualitative. It includes no probabilistic treatment of risk, simply identifying plausible major accident and disaster events and commenting on their potential severity and the outline approach to mitigation. It purposely considers environmental effects as its focus, and where effects on human health are noted, it is not intended to substitute for current and future safety case development.

## 13.5 Baseline Conditions

13.5.1 Baseline conditions are assumed to be routine aluminium recycling and billet casting operations for the purpose of this chapter, rather than any physical description.

## 13.6 Receptors Brought Forward for Assessment

13.6.1 The following receptors have been brought forward for assessment:

- There are no habitat sites contiguous to the Proposed Development site boundary, the nearest international and local designation is the Ben Nevis SAC and SSSI which is 0.34 km east of the boundary. There are however areas of broad-leaved woodland partly within the site boundary with local ecological amenity value.
- Wildlife receptors: Survey work detailed in chapter 8 notes the presence of numerous bird, mammal and reptile species within a 5 km radius of the Proposed Development  These have been treated generically as potential residents of, or visitors to, the curtilage of the site.
- Human receptors: Employees and contractors working at the Proposed Development will be the nearest human receptors considered.

## 13.7 Standard Mitigation

13.7.1 Standard mitigation measures will be implemented via the proposed design and operational practices at the Proposed Development, including but not limited to the following:

- Development of management system and operating procedures to closely control the handling of molten metal;
- Procedures to exclude sources of water contamination from feedstock, scrap and molten metal; and
- Construction of containment and factory floor fabric to withstand high temperature effects.

## 13.8 Potential Effects

### *Construction*

13.8.1 No major accidents or disaster events are reasonably foreseeable within the scope of the construction phase of the Proposed Development.

### *Operation*

13.8.2 Major accident and disaster events which were screened out of assessment are shown in Table 13.1 below, along with reasons for no further consideration. They are generally natural disasters and extreme weather events with no serious risk of occurrence.

*Table 13.1 Events screened out*

| Event | Reason for screening out |
|---|---|
| Tectonic activity | British Geological Survey records show no recorded earthquake above 5 local magnitude ("strong") within 10 km of Fort William since records began and only five records in total. (British Geological Survey, 2020). This intensity would have been sufficient for tremors to be felt but not to have caused damage to plant or buildings. |
| Extreme temperature | Highly unlikely under the most pessimistic climate change scenarios given Fort William's latitude (see chapter 12). |
| Extreme storm | Building Regulations are tolerant of reasonably foreseeable extremes. Activities with the potential to be compromised by extreme weather conditions would be postponed until a storm event had passed. |
| Storm surge (inundation) | Elevation and distance from the coast makes inundation highly unlikely. No accounts of storm surge at the proposed development |

13.8.3 Climate-related risks are discussed in more detail in chapter 12 of this EIA Report.

13.8.4 Events taken forward for assessment are summarised in Table 13.2 below. The events have been grouped into losses of containment of molten metal, ignition of evolved hydrogen and explosion caused by rapid steam evolution by water submerged within molten metal. The nature of the hazards is discussed in the following sections.

#### Loss of containment (molten metal)

13.8.5 It is assumed for this assessment that loss of containment of an entire batch of molten metal , if uncontrolled, would be contained within the Recycling and Billet Casting Facility itself and cool through removal from the heat source and contact with surfaces at ambient temperatures before quantities sufficient to cause damage to occur to any on-site habitats or the wildlife supported escaped.

#### Evolution of explosive gases

13.8.6 The evolution of hydrogen from unwanted reactions between water and molten aluminium may temporarily increase the prevailing hydrogen concentration within a built environment, but the quantities will be very small and workplace ventilation would mitigate against short-term health effects. Once outside the building envelope any loss would have no particular effect, it would continue to decrease in concentration and rapidly dissipate.

13.8.7 The quantity of water contamination sufficient to cause an indoor hydrogen concentration exceeding the lower explosive level for hydrogen in air (4 % by volume) is not realistic.

13.8.8 In the event of a leak or failure of LPG containment a flammable vapour cloud could potentially form an explosive fuel-air vapour mixture which could cause injury, loss of life and structural damage if ignited. Direct environmental impacts beyond risk to human health would be limited to possible temporary effects on adjoining habitat, wildlife and local air quality; indirect effects could potentially include damage to soil, groundwater and local watercourses which receive contaminated firewater runoff.

13.8.9 The risk of this type of accident will be controlled by suitable instrumentation and routine inspection and maintenance driven by standard operating procedures.

***Water / molten metal explosion***

13.8.10 Water which is completely engulfed by molten aluminium can cause explosive formation of steam and metal spray droplets – liquid water rapidly vaporises into a far greater volume of steam which is explosively released from the metal matrix, spraying molten metal. At a sufficient scale this phenomenon can cause significant damage to plant and building fabric and potential injury and loss of life.

13.8.11 Water in contact with molten metal but not engulfed as described (e.g. rain on an open crucible in transit across the yard) will either evaporate or be reduced to hydrogen and oxygen. As previously discussed, the quantities involved preclude hydrogen build-up as a material issue.

13.8.12 Historic incidents of this kind have reportedly been caused through the introduction of wet scrap and even accidental loss of beverage containers into melt furnaces.

13.8.13 All but the most catastrophic incident of this nature would be largely contained within the building envelope. The possibility of effects on habitat and wildlife within the wider site boundary appears remote.

*Table 13.2 Events assessed*

| Event | Receptors | Potential Consequences | Significance | Mitigation |
|---|---|---|---|---|
| **Loss of containment** | | | | |
| Molten aluminium loss | Human | Escape of molten metal batch could cause injury or fatality within building envelope. Rapid cooling expected, clean-up not expected to cause long term soil contamination as will be on made ground. | **Moderate** | Procedural and instrumental controls. Integrity specification and tests for building fabric. |
| **Evolution of explosive gas** | | | | |
| Hydrogen gas evolution | Human | Inundation of an indoor workspace could lead to health effects at high concentrations. Lower explosive limit highly unlikely to be reached | **Minor** | Ventilation. |
| LPG vapour explosion | | Blast could affect human, wildlife and habitat receptors within the site boundary. Some manageable secondary effects e.g. air pollution. | **Moderate** | Monitoring and instrumental controls. |
| **Water / molten metal explosion** | | | | |
| Water engulfed by molten aluminium | Human, Wildlife, Habitat | Blast could affect human receptors within the building envelope, outdoor receptors much less likely to be affected | **Major (Human), Negligible (Others)** | Procedures to ensure only dry materials melted. Restrictions on liquids within the Recycling and Billet Casting Facility. Building watertight by design. |

### *Decommissioning*

13.8.14 Although the Proposed Development does not have a pre-determined operational lifespan, it is anticipated to be operational for at least 40 years and possibly more.

13.8.15 Activities during decommissioning are expected to be typical of a relatively small-scale construction project. The Proposed Development will be decommissioned in accordance with contemporary legislation and good practice guidance for the demolition and removal of built assets.

## 13.9 Additional Mitigation

13.9.1 No further mitigation is proposed for the control of environmental impacts beyond the Applicant's expected management and operating procedures.

## 13.10 Residual Effects

### *Construction*

13.10.1 No major accidents or disaster events are reasonably predicted within the scope of the construction phase of the Proposed Development.

### *Operation*

13.10.2 Residual effects are difficult to assess in the context of environmental effects of major accidents and disasters. The effectiveness of the proposed mitigation cannot be absolutely guaranteed as these are low-frequency random events but may reasonably be expected to prevent harm to human and other receptors.

### *Decommissioning*

13.10.3 The Proposed Development will be decommissioned in accordance with contemporary legislation and good practice guidance for the demolition and removal of built assets.

## 13.11 Summary

13.11.1 This chapter considers the potential for activities at the Proposed Development to cause major accidents or be affected by natural disasters, in both cases focussing on where harm to the environment as a consequence could reasonably occur. The assessment should be viewed in the context of an environmental impact assessment. It is intended to inform management and mitigation of risks to the environment at a general level; it does not represent an exhaustive treatment of every possible risk of environmental damage. "Major" is defined as having the potential to cause permanent or long-term damage to a receptor, including loss of life or permanent destruction of habitat, therefore all scenarios assessed are of this inherent magnitude.

13.11.2 The likelihood of a natural disaster leading to major environmental damage is assessed as very low.

13.11.3 In the event of a leak or failure of LPG containment a flammable vapour cloud could potentially form an explosive fuel-air vapour mixture which could cause injury, loss of life and structural damage if ignited. Direct environmental impacts would be limited to temporary effects on local air quality; indirect effects could potentially include damage to soil, groundwater and local watercourses which receive contaminated firewater runoff. This is assessed as of **moderate** significance.

13.11.4 The risk of this type of accident will be controlled by suitable instrumentation and routine inspection and maintenance driven by standard operating procedures.

13.11.5 Molten metal loss could cause injury, loss of life and structural damage but it unlikely to have any further off-site environmental effects or impacts on soil and groundwater. This is considered of **moderate** significance.

13.11.6 Water in topical contact with molten aluminium can cause rapid production of steam and decomposition of the water molecules. The evolution of hydrogen in the quantities formed by water contamination may have slight and temporary occupational health effects but will not realistically approach the 4 % lower explosive limit. This is considered of **negligible** significance.

13.11.7 Water engulfed by molten aluminium can cause an explosive release of metal droplets followed by a strongly exothermic reaction between aluminium and water, which also releases hydrogen which can then combust at concentrations above 4 % by volume.

13.11.8 Explosive releases of molten metal may cause injury, loss of life and structural damage will be controlled within the building envelope but is unlikely to have any further off-site environmental effects or impacts on soil and groundwater. This is considered of **moderate** significance.

13.11.9 Loss of molten metal and water /metal explosion could both have serious consequences on operator welfare and potentially lead to loss of life and are accordingly assessed as of **major** significance.

13.11.10 These risks will be controlled by strict procedures for the drying of scrap and other feedstock for melting and the control of sources of liquids within the Recycling and Billet Casting Facility.

13.11.11 Mitigation of risks of environmental impacts from major accidents will be maintained through suitable risk assessments, management system operating procedure and process instrumentation.

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# Chapter 14 Socio-economic Effects

# 14. Socio-economic Effects

# 14. Socio-economic Effects

## 14.1 Introduction

14.1.1 This chapter was written by BiGGAR Economics and considers the socio-economic effects associated with the construction and operation of the Proposed Development; an aluminium Recycling and Billet Casting Facility production line adjacent to an existing Smelter already operated by the Applicant in Fort William, Lochaber.

14.1.2 The remainder of this chapter is structured as follows:

- Section 14.2 sets out relevant legislation, policy and guidelines;
- Section 14.3 provides a note on consultation;
- Section 14.4 describes the assessment methodology;
- Section 14.5 considers the baseline socio-economic conditions;
- Section 14.6 lists the receptors brought forward for assessment;
- Section 14.7 considers any mitigation required;
- Section 14.8 assesses potential effects;
- Section 14.9 considers any additional mitigation required;
- Section 14.10 assesses any residual effects;
- Section 14.11 describes any cumulative impacts; and
- Section 14.12 provides a summary of the chapter's findings.

## 14.2 Legislation, Policy and Guidelines

### *Legislation*

14.2.1 There is no relevant legislation on socio-economic impacts. The analysis in this chapter was based on best-practice in the assessment of net economic impacts and on relevant sectoral guidance, as set out below.

### *Guidance*

14.2.2 The assessment is in line with the following guidance documents:

- Scottish Enterprise's Economic Impact Assessment for Appraisal, Monitoring and Evaluation – a Guidance Overview (Scottish Enterprise, 2014); and
- the Scottish Government's Draft Advice on Net Economic Benefit and Planning (Scottish Government, 2016).

14.2.3 The economic benefits considered in this chapter are net economic benefits, which are defined as the difference in economic impact between the scenario where the Proposed Development takes place and the case where it does not go ahead.

14.2.4 In assessing net economic benefits, it is necessary to consider:

- deadweight: those impacts that would occur even if the Proposed Development did not go ahead;
- displacement: activity elsewhere in the economy that would be offset by the Proposed Development;

- leakage: the proportion of impact that benefits economies outwith the one where the Proposed Development occurs; and
- multipliers: the effects across the supply chain (indirect impacts) and through the spending of employees (induced impacts).

14.2.5 These aspects are considered in the analysis of economic impacts in this chapter and included in the methodology adopted for the assessment.

## 14.3 Consultation

14.3.1 No consultations were necessary. The BiGGAR Economics team has good knowledge of the socio-economic conditions in the study areas and undertook the socio-economic assessment for the EIA of the proposed AWP at the same site as the Proposed Development.

## 14.4 Assessment Methodology

### *Measures and Sources of Impact*

14.4.1 As standard practice in similar assessments, economic impacts are measured in terms of:

- Gross Value Added (GVA), a measure of economic output; and
- employment, expressed as years of employment during the construction phase, when jobs will be temporary, and as headcount employment during the operational phase.

14.4.2 The assessment of economic benefits considers the following sources of impact:

- construction impact: the economic activity associated with the construction of the Proposed Development;
- operational impact: the economic activity associated with the operation of the Proposed Development, which includes:
  - direct: impact of operating the Proposed Development and the employment required for its operation;
  - supply spending: impact associated with supply chain expenditure; and
  - staff spending: impact from employees' spending their salaries and wages within the economy.

14.4.3 The methodology followed in assessing each of these impacts is set out below in more detail and underpins both the estimates of the baseline economic impact and those associated with the Proposed Development.

### *Study Areas*

14.4.4 The study areas for the assessment were:

- Lochaber (including the electoral wards of Fort William and Ardnamurchan and Caol and Mallaig, unless otherwise stated);
- Highland (The Highland Council area); and
- Scotland.

### Construction Impact

14.4.5 The construction of the Proposed Development will result in a series of economic benefits arising from expenditure in construction contracts. This spending will benefit those businesses that are awarded contracts, their supply chains and have impacts through the spending in the economy of the workers carrying out those contracts.

14.4.6 To estimate these impacts, it was first necessary to estimate the level of expenditure required to construct the Proposed Development. Then, assumptions were made on the ability of local businesses to carry out construction contracts. These assumptions were based on analysis of the type of works required and whether those skills are available in Lochaber, Highland and Scotland. Economic ratios from the UK Annual Business Survey (Office for National Statistics, 2020) were then applied to the spending taking place in each study area to estimate sectoral GVA and employment.

14.4.7 It was then necessary to account for indirect impacts, those associated with spending across the supply chain, and induced impacts, those linked to employees working for contractors spending their salaries and wages in the economy. To achieve this, the Scottish GVA and employment Type 1 and Type 2 multipliers from the Scottish Input-Output Tables (Scottish Government, 2020) were applied.

14.4.8 Indirect GVA and employment impacts were estimated by multiplying direct impacts by the Type 1 GVA and employment multipliers. Induced GVA and employment impacts were estimated by multiplying direct GVA and employment by the difference between Type 2 and Type 1 GVA and employment multipliers.

14.4.9 Since the multipliers from the Scottish Input Output Tables refer to aggregate impacts within the Scottish economy, it was necessary to adjust these to reflect impacts at the Lochaber and Highland level. In line with the methodology followed in the EIA of the AWP, it was assumed that the multiplier effect in Lochaber would be 20% and in Highland 40% of that of Scotland.

### Operational Impact

14.4.10 The assessment of operational impacts is based on a production level of around 80 kt by 2025. This is the scenario that is considered as the central scenario in this assessment and, as such, is described in detail. Estimates of impact are also provided for a scenario under which production would be 100 kt.

### Direct Impact

14.4.11 The direct impact of the Proposed Development was estimated in terms of the headcount employment that it supports and of the GVA it generates. Based on guidance from Scottish Enterprise (Scottish Enterprise, 2017), direct GVA was estimated as the sum of operating profits, employee costs, depreciation and amortisation.

### Supply Spending Impact

14.4.12 The supply spending impact associated with the Proposed Development is the economic impact linked to the expenditure on goods and services.

14.4.13 To estimate this, it was first necessary to consider the ability of businesses across the three study areas to perform contracts, which depended on the type of contracts and whether those skills were available in Lochaber, Highland and Scotland. The direct impact from supply chain expenditure was estimated by dividing the turnover associated with each contract by the appropriate sectoral turnover per GVA and turnover per job ratios, as sourced from the UK Annual Business Survey.

14.4.14 It was then necessary to account for indirect and induced effects. This was done by applying the relevant sectoral Type 1 and Type 2 Scottish multipliers to the estimates of direct GVA and employment, as set out above.

### Staff Spending Impact

14.4.15 The staff spending impact was estimated based on the salaries and wages received by those working at the Proposed Development. The spending of salaries stimulates the economic activity of those businesses where purchases are made.

14.4.16 The first step in estimating the economic impact from staff spending their salaries was to establish how much of their spend would take place in each of the study areas considered. Evidence from the

Input-Output Tables suggests that around 74% of household expenditure in Scotland benefits businesses based in Scotland. It was assumed that around 50% of household spending would take place in Lochaber and 60% in Highland.

14.4.17 Spending was then discounted by 8%, the share of household expenditure that is devoted to Value Added Tax (VAT), based on a study carried out by the European Commission (European Commission, 2013). The direct GVA and employment supported by workers' spending were then estimated by dividing their expenditure by the turnover per GVA and turnover per job ratios for the Household Expenditure sector.

14.4.18 Indirect and induced impacts were then estimated by applying Type 1 and Type 2 GVA and employment multipliers to the direct GVA and employment supported by staff spending.

### *Desk Study*

14.4.19 The assessment was conducted through desk-based research and no site visit was necessary.

### *Assessment of Potential and Residual Effect Significance*

14.4.20 The assessment follows the evaluation methodology used in similar environmental impact assessments. This assesses the significance of a change in socio-economic conditions based on the sensitivity of the receptor and the magnitude of impact.

14.4.21 The aspects considered when appraising the sensitivity to changes in socio-economic conditions were the scale of the economy affected, its relative fragility and the diversification of its economic base.

14.4.22 For instance, an area with smaller economic activity is more sensitive to a change in employment than a relatively larger economic area. Equally, an economic area where activity is concentrated in one economic sector is more sensitive to the emergence of opportunities in another sector than an economy with a diversified economic base.

14.4.23 The magnitude of impacts is assessed based on professional judgement, considering socio-economic effects on the study areas as calculated in the economic model, including changes in employment and GVA, and impacts on the balance of trade.

14.4.24 The significance of changes is then assessed based on sensitivity and magnitude. Under environmental impact assessment legislation, **major** and **moderate** impacts are to be considered as significant.

*Table 14.1 Significance Criteria*

| Significance | Description |
|---|---|
| Major | Major loss/improvement to key elements/features of the baseline conditions such that post development character/composition of baseline condition will be fundamentally changed. |
| Moderate | Loss/improvement to one or more key elements/features of the baseline conditions such that post development character/composition of the baseline condition will be materially changed. |
| Minor | Changes arising from the alteration will be detectable but not material; the underlying composition of the baseline condition will be similar to the pre-development situation. |
| Negligible | Very little change from baseline conditions. Change is barely distinguishable, approximating to a no change situation. |

*Requirements for Mitigation*

14.4.25 The assessment did not identify any requirements for mitigation.

*Limitations to Assessment*

14.4.26 The description of the baseline was limited by the time delay of statistical releases, which means that some changes in the economy that have occurred in the period intervening between statistical releases could not be accounted for. There is also uncertainty about the impact of the COVID-19 pandemic on the economy, which may result in further changes to the economy's business base and to employment.

## 14.5 Baseline Conditions

*Strategic Context*

**National Performance Framework**

14.5.1 The National Performance Framework, created by the Scottish Government to measure social and economic progress across the country, sits at the top of the policy hierarchy in Scotland, with all other policies and strategies designed to meet the purpose and outcomes that it sets out.

14.5.2 The overarching purpose of the National Performance Framework is to '*focus on creating a more successful country with opportunities for all of Scotland to flourish through increased wellbeing, and sustainable and inclusive growth*' (Scottish Government, 2020).

14.5.3 It aims to do this by:

- creating a more successful country;
- giving opportunities to all people living in Scotland;
- increasing the wellbeing of people living in Scotland;
- creating sustainable and inclusive growth; and
- reducing inequalities and giving equal importance to economic, environmental and social progress.

14.5.4 The purpose and aims of the National Performance Framework can be summarised into three distinct, yet interlinked, clauses:

- prosperity (measured by the 11 national outcomes);
- inclusion (all areas of Scotland have to flourish, not just the country as a whole) and;
- sustainable and economic growth (measured in terms of economic output and employment).

14.5.5 The Proposed Development contributes to the each of the above clauses. The Proposed Development encapsulates sustainable manufacturing in its development and has the purpose of securing and improving the prosperity of its workers through the safeguarding of jobs and the opportunity to up/re-skill. This would enable sustainable economic growth through the creation of high value jobs for the local economy.

14.5.6 The Proposed Development protects the current and future wellbeing and prosperity of existing employees at the smelter and the wider supply chain, whilst creating inclusive growth for Lochaber and Highland.

**Scotland's Economic Strategy and Action Plan**

14.5.7 In 2015 the Scottish Government set out its Economic Strategy which strives to enhance both equality and sustainable economic growth in Scotland.

14.5.8 The strategy highlights four key priorities:

- investment: creating opportunities for the people of Scotland at all stages of life, the foundations for businesses to grow and innovate and advance the capabilities of local communities;
- innovation: establishing a culture which encourages businesses and workplaces to adopt innovative ideas, research and practices;
- inclusive growth: tackling barriers to employment and acting on opportunities in local communities; and
- internationalisation: enhancing export and market opportunities for all businesses and industries in Scotland and continuing to promote Scotland internationally as a place for other countries to invest in.

14.5.9 Together these priorities aim to reduce the gap in economic performance between regions in Scotland, support and enable growth in local communities, create employment opportunities and enable Scottish businesses to flourish.

14.5.10 The Scottish Government's Economic Action Plan 2019/20 (Scottish Government, 2018) accompanies the country's economic strategy and sets out how Scotland plans to become a leader in technological and social innovations. The key aims are to increase the country's productivity and competitiveness and to do so by supporting businesses and encouraging investment and innovation.

14.5.11 The Scottish Government identified eight key themes in order to achieve this growth:

- investment: boosting private and public investment and delivering world-class infrastructure;
- enterprise: enabling Scottish businesses to operate competitively;
- international: attracting highly skilled individuals from across the world and increasing export volume;
- innovation: supporting world-leading innovation;
- skills: ensuring a highly skilled Scottish workforce with a focus on education, training and re-skilling;
- place: supporting all areas of Scotland to thrive;
- people: a workforce that is sustainable and thrives; and
- sustainability: benefiting from Scotland's transition towards a low carbon economy.

14.5.12 The plan also details how Scotland will transition into a carbon neutral economy. Scotland has a target of becoming a carbon neutral economy by 2050. By 2030, 50% of Scotland's energy sources are aimed to be supplied by renewable sources and productivity of energy sources is to rise 30%.

14.5.13 The Proposed Development will be powered by the existing hydro-power plant and green energy sources and displace more fossil fuel intensive aluminium suppliers based in Asia and the Gulf, as so will contribute to this target.

14.5.14 The Proposed Development represents an opportunity to benefit from Fort William's geographic comparative advantage, in addition to the Applicant being the only aluminium smelter in the UK. This aspect of the Proposed Development is in line with the strategy's focus on inclusive growth, by investing in Lochaber and Highland and the anticipated up-skilling of existing employees, which will boost the local education and skills levels.

14.5.15 Geographic comparative advantage is also linked to the internationalisation priority of Scotland's economic strategy, as the Proposed Development seeks to increase the Applicant's export potential and cater for the demand of UK businesses, that would otherwise import. The Proposed Development is well placed to gain competitive advantage in the market, as a result of the site's location which will provide Western European consumers with shorter lead times than their competitors in Asia.

14.5.16 Additionally, gaining a competitive advantage into this market helps to ensure continuity for the UK supply chain in the face of uncertainty on international suppliers as a result of Brexit and trade disruption during the COVID-19 pandemic.

### Economic Recovery Plan

14.5.17 The Economic Recovery Implementation Plan (Scottish Government, 2020) is the Scottish Government's response to the recommendations in the Report of the Advisory Group on Economic Recovery (Advisory Group on Economic Recovery, 2020) and sets out how it intends to take those forward. It prioritises a sustainable recovery that supports jobs and supports all parts of Scotland, while meeting its climate change targets and wider environmental objectives.

14.5.18 This was further developed in the Scottish Government's Programme for Government (Scottish Government, 2020), which focuses on economic recovery, making clear that the aim is not a return to business as usual, but a transition to a '*fairer, greener and wealthier country*'.

14.5.19 The negative economic and social impacts of the COVID-19 pandemic further increase the need for the benefits that the Proposed Development will deliver and their long-term sustainability.

14.5.20 The Proposed Development contributes to these priorities through supporting jobs in Lochaber and the wider Highland region, whilst using green energy sources from the site's existing hydro-power plant.

### Highlands and Islands Enterprise Strategy (2019 – 2022)

14.5.21 The overarching themes of the three-year strategy for the Highlands and Islands (Highlands and Islands Enterprise, 2019) are people and place, with a strong emphasis placed on achieving inclusive growth for all areas in the region.

14.5.22 The renewable energy sector and low carbon economy have been identified as areas of significant economic, social and industrial opportunities for the area both now and in the future.

14.5.23 The Proposed Development would represent significant investment into the Highlands and Islands, whilst boosting the skills and profile of the area.

### Fort William 2040 (FW2040)

14.5.24 Covering the areas of Lochaber, Skye and Wester Ross, the Highlands and Islands Enterprise Strategy makes reference to the Ambitious Masterplan: Fort William 2040 (FW2040) (The Highland Council, Highlands and Islands Enterprise and the Scottish Government, 2019). The strategy notes the area's strong tourism sector and natural capital and was developed to promote long-term growth and provide a vision for the area.

14.5.25 The masterplan was developed in response plan to establish manufacturing facilities at the smelter in Lochaber. The Proposed Development highlights the Applicant's commitment to the economic development of the local area. The Applicant is also part of the Lochaber Delivery Group, which brings together senior leadership from the Scottish Government, Highland Council, Highlands and Islands Enterprise, other public sector bodies and the GFG Alliance to use '*aluminium manufacturing to transform the local economy*' (Scottish Government, 2017).

14.5.26 The masterplan identifies a further 20 projects that together will '*transform the town as a place to live, work and study*'. Included in this is establishing West Highland College UHI as a centre for science, technology, health and engineering to supply the local labour market with a flow of skilled individuals. The Proposed Development may accelerate this skill flow through up/re-skilling the existing labour force and can also provide a potential job location for those who study at the College.

### Green Aluminium Strategy (GREENSTEEL)

14.5.27 In 2019, the Scottish Parliament unanimously passed the Climate Change (Emissions Reduction Targets) (Scotland) Act (Scottish Parliament, 2019). The Act sets a legally binding target of achieving net-zero carbon emissions by 2045 with interim targets of 70% carbon emissions reductions by 2030 and 90% by 2040.

14.5.28 The Applicant's Green Aluminium Strategy and Carbon Neutral Strategy (GREENSTEEL) reflects the company's commitment to using locally sourced raw materials and green power to reduce emissions and contribute to a sustainable economic and environmental future for the industry. This strategy reflects the Applicant's focus on sustainability and strives to use domestically recycled and upcycled scrap steel through renewable energy. The Proposed Development would help to support this strategy and the Applicant's other activities at the site.

14.5.29 The Applicant strives to become carbon neutral by 2030 and the Proposed Development will contribute to this, using the hydro-electric power station and other renewable energy sources to provide green energy.

### Summary of Strategic Context

14.5.30 The Proposed Development seeks to achieve the aims and priorities of Scotland's key economic strategies, whilst also contributing to the outcomes of the National Performance Framework.

14.5.31 These strategies highlight the key features of inclusivity, sustainable economic growth and prosperity for all with a focus on a green recovery and on both the safeguarding and creation of jobs following the COVID-19 pandemic.

14.5.32 The strategies highlight a focus on clean, green energy and reductions in carbon emissions at a national, regional and local level and are supported by the Applicant's own strategy and wider goals of reducing emissions in aluminium production.

14.5.33 The Proposed Development aligns with the identified key strategic themes and priorities and represents a significant investment opportunity for Lochaber and Highland that will safeguard hundreds of jobs, in a time of great economic uncertainty. It will also contribute significantly to the country's net zero emissions targets and increase the skills profile of Lochaber.

### *Economic Context*

### Population

14.5.34 Lochaber has a population of 19,805, accounting for approximately 8.4% of Highland's population, and 0.4% of Scotland's total population.

14.5.35 In 2019, proportion of the population of working age in Lochaber and Highland was 61.5%, lower than the Scottish average of 64.5% whilst the proportion of the population aged 65+ in Lochaber (21.5%) and Highland (22.0%) accounted for a larger proportion of the population than for Scotland as a whole (18.7%).

***Table 14.2 Population, 2019***

| | Lochaber | Highland | Scotland |
|---|---|---|---|
| **Total** | **19,805** | **235,830** | **5,463,000** |
| 0-15 | 17.1% | 16.6% | 16.9% |
| 16-64 | 61.5% | 61.5% | 64.5% |
| 65+ | 21.5% | 22.0% | 18.7% |

Source: National Records of Scotland (2020). Mid-2019 Population Estimates. Note: figures may not sum due to rounding.

14.5.36 Population projections from 2012 (NHS Highland,2017) indicate that the population of Lochaber is expected to decline over the next decade with an expected increase in the proportion of the population aged 65+ to around 26% of the area's total population by 2027.

14.5.37 The population of Highland is expected to increase by 0.5%, by 2028, less than the expected increase for Scotland as a whole, 1.8%. The proportion of the population of working age in Highland is expected to decrease to 58.9% by 2028, lower than for Scotland as a whole (62.3%). The proportion of the population aged 65 and over in Highland is expected to increase by 2028 with over a quarter (26.3%) of its population aged 65+ compared to 22.1% for Scotland.

*Table 14.3 Population Projections 2018 - 2028*

| | Highland | | Scotland | |
|---|---|---|---|---|
| | 2018 | 2028 | 2018 | 2028 |
| **Total** | **235,540** | **236,664** | **5,438,000** | **5,537,116** |
| 0-15 | 16.7% | 14.8% | 16.9% | 15.6% |
| 16-64 | 61.2% | 58.9% | 64.2% | 62.3% |
| 65+ | 22.1% | 26.3% | 18.9% | 22.1% |

Source: National Records of Scotland (2020) Population Projections 2018-2028

### Economic Activity

14.5.38 The economic activity rate of Lochaber is 75.9%, which is lower than that for Highland (78.7%) but above the average for Scotland (74.8%).

14.5.39 The unemployment rate across the Highland is 2.5%, which is lower than that of Scotland (3.5%) and higher than that in Lochaber where the unemployment rate is 2.1%.

14.5.40 The gross median annual wage of full-time workers in Lochaber (£29,500) and Highland (£29,800) is close to the Scottish average of £30,000.

*Table 14.4 Economic Activity*

| | Lochaber* | Highland | Scotland |
|---|---|---|---|
| Economic activity rate | 75.9% | 78.7% | 74.8% |
| Unemployment rate | 2.1% | 2.5% | 3.5% |
| Gross median annual full-time wage (£) | £29,500** | £29,800 | £30,000 |

Source: Office for National Statistics, Annual Population Survey (2019) *Represented by data for the NUTS3 level for Lochaber, Skye & Lochalsh, Arran & Cumbrae and Argyll and Bute. **ONS (2019) Annual Survey of Hours and Earnings – resident analysis (Gross Annual Wage for Ross, Skye and Lochaber).

### Industrial Structure

14.5.41 Lochaber has a significantly larger share of employment in the manufacturing sector (7.3%) than the average across Scotland (6.5%) and Highland (4.7%), which reflects the existing operations and employment at the smelter. Other areas of manufacturing employment in Lochaber include manufacturing of food products and wood products.

14.5.42 Highland has 16.4% of employees in health services and 13.3% in accommodation and food services. This is larger than the percentage of those employed in these sectors on average in Scotland, where 15.4% of those in employment are employed within the health sector and 8.2% within the accommodation and food services sector.

14.5.43 In Lochaber, 24.5% of workers are employed in accommodation and food services, indicating the important of tourism as a significant source of employment in the area.

***Table 14.5 Industrial Structure***

| | Lochaber | Highland | Scotland |
|---|---|---|---|
| Agriculture, forestry and fishing | 4.5% | 10.2% | 3.3% |
| Mining, quarrying and utilities | 1.7% | 2.7% | 2.6% |
| Manufacturing | 7.3% | 4.7% | 6.5% |
| Construction | 5.7% | 6.2% | 5.5% |
| Motor trades | 1.1% | 2.0% | 1.9% |
| Wholesale | 1.1% | 2.0% | 2.4% |
| Retail | 10.5% | 9.4% | 9.0% |
| Transport & storage (inc. postal) | 5.2% | 4.7% | 4.1% |
| Accommodation & food services | 24.5% | 13.3% | 8.2% |
| Information and communication | 0.6% | 2.0% | 3.3% |
| Financial & Insurance | 0.4% | 0.8% | 3.2% |
| Property | 2.0% | 1.4% | 1.5% |
| Professional, scientific & technical | 2.5% | 4.7% | 7.1% |
| Business administration & support services | 3.0% | 4.7% | 7.8% |
| Public administration & defence | 4.1% | 4.7% | 6.0% |
| Education | 8.2% | 7.0% | 7.9% |
| Health | 11.4% | 16.4% | 15.4% |
| Arts, entertainment, recreation & other services | 5.2% | 4.7% | 4.4% |
| **Total Employment** | **11,000** | **128,000** | **2,602,000** |

Source: Office for National Statistics (2019) Business Register and Employment Survey.

### COVID-19 Job Retention Scheme

14.5.44 The Job Retention Scheme (JRS) and the Self-Employment Income Support Scheme (SEISS) was introduced to help support the UK economy in the midst of the COVID-19 pandemic. The scheme supports employees and the self-employed in sectors effected by COVID-19 public health restrictions.

14.5.45 At the peak of take-up in June 2020, there were 36,600 employees in the Highland Council area on JRS and a further 8,900 were on SEISS, giving a total of 45,500 on furlough from their employment, equivalent to 38.6% of all employment in Highland, compared to one-third of employees on furlough for Scotland as a whole.

14.5.46 At the time of writing, it is difficult to predict what the longer-term economic consequences of the COVID-19 pandemic might be. The consequences might be expected to greater for some sectors and areas than others, with Lochaber likely to be amongst the hardest hit areas in the country, given that Lochaber has 24.5% of employment in accommodation and food services, compared with 13.3% for Highland and 8.2% for Scotland.

*Table 14.6 COVID-19 Job Retention Scheme, Uptake by 30th June 2020*

| | Highland | Scotland |
|---|---|---|
| Employees on JRS | 36,600 | 736,500 |
| Self-employed on SEISS | 8,900 | 155,000 |
| Total JRS and SEISS | 45,500 | 891,500 |
| *Percentage of Employment* | *38.6%* | *33.6%* |

Source: HMRC, (2020). HMRC Coronavirus Statistics.

### Qualification Levels

14.5.47 Lochaber has a lower percentage of the population (38.4%) achieving at least an NVQ4 qualification (equivalent to a Higher National Certificate (HNC)) when compared to Highland (43.7%) and Scotland as a whole (45.3%). In Lochaber (6.8%) and Highland (6.9%), a lower proportion of the population holds no qualifications than Scotland (9.8%).

*Table 14.7 Qualification Levels, 2019*

| | Lochaber* | Highland | Scotland |
|---|---|---|---|
| % with NVQ4+ | 38.4% | 43.7% | 45.3% |
| % with NVQ3+ | 58.7% | 60.8% | 60.8% |
| % with NVQ2+ | 77.7% | 78.9% | 75.6% |
| % with NVQ1+ | 88.2% | 86.3% | 83.5% |
| % with other qualifications | 5.0% | 6.8% | 6.7% |
| % with no qualifications | 6.8% | 6.9% | 9.8% |

Source: Office for National Statistics (2019). Annual Population Survey * Represented by data for the NUTS3 level for Lochaber, Skye & Lochalsh, Arran & Cumbrae and Argyll and Bute.

### Balance of Trade

14.5.48 In 2018, Scotland exported a total of £108.4 billion worth of goods and services and imported goods and services worth of £108.2 billion (Scottish National Accounts Programme, 2019), so the value of Scotland's exports exceeded that of its imports by around £200 million.

14.5.49 In the same year, Scotland exported £0.8 billion worth of basic metals and fabricated metals (except machinery) internationally (Scottish Government, 2020), accounting for 9.1% of total exports.

*Table 14.8 Balance of Trade, 2018*

| | Imports (£bn) | Exports (£bn) |
|---|---|---|
| Onshore (rest of the UK) | 59.3 | 51.0 |
| Onshore (rest of the world) | 33.9 | 33.0 |
| Offshore (rest of the world & rest of UK) | 15.0 | 24.5 |
| **Total** | **108.2** | **108.4** |

Source: Scottish National Accounts Programme (2019), Whole of Scotland Economic Accounts Project

### *Summary of Economic Context*

14.5.50 The population of Lochaber is expected to decline over the next decade, unlike the trends expected for the wider Highland region and Scotland, which are both expected to see population increases. The proportion of the Lochaber population of retirement age is expected to increase, indicating a particular decline in the projected working age population.

14.5.51 Lochaber has a lower unemployment rate than both Highland and Scotland and has a higher economic activity rate than the national average. Employment is largely concentrated in manufacturing and sectors associated with tourism, which accounts for a larger share of employment than it does for the Highland and Scottish economies. This industrial structure reflects the importance of tourism and the existing operations of the smelter to the local area.

14.5.52 The high proportion of employment in Lochaber that is associated with tourism means that the area will have been amongst the hardest hit areas in the country by the negative economic impacts associated with the COVID-19 pandemic.

14.5.53 Lochaber has a lower proportion of the population entering into tertiary education, with the percentage of those holding NVQ4+ qualifications in the area lower than the rates for both Highland and Scotland. This highlights that there could be benefits to those employed in Lochaber from the up-skilling aims of the Proposed Development.

### *Baseline Economic Impact*

14.5.54 The baseline economic impact of the existing smelter already operated by the Applicant comes from three sources:

- direct impact;
- supply spending impact; and
- staff spending impact.

14.5.55 The direct impact of the existing facilities was estimated based on the accounts of Liberty Aluminium Lochaber Ltd. (Liberty Aluminium Lochaber Ltd., 2019), the former name of the Applicant, and Simec Lochaber Hydropower 2 Limited (Simec Lochaber Hydropower 2 Limited,2020). The approach followed was set out in Section 14.4 and involved summing up total employees' costs, depreciation and profits. In this way, it was estimated that in 2018/19 the direct GVA impact associated with the existing facilities was £14.5 million. Over the same period, the existing facilities directly employed 194 people.

14.5.56 The activity undertaken at the existing facilities requires spending on supplies of goods and services, including raw materials, energy and other costs and it was necessary to establish how much of this would occur in each study area. Although raw materials and some energy expenditure was imported from outside of Scotland, around 20% of supplier spending occurred in Lochaber, 28% in Highland (inclusive of Lochaber) and 36% in Scotland (inclusive of Highland).

14.5.57 It was estimated that in 2019 the total impact associated with expenditure on goods and services, inclusive of indirect and induced impacts, was £1.5 million GVA and 20 jobs in Lochaber, £2.3 million GVA and 32 jobs in Highland and £3.9 million GVA and 54 jobs across Scotland.

14.5.58 Finally, it was necessary to consider the impact generated by the spending of the employees working at the existing facilities. Based on an analysis of the accounts, around £10.3 million were paid in salaries and wages. It was estimated that this spending, including multiplier effects, generated £1.6 million GVA and supported 36 jobs in Lochaber, £2.1 million GVA and supported 48 jobs across Highland and £3.3 million GVA and 75 jobs across Scotland.

14.5.59 Adding the direct, supply expenditure and staff spending impacts, it was estimated that in 2019 the impact associated with the existing facilities was:

- £17.7 million GVA and 250 jobs in Lochaber;

- £18.9 million GVA and 274 jobs in Highland; and
- £21.7 million GVA and 323 jobs across Scotland.

*Table 14.9 Baseline Economic Impact (Existing Facilities)*

| | Lochaber | Highland | Scotland |
|---|---|---|---|
| **Employment** | | | |
| Direct Impact | 194 | 194 | 194 |
| Supply Spending Impact | 20 | 32 | 54 |
| Staff Spending Impact | 36 | 48 | 75 |
| **Total Employment** | **250** | **274** | **323** |
| **GVA (£ million)** | | | |
| Direct Impact | 14.5 | 14.5 | 14.5 |
| Supply Spending Impact | 1.5 | 2.3 | 3.9 |
| Staff Spending Impact | 1.6 | 2.1 | 3.3 |
| **Total GVA** | **17.7** | **18.9** | **21.7** |

Note: Totals may not add up due to rounding.

## 14.6 Receptors Brought Forward for Assessment

14.6.1 The socio-economic assessment sought to establish the socio-economic contribution that the Proposed Development might make to the local, regional and national economy and so the following receptors were considered as part of the assessment:

- the economy of Lochaber;
- the economy of Highland; and
- the economy of Scotland.

## 14.7 Standard Mitigation

14.7.1 The assessment did not identify any requirements for mitigation.

## 14.8 Potential Effects

### *Construction*

14.8.1 The first step in estimating the economic impact arising from the construction of the Proposed Development was to estimate its total expected costs. Initial estimates suggest that the Proposed Development will cost up to £82 million.

14.8.2 In order to estimate the economic impact associated with construction, it was necessary to make an assumption about the share of contracts that could be secured in each study area, and the sectors in which this spending would occur, for example civil engineering, engineering activities, etc. A significant proportion of expenditure would be on equipment likely to be manufactured outside of Scotland, such as furnaces.

14.8.3 Based on an analysis of the business base of the three study areas, it was assumed that around 10% of construction expenditure could take place in Lochaber, 21% in Highland and 37% in Scotland. These contracts are concentrated in the construction and engineering services, such as the construction of the Recycling and Billet Casting Facility production line.

14.8.4 Based on the sectors of expenditure across the study areas, economic ratios were used to estimate the direct jobs and GVA supported. Indirect and induced impacts associated with construction activity were then estimated by applying the relevant Type 1 and Type 2 employment and GVA multipliers.

14.8.5 No displacement is expected to take place, as there are enough construction businesses to cater for the contracts that are likely to be awarded locally. If the Proposed Development were not to go ahead, no construction activity would take place at the site. As a result, deadweight was also assumed to be 0%.

14.8.6 In this way, it was estimated that the net economic impact associated with the construction of the Proposed Development will be around:

- £4.0 million GVA and 46 years of employment in Lochaber;
- £9.8 million GVA and 114 years of employment in Highland; and
- £23.7 million GVA and 291 years of employment across Scotland.

*Table 14.10 Net Economic Impact from Construction*

| | Lochaber | Highland | Scotland |
|---|---|---|---|
| Employment (Years of Employment) | 46 | 114 | 291 |
| GVA (£ million) | 4.0 | 9.8 | 23.7 |

14.8.7 The effect of the Proposed Development during the construction phase on the economy of Lochaber was assessed as **minor**, given the scale of the impact on employment with respect to total employment in Lochaber.

14.8.8 The effect of the Proposed Development on both the economy of Highland and that of Scotland was assessed as **negligible**.

### *Operation*

#### Economic Impact

14.8.9 The economic impact of the Proposed Development during its operation includes direct impact, impact from supply chain expenditure and impact from staff spending in the economy.

14.8.10 To estimate the direct impact, the same approach as used in the baseline economic impact was adopted. The level of turnover was based on the Proposed Development producing 80 kt. It was estimated that the direct impact of the Proposed Development will be £32.7 million GVA and 194 jobs.

14.8.11 The operation of the Proposed Development will require expenditure in goods and services. The economic sectors in Scotland that will benefit from spending from the Proposed Development include shipping, maintenance contractors, production service contractors, and scrap aluminium (of which it was assumed 50% could be secured from within Scotland). Spending on these goods and services was estimated to generate £1.6 million GVA and 25 jobs in Lochaber, £2.4 million GVA and 38 jobs in Highland, and £27.8 million GVA and 583 jobs across Scotland.

14.8.12 However, scrap aluminium would continue to be collected and processed in Scotland and then exported even if the Proposed Development did not go ahead, and therefore this activity was considered to be deadweight and so was subtracted from the impact calculated. On this basis, the net economic impact would be £1.6 million GVA and 25 jobs in Lochaber, £2.4 million GVA and 38 jobs in Highland, and £7.3 million GVA and 130 jobs across Scotland.

14.8.13 The Proposed Development is also expected to generate economic benefits through the spending in the economy of the staff employed. The impact was based on 50% of staff spending taking place in Lochaber, 60% in Highland and 74% across Scotland.

14.8.14 It was estimated that the spending in the economy of staff involved in the operation of the Proposed Development will generate £1.7 million GVA and support 37 jobs in Lochaber; £2.2 million GVA and 49 jobs in Highland; and £3.4 million GVA and 77 jobs across Scotland.

14.8.15 Deadweight considers a project proposal against the counterfactual of what would happen in an area, if the project did not go ahead. If the Proposed Development were not to go ahead, the aluminium smelter will not operate. This scenario would imply a negative impact on economic activity compared to the baseline assessment of impact and so the safeguarding of existing baseline impacts forms part of the socio-economic benefits of the Proposed Development.

14.8.16 It was assumed that there would not be any labour market displacement effects as a result of the Proposed Development, as it would safeguard current employment and not create any pressures on the job market or on other manufacturers.

14.8.17 In this way, it was estimated that the total net economic impact from the operation of the Proposed Development will be:

- £35.7 million GVA and 256 jobs in Lochaber;
- £36.9 million GVA and 281 jobs in Highland; and
- £43.0 million GVA and 401 jobs across Scotland.

*Table 14.11 Net Economic Impact from Operation*

| | Lochaber | Highland | Scotland |
|---|---|---|---|
| **Employment** | | | |
| Direct Impact | 194 | 194 | 194 |
| Supply Spending Impact | 25 | 38 | 130 |
| Staff Spending Impact | 37 | 49 | 77 |
| **Total Employment** | **256** | **281** | **401** |
| **GVA (£ million)** | | | |
| Direct Impact | 32.4 | 32.4 | 32.4 |
| Supply Spending Impact | 1.6 | 2.4 | 7.3 |
| Staff Spending Impact | 1.7 | 2.2 | 3.4 |
| **Total GVA** | **35.7** | **36.9** | **43.0** |

Note: totals may not add up due to rounding.

### Balance of Trade

14.8.18 The Proposed Development would result in a significant increase in turnover, with a portion of the products being exported to the rest of the world, predominantly Western Europe, and the remaining being sold to domestic companies. Both domestic sales and international exports are to be considered as having a positive net impact on the balance of trade, as domestic sales would cover demand that would otherwise be met by imports.

14.8.19 It was then necessary to subtract the value of imports, including raw materials imported from Ireland and Belgium. It was also necessary to exclude the value of scrap aluminium, which would otherwise be exported.

14.8.20 Overall, the Proposed Development is expected to result in a UK trade surplus (i.e., exports exceed imports) of £48.5 million. The Proposed Development will also have a positive impact on Scotland's balance of trade, with exports exceeding imports by £37.4 million. The UK trade surplus associated with the Proposed Development is larger than that for Scotland, as some inputs will be imported from the rest of the UK.

14.8.21 As set out in the baseline, in 2018 the value of Scotland's exports exceeded that of its imports by around £200 million. The Proposed Development is associated with a trade surplus for Scotland of £37.4 million, around 19% of the total trade surplus for Scotland.

### Significance Assessment

14.8.22 The Proposed Development will safeguard the operations of the Lochaber smelter and its employment. The smelter is an important source of manufacturing jobs in Lochaber: it supports 194 direct jobs, equivalent to around 2% of all employment in the area and around one in four of the existing manufacturing jobs in Lochaber.

14.8.23 Compared to jobs in other sectors of the local economy, such as those in tourism and hospitality, employment in manufacturing is associated with relatively higher wages. Given the local economic structure, the loss of these jobs may lead existing employees to look for job opportunities elsewhere in Scotland or to seek employment locally in lower-paying sectors, displacing other employees and negatively affecting the level of productivity in the Lochaber economy.

14.8.24 The relative diversification of the economic base of an area affects its relative sensitivity to change. In particular, the more an economic area relies on a few economic sectors, the more it is vulnerable to sudden economic shocks and to changes to its baseline. As set out in the baseline, the local economy has over 46% of employment across three sectors; accommodation and food services, health and retail.

14.8.25 The importance of economic diversification has been exposed by the economic impact of the COVID-19 pandemic, with restrictions affecting sectors, such as tourism and hospitality, with accommodation and food services accounting for around 25% of employment in Lochaber. The diversification of the business base adds to the socio-economic resilience of the area and reduces its exposure and vulnerability.

14.8.26 For all these reasons, the closure of the existing plant as a result of the Proposed Development not going ahead, is likely to lead to a major loss in a key feature of the local economy, with fundamental changes on the baseline condition. As a result, the effect of the operation of the Proposed Development on the economy of Lochaber was assessed as **major**, which is significant.

14.8.27 As set out in the economic baseline, the manufacturing sector is relatively less important in Highland compared to Scotland and the jobs that will be supported by the Proposed Development are around 3% of the manufacturing jobs in the region. The loss of the Lochaber smelter and of the Proposed Development will diminish the sector's importance regionally and affect the diversity of its economic base.

14.8.28 The sensitivity of Highland is assessed with respect to how any changes may affect its future demographics, to the diversification of its economic base and to its relative ability compared to other areas of Scotland to attract investment.

14.8.29 The loss of relatively high value jobs may make it harder for Highland to retain its young people. This will make it harder to offset the expected decline in the population of the region and will exacerbate existing imbalances in its population structure, with impacts on the sustainability of the Highland economy.

14.8.30 Therefore, if the Proposed Development were not to go ahead this would lead to changes to a key feature of its economy leading to a material change on the baseline condition. For this reason, the effect of the operation of the Proposed Development on the economy of Highland was assessed as **moderate**, which is significant.

14.8.31 While the Proposed Development does not make a sizable contribution in terms of employment supported and GVA generated in the context of the Scottish economy as a whole, it retains strategic importance for at least two reasons: its relevance to inclusive growth and the strategic importance of manufacturing jobs.

14.8.32 The Scottish Government is committed to inclusive growth, that is achieving sustainable growth within all of Scotland's regions. The loss of the Proposed Development in Highland would affect its present economic performance and its future prospects.

14.8.33 In addition to the importance of diversification in the face of economic shocks, the COVID-19 pandemic has led to a rethink of global supply chains, away from considerations based purely on cost. The retention of manufacturing production within Scotland is strategically important in making the economy more resilient to disruptions determined by external shocks.

14.8.34 The Proposed Development will contribute to Scotland's trade surplus. In particular, in 2018 the difference between exports and imports with the rest of the world (including the rest of the UK) was around £200 million. The analysis has shown that the Proposed Development will make a contribution to Scotland's trade surplus of £37.4 million. This is almost a fifth of the baseline trade surplus. At the margin, the loss of the smelter may deteriorate the Scottish balance of trade and shift it close to a deficit position with respect to the rest of the world.

14.8.35 Due to its strategic importance relative to inclusive growth, to the retention of manufacturing jobs and avoidance of exposure to import markets, the effect of the operation of the Proposed Development on the economy of Scotland was assessed as **minor**.

#### *Economic Impact from Production of 100 kt*

14.8.36 The analysis also considered a scenario where production at the Proposed Development is 100 kt. On this basis, it was estimated that the Proposed Development could support through its operation up to:

- £45.8 million GVA and 287 jobs in Lochaber;
- £47.4 million GVA and 319 jobs in Highland; and
- £54.5 million GVA and 460 jobs across Scotland.

14.8.37 With production levels at 100 kt, the contribution of the Proposed Development to the balance of trade was estimated as £62.4 million in net exports at the level of Scotland and £68.7 million in net exports at the level of the UK economy.

#### *Impact of Previous Investment Proposition*

14.8.38 In the past the Applicant considered the construction of an alloy wheel plant (AWP) at the site. In 2017, BiGGAR Economics carried out an economic impact assessment of that proposal.

14.8.39 The assessment found that the proposed investment could generate a total annual impact of:

- £54.1 million GVA and 679 jobs in Lochaber;
- £57.7 million GVA and 744 jobs in Highland; and
- £67.4 million GVA and 824 jobs in Scotland.

14.8.40 As a result of decline in automotive production in the UK, the proposal is now considered as not commercially viable.

## 14.9 Additional Mitigation

14.9.1 The assessment did not identify any requirements for mitigation.

## 14.10 Residual Effects

### *Construction*

14.10.1 The effects from the construction of the Proposed Development have been assessed as **minor** for the economy of Lochaber and as **negligible** for the economies of Highland and Scotland.

### *Operation*

14.10.2 The effects linked to the operational phase have been assessed as **major** for the economy of Lochaber, as **moderate** for the economy of Highland and as **minor** for the economy of Scotland.

## 14.11 Cumulative Assessment

14.11.1 The Applicant has other investment plans for the area, including the development of the proposed Glenshero Wind Farm.

14.11.2 There is potential for beneficial cumulative effects if more than one of these projects being considered by the Applicant is realised, in particular through the creation of employment opportunities in Highland. These may be important in increasing the ability of the area to retain its young people.

## 14.12 Summary

14.12.1 This chapter provides the socio-economic assessment of the Proposed Development. The analysis has considered impacts associated with construction and operation and how the Proposed Development fits into the local, regional and national economic context.

14.12.2 Lochaber has an ageing population which is expected to decline over the next decade. The area has high economic activity rates coupled with a low unemployment rate and a distinct industrial structure which reflects the area's main operations and attractions. Tourism is a significant source of employment in the area and so the Lochaber economy will have been particularly adversely impacted by the COVID-19 pandemic.

14.12.3 It is estimated that the construction of the Proposed Development will generate:

- £4.0 million GVA and support 46 years of employment in Lochaber;
- £9.8 million GVA and support 114 years of employment in Highland; and
- £23.7 million GVA and support 291 years of employment in Scotland.

14.12.4 The effect of the construction of the Proposed Development has been assessed as **minor** (beneficial) at the Lochaber level, and **negligible** at both the Highland and Scotland level. The construction phase can also contribute to the economic recovery from the COVID-19 pandemic by providing temporary construction jobs locally, regionally and nationally.

14.12.5 During operation, it is estimated that the direct impact of the Proposed Development would be:

- £35.7 million GVA and support 256 jobs in Lochaber;
- £36.9 million GVA and support 281 jobs in Highland; and
- £43.0 million GVA and support 401 jobs in Scotland.

14.12.6 The retention of the Lochaber smelter and the jobs created by the Proposed Development are important to the future of the local economy, as they will contribute to the diversity of the local economic base, will bring opportunities for up-skilling, and safeguard local manufacturing jobs. For these reasons, the effect of the operation of the Proposed Development was assessed as **major** (beneficial) and significant.

14.12.7 The Proposed Development will contribute to retention, to diversification of Highland's economic base and maintain its attractiveness to investment. As a result, the effect of the operation of the Proposed Development on the economy of Highland was assessed as **moderate** (beneficial) and significant.

14.12.8 From the perspective of the Scottish economy, the Proposed Development will contribute to the geographical spread of economic opportunities across Scotland, reduce its vulnerability to trade shocks and make a contribution to the Scottish balance of trade. Its effect on the Scottish economy was assessed as **minor** (beneficial).

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# Chapter 15 Schedule of Environmental Commitments

# 15. Environmental Commitments

# 15. Schedule of Environmental Commitments

## 15.1 Introduction

15.1.1 A Schedule of Environmental Commitments is considered best practice in EIA and acts as a quick reference for anyone interested primarily in the mitigation measures to which the Applicant is committed. The assessment of residual effects presented within the EIA Report has been based on the Schedule of Environmental Commitments. It will be utilised by the Applicant throughout the development of the detailed design, and the appointed contractors will be required to allow for, and ultimately implement, each of the measures in this schedule as a minimum.

## 15.2 Schedule of Environmental Commitments

15.2.1 Table 15.1 below presents a Schedule of Environmental Commitments for the Proposed Development, listed according to the relevant environmental discipline area. Further detail on each of the mitigation measures and commitments is included in the relevant EIA Report chapters, to which reference should also be made. Where appropriate, these mitigation measures and commitments will be subject to valid and enforceable planning conditions.

15.2.2 Where mitigation measures are stated to be undertaken pre-construction or during construction, it can be assumed that these mitigation measures will also be implemented pre-decommissioning and during decommissioning, unless stated otherwise.

*Table 15.1 Schedule of Environmental Commitments*

| Subject Area | Commitment | Timing |
|---|---|---|
| Proposed Development - General | | |
| Construction Environmental Management Plan (CEMP) | All construction works will be subject to a CEMP to minimise environmental impacts during this phase of the Proposed Development. The CEMP will contain, as a minimum, the following management plans:<br>➢ Pollution Prevention Management Plan<br>➢ Construction Noise Management Plan;<br>➢ Dust and Air Quality Management Plan;<br>➢ Site Waste Management Plan;<br>➢ Water Quality and Pollution Management Plan;<br>➢ Peat Management Plan; and<br>➢ Construction Traffic Management Plan.<br><br>An outline CEMP, for information at the planning stage, is included in Volume IV as Technical Appendix 3.1. On appointment of the Principal Contractor, the outline CEMP will be reviewed, updated and submitted to The Highland Council for agreement prior to any construction activities commencing at the Proposed Development. | Pre-construction and construction |
| Pollution Prevention Strategy | Prior to commencement of construction activities, a pollution prevention strategy, contained within a CEMP, will be agreed with SEPA to ensure that appropriate measures are put in place to protect watercourses and the surrounding environment.<br><br>High standards of health and safety will be established and maintained at all times. All activities will be undertaken in a manner compliant with applicable health and safety legislation and with relevant good practice, as defined under applicable statutory requirements and codes of practice and guidance. | Pre-construction and construction |
| Operational Environmental Management Plan (OEMP) | All operational works will be subject to an OEMP to minimise environmental impacts during this phase of the Proposed Development. On receipt of planning permission, the Applicant will work to review and update current operating procedures on site and develop and submit an OEMP to The Highland Council for agreement prior to operational activities commencing at the Proposed Development. | Pre-operation and operation |

| Subject Area | Commitment | Timing |
|---|---|---|
| Decommissioning Environmental Management Plan (DEMP) | During decommissioning of the Proposed Development, the Applicant will produce, and adhere to, a DEMP. The DEMP shall be developed in accordance with current legislation and guidance at the time of decommissioning. | Pre-decommissioning |
| Landscape and Visual | | |
| Visual impact | The design of the Proposed Development has evolved as part of an iterative process which has aimed to provide an optimal design in environmental, as well as technical and economic terms and, landscape and visual mitigation measures have been a central consideration in the design process. The proposed design layout has been developed to minimise the effect on the surrounding landscape and visual resource. The layout design has therefore evolved with the intention of presenting a simple, well balanced image of the Proposed Development in the majority of views. | Pre-construction |
| Topsoil and subsoil stockpiling | Any operations requiring the stripping, stockpiling and re-spreading of topsoils and subsoils will require to be undertaken in accordance with the PMP and CEMP. Locations and heights of stockpiles will need to be agreed to ensure no issues with pollution (i.e., sediment run-off into any water courses) best practice techniques will be employed. These are outlined in Chapter 7: Hydrology and Hydrogeology. | Construction and Operation |
| Removal and or implementation of planting | Any operations requiring the removal or implementation of landscape elements (trees, scrub, grassland) will require to be undertaken in accordance with the PMP and CEMP.<br><br>No new planting is proposed, but if any is ultimately required, species selection will be undertaken in consultation with the Ecologist to ensure appropriate species and locations for the locale and in recognition of site species and habitats. | Construction and Operation |
| Hydrology and Hydrogeology | | |
| Good Practice Measures | The following standard good practice measures are assumed to be incorporated as embedded mitigation:<br>➢ Requirements for pre-development, construction and post-development groundwater sampling and monitoring will be agreed with SEPA at the post-planning stage via PPC pre-application consultation;<br>➢ A Construction Environmental Management Plan (CEMP) will be in place to control potentially polluting activities to prevent adverse impact to downstream persons, properties and environment during the construction phase; | Pre-construction and Construction |

| Subject Area | Commitment | Timing |
|---|---|---|
| | ➢ All earthmoving works or similar operations would be carried out in accordance with BSI Code of Practice for Earth Works BS6031:2009;<br>➢ The drainage design outlined in the DIA (Technical Appendix 7.2) details the Proposed Development drainage design mitigating increased discharge rates and flood risk, as well as enhancing the water quality;<br>➢ All site discharges and temporary water abstraction would be regulated under the CAR licensing regime and all necessary licenses would be sought from SEPA prior to the commencement of an operations on-site; and<br>➢ While it is acknowledged that best practice to minimise run-off would be to undertake construction and dismantling during the driest period of the year, given the high annual rainfall averages there is likely to be periods of rainfall likely to generate surface water runoff during the construction phase. Therefore, Site management would check the local weather forecast daily and prime all Site staff to ensure that everyone is aware of their responsibilities to maintain the pollution control system during wet weather or suspend sensitive operations during adverse weather conditions. | |
| Peat Management | A draft Peat Management Plan (Technical Appendix 8.2) has been developed to set out the approach to the management of the peat resource during construction of the facility. Of relevance to hydrology and hydrogeology are the following;<br>➢ The design and location of stockpiles, including incorporated drainage elements, will be agreed with the Ecological Clerk of Works (ECoW) and Geotechnical Consultant / Geotechnical Clerk of Works prior to excavation works commencing.<br>➢ Temporary peat storage areas will be located such that erosion and run off is limited, leachate from the material is controlled, and stability of the existing peatland in the vicinity is not affected.<br>Excavated material will be stockpiled at least 150 m away from the nearest watercourse. This will ensure that any wetting required on stored peat does not runoff and discharge into watercourses. | Pre-construction and Construction |
| Proposed Drainage Design | The drainage design outlined in the DIA (Technical Appendix 7.2) details the Proposed Development drainage design mitigating increased discharge rates and flood risk, as well as enhancing the water quality.<br><br>To ensure the proposed surface water management strategy remains operational and capable of managing large storm events, drainage components should be inspected and maintained throughout the life of the development. Regular | Operation |

| Subject Area | Commitment | Timing |
|---|---|---|
| | inspection / maintenance will ensure efficient operation and prevent failure / loss of performance of drainage system. Monitoring and maintenance of the drainage strategy measures have been recommended and set out in Technical Appendix 7.2. The maintenance plan has been developed from best practice guidance, information provided in the CIRIA Report C753 and manufacturer's guidelines. | |
| Ecology and Biodiversity | | |
| Preconstruction surveys for protected species | A pre-construction survey for protected species will be carried out. If evidence of protected species presence is identified, additional mitigation may be identified and implemented to prevent impacts on individuals. | Pre-construction |
| Ecological Clerk of Works (ECoW) | The Applicant will appoint a suitably qualified ECoW prior to the commencement of any construction activities. The ECoW will be present and oversee all construction activities as well as providing toolbox talks to all site personnel with regards to priority species and habitats, as well as undertaking monitoring works, overseeing the relocation of any significant stands of nationally important species of plants and briefings to relevant staff and contractors as appropriate. | Pre-construction and Construction |
| CEMP | Full details of construction mitigation measures will be provided in a CEMP to be agreed with THC, in consultation with NatureScot and SEPA, post-consent but prior to the development commencing. An outline CEMP is provided in Volume IV as Technical Appendix 3.1. | Pre-construction and Construction |
| Peat Management | A Peat Management Plan (PMP) will be implemented during the construction and operation phases that will focus on the enhancement and restoration of blanket bog within former areas of conifer plantation through the re-use of excavated peat from the Proposed Development. A Draft PMP is presented as Technical Appendix 8.2 and will be finalised post-consent in agreement with THC, NatureScot and SEPA.<br><br>Monitoring to be carried out in years one, two, three and five post construction as detailed in the PMP to identify any additional treatment works that might be required to restore the peat receptor areas to active peatland. | Construction and Operation |
| Pollution prevention | In order to prevent pollution of watercourses within the site (with particulate matter or other pollutants such as fuel), best practice techniques will be employed. These are outlined in EIA Report Chapter 7: Hydrology and Hydrogeology. | Construction and Operation |
| Access, Traffic and Transport | | |
| Construction Traffic | All construction traffic will be subject to a Construction Traffic Management Plan (CTMP) to minimise environmental impacts of increased HGV and total traffic resulting from the construction phase of the Proposed Development. | Pre-construction and Construction |

| Subject Area | Commitment | Timing |
|---|---|---|
| Management Plan | | |
| Travel Plan | All operational staff trips generated by the Proposed Development (arrivals and departures) will be subject to a Travel Plan to encourage more sustainable travel by staff of the Proposed Development. | Operation |
| Noise and Vibration | | |
| CEMP | A CEMP will be produced and implemented to minimise unnecessary disruption associated with construction works. The CEMP will provide contact details for the contractor undertaking the works, name the personnel responsible for communication with residents, and set out a complaints procedure such that noise complaints are handled appropriately. An outline CEMP is provided in Volume IV as Technical Appendix 3.1.<br><br>Where reasonably practicable, quiet working methods will be employed, including the use of the most suitable plant, reasonable hours of work for noisy operations, and economy and speed of operations.<br><br>Plant will be switched off when not in use, and unavoidably noisy works will, if required, be screened to reduce noise propagation towards neighbouring properties. | Construction |
| General Noise Management | Fixed and mobile plant will be specified such that it meets appropriate noise limits at noise sensitive receptors. Where necessary, attenuation such as acoustic enclosures will be specified to enable noise limits to be met. | Operation |
| Air Quality | | |
| CEMP and CTMP | Mitigation measures during construction will comprise implementation of a CEMP and a CTMP in relation to staff movements to and from the site. An outline CEMP including measures for mitigating against potential dust nuisance and human health impacts is presented in Volume IV Technical Appendix 3.1. | Construction |
| Operational Controls and Permitting | Abatement technologies have been considered in order to minimise the impacts of emissions from the Proposed Development sources at sensitive receptors. The following emission reductions compared to Best Available Technique Emission Limit Values (ELVs) have been included in the assessment based on the lead solution currently proposed by prospective equipment manufacturers:<br>➢ 90% for HCl at BP2Large and Small;<br>➢ 81% for NOx at BP2Large and 80% at BP2Small;<br>➢ 33% for CO at BP2Large and 67% at BP2Small; and | Operation |

| Subject Area | Commitment | Timing |
| --- | --- | --- |
| | ➢ 33% for TVOC at BP2Small.<br><br>Post consent and as part of the permitting process the Applicant will liaise with SEPA and specify ELVs which may vary from those considered as part of this assessment. The ELVs specified within the permit will however be derived to ensure that impacts associated with the Proposed Development do not exceed those assessed as part of this assessment.<br><br>Emissions monitoring to ensure compliance will be agreed with SEPA and undertaken as part of the PPC process. | |
| Climate Change | | |
| Climate Effects / Resilience | A range of standard mitigation measures will be implemented to lessen the impact of potentially significant climate effects on the Proposed Development:<br><br>➢ A comprehensive drainage system will be implemented to mitigate flood risk during the construction and operation of the Proposed Development;<br><br>➢ Site activities during the construction and operational phases will be suspended during extreme weather events to mitigate against health and safety risks for site personnel and potential damage to structures and equipment; and<br><br>➢ Construction and site personnel must be provided with appropriate personal protective equipment (PPE) to mitigate against the health and safety risks posed by extreme weather. For example, eyewear to mitigate against the health effects of dust mobilisation in high winds. | Construction |
| | The design of the Proposed Development is considered sufficient to withstand the effects of slight changes to ambient temperature, maximum temperature and rainfall expected over the course of its lifespan | Operation |
| Greenhouse Gas (GHG) Emissions | IEMA best practice guidance considers all GHG emissions to be significant due to their contribution towards climate change. The following measures will be applied to reduce resulting GHG emissions during construction:<br><br>➢ Consideration of lower-carbon construction materials (notably structural steel and concrete) as supply chains are clarified;<br><br>➢ Minimisation of off-site spoil disposal;<br><br>➢ Peat Management Plant; | Construction |

| Subject Area | Commitment | Timing |
|---|---|---|
| | ➢ Use of hydroelectric power;<br>➢ Specification of energy efficient furnaces; and<br>➢ Investigation of non-fossil furnace fuels as commercial solutions emerge. | |
| | The following measures will be applied to reduce GHG emissions during operation:<br>➢ Use of hydroelectric power;<br>➢ Specification of energy efficient furnaces; and<br>➢ Investigation of non-fossil furnace fuels as commercial solutions emerge. | Operation |
| Major Accidents and Disasters | | |
| Safety case and risk assessment | The new activities at the Proposed Development site will be considered in the updated scope of a site-wide Major Accident Prevention Policy as a requirement under the COMAH regulations for Lower Tier sites. A suitable hazard and environmental incident identification exercise will follow and feed into updated site procedures. | Operation |
| Socio-economic Effects – no specific commitments | | |

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# Chapter 16 Summary of Residual Effects

# 16. Summary of Residual Effects

# 16. Summary of Residual Effects

## 16.1 Introduction

16.1.1 This summary of residual effects provides a summary of effects of the Proposed Development, mitigation measures and the residual effects anticipated after mitigation measures have been applied.

## 16.2 Summary of Residual Effects

16.2.1 Residual effects during construction, operation and, as relevant, decommissioning are summarised in Tables 16.1 and 16.2.

16.2.2 Table 16.1 provides a concise reference to each of the residual environmental effects identified for receptors in the Landscape and Visual Assessment of the EIA Report.

16.2.3 Table 16.2 provides a concise reference to each of the residual environmental effects identified in all other technical sections of the EIA Report as well as a cross reference to the relevant mitigation measures identified.

*Table 16.1 Summary of Residual Effects - Landscape and Visual*

| Receptor | Significance of Potential Effect | |
|---|---|---|
| | Significance | Beneficial/Adverse |
| Direct Landscape Effects on the Landscape Resource | | |
| Proposed Site | Small-scale effects within western and southern areas of the site.<br>Slight significance. | Neutral - neither beneficial nor adverse as proposals within an existing industrial area. |
| Effects on Landscape Character Areas | | |
| Mountain Massif | Localised, permanent effects of small scale arising from increased proximity and visibility of industrial buildings within 1-2 km to the south of the site<br><br>Low-Negligible effects<br>Slight significance | Adverse |
| Lochs with Settled Edges Character (includes site) | Small scale effects will arise within the western and southern parts of the site extending to the edge of this character area 1 km south of the proposed building. Limited extent.<br>Negligible effects<br>Minimal significance. | Neutral |
| Broad Forested Strath | Negligible effects<br>Minimal significance | Neutral |
| Smooth Moorland Ridges | Negligible effects<br>Minimal significance | Neutral |
| Implications for Designated Landscapes | | |
| Ben Nevis and Glen Coe National Scenic Area (NSA) | Localised effects on views within 2 km of the site, and landscape character at the northern end of Glen Nevis.<br><br>Slight significance. | Adverse |
| Wild Land Areas | Negligible effects on Wild Land Areas.<br>Minimal significance | Neutral |
| Effects on Settlements | | |
| Claggan | Occasional glimpsed views seen between buildings and through vegetation.<br>Slight significance. | Adverse |
| Inverlochy | Occasional glimpsed views seen between buildings and through vegetation.<br>Slight significance. | Adverse |
| Caol and Lochyside | Building seen in long views along Clunes Avenue and Kilmallie Road in Caol, and from B8006 between railway and A830.<br>Slight significance. | Adverse |
| Corpach and Drumfada | Building seen adjacent to existing plant in views from cemetery; nearby open areas along Caledonian Road; from the sea locks and from sort stretches of the A830 – particularly in winter.<br>Slight significance. | Adverse |
| Effects on Route Corridors | | |
| Road and Rail | Effects on primary road and rail routes will be Negligible.<br>Minimal significance | Neutral |
| West Highland Way | Occasional views from the route as it ascends the western slopes of Glen Nevis – primarily affecting northbound walkers.<br>Moderate-Slight significance | Adverse |

| Receptor | Significance of Potential Effect | |
|---|---|---|
| | Significance | Beneficial/Adverse |
| Ben Nevis (path from Achintee House) | Views of the proposed building beyond Achintee house and nearby woodland for walkers descending from Ben Nevis.<br>Slight-Minimal significance | Adverse |
| Witches cycle trails | Negligible Effects<br>Minimal significance | Neutral |
| Nevis Range | Negligible Effects<br>Minimal significance | Neutral |
| Effects on Viewpoints | | |
| Viewpoint 1 – Primrose Hill | Medium scale of effect<br>Moderate significance | Neutral (due to relationship of proposed building alongside existing buildings of similar scale and form) |
| Viewpoint 2 – Cow Hill | Large – medium scale of effect where the building is seen in open elevated views within up to one km.<br>Major-Moderate significance | Adverse |
| Viewpoint 3 – Achintree Road | Medium scale of effect<br>Moderate significance | Adverse |
| Viewpoint 4 - Meall an t-Suidhe | Small scale of effect<br>Slight significance | Neutral |
| Viewpoint 5 - Bench on North Face footpath | Small scale of effect<br>Slight significance | Neutral |
| Viewpoint 6 – Sgurr Finniosgaig | Negligible Effects<br>Minimal significance | Neutral |
| Viewpoint 7 – Creag a Chail | Medium scale of effect<br>Moderate significance | Neutral |
| Viewpoint 8 – Neptune's Staircase | Medium scale of effect<br>Moderate significance | Neutral |
| Viewpoint 9 – Corpach Sea Locks | Small scale of effect<br>Slight significance | Neutral |
| Viewpoint 10 – Trig point near Achaphubuil | Small scale of effect<br>Slight significance | Neutral |
| Viewpoint 11 – Cemetery at Drumfada | Small scale of effect<br>Slight significance | Neutral |
| Viewpoint 12 – West Highland Way | Small scale of effect<br>Slight significance | Neutral |

*Table 16.2 Summary of Residual Effects*

| Description of Effect | Significance of Potential Effect | | Mitigation Measure | Significance of Residual Effect | |
|---|---|---|---|---|---|
| | **Significance** | **Beneficial/ Adverse** | | **Significance** | **Beneficial/ Adverse** |
| Ecology and Biodiversity | | | | | |
| Construction | | | | | |
| Habitat loss – wet modified bog | Medium | Adverse | Peat Management Plan (PMP) to use excavated peat for peatland restoration elsewhere on site. | Low | Beneficial |
| Operation | | | | | |
| No further effects on the IEF brought forward for assessment are predicted during the operational phase. | N/A | N/A | N/A | N/A | N/A |
| Decommissioning | | | | | |
| No further effects on the IEF brought forward for assessment are predicted during the decommissioning phase. | N/A | N/A | N/A | N/A | N/A |
| Hydrology and Hydrogeology | | | | | |
| Construction | | | | | |
| Changes to groundwater flow | Negligible to Minor | Adverse | In addition to the embedded mitigation and mitigation by design, CEMP environmental monitoring will be carried out and ongoing improvements to the CEMP measures made if potential is identified. | Negligible to Minor | Adverse |
| Pollution Impact from Sediment Run-off/Transport or Chemical Contaminated Run-off | Minor to Negligible | Adverse | In addition to the embedded mitigation and mitigation by design, CEMP environmental monitoring will be carried out and ongoing improvements to the CEMP measures made if potential is identified. | Minor to Negligible | Adverse |
| Operation | | | | | |
| Surface Water Drainage (Increased Rate of Surface Water Run-off) | Minor to Moderate | Beneficial | In addition to the embedded mitigation and mitigation by design, drainage components will be inspected and maintained throughout the life of the development. | Minor to Moderate | Beneficial |
| Long-term Changes to Groundwater Flow Regime | Negligible to Minor | Adverse | No specific measures beyond embedded mitigation. | Negligible to Minor | Adverse |
| Decommissioning | | | | | |
| DEMP and associated appropriate controls at time of decommissioning. | | | | | |
| Access, Traffic and Transport | | | | | |
| Construction | | | | | |
| Smelter Access Road (Severance) | Minor | Adverse | Construction Traffic Management Plan | Negligible | Adverse |
| Smelter Access Road (Driver Delay) | Minor | Adverse | Construction Traffic Management Plan | Negligible | Adverse |
| Smelter Access Road (Pedestrian Delay and Amenity) | Minor | Adverse | Construction Traffic Management Plan | Negligible | Adverse |
| Smelter Access Road (Accidents and Safety) | Minor | Adverse | Construction Traffic Management Plan | Negligible | Adverse |
| Smelter Access Road (Dust and Dirt) | Minor | Adverse | Construction Traffic Management Plan | Negligible | Adverse |

| Description of Effect | Significance of Potential Effect | | Mitigation Measure | Significance of Residual Effect | |
|---|---|---|---|---|---|
| | **Significance** | **Beneficial/ Adverse** | | **Significance** | **Beneficial/ Adverse** |
| Operation | | | | | |
| Smelter Access Road (Severance) | Minor | Adverse | Travel Plan | Negligible | Adverse |
| Smelter Access Road (Driver Delay) | Minor | Adverse | Travel Plan | Negligible | Adverse |
| Smelter Access Road (Pedestrian Delay and Amenity) | Minor | Adverse | Travel Plan | Negligible | Adverse |
| Smelter Access Road (Accidents and Safety) | Minor | Adverse | Travel Plan | Negligible | Adverse |
| Smelter Access Road (Dust and Dirt) | Minor | Adverse | Travel Plan | Negligible | Adverse |
| Decommissioning | | | | | |
| Decommissioning traffic | Negligible | n/a | Appropriate controls at time of decommissioning | Negligible | n/a |
| Noise and Vibration* | | | | | |
| Construction | | | | | |
| Noise from construction traffic | Neutral | Adverse | None proposed | Neutral | Adverse |
| Noise from construction activities | Neutral | Adverse | Construction noise control measures outlined in CEMP | Neutral | Adverse |
| Operation | | | | | |
| Noise from operation of billet plant | Neutral to Slight | Adverse | No specific measures beyond embedded mitigation. | Neutral to Slight | Adverse |
| Noise from additional road traffic movements | Neutral | Adverse | None proposed | Neutral | Adverse |
| Decommissioning | | | | | |
| Noise from decommissioning works | Neutral | Adverse | None proposed | Neutral | Adverse |
| Air Quality | | | | | |
| Construction | | | | | |
| Change in pollutant concentrations associated with construction phase traffic | Negligible | Adverse | n/a | Negligible | Adverse |
| Construction phase effects on human health | Minor | Adverse | Implementation of good practice and site-specific mitigation measures as detailed in Appendix 1 Annex 6. | Negligible | Adverse |
| Construction phase effects on dust soiling | Minor | Adverse | Implementation of good practice and site-specific mitigation measures as detailed in Appendix 1 Annex 6. | Negligible | Adverse |
| Operation | | | | | |
| Change in pollutant concentrations associated with operational phase traffic | Negligible | Adverse | n/a | Negligible | Adverse |
| Change in pollutant concentrations associated with the Proposed Development emissions sources (Human Receptors) | Negligible | Adverse | n/a | Negligible | Adverse |
| Effects associated with introduction of Dioxins/Furans | Negligible | Adverse | n/a | Negligible | Adverse |
| Change in pollutant concentrations associated with the Proposed Development emissions sources (Ecological Receptors) – Critical Levels | No likely significant adverse effects | Adverse | n/a | No likely significant adverse effects | Adverse |
| Change in nitrogen nutrient depositions associated with the Proposed Development emissions sources (Ecological Receptors) | No likely significant adverse effects | Adverse | n/a | No likely significant adverse effects | Adverse |

| Description of Effect | Significance of Potential Effect | | Mitigation Measure | Significance of Residual Effect | |
|---|---|---|---|---|---|
| | **Significance** | **Beneficial/ Adverse** | | **Significance** | **Beneficial/ Adverse** |
| Change in acid depositions associated with the Proposed Development emissions sources (Ecological Receptors) | Minor | Adverse | n/a | Minor | Adverse |
| Decommissioning | | | | | |
| DEMP and associated appropriate controls at time of decommissioning. | | | | | |
| Climate Change | | | | | |
| Construction | | | | | |
| Residual disruption to construction from extreme weather events | Minor | Adverse | Temporary cessation of works, site drainage, PPE | No likely significant adverse effects | Adverse |
| Release of GHGs from construction plant, transportation and from embodied GHG of construction materials | Minor | Adverse | Minimisation of spoil haulage, low carbon alternative materials, CEMP measures for plant idling etc | Minor | Adverse |
| Operation | | | | | |
| GHG emissions directly from process and from electricity import | Moderate | Adverse | Energy efficient furnaces, hydroelectric power | Moderate | Adverse |
| Decommissioning | | | | | |
| N/A | | | | | |
| Major Accidents and Disasters | | | | | |
| N/A | | | | | |
| Socio-economic Effects | | | | | |
| Construction | | | | | |
| £4.0 million and 46 years of employment in Lochaber | Minor | Beneficial | N/A | Minor | Beneficial |
| £9.8 million GVA and 114 years of employment in Highland | Negligible | Beneficial | N/A | Negligible | Beneficial |
| £23.7 million GVA and 291 years of employment in Scotland | Negligible | Beneficial | N/A | Negligible | Beneficial |
| Operation | | | | | |
| £35.7 million GVA and 256 jobs in Lochaber | Major | Beneficial | N/A | Major | Beneficial |
| £36.9 million GVA and 281 jobs in Highland | Moderate | Beneficial | N/A | Moderate | Beneficial |
| £43.0 million GVA and 401 jobs in Scotland | Minor | Beneficial | N/A | Minor | Beneficial |
| Decommissioning | | | | | |
| Not Applicable | | | | | |

** Note: Noise impact assessment uses significance descriptors set out in PAN1/2011 TAN.*

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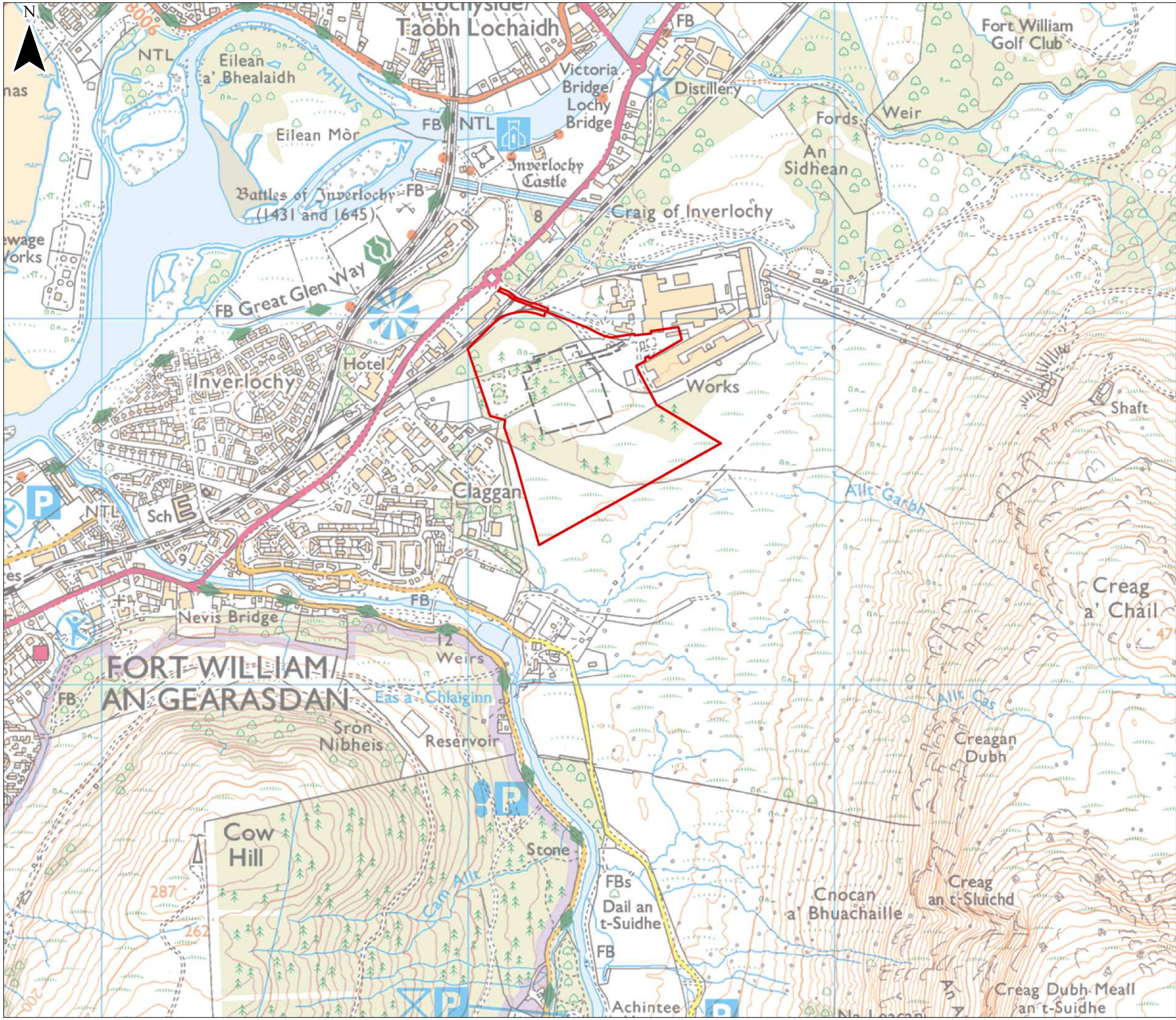
# Volume III EIA Drawings

# Chapter 1 -

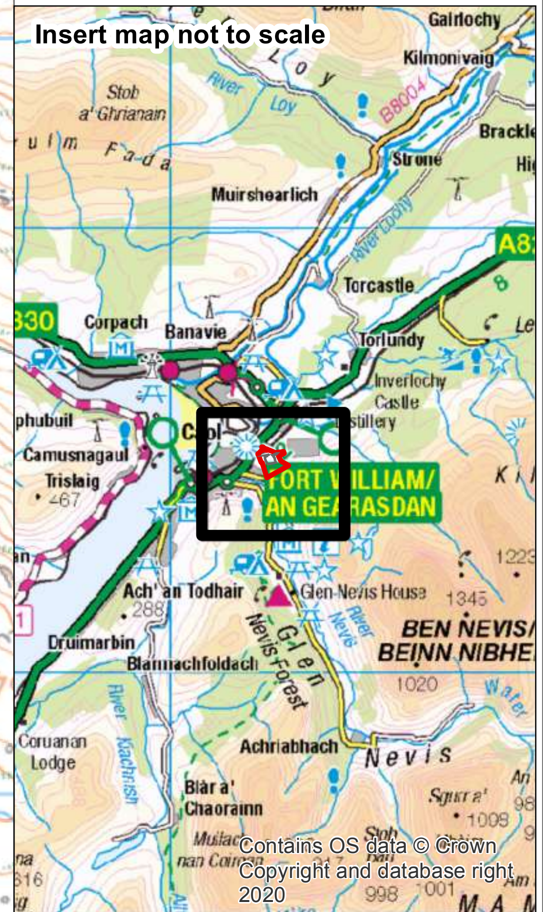
# Chapter 2 -

# Chapter 3 Drawing 3.1 Location and Extent of Proposed Development




**KEY**

- Planning Application Boundary
- Proposed Development Footprint




0 230 460 Meters

**Scale 1:10,000 @ A3**

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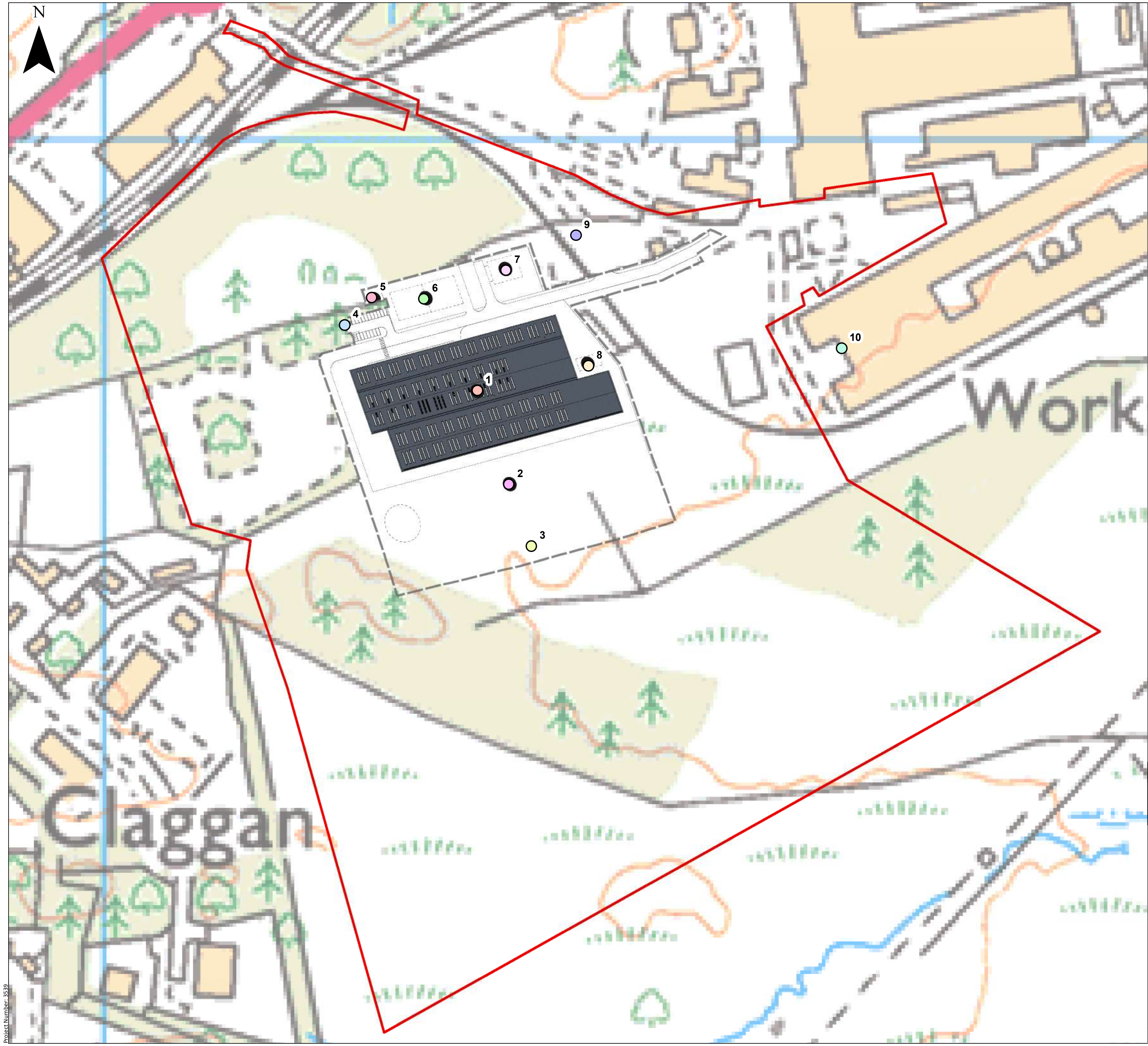
**Drawing 3.1**

**Location and Extent of Proposed Development**

| Date: 07/05/2021 | Drawn by: GM | Checked by: RF | Version: V1 |
|---|---|---|---|

Project Number: 3539

# Chapter 3 Drawing 3.2 Proposed Development Layout




**KEY**

- Planning Application Boundary
- Proposed Development Footprint
- 1 - Proposed Recyling and Billet Casting Facility
- 2 - Proposed Yard and Laydown Area
- 3 - Proposed SUDS and Swale
- 4 - Proposed Car Park with pedestrain route to Main Entrance
- 5 - Electrical Plant
- 6 - Water Treatment Plant
- 7 - Gas Facility
- 8 - Process Gases Storage
- 9 - Weigh Bridge
- 10 - Existing Smelter Facility

0 60 120 Meters

Scale 1:2,600 @ A3

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**Drawing 3.2**

**Proposed Development Layout**

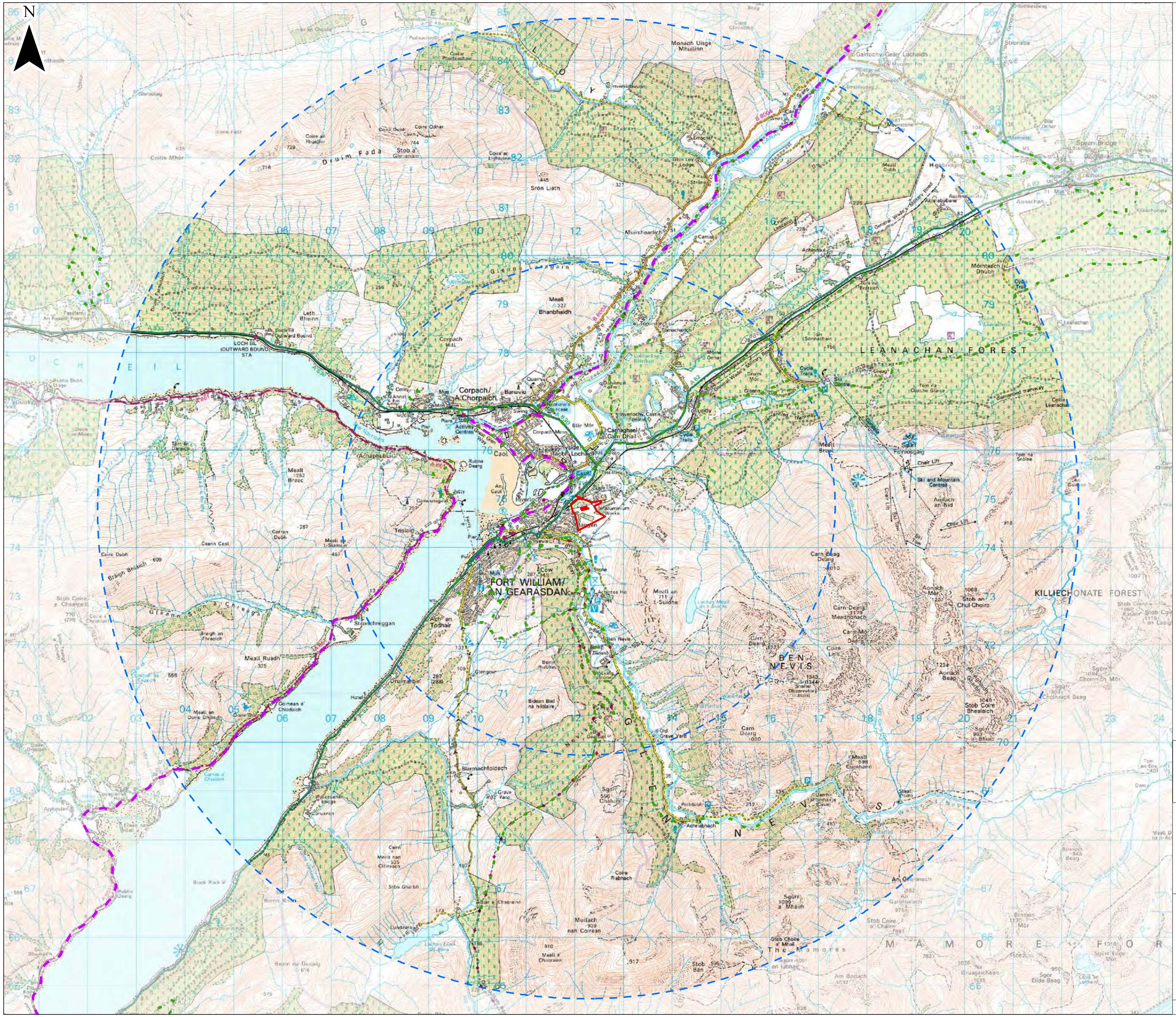
| Date: | Drawn by: | Checked by: | Version: |
|---|---|---|---|
| 07/05/2021 | GM | RF | V1 |

Project Number: 3539

## Chapter 4 -

# Chapter 5 -

# Chapter 6 Drawing 6.1 Site Context




## KEY

- Site boundary
- Proposed building location
- Distance from proposed building (5km, 10km)
- National Cycle Route
- Core Paths
- Long Distance Walking Routes: Great Glen Way West Highland Way
- Panoramic Viewpoint

Great Glen Canoe Trail follows Caledonian Canal northwards from Neptune's Staircase

0 1.5 3 km

Scale 1:75,000 @ A3

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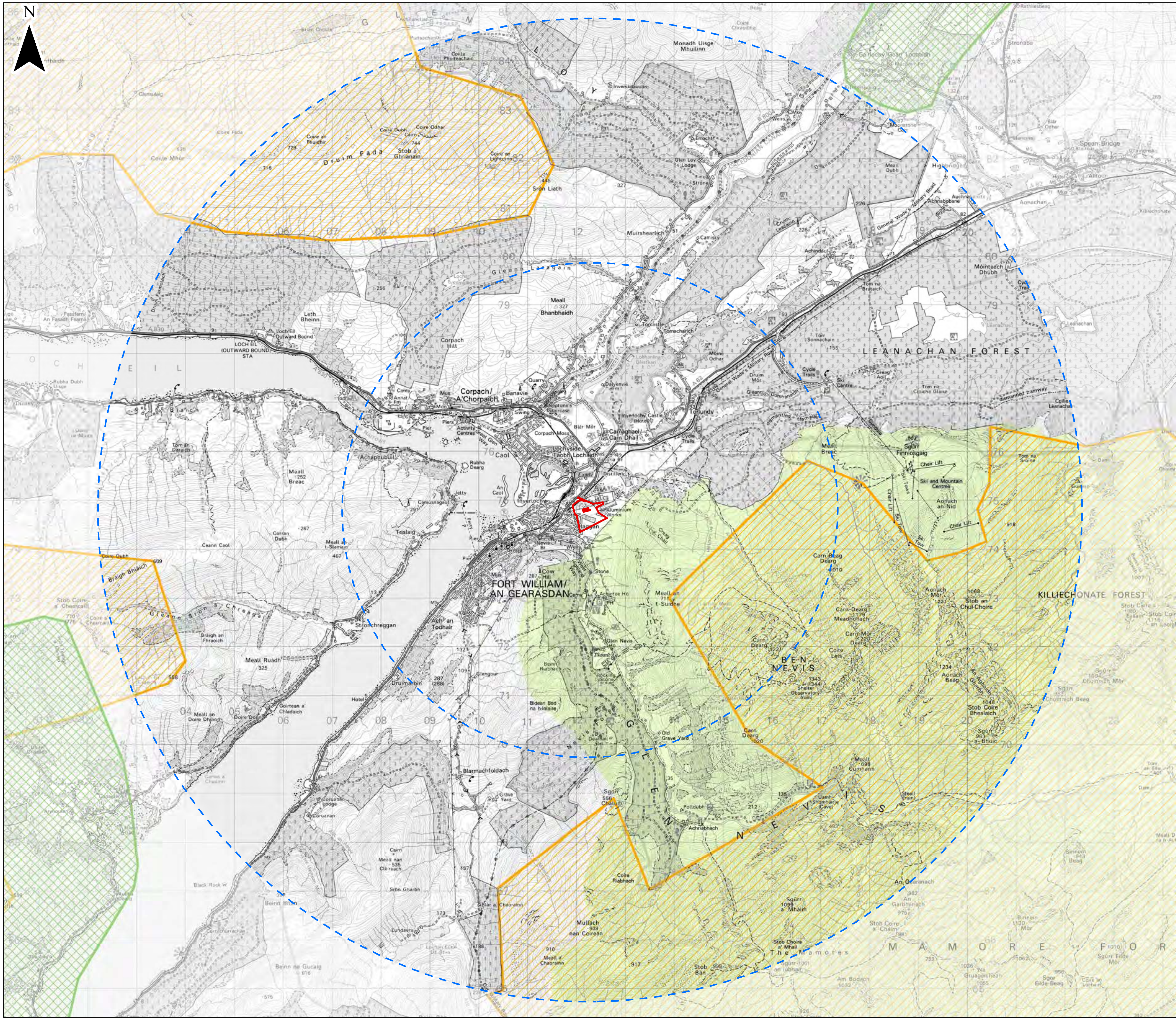
**Drawing 6.1**

**Site Context**

| Date: | Drawn by: | Checked by: | Version: |
|---|---|---|---|
| 09/04/2021 | SHa | SI | Final |

Project Number: 3539

# Chapter 6 Drawing 6.2 Policy Context




**KEY**

- Site boundary
- Proposed building location
- Distance from proposed building (5km, 10km)
- Local Landscape Area (LLA)
- Wild Land Area
- National Scenic Area (NSA)

0 1.5 3 km

**Scale 1:75,000 @ A3**

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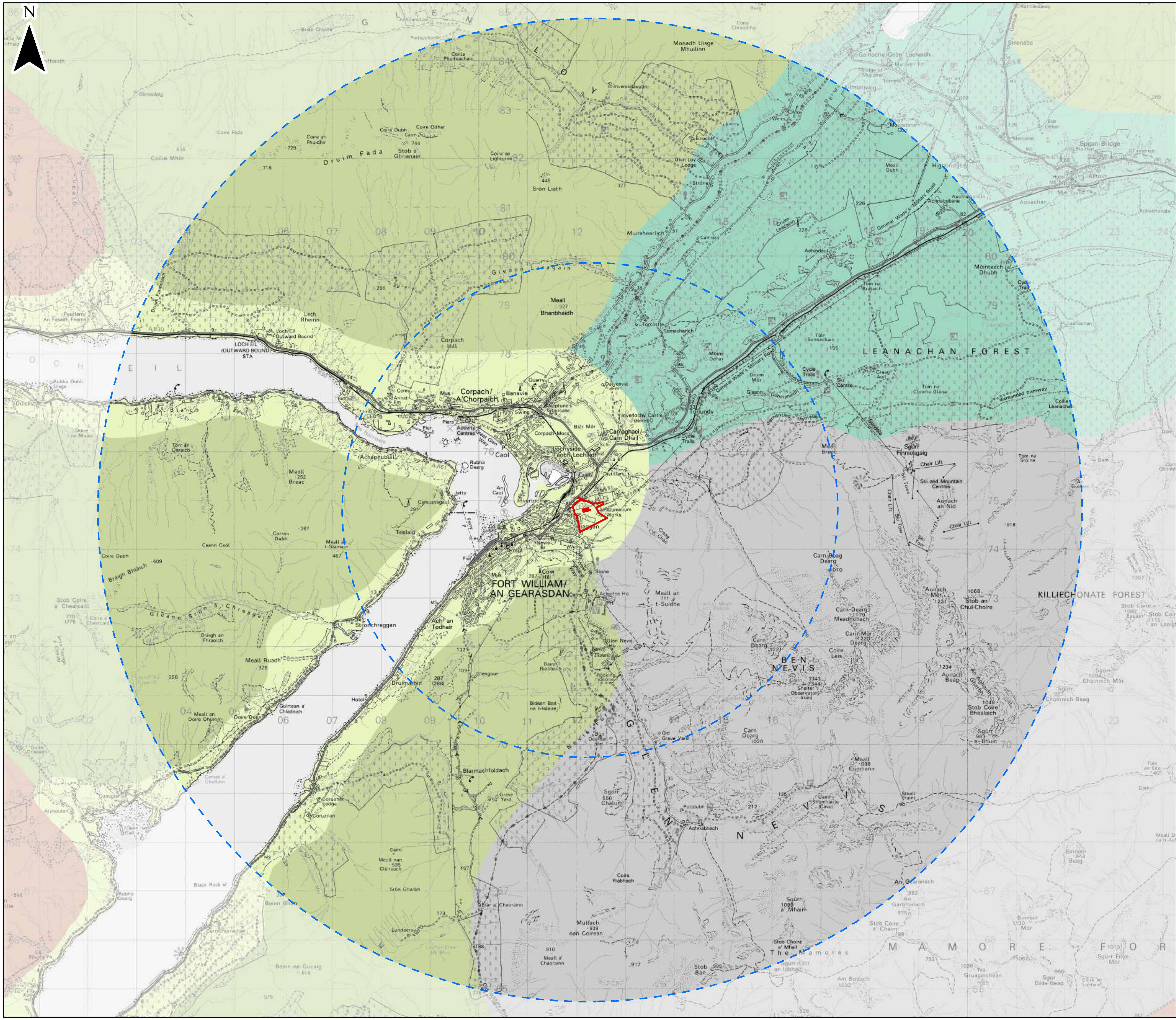
**Drawing 6.2**

**Policy Context**

| Date: 09/04/2021 | Drawn by: SHa | Checked by: SI | Version: Final |
|---|---|---|---|

Project Number: 3539

# Chapter 6 Drawing 6.3 Landscape Character




**KEY**

- Site boundary
- Proposed building location
- Distance from proposed building (5km, 10km)

**Landscape Character Type (LCT)**

- 233 - Mountain Massif - Lochaber
- 234 - Lochs with Settled Edges
- 235 - Broad Forested Strath
- 236 - Smooth Moorland Ridges
- 238 - Rugged Massif - Lochaber

0 1.5 3 km

**Scale 1:75,000 @ A3**

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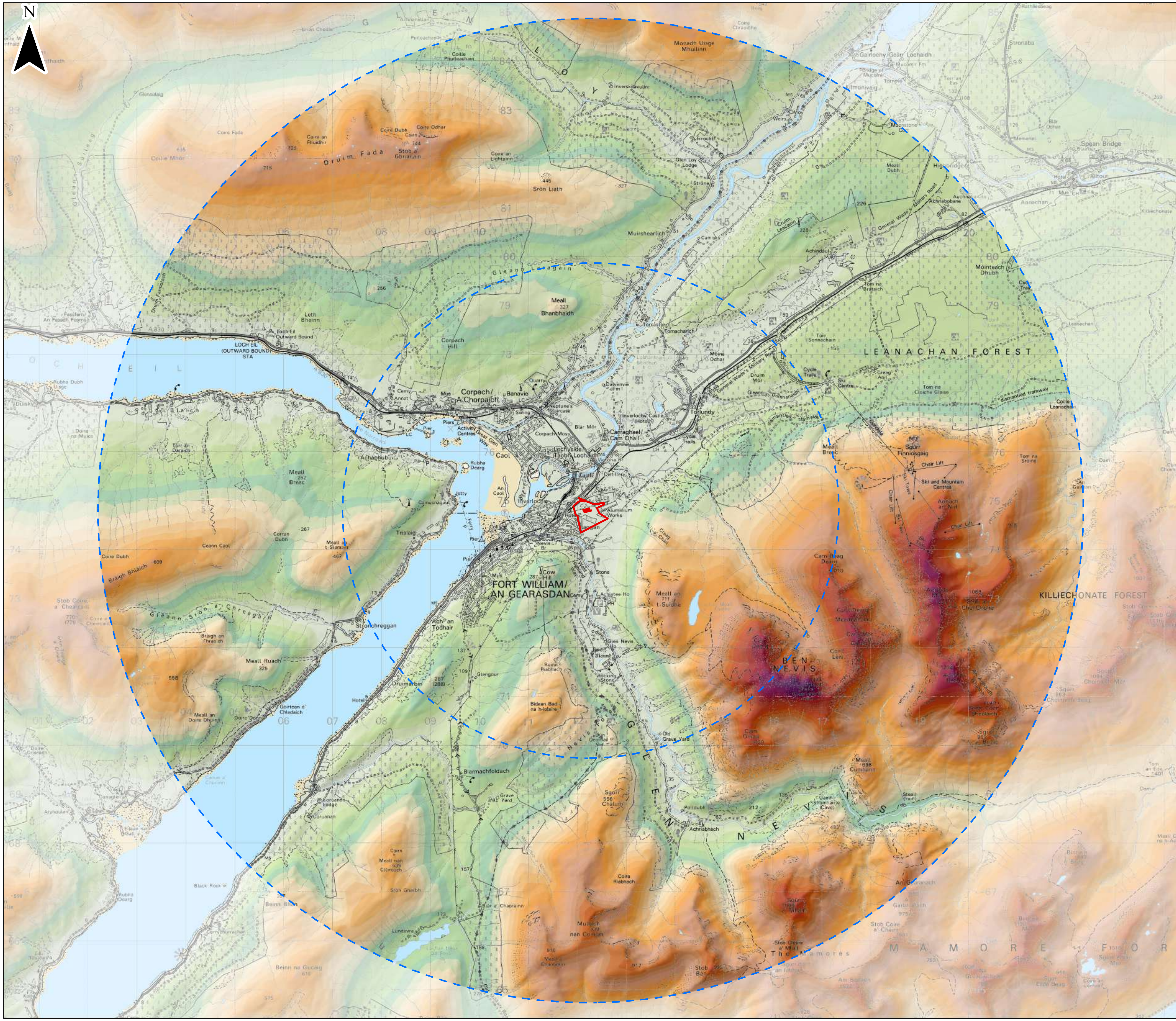
**Drawing 6.3**

**Landscape Character**

| Date: 09/04/2021 | Drawn by: SHa | Checked by: SI | Version: Final |
|---|---|---|---|

Project Number: 3539

## Chapter 6 Drawing 6.4 Topography




**KEY**

Site boundary

Distance from proposed building (5km, 10km)

**Elevation (mAOD)**

| | |
|---|---|
| -50 - 0 | 650 - 700 |
| 0 - 50 | 700 - 750 |
| 50 - 100 | 750 - 800 |
| 100 - 150 | 800 - 850 |
| 150 - 200 | 850 - 900 |
| 200 - 250 | 900 - 950 |
| 250 - 300 | 950 - 1,000 |
| 300 - 350 | 1,000 - 1,050 |
| 350 - 400 | 1,050 - 1,100 |
| 400 - 450 | 1,100 - 1,150 |
| 450 - 500 | 1,150 - 1,200 |
| 500 - 550 | 1,200 - 1,250 |
| 550 - 600 | 1,250 - 1,300 |
| 600 - 650 | 1,300 - 1,350 |

0 1.5 3 km

Scale 1:75,000 @ A3

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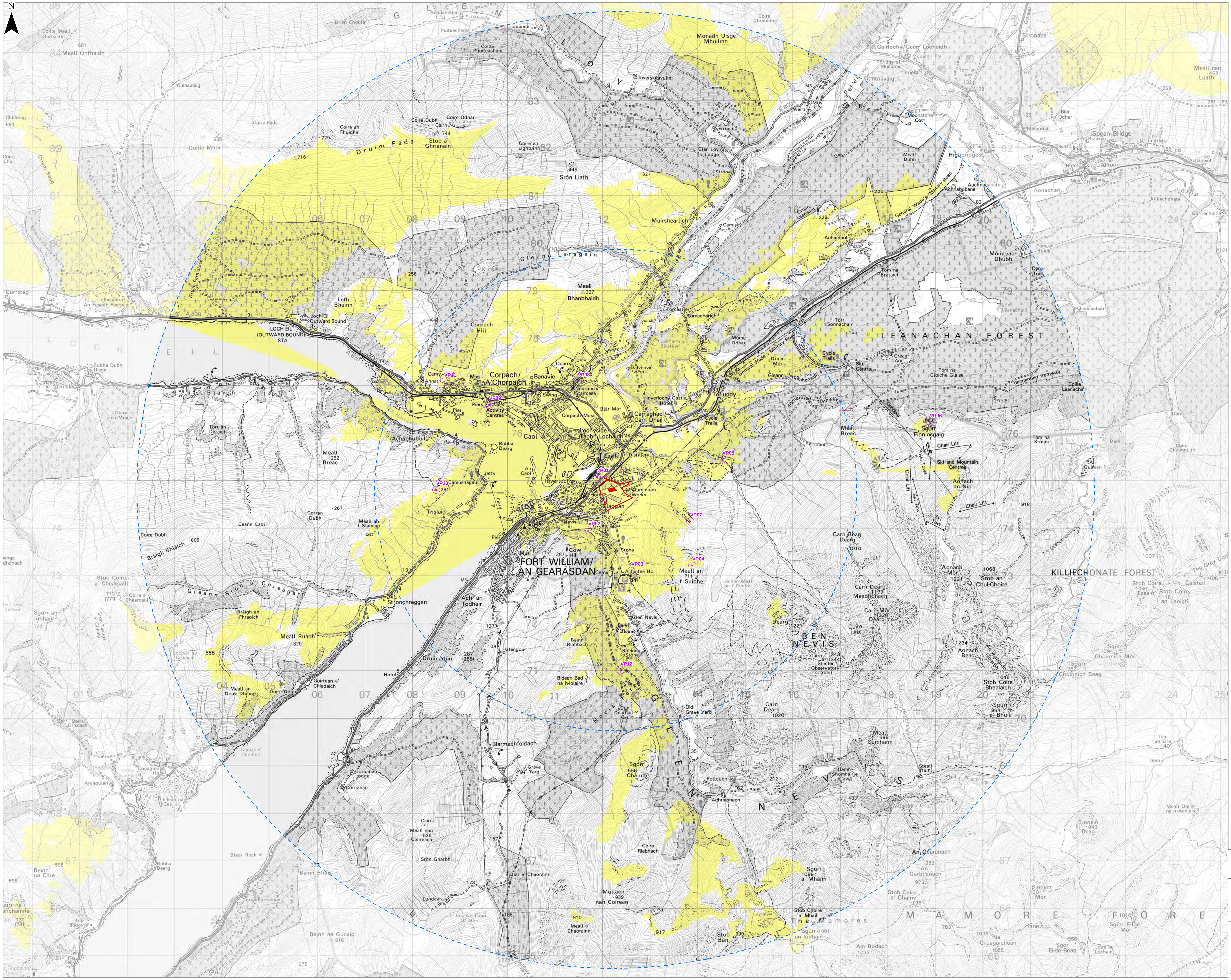
**Drawing 6.4**

**Topography**

| Date: 09/04/2021 | Drawn by: SHa | Checked by: SI | Version: Final |
|---|---|---|---|

Project Number: 3539

# Chapter 6 Drawing 6.5 Bareground ZTV




**KEY**

Site boundary

Proposed building location

Distance from proposed building (5km, 10km)

Zone of Theoretical Visibility (ZTV)

Viewpoints

VP01 - Primrose Hill
VP02 - Cow Hill
VP03 - Achintree Road
VP04 - Meall an t-Suidhe
VP05 - Bench on North Face path
VP06 - Sgurr Finniosgaig
VP07 - Creag a Chail
VP08 - Neptune's Staircase
VP09 - Corpach Sea Locks
VP10 - Trig point near Achaphubuil
VP11 - Cemetery at Drumfada
VP12 - West Highland Way

Note: ZTV is based on a building height of 19.3m, with three chimneys, as detailed by Keppie, at 19.8m tall. The building represents the worst case scenario and would be constructed using a 'saw-toothed' roof design that ranges from c. 16.1-19.3m tall, not including chimney stacks.

This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the viewshed routine in the ESRI ArcGIS Suite. The areas shown are the maximum theoretical visibility, taking into account topography only, which has been included in the model with the heights obtained from Nextmap 25. The model does not take into account any above ground features and therefore gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be noticeably less than that suggested by this plan and visibility from principal settlements is likely to be possible from peripheral areas only.

The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on Nextmap 25 terrain data and has a $25m^2$ resolution.

0 0.9 1.8 km

Scale 1:36,000 @ A1

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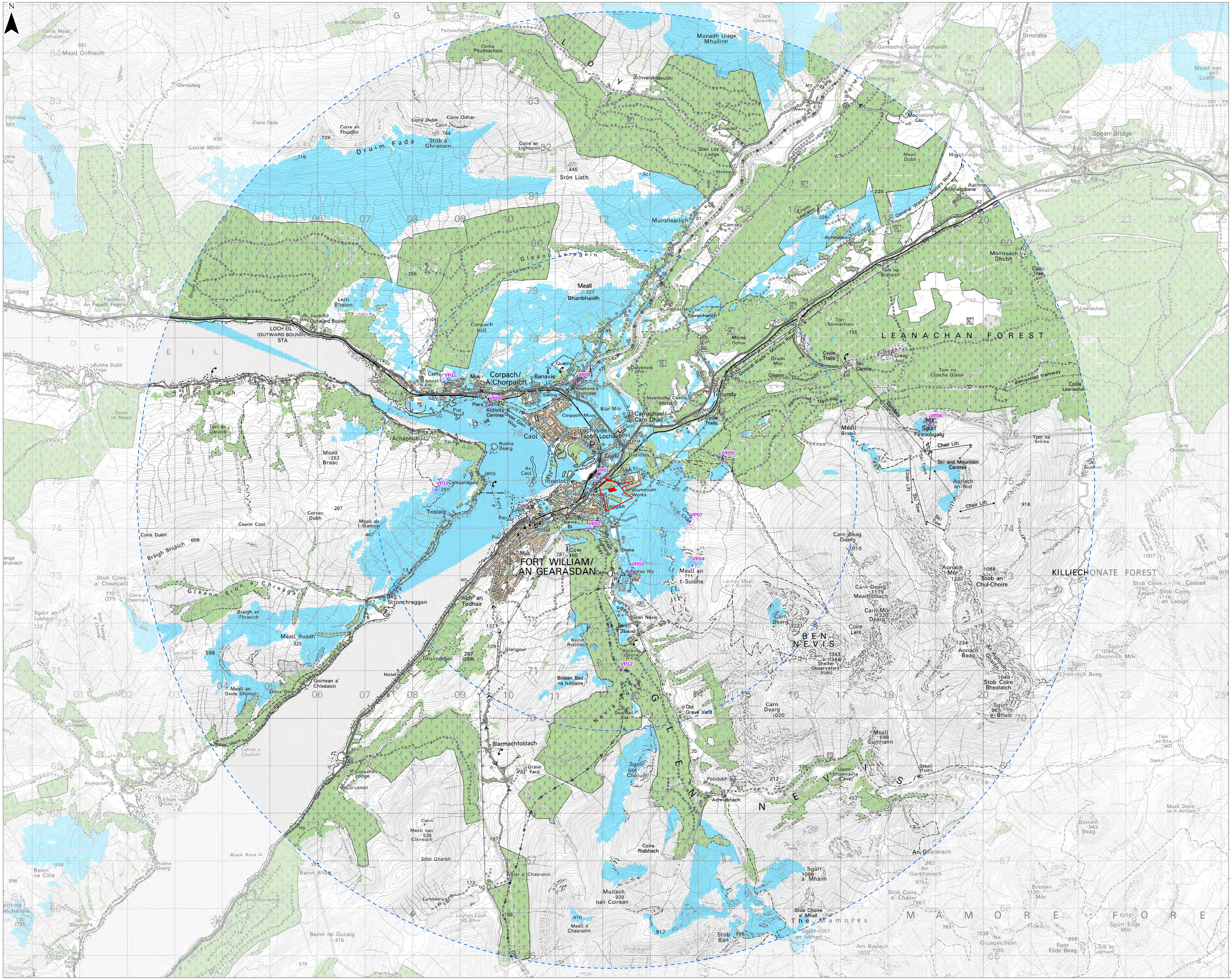
**Drawing 6.5**
**Zone of Theoretical Visibility (ZTV) study - bare ground**

| Date: 09/04/2021 | Drawn by: SHa | Checked by: SI | Version: Final |
|---|---|---|---|

Project Number: 3539

# Chapter 6 Drawing 6.6 WoodSett ZTV




**KEY**

- Site boundary
- Proposed building location
- Distance from proposed building (5km, 10km)
- Urban Area
- Woodland
- Zone of Theoretical Visibility (ZTV)
- Viewpoints

VP01 - Primrose Hill
VP02 - Cow Hill
VP03 - Achintree Road
VP04 - Meall an t-Suidhe
VP05 - Bench on North Face path
VP06 - Sgurr Finniosgaig
VP07 - Creag a Chail
VP08 - Neptune's Staircase
VP09 - Corpach Sea Locks
VP10 - Trig point near Achaphubuil
VP11 - Cemetery at Drumfada
VP12 - West Highland Way

Note: ZTV is based on a building height of 19.3m, with three chimneys, as detailed by Keppie, at 19.8m tall. The building represents the worst case scenario and would be constructed using a 'saw-toothed' roof design that ranges from c. 16.1-19.3m tall, not including chimney stacks.

This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the viewshed routine in the ESRI ArcGIS Suite. The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and settlements, which have been included in the model with the heights obtained from Nextmap 25. It should be noted that in some areas woodlands included within the ZTV may comprise active forestry, resulting in the felling and replanting of some areas modelled in the ZTV study. The ZTV study reflects this pattern at a specific point in time, as it is based on real height information. Whilst the felling cycle will alter the heights of different areas of forestry over time, altering localised visual effects, the wider pattern will remain relatively constant.

The model does not take into account any localised features such as small copses, hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.

The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on Nextmap 25 terrain data and has a $25m^2$ resolution.

0 0.9 1.8 km

**Scale 1:36,000 @ A1**

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EIA Report

**Drawing 6.6**
**Zone of Theoretical Visibility (ZTV) study - woodlands and settlements**

| Date: 09/04/2021 | Drawn by: SHa | Checked by: SI | Version: Final |
|---|---|---|---|

Project Number: 3539

# Chapter 6 Drawing 6.7 Viewpoint 1 - Primrose Hill

LDĀ DESIGN

**IMAGES FOR LANDSCAPE ASSESSMENT**




**Viewpoint 1 - Primrose Hill**

This view looks out from the top of a low hill adjacent to the A82 as it passes the proposed development site. The viewpoint offers a 360° panorama taking in views along Loch Eil, up Glen Nevis and the Great Glen and across the site towards Meall an t-Suidhe and Ben Nevis beyond. Towards the site the view takes in a new retail development adjacent to the road with existing factory buildings and associated hydro pipes seen over woodland immediately behind.

The proposed development would also appear above woodland behind the new retail units following the same long, linear form. It would extend the presence of factory buildings across this section of the view and, as a result of increased proximity, the proposed building would appear notably larger than the existing smelter sheds. Although the proposed development is notable it forms part of a much wider panoramic view where the main focus would tend to be away from the site, indeed the bench located at the viewpoint is oriented in the opposite direction in order to take advantage of views to the northwest. Considering the panoramic nature of the view and significant interest in other directions effects here would be **Medium** scale and, on balance, **Neutral**.

*The image contained on this page is not representative of scale and distance from the actual viewpoint and shows the development in its wider landscape context only.*

| | | | |
|---|---|---|---|
| ISSUED BY | Glasgow | t: 0141 222 9780 | |
| DATE | Mar 2021 | DRAWN | JB/VW |
| SCALE@A3 | NTS | CHECKED | SHa |
| STATUS | Final | APPROVED | RK |

**DRAWING 6.7**

| | |
|---|---|
| Camera Location (OS Grid Reference): | 211880 E 775077 N |
| Ground Level (mAOD): | 30m |
| Direction of View: bearing from North (0°): | 124° |
| Distance to development: | 0.3km |
| Horizontal Field of View: | 65.5° (Planar projection) |
| Paper Size: | 420mm x 297mm (A3) |
| Enlargement Factor: | TBC |
| Visualisation Type: | Type 3 |
| Photo Date / Time: | 18/02/2021 14:55 |
| Camera Model and Sensor Format: | Canon EOS 6D, FFS |
| Lens Make, Model and Focal Length: | Canon EF50mm f/1.8 STM |
| Height of Camera Lens above Ground (mAOD): | 1.5m |

PROJECT TITLE

BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE

Drawing 6.7: Viewpoint 1 - Primrose Hill

# Chapter 6 Drawing 6.8 Viewpoint 2 - Cow Hill


**Viewpoint 2 - Cow Hill**

This view looks out from a footpath on Cow Hill, across woodland on the valley floor, towards the site. Amongst the extensive tree cover houses at Claggan can be seen in the foreground along with some of the buildings in the Ben Nevis Industrial Estate and Glen Nevis Business Park. Beyond these the existing aluminium factory can be seen to the right of view and the new retail park to the left. In the distance beyond, Lochaber High School can be seen quite prominently with wooded valley back dropped by hills extending into the distance.

The proposed alloy wheel facility would be seen in front and to the left of the existing aluminium plant and beyond the industrial estate. The building would appear larger than the existing factory buildings due to increased proximity and would be a notable addition to the existing view, albeit partially screened by woodland within and bordering the site. Although large, the proposed building would be seen in the context of the existing factory and industrial estate and the broken form of the roof line and mix of material finishes to the roof help to break up the mass. Effects would be of **Large-Medium** scale. On balance these would be **Adverse** due to the size and proximity of the building.

*The image contained on this page is not representative of scale and distance from the actual viewpoint and shows the development in its wider landscape context only.*

| | | | |
|---|---|---|---|
| ISSUED BY | Glasgow | t: 0141 222 9780 | |
| DATE | Mar 2021 | DRAWN | JB/VW |
| SCALE@A3 | NTS | CHECKED | SHa |
| STATUS | Final | APPROVED | RK |

**DRAWING 6.8**

| | |
|---|---|
| Camera Location (OS Grid Reference): | 211700 E 773955 N |
| Ground Level (mAOD): | 83m |
| Direction of View: bearing from North (0°): | 33° |
| Distance to development: | 0.9km |
| Horizontal Field of View: | 65.5° (Planar projection) |
| Paper Size: | 420mm x 297mm (A3) |

| | |
|---|---|
| Enlargement Factor: | TBC |
| Visualisation Type: | Type 3 |
| Photo Date / Time: | 18/02/2021 11:23 |
| Camera Model and Sensor Format: | Canon EOS 6D, FFS |
| Lens Make, Model and Focal Length: | Canon EF50mm f/1.8 STM |
| Height of Camera Lens above Ground (mAOD): | 1.5m |

PROJECT TITLE
BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE
Drawing 6.8: Viewpoint 2 - Cow Hill

## Chapter 6 Drawing 6.9 Viewpoint 3 - Achintee Road

LDĀ DESIGN

## IMAGES FOR LANDSCAPE ASSESSMENT

Z:\7639_Lochaber_Rev_LVIA\6docs\Visuals\7639_VP_03.indd


**Viewpoint 3 - Achintee Road**

This view is taken from just north of the car park at the Ben Nevis Inn and looks back along Achintee Road and the lower reaches of Glen Nevis. Although channelled towards the site this is a wide view that takes in the lower slopes of Ben Nevis to one side, Cow Hill to the other and facing away from the site views along Glen Nevis. Beyond the small copse in the foreground, trees can be seen in the valley in the direction of Fort William with houses and some larger buildings seen amongst them. To the right the chimney stacks of the existing aluminium smelter and some other factory infrastructure can be seen appearing above trees and set against a backdrop of distant hills.

The proposed building would be seen to the left of the existing factory buildings filling a gap between these and the houses to the left of view, albeit largely screened by existing woodland within the site. The western end of the building would, however, stick out beyond the woodland and be seen more prominently although the staggered form of the proposed building breaks up the mass of this exposed end to a certain degree. Proposed woodland planting to the western and southern edges of the site (refer to Drawing 6.1) would, in time, help to further break up the mass and settle the building further into the landscape although would not entirely screen it. Effects here would be **Small** scale and **Adverse** as a result of bridging the apparent gap between the existing factory buildings and those in Fort William seen to the left of view.

*The image contained on this page is not representative of scale and distance from the actual viewpoint and shows the development in its wider landscape context only.*

| | | | |
|---|---|---|---|
| ISSUED BY | Glasgow | t: 0141 222 9780 | |
| DATE | Mar 2021 | DRAWN | JB/VW |
| SCALE@A3 | NTS | CHECKED | SHa |
| STATUS | Final | APPROVED | RK |

**DRAWING 6.9**

| | |
|---|---|
| Camera Location (OS Grid Reference): | 212604 E 773106 N |
| Ground Level (mAOD): | 36m |
| Direction of View: bearing from North (0°): | 354° |
| Distance to development: | 1.7km |
| Horizontal Field of View: | 65.5° (Planar projection) |
| Paper Size: | 420mm x 297mm (A3) |
| Enlargement Factor: | TBC |
| Visualisation Type: | Type 3 |
| Photo Date / Time: | 18/02/2021 12:29 |
| Camera Model and Sensor Format: | Canon EOS 6D, FFS |
| Lens Make, Model and Focal Length: | Canon EF50mm f/1.8 STM |
| Height of Camera Lens above Ground (mAOD): | 1.5m |

PROJECT TITLE
BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE
Drawing 6.9: Viewpoint 3 - Achintee Road

## Chapter 6 Drawing 6.10 Viewpoint 4 - Meall an t-Suidhe


**Viewpoint 4 - Meall an t-Suidhe**

This view looks out from a subsidiary peak of Ben Nevis and affords a wide view out across Fort William and beyond; up both Loch Eil and towards the Great Glen. The buildings of Fort William and the adjacent settlements can be clearly seen spreading across the flat ground adjacent to the loch and just out of shot to the left the communications masts at Cow Hill and Achaphubuil are distinct landmarks. In the centre of view, at the base of the hill, the existing aluminium smelter buildings can be clearly seen surrounded by moorland and forestry.

The proposed building would be clearly seen in the open space to the left of the existing smelter building in an area currently occupied by open moorland and a rectilinear woodland block. The roof form of the proposed building will break up the massing and relate to the existing buildings on site. Retained woodland within the site would partially screen the western end and help to ground the building. Although a notable addition the proposed building would be seen in the context of the existing factory and as a relatively minor part of a very large and expansive view. Effects here would be of **Small** scale and **Neutral**.

*The image contained on this page is not representative of scale and distance from the actual viewpoint and shows the development in its wider landscape context only.*

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| STATUS | Final | APPROVED | RK |
| **DRAWING** | **6.10** | | |

| | | | |
|---|---|---|---|
| Camera Location (OS Grid Reference): | 213886 E 773217 N | Enlargement Factor: | TBC |
| Ground Level (mAOD): | 682m | Visualisation Type: | Type 3 |
| Direction of View: bearing from North (0°): | 318° | Photo Date / Time: | 15/09/2017 11:30 |
| Distance to development: | 2.1km | Camera Model and Sensor Format: | Canon EOS 5D Mark II, FFS |
| Horizontal Field of View: | 65.5° (Planar projection) | Lens Make, Model and Focal Length: | Canon EF50mm f/1.8 STM |
| Paper Size: | 420mm x 297mm (A3) | Height of Camera Lens above Ground (mAOD): | 1.5m |

PROJECT TITLE

BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE

Drawing 6.10: Viewpoint 4 - Meall an t-Suidhe

# Chapter 6 Drawing 6.11 Viewpoint 5 - Bench on North Face path

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## IMAGES FOR LANDSCAPE ASSESSMENT

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**Viewpoint 5 - Bench on North Face path**

This view looks out from a bench beside the North Face Path heading up Ben Nevis and looks out across Fort William, along Loch Eil which extends away into the distance. The existing factory is seen prominently in the centre of view, as is Lochaber High School to the far right; beyond these, housing and smaller buildings in and around Fort William can be seen extending to the loch. The focus of this view tends to be above the town though as the eye is drawn along Loch Eil and up to the surrounding hills.

The proposed alloy wheel facility would be seen beyond the buildings of the existing factory and would be partially screened by these at the near end. The proposed building would increase the overall size of built development on the factory site although in the context of the wider view this makes a limited change. Effects here would be **Small** scale and **Neutral**.

*The image contained on this page is not representative of scale and distance from the actual viewpoint and shows the development in its wider landscape context only.*

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**DRAWING 6.11**

| | |
|---|---|
| Camera Location (OS Grid Reference): | 214518 E 775445 N |
| Ground Level (mAOD): | 210m |
| Direction of View: bearing from North (0°): | 253° |
| Distance to development: | 2.2km |
| Horizontal Field of View: | 65.5° (Planar projection) |
| Paper Size: | 420mm x 297mm (A3) |
| Enlargement Factor: | TBC |
| Visualisation Type: | Type 3 |
| Photo Date / Time: | 12/10/2017 14:00 |
| Camera Model and Sensor Format: | Canon EOS 5d Mark III, FFS |
| Lens Make, Model and Focal Length: | Canon EF50mm f/1.4 USM |
| Height of Camera Lens above Ground (mAOD): | 1.5m |

PROJECT TITLE
BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE
Drawing 6.11: Viewpoint 5 - Bench on North Face path

# Chapter 6 Drawing 6.12 Viewpoint 6 - Sgurr Finniosgaig


**Viewpoint 6 - Sgurr Finniosgaig**

This view looks out from an elevated panoramic viewpoint from the Nevis Range ski area, taking in an expansive 360° view. Existing development at Fort William is seen adjacent to the loch in the centre of the view and relatively distant, beyond this the eye is drawn along Loch Eil to distant hills and mountains.

The proposed development would be visible just above the ridge of a hill in the middle distance and would be partially screened by intervening woodland. In this view the existing factory buildings are not visible so the proposed alloy wheel facility would not be seen in the context of the wider smelter facility. Despite this, the introduction of the new building would not be particularly notable and it would easily sit within the existing pattern of built development as seen from this location. Effects here would be **Negligible** and **Neutral**.

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**DRAWING** **6.12**

| | |
|---|---|
| Camera Location (OS Grid Reference): | 218884 E 776230 N |
| Ground Level (mAOD): | 661m |
| Direction of View: bearing from North (0°): | 260° |
| Distance to development: | 6.6km |
| Horizontal Field of View: | 65.5° (Planar projection) |
| Paper Size: | 420mm x 297mm (A3) |
| Enlargement Factor: | TBC |
| Visualisation Type: | Type 3 |
| Photo Date / Time: | 19/09/2017 11:15 |
| Camera Model and Sensor Format: | Canon EOS 5D Mark II, FFS |
| Lens Make, Model and Focal Length: | Canon EF50mm f/1.8 STM |
| Height of Camera Lens above Ground (mAOD): | 1.5m |

PROJECT TITLE

BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE

Drawing 6.12: Viewpoint 6 - Sgurr Finniosgaig

# Chapter 6 Drawing 6.13 Viewpoint 7 - Creag a Chail


**Viewpoint 7 - Creag a Chail**

This view looks out from a minor summit on the lower slopes of Ben Nevis, affording a wide view across Fort William, it's adjacent settlements and beyond. Channelled views up Loch Eil are the biggest draw in the view and although partial views up other nearby glens are also possible. There is an open view down onto the site and existing aluminium plant which is seen beside the new retail park, extending out from the edge of town.

The proposed building would be clearly seen in the open space to the left of the existing smelter building in an area currently occupied by open moorland and a rectilinear woodland block, which would be partially removed. The building would be a notable extension to the existing factory site although would appear similar in scale and form and would visually relate to the existing buildings. Retained woodland would provide some very limited screening of the western end of the building, helping it settle in the existing landscape, although the majority of the site would be in open view. To the right of the building the service and dispatch yard would be clearly seen along with activities going on within which would frequently give movement to the view. Effects here would be **Medium-Small** scale and, on balance, **Neutral**.

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**DRAWING 6.13**

| | |
|---|---|
| Camera Location (OS Grid Reference): | 213844 E 774142 N |
| Ground Level (mAOD): | 478m |
| Direction of View: bearing from North (0°): | 295° |
| Distance to development: | 1.6km |
| Horizontal Field of View: | 65.5° (Planar projection) |
| Paper Size: | 420mm x 297mm (A3) |
| Enlargement Factor: | TBC |
| Visualisation Type: | Type 3 |
| Photo Date / Time: | 15/09/2017 10:00 |
| Camera Model and Sensor Format: | Canon EOS 5D Mark II, FFS |
| Lens Make, Model and Focal Length: | Canon EF50mm f/1.8 STM |
| Height of Camera Lens above Ground (mAOD): | 1.5m |

PROJECT TITLE

BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE

Drawing 6.13: Viewpoint 7 - Creag a Chail

# Chapter 6 Drawing 6.14 Viewpoint 8 - Neptune's Staircase


**Viewpoint 8 - Neptune's Staircase**

This view looks out from beside the Neptune's Staircase lock flight on the Caledonian Canal which tends to be the main focus of people in this area, both for users of the locks and visitors to this attraction. The foreground is occupied by canalside vegetation, amongst which some nearby houses can be seen with a long view up Glen Nevis seen in the distance beyond and the summits of Meall an t-Suidhe and Ben Nevis seen to the left. In the mid distance, set amongst woodland in the flat bottom of the valley, the existing aluminium smelter building can be seen along with the closer Lochaber High School buildings.

The proposed alloy wheel facility would be seen to the right of the existing smelter building and would be very similar in appearance as a long, linear roofline seen above intervening woodland, although chimney stacks would not be a prominent feature, as they are with the existing building. It would notably extend the spread of factory buildings, approximately doubling the width, although the overall nature of the view would change little. Effects here would be **Negligible** scale and **Neutral**.

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**DRAWING 6.14**

| | |
|---|---|
| Camera Location (OS Grid Reference): | 211480 E 777089 N |
| Ground Level (mAOD): | 25m |
| Direction of View: bearing from North (0°): | 159° |
| Distance to development: | 2.4km |
| Horizontal Field of View: | 65.5° (Planar projection) |
| Paper Size: | 420mm x 297mm (A3) |
| Enlargement Factor: | TBC |
| Visualisation Type: | Type 3 |
| Photo Date / Time: | 19/09/2017 15:05 |
| Camera Model and Sensor Format: | Canon EOS 5D Mark II, FFS |
| Lens Make, Model and Focal Length: | Canon EF50mm f/1.8 STM |
| Height of Camera Lens above Ground (mAOD): | 1.5m |

PROJECT TITLE
BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE
Drawing 6.14: Viewpoint 8 - Neptune's Staircase

# Chapter 6 Drawing 6.15 Viewpoint 9 - Corpach Sea Locks

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**Viewpoint 9 - Corpach Sea Locks**

This view looks out from the picnic area adjacent to Corpach Sea Locks, back across the bay towards Caol with Ben Nevis rising beyond and drawing the eye up away from the developed coastline. The hydro pipes at the existing aluminium factory and the communications mast on Cow Hill are notable landmarks to the centre and far right of the view. The smelter buildings at the existing factory can be seen beyond houses at Caol to the right hand side of the settlement although heavily screened by intervening woodland with the chimney stacks and silos being the most prominent features.

The proposed building would be seen to the right of the existing factory buildings and would be notably more prominent with the full length of the building appearing over intervening woodland. Despite this it would be a relatively minor addition to the overall pattern of built development as seen from here and no more prominent than houses and school buildings at Caol. Effects here would be **Negligible** scale and **Neutral**.

*The image contained on this page is not representative of scale and distance from the actual viewpoint and shows the development in its wider landscape context only.*

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| **DRAWING** | **6.15** | | |

| | |
|---|---|
| Camera Location (OS Grid Reference): | 209612 E 776596 N |
| Ground Level (mAOD): | 4m |
| Direction of View: bearing from North (0°): | 125° |
| Distance to development: | 3.1km |
| Horizontal Field of View: | 65.5° (Planar projection) |
| Paper Size: | 420mm x 297mm (A3) |
| Enlargement Factor: | TBC |
| Visualisation Type: | Type 3 |
| Photo Date / Time: | 19/09/2017 14:36 |
| Camera Model and Sensor Format: | Canon EOS 5D Mark II, FFS |
| Lens Make, Model and Focal Length: | Canon EF50mm f/1.8 STM |
| Height of Camera Lens above Ground (mAOD): | 1.5m |

PROJECT TITLE
BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE
Drawing 6.15: Viewpoint 9 - Corpach Sea Locks

## Chapter 6 Drawing 6.16 Viewpoint 10 - Trig point near Achaphubuil

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**Viewpoint 10 - Trig point near Achaphubuil**

This view is taken from the trig point, adjacent to the communications mast, on the hill above Achaphubuil and Camusnagaul. It looks out across the top of Loch Linnhe towards Fort William and it's adajcent settlements with Ben Nevis seen rising beyond. Out of shot the viewpoint offers an expansive panoramic view taking in the length of Loch Linnhe, views across Loch Eil and views up the Great Glen to the bottom of Loch Lochy. The existing aluminium factory can be seen openly to the base of the hydro pipes as one constituent part of the wider pattern of built development along the coast.

The proposed building would be seen to the right of the existing factory, extending the linear form of the existing smelter buildings towards smaller buildings at the Ben Nevis industrial estate. The lower part of the building would be screened by adjacent woodland although it would largely be in open view as the existing plant is at present. The form of the roof on the proposed building would help to break up its larger mass and reflects the pattern of existing factory buildings.
It would be a discernible new addition to the factory site although would be a minor change to the wider pattern of development seen from here and overall effects would be **Small** scale and **Neutral**.

*The image contained on this page is not representative of scale and distance from the actual viewpoint and shows the development in its wider landscape context only.*

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| STATUS | Final | APPROVED | RK |
| **DRAWING** | **6.16** | | |

| | |
|---|---|
| Camera Location (OS Grid Reference): | 208498 E 774806 N |
| Ground Level (mAOD): | 290m |
| Direction of View: bearing from North (0°): | 92° |
| Distance to development: | 3.6km |
| Horizontal Field of View: | 65.5° (Planar projection) |
| Paper Size: | 420mm x 297mm (A3) |

| | |
|---|---|
| Enlargement Factor: | TBC |
| Visualisation Type: | Type 3 |
| Photo Date / Time: | 19/09/2017 17:05 |
| Camera Model and Sensor Format: | Canon EOS 5D Mark II, FFS |
| Lens Make, Model and Focal Length: | Canon EF50mm f/1.8 STM |
| Height of Camera Lens above Ground (mAOD): | 1.5m |

PROJECT TITLE
BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE
Drawing 6.16: Viewpoint 10 - Trig point near Achaphubuil

# Chapter 6 Drawing 6.17 Viewpoint 11 - Cemetery at Drumfada

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## IMAGES FOR LANDSCAPE ASSESSMENT

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**Viewpoint 11 - Cemetery at Drumfada**

This view looks out from the cemetery, across Loch Linnhe and towards Ben Nevis. Dense trees and hedges around the perimeter of the cemetery block wider views from here and frame the vista across the loch. Fort William and Caol can be seen distinctly to either side of the water with associated settlements less prominent set amongst the woodland between. The existing factory buildings are seen partially screened by woodland at the base of the hydro pipes, beyond houses at Caol.

The proposed alloy wheel facility would be seen in a similar context to the existing factory, partially screened by woodland, to the right of the current plant although would be slightly more prominent. It would extend the spread of the factory notably but would make little change to the overall pattern of built development in the coastal area. Effects here would be **Negligible** scale and **Neutral**.

*The image contained on this page is not representative of scale and distance from the actual viewpoint and shows the development in its wider landscape context only.*

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**DRAWING 6.17**

| | |
|---|---|
| Camera Location (OS Grid Reference): | 208668 E 777081 N |
| Ground Level (mAOD): | 39m |
| Direction of View: bearing from North (0°): | 124° |
| Distance to development: | 4.2km |
| Horizontal Field of View: | 65.5° (Planar projection) |
| Paper Size: | 420mm x 297mm (A3) |
| Enlargement Factor: | TBC |
| Visualisation Type: | Type 3 |
| Photo Date / Time: | 19/09/2017 14:15 |
| Camera Model and Sensor Format: | Canon EOS 5D Mark II, FFS |
| Lens Make, Model and Focal Length: | Canon EF50mm f/1.8 STM |
| Height of Camera Lens above Ground (mAOD): | 1.5m |

PROJECT TITLE

BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE

Drawing 6.17: Viewpoint 11 - Cemetery at Drumfada

## Chapter 6 Drawing 6.18 Viewpoint 12 - West Highland Way

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**Viewpoint 12 - West Highland Way**

This viewpoint offers a channelled view north along Glen Nevis towards and beyond the existing aluminium plant. To the right of view the steep and open lower slopes of Ben Nevis contrast with the shallower wooded slopes extending towards Cow Hill to the left of view. In the centre, buildings can be seen dotted amongst woodland across the valley floor with more industrial and larger scale residential development seen in the distance beyond the end of the glen. The existing factory is seen partially screened by woodland just beyond the glen with Lochaber High School another notable feature to the left of this, although both are quite distant.

The proposed building would be seen to the left of the existing aluminium factory building and just below Lochaber High School. Retained woodland within the site would offer significant screening of then new building with only the southwestern elevation in open view. The staggered form of this elevation would help reduce the apparent scale of the building as seen from here and in time proposed woodland planting to the south of the building would provide some additional screening here although would not completely hide the building. Effects here would be **Small** scale and **Neutral**.

*The image contained on this page is not representative of scale and distance from the actual viewpoint and shows the development in its wider landscape context only.*

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**DRAWING 6.18**

| | |
|---|---|
| Camera Location (OS Grid Reference): | 212376 E 771005 N |
| Ground Level (mAOD): | 137m |
| Direction of View: bearing from North (0°): | 358° |
| Distance to development: | 3.6km |
| Horizontal Field of View: | 65.5° (Planar projection) |
| Paper Size: | 420mm x 297mm (A3) |
| Enlargement Factor: | TBC |
| Visualisation Type: | Type 3 |
| Photo Date / Time: | 19/09/2017 16:40 |
| Camera Model and Sensor Format: | Canon EOS 5d Mark III, FFS |
| Lens Make, Model and Focal Length: | Canon EF50mm f/1.4 USM |
| Height of Camera Lens above Ground (mAOD): | 1.5m |

PROJECT TITLE

BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE

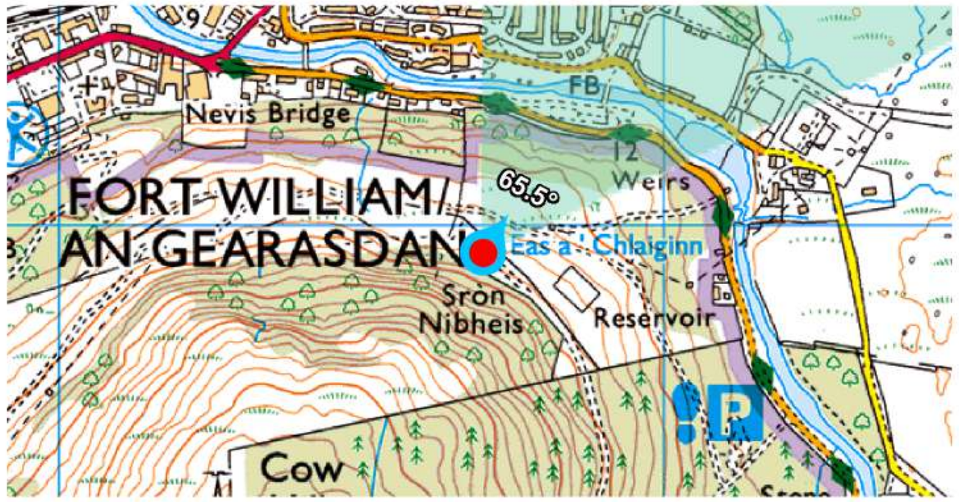
Drawing 6.18: Viewpoint 12 - West Highland Way

# Chapter 6 Drawing 6.19 Viewpoint Locations 1 – 6


**Viewpoint 1 - Primrose Hill**

OS Grid Reference: 211880, 775077 mAOD: 30m Distance to development: 0.3km

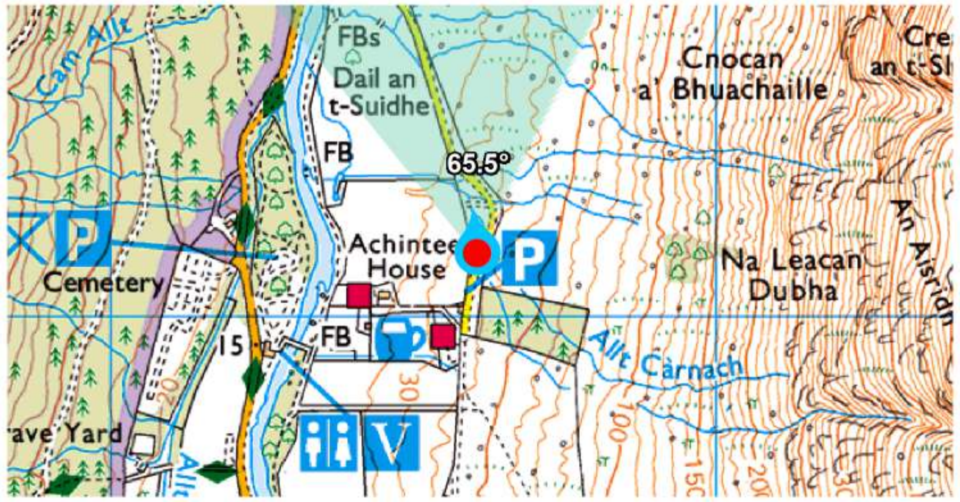
This viewpoint is located at the Battle of Inverlochy memorial plaque at the high point of Primrose Hill. This can be accessed via a gate off the minor road leading to Inverlochy Castle from the A82. Go through the gate and head south west across the field towards the hilltop where the memorial plaque and a bench can be found.




**Viewpoint 2 - Cow Hill**

OS Grid Reference: 211700, 773955 mAOD: 83m Distance to development: 0.9km

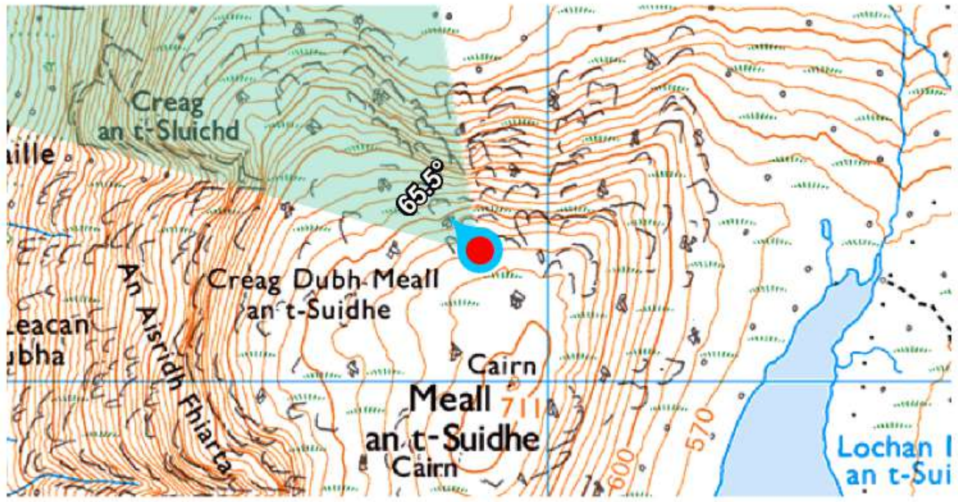
This viewpoint is located on a footpath on the northern face of Cow Hill accessed from the Braveheart car park off the Glen Nevis road. Follow the main path north from the car park to the first junction then follow the path to the left for around 100m heading up hill until the proposed development site comes into clear view.




**Viewpoint 3 - Achintee Road**

OS Grid Reference: 212604, 773106 mAOD: 36m Distance to development: 1.7km

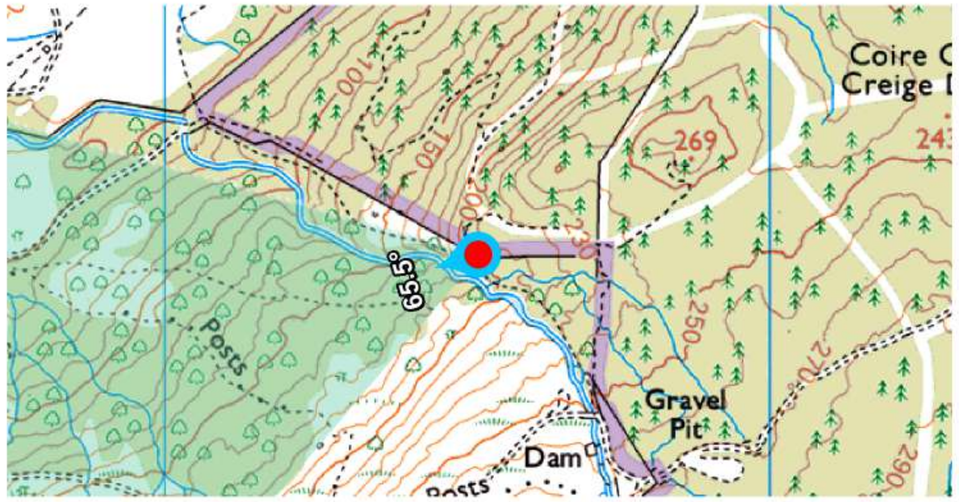
This viewpoint is located on the left hand side of the road as it begins to descend, just to the north of the car park at the Ben Nevis Inn.




**Viewpoint 4 - Meall an t-Suidhe**

OS Grid Reference: 213886, 773217 mAOD: 682m Distance to development: 2.1km

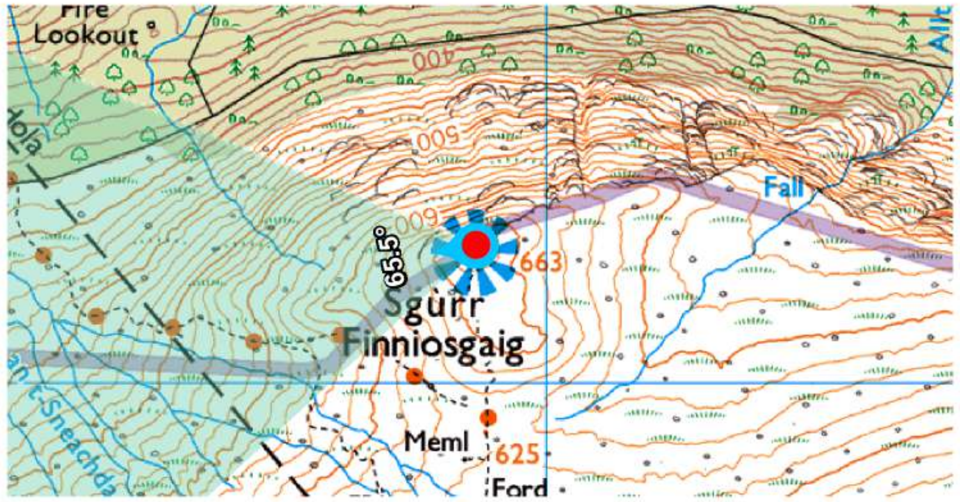
This viewpoint is located amongst the crags on the northern slopes of Meall an t-Suidhe. Follow the main Ben Nevis path up from the Ben Nevis Inn until it passes the lochan. Depart the path and head across moorland around the southern edge of the lochan towards the saddle between the two peaks on the hill and ascend here where the slopes are less steep. Head north along the ridge and begin to descend the northern face until reaching the viewpoint.




**Viewpoint 5 - Bench on North Face path**

OS Grid Reference: 214518, 775445 mAOD: 210m Distance to development: 2.2km

This viewpoint is located on the path ascending Ben Nevis accessed from the North Face car park. Follow the forestry track southeast from the car park across the bridge until it turns to the left then depart the track and follow the footpath leading uphill to the right. Continue along this path until it emerges from woodland where a bench is located to the side of the path. The viewpoint is located at the bench.




**Viewpoint 6 - Sgurr Finniosgaig**

OS Grid Reference: 218884, 776230 mAOD: 661m Distance to development: 6.6km

This is located at a marked panoramic viewpoint adjacent to the Nevis Range ski area. Park at the Nevis Range car park and take the gondola up to the top then take the path to the left and follow this north to the viewpoint.

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**DRAWING** 6.19



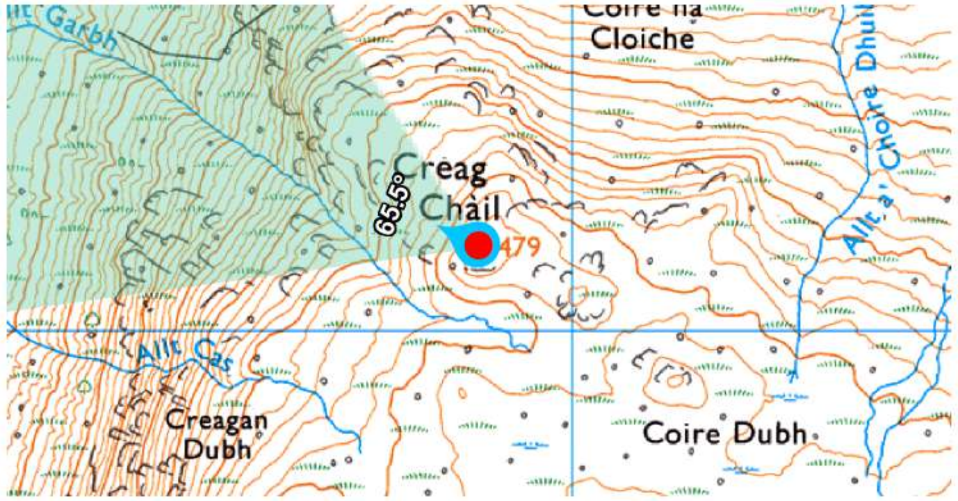
PROJECT TITLE

BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE

Drawing 6.19: Viewpoint Locations 1 - 6

# Chapter 6 Drawing 6.20 Viewpoint Locations 7 - 12




### Viewpoint 7 - Creag a Chail

OS Grid Reference: 213844, 774142 mAOD: 478m Distance to development: 1.6km

This viewpoint is located at a minor summit to the southeast of the proposed development site. Start at the football pitch at Claggan and follow the path past the substation before heading northeast across boggy ground. Follow the path of the Allt Garbh burn up the steep hillside and where the gradient begins to reduce cross the burn and head up to the subsidiary peak.


### Viewpoint 8 - Neptune's Staircase

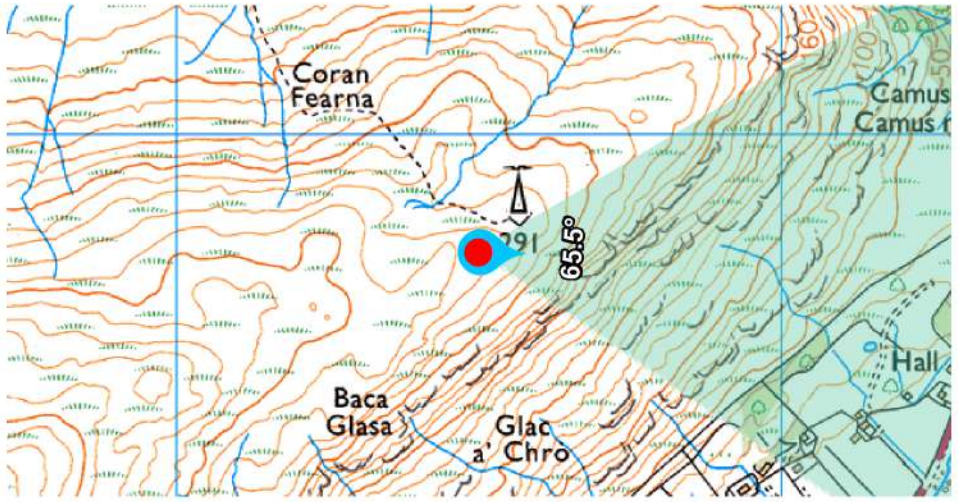
OS Grid Reference: 211480, 777089 mAOD: 25m Distance to development: 2.4km

This viewpoint is located adjacent to the flight of locks at Neptune's Staircase on the Caledonian Canal. Park at the Banavie Locks car park off the B8004 and follow the path up past The Moorings Hotel to the locks. Continue uphill, crossing the canal via one of the lock gates, until you reach the viewpoint which is located adjacent to the third set of gates from the top of the flight.


### Viewpoint 9 - Corpach Sea Locks

OS Grid Reference: 209612, 776596 mAOD: 4m Distance to development: 3.1km

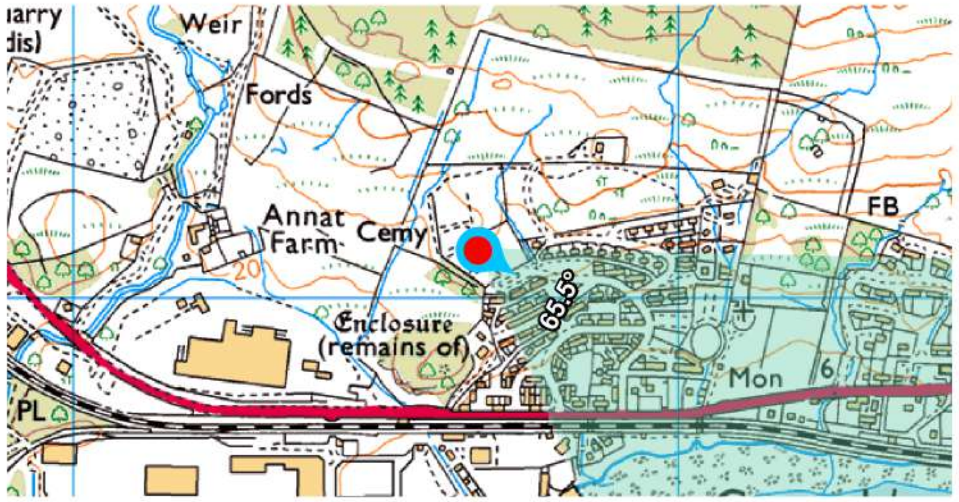
This viewpoint is located at the picnic area adjacent to the entrance to the Corpach Sea Locks. From the car park adjacent to the locks head south, crossing the lock gates to the picnic area at the point where the viewpoint is located at the shoreline.




### Viewpoint 10 - Trig point near Achaphubuil

OS Grid Reference: 208498, 774806 mAOD: 290m Distance to development: 3.6km

This viewpoint is located at the trig point adjacent to a communications mast on top of the hill above Achaphubuil. Head east on the A861 from the row of semi detached houses at Achaphubuil until reaching a track leading off the road to the right; follow this all the way up the hill until reaching the mast. At the top bear right and follow the path up to the trig point.




### Viewpoint 11 - Cemetery at Drumfada

OS Grid Reference: 208668, 777081 mAOD: 39m Distance to development: 4.2km

This viewpoint is located on the central path within Kilmallie cemetery at Drumfada. This can be accessed from the top of Caledonian Road.


### Viewpoint 12 - West Highland Way

OS Grid Reference: 212376, 771005 mAOD: 137m Distance to development: 3.6km

This viewpoint is located on the West Highland Way as it passes along the western side of Glen Nevis. It is accessed from the road to the west of the Ben Nevis Restaurant on the Glen Nevis road. Follow the path up behind the houses and through the woods, taking a right then a left. This leads to a relatively straight track running past recently felled woodland. Continue for 1.2km where the viewpoint is located on the bend where the track bears left just before re-entering established woodland.

| | | | |
|---|---|---|---|
| ISSUED BY | Glasgow | t: 0141 222 9780 | |
| DATE | Mar 2021 | DRAWN | VW |
| SCALE@A3 | NTS | CHECKED | SHa |
| STATUS | Final | APPROVED | RK |

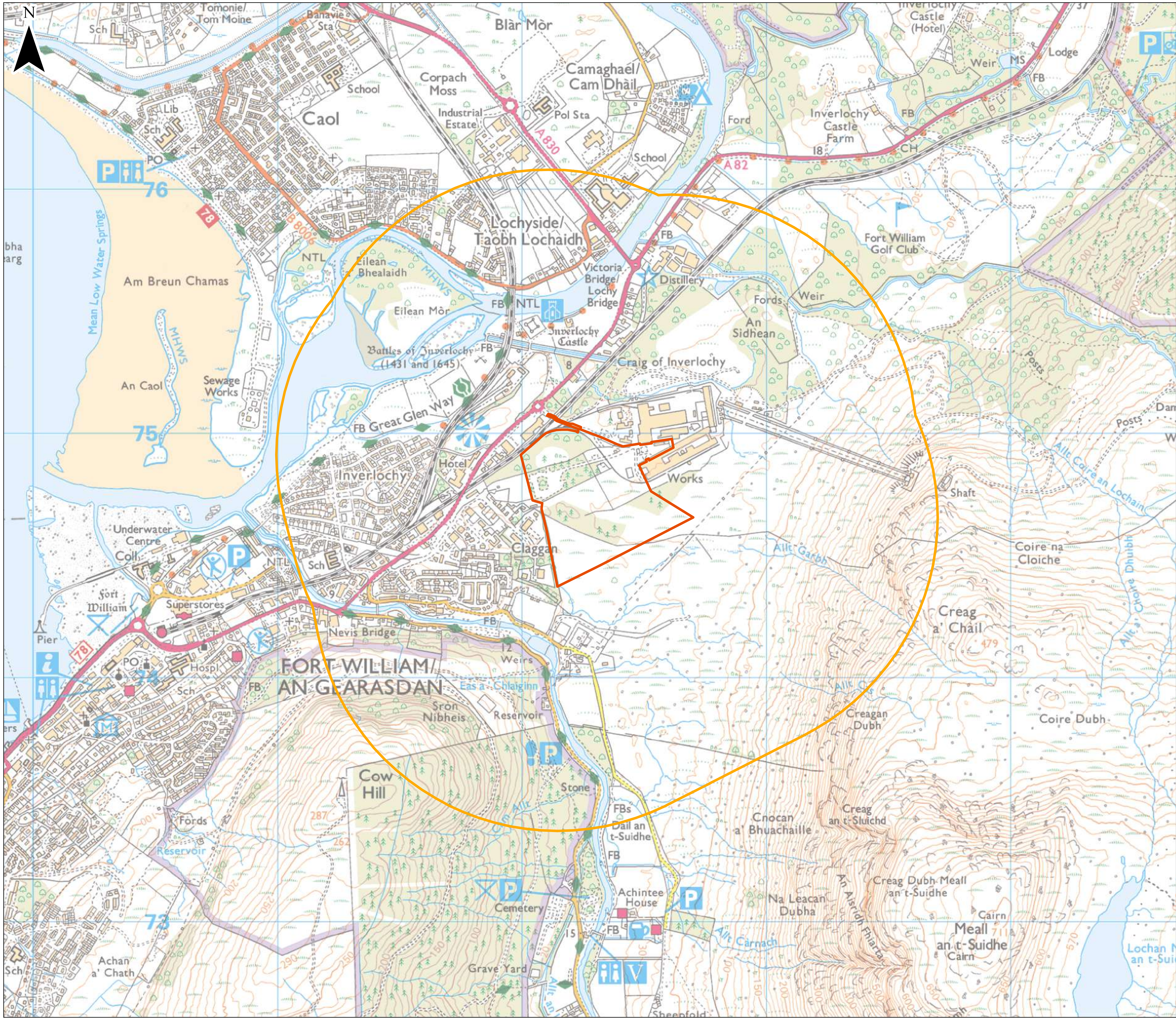
**DRAWING** 6.20



PROJECT TITLE
BILLET PRODUCTION FACILITY, LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE
Drawing 6.20: Viewpoint Locations 7 - 12

# Chapter 7 Drawing 7.1 Hydrological and Hydrogeological Study Area




**KEY**

Site Boundary

Study Area (1km)

0 0.35 0.7 km

Scale 1:15,000 @ A3

Alvance British Aluminium
EIA Report

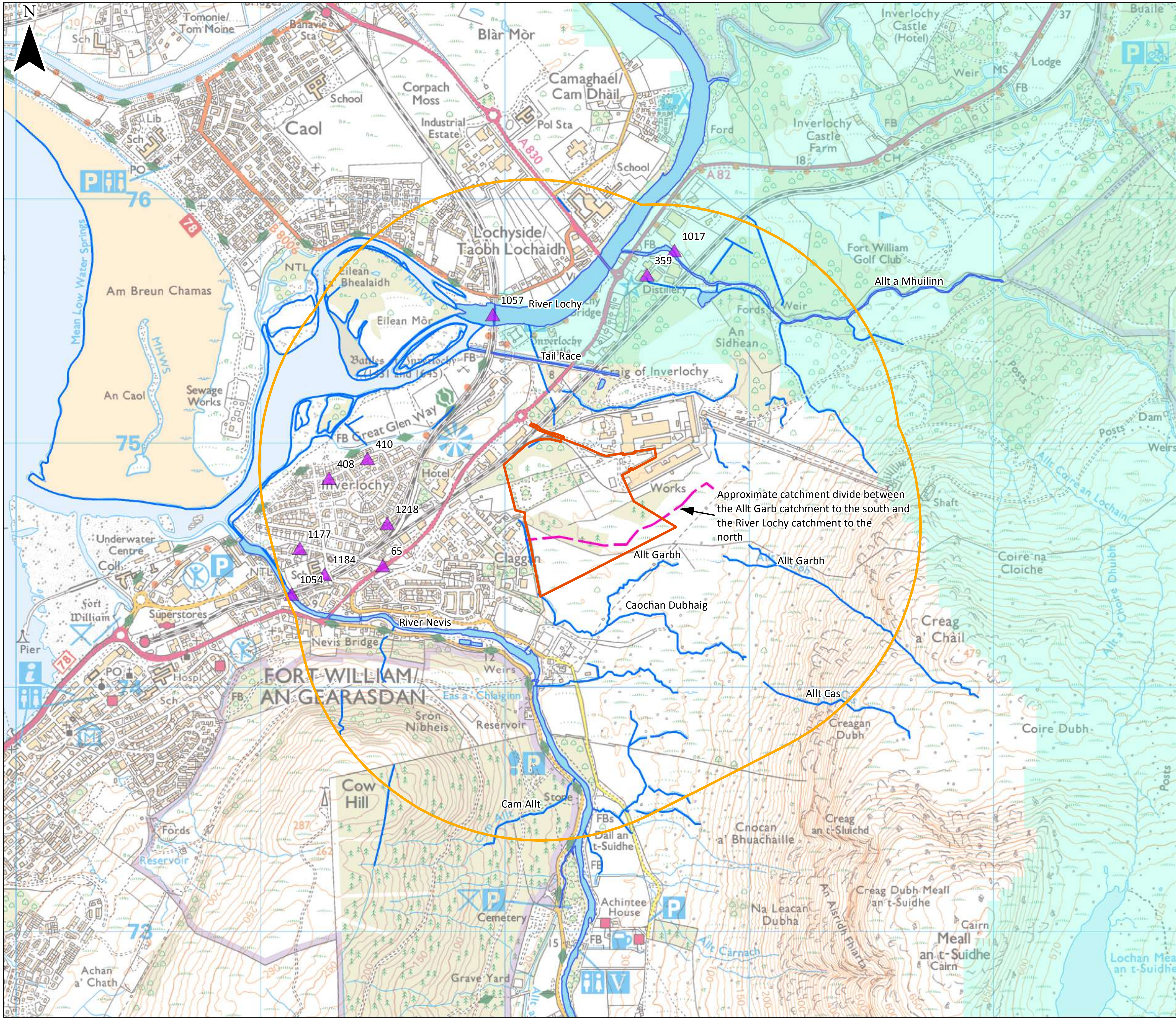
**Drawing 7.1**

**Hydrological and Hydrogeological Study Area**

| Date: 31/03/2021 | Drawn by: KB | Checked by: ZR | Version: V1 |
|---|---|---|---|

Project Number: 3539

# Chapter 7 Drawing 7.2 Hydrological Overview




**KEY**

- Site Boundary
- Study Area (1km)
- THC Flooding Record Locations (THC ID)
- Watercourses (as identified on OS 1:25000 mapping)
- Waterbodies (as identified on OS 1:25000 mapping)
- Drinking water protected areas - surface water
- Approximate catchment divide between the Allt Garb catchment to the south and the River Lochy catchment to the north

0 0.35 0.7 km

Scale 1:15,000 @ A3

ALVANCE

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EIA Report

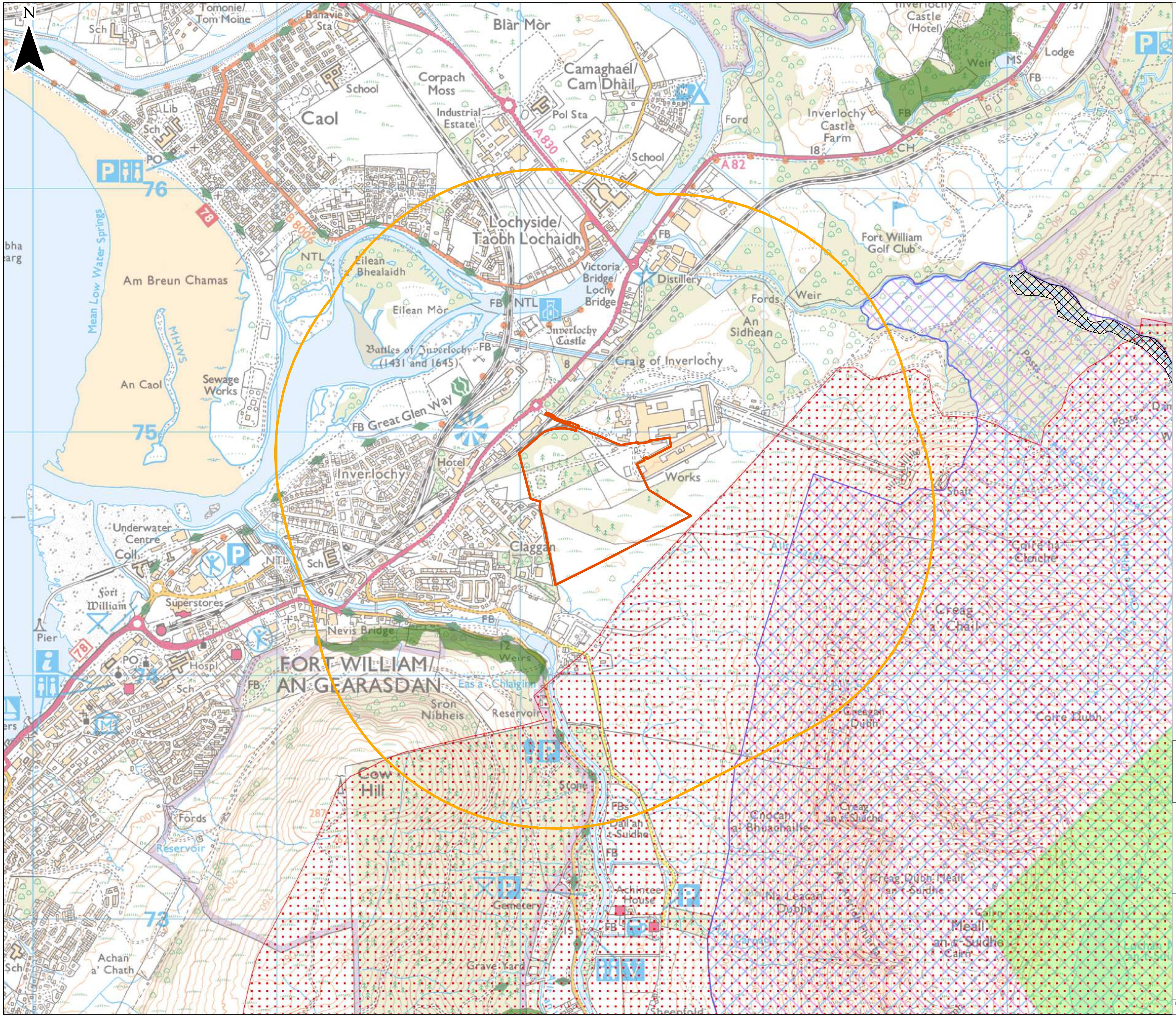
**Drawing 7.2**

**Hydrological Overview**

| Date: 31/03/2021 | Drawn by: KB | Checked by: ZR | Version: V1 |
|---|---|---|---|

Project Number: 3539

# Chapter 7 Drawing 7.3 Relevant Environmental Constraints




**KEY**

- Site Boundary
- Study Area (1km)
- Geological Conservation Review
- National Scenic Areas
- Wild Land
- SAC
- SSSI
- Ancient Woodland Inventory

0 0.35 0.7 km

Scale 1:15,000 @ A3

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EIA Report

**Drawing 7.3**

**Chapter Relevant Environmental Constraints**

| Date: 31/03/2021 | Drawn by: KB | Checked by: ZR | Version: V1 |
|---|---|---|---|

Project Number: 3539

# Chapter 7 Drawing 7.4 CAR Licence Sites


**KEY**

- Site Boundary
- Study Area (1km)
- CAR Licence Sites within study area (note some locations have multiple licenses)

0 0.35 0.7 km

Scale 1:15,000 @ A3

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EIA Report

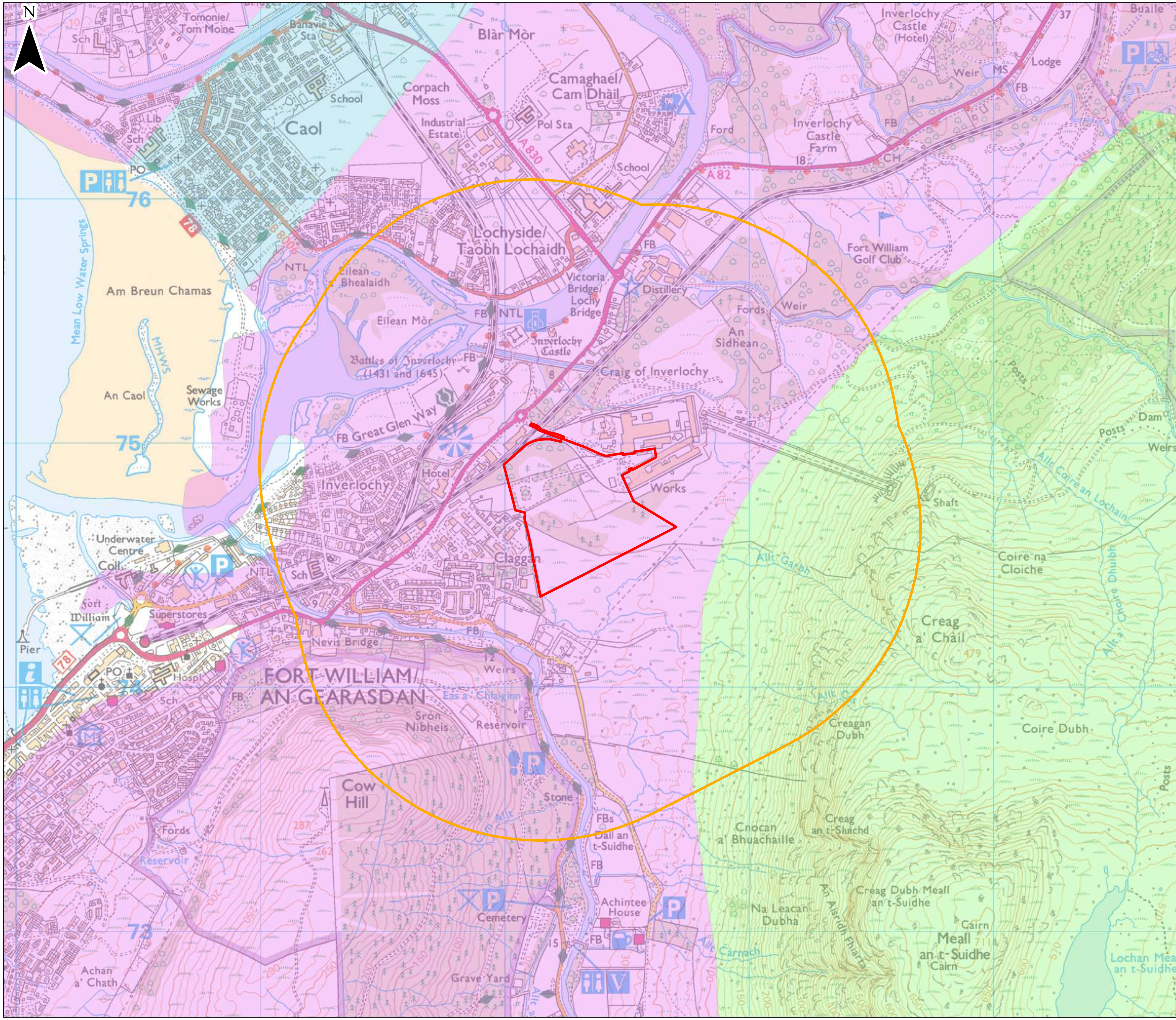
**Drawing 7.4**

**CAR Licence Sites**

| Date: 31/03/2021 | Drawn by: KB | Checked by: ZR | Version: V1 |
|---|---|---|---|

Project Number: 3539

# Chapter 7 Drawing 7.5 Hydrogeological Overview

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EIA Report

**Drawing 7.5**

**Hydrogeological Overview Summary**

| Date: 31/03/2021 | Drawn by: KB | Checked by: ZR | Version: V1 |
|---|---|---|---|

# Chapter 8 Drawing 8.1 Site Location


**KEY**

- Wider Development Boundary
- Footprint of Works
- Development footprint plus SUDs drainage area


0 0.05 0.1 0.15 km

Scale 1:2,800 @ A3

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Alvance British Aluminium – Billet Facility
EIA Report

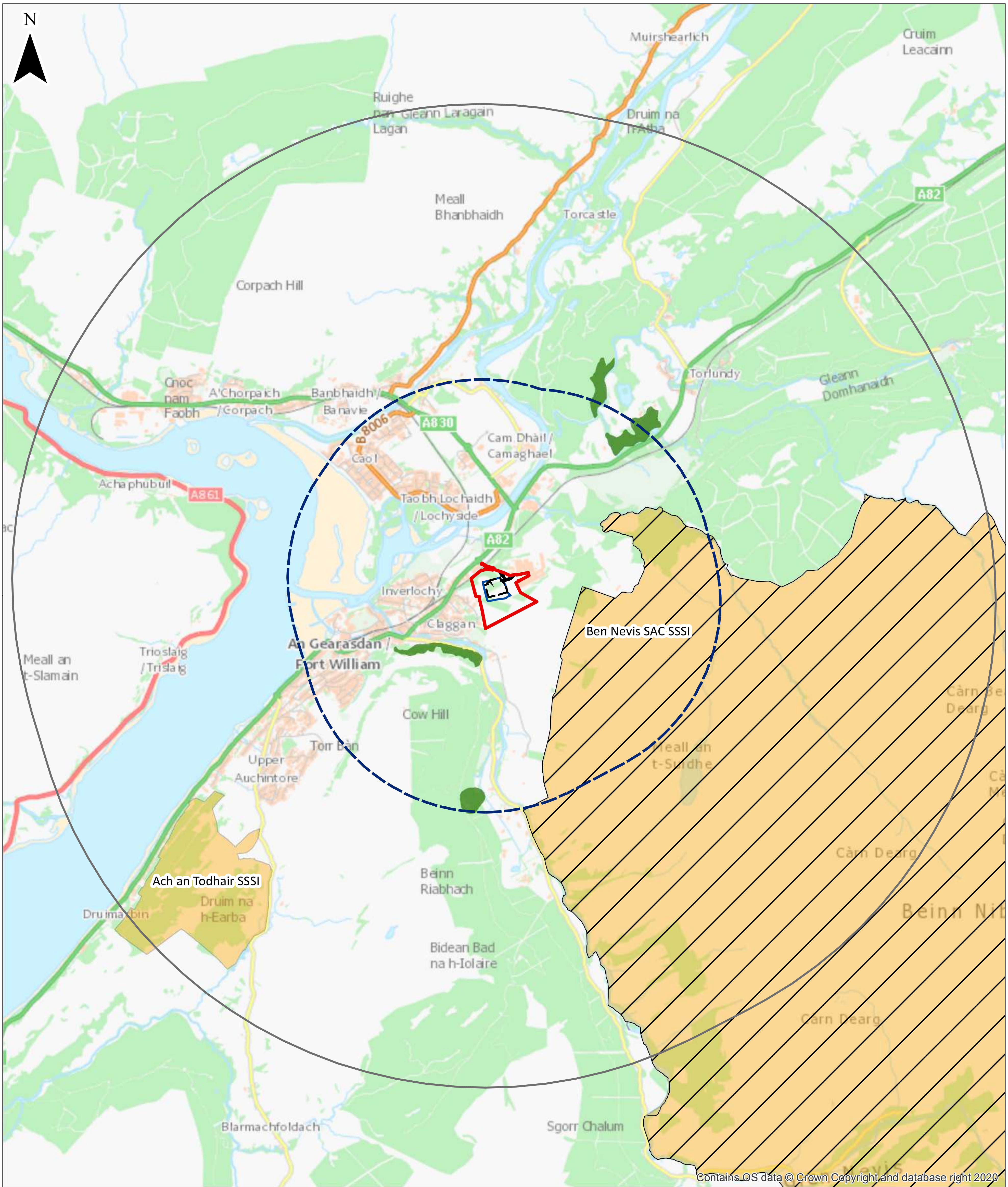
**Drawing 8.1**

**Site Location**

| Date: 06/05/2021 | Drawn by: AG | Checked by: MF | Version: V1 |
|---|---|---|---|

Project Number: 3539

# Chapter 8 Drawing 8.2 Nature Conservation Designations




**KEY**

- Wider Development Boundary
- Footprint of Works
- Development footprint plus SUDs drainage area
- Buffer (2km)
- Buffer (5km)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland

0 1 2 km

Scale 1:42,000 @ A3

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EIA Report

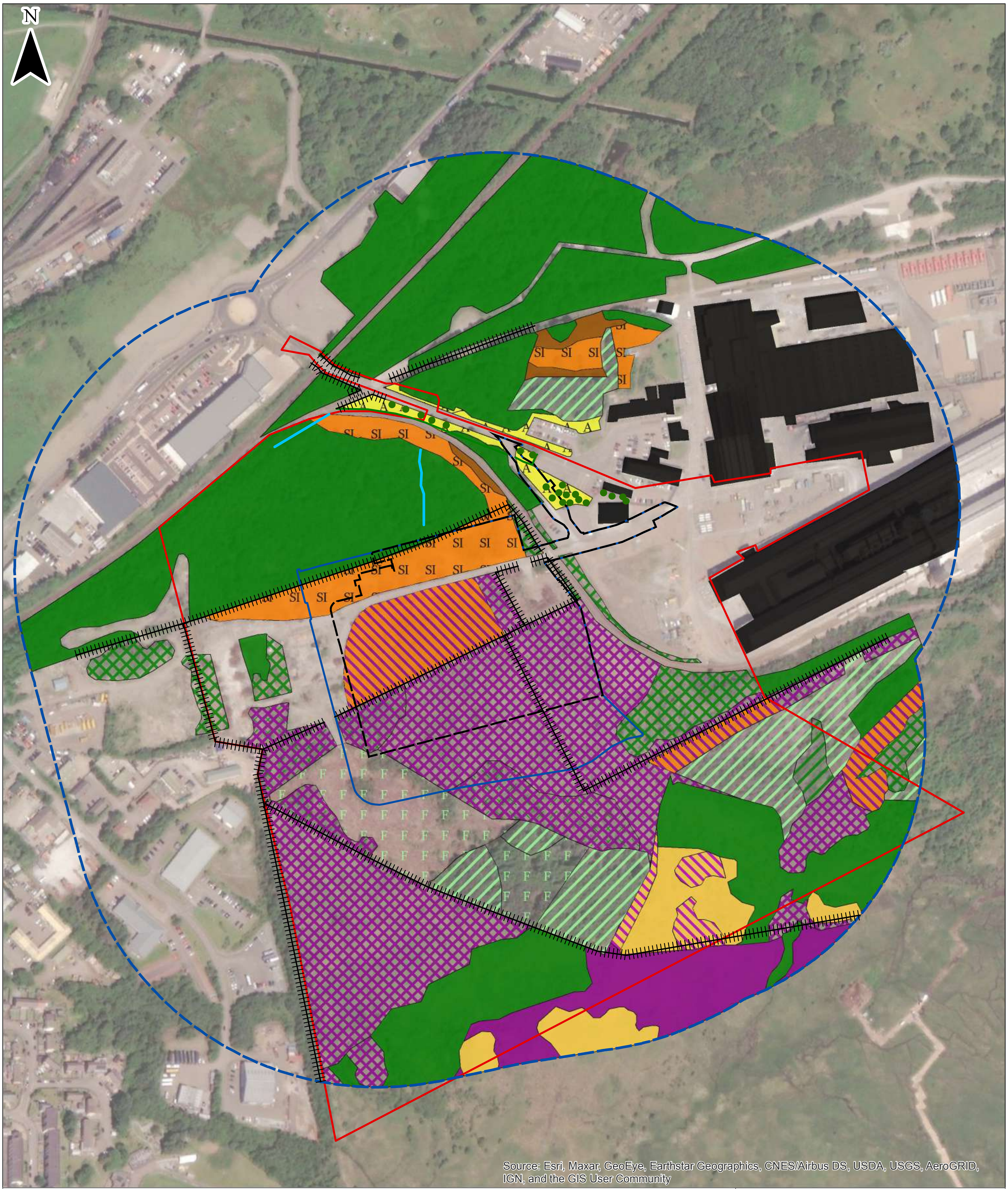
**Drawing 8.2**

**Nature Conservation Designations**

| Date: 06/05/2021 | Drawn by: AG | Checked by: MF | Version: V1 |
|---|---|---|---|

Project Number: 3539

# Chapter 8 Drawing 8.3 Phase 1 Habitats




**KEY**

- Wider Development Area
- Footprint of Works
- Development footprint plus SUDs drainage area
- Buffer (250m)

**Phase 1 Habitats**

- Semi-natural broadleaved woodland (A1.1.1)
- Broadleaved plantation woodland (A1.1.2)
- Coniferous plantation woodland (A1.2.2)
- Dense/continuous scrub (A2.1)
- Scattered scrub (A2.2)
- Broadleaved parkland/scattered trees (A3.1)
- Recently felled broadleaved woodland/ marshy grassland mosaic (A4.1/B5)
- Recently felled coniferous woodland (A4.2)
- Semi-improved neutral grassland (B2.2)
- Marshy grassland (B5)
- Continuous bracken (C1.1)
- Acid dry dwarf shrub heath (D1.1)
- Wet dwarf shrub heath (D2)
- Blanket bog (E1.6.1)
- Wet modified bog (E1.7)
- Running water (G2)
- Amenity grassland (J1.2)
- Species-poor intact hedge (J2.1.2)
- Fence (J2.4)
- Buildings (J3.6)
- Other (J5)

0 0.05 0.1 0.15 km

Scale 1:3,413 @ A3

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EIA Report

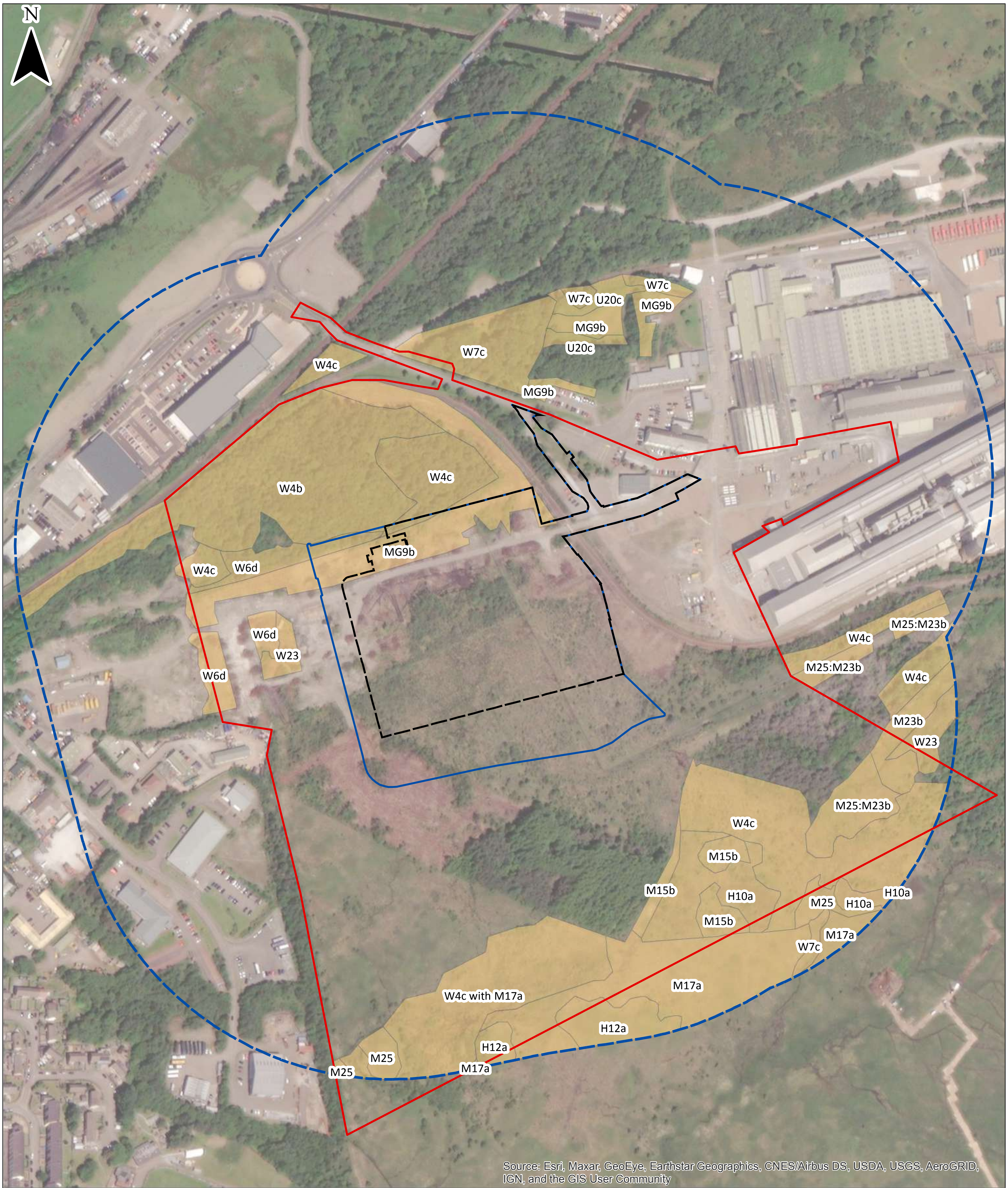
**Drawing 8.3**

**Phase 1 Habitat Survey**

| Date: 06/05/2021 | Drawn by: AG | Checked by: MF | Version: V1 |
|---|---|---|---|

Project Number: 3539

# Chapter 8 Drawing 8.4 NVC Communities




**KEY**

- Wider Development Boundary
- Footprint of Works
- Development footprint plus SUDs drainage area
- Buffer (250m)
- NVC Communities

0 0.05 0.1 0.15 km

Scale 1:3,300 @ A3

Alvance British Aluminium – Billet Facility
EIA Report

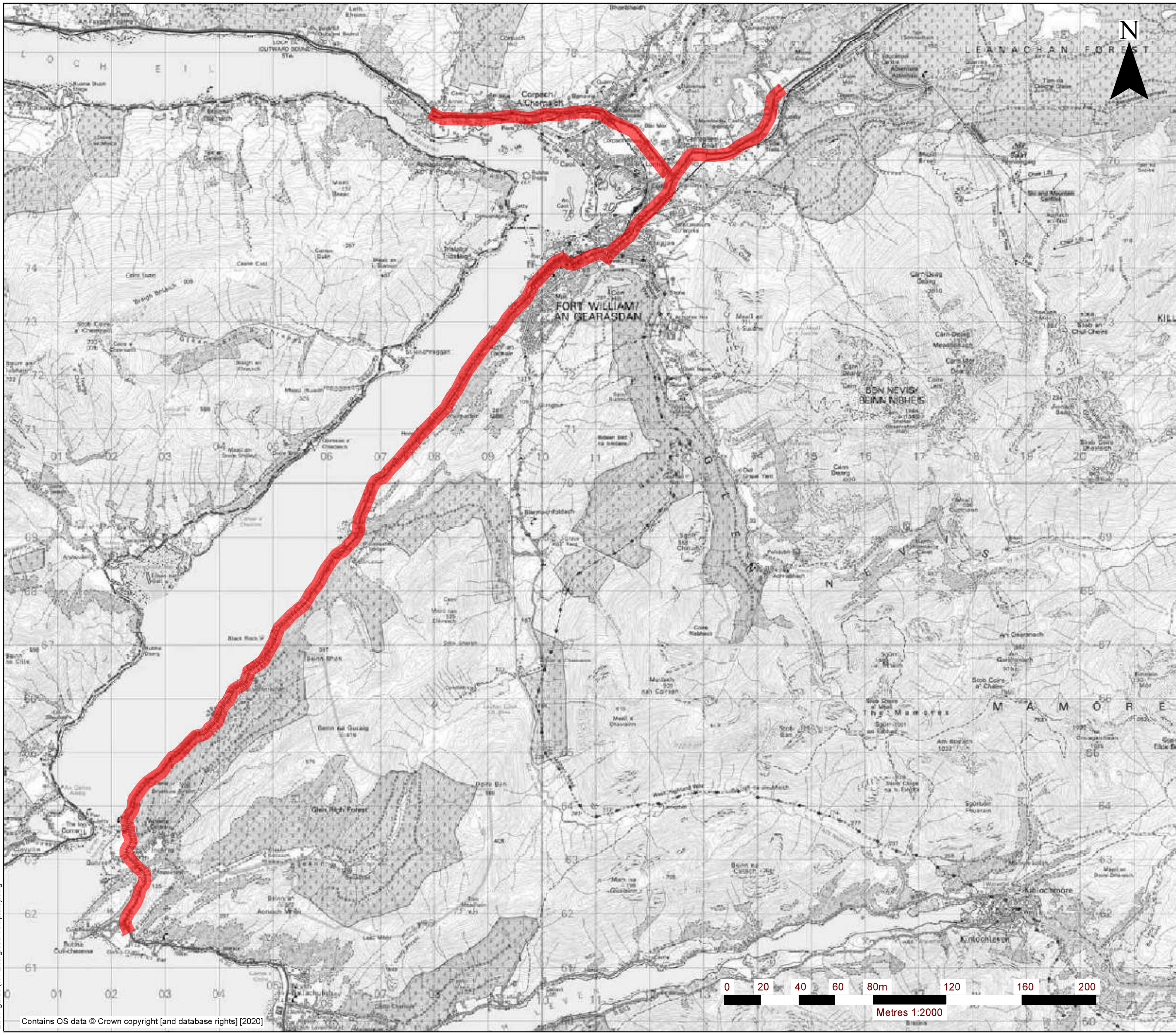
**Drawing 8.4**

**NVC Communities**

| Date: 06/05/2021 | Drawn by: AG | Checked by: MF | Version: V1 |
|---|---|---|---|

Project Number: 3539

# Chapter 9 Drawing 9.1 Traffic Study Area




EIA Figures (ITPEnergised Template).dwg

NOTES

1. Do not scale from drawing

LEGEND

STUDY AREA

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| 01 | 04/21 | INITIAL ISSUE | CH | ADV |

CLIENT: ALVANCE ITPENERGISED

PROJECT:
BILLET PLANT
LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE:
**TECHNCIAL APPENDIX 9.1**
**STUDY AREA**

SCALE: NTS

DATE: APRIL 2021

DRAWING NUMBER: 9.1

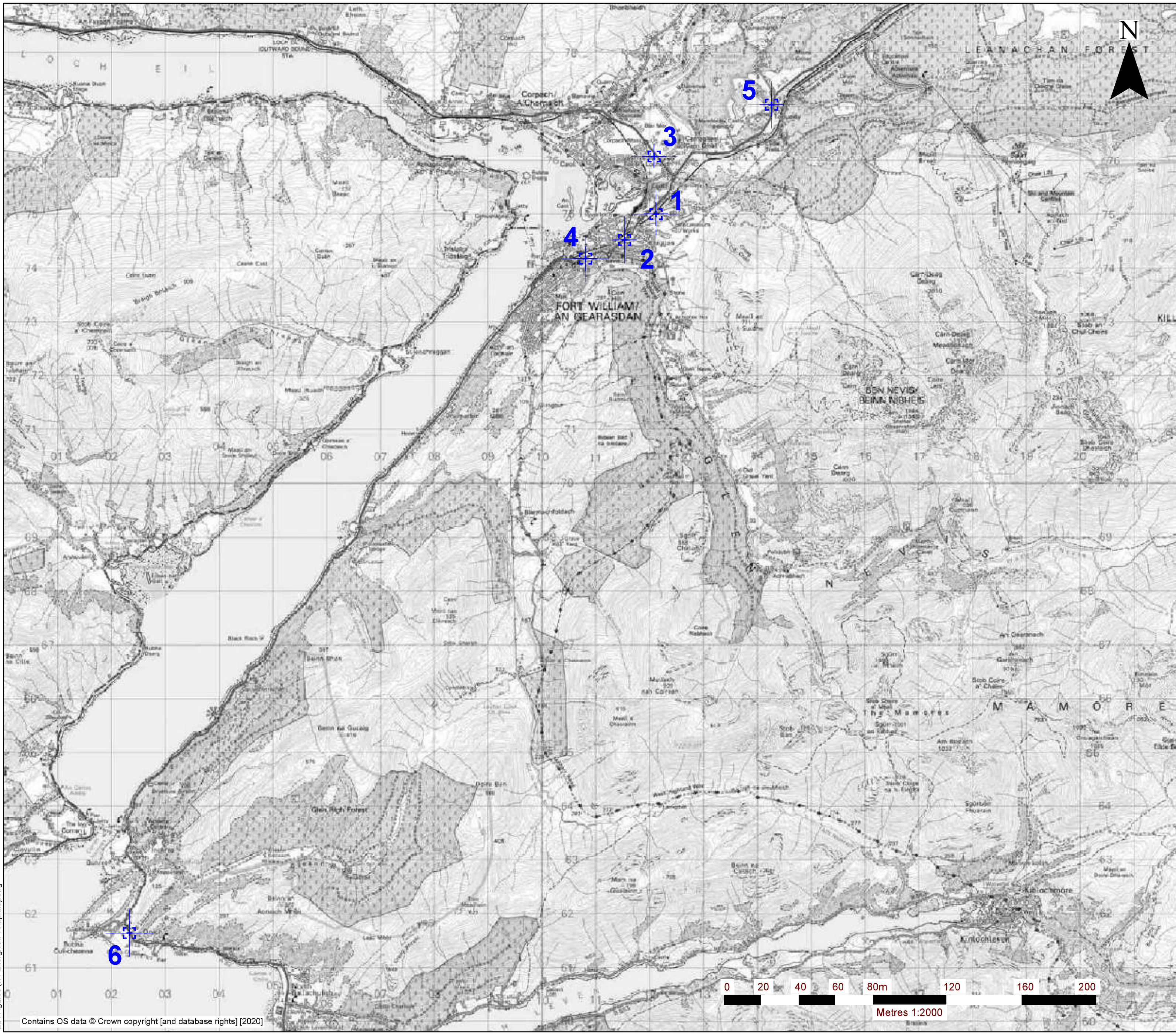
REV: 01

DRAWING STATUS: INFORMATION

SYSTRA

CENTRUM HOUSE
38 QUEEN STREET
GLASGOW
G1 3DX
T: +44 (0) 141 468 4205
www.systra.co.uk

# Chapter 9 Drawing 9.2 Traffic Counter Locations






N

NOTES

1. Do not scale from drawing

LEGEND

COUNTER LOCATION

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| 01 | 04/21 | INITIAL ISSUE | CH | ADV |

CLIENT: ALVANCE ITPENERGISED

PROJECT:
BILLET PLANT
LOCHABER SMELTER, FORT WILLIAM

DRAWING TITLE:
**TECHNCIAL APPENDIX 9.2**
**COUNTER LOCATIONS**

SCALE: NTS

DATE: APRIL 2021

DRAWING NUMBER: 9.2

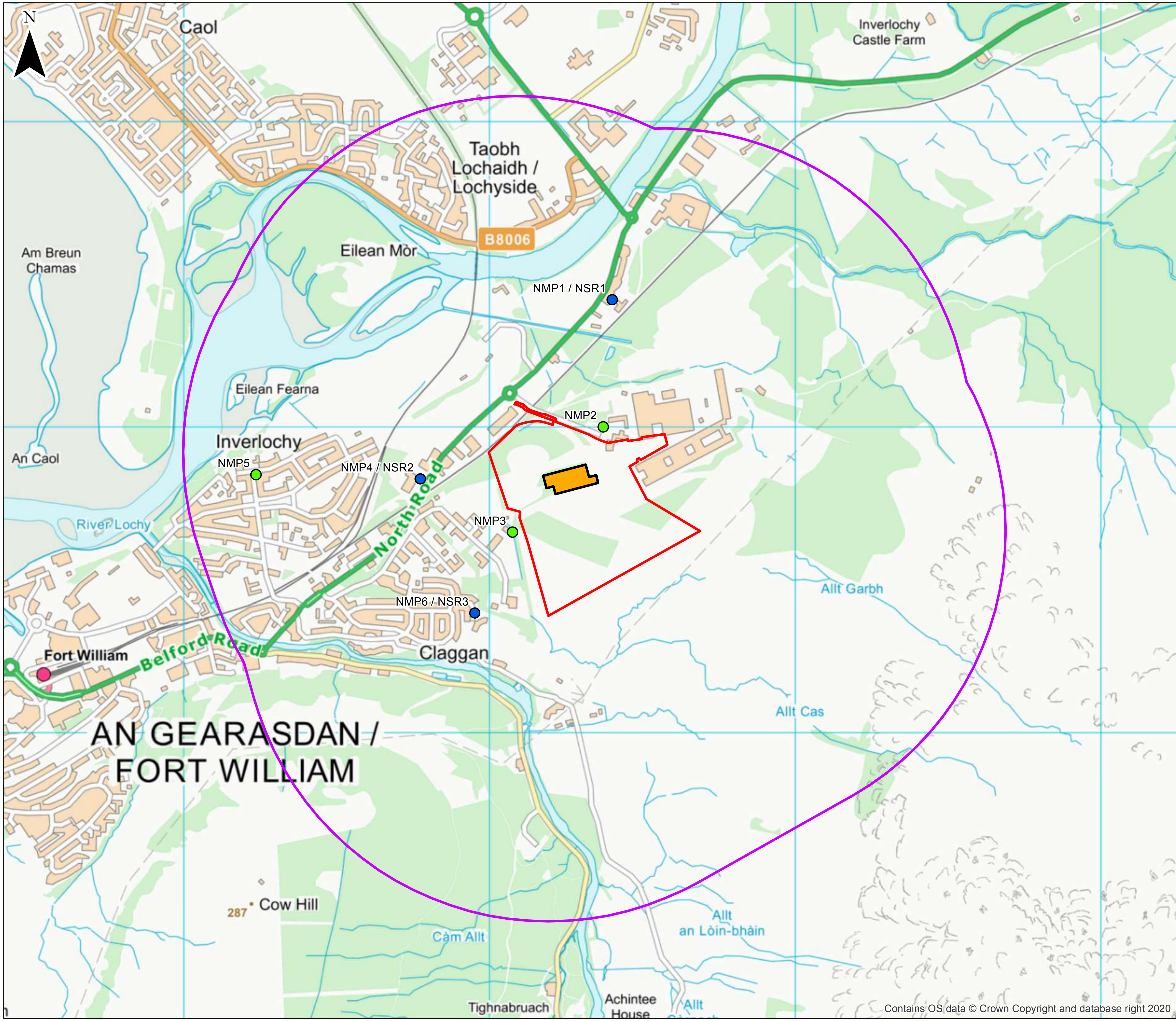
REV: 01

DRAWING STATUS: INFORMATION

SYSTRA
CENTRUM HOUSE
38 QUEEN STREET
GLASGOW
G1 3DX
T: +44 (0) 141 468 4205
www.systra.co.uk

EIA Figures (ITPEnergised Template).dwg

# Chapter 10 Drawing 10.1 Study Area, NSRs and NMPs




**KEY**

- Site Boundary
- Site Boundary 1 km Buffer
- Billet Plant Building
- NSRs and NMPs
- NMPs Only

0 0.35 0.7 km

Scale 1:12,000 @ A3

ALVANCE

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Alvance British Aluminium
Noise Impact Assessment

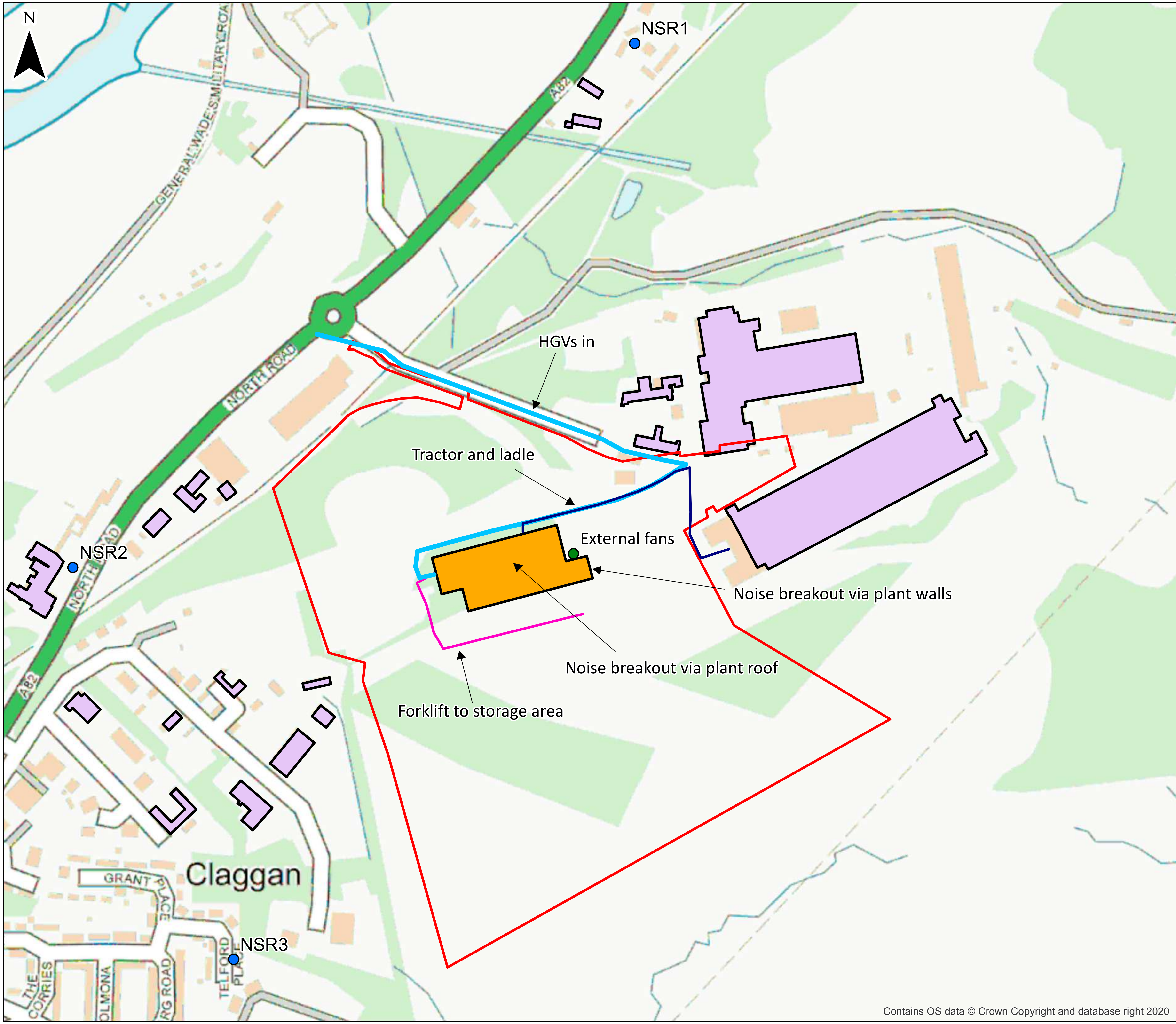
**Drawing 10.1**

**Study Area, NSRs and NMPs**

| Date: 25/02/2021 | Drawn by: SM | Checked by: SW | Version: V1 |
|---|---|---|---|

Project Number: 3539

## Chapter 10 Drawing 10.2 Modelled Operational phase noise sources




KEY

- Site Boundary
- Billet Plant Building
- Other modelled buildings
- NSRs
- Fans and External Plant

0 0.1 0.2 km

Scale 1:4,100 @ A3

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Alvance British Aluminium
Noise Impact Assessment

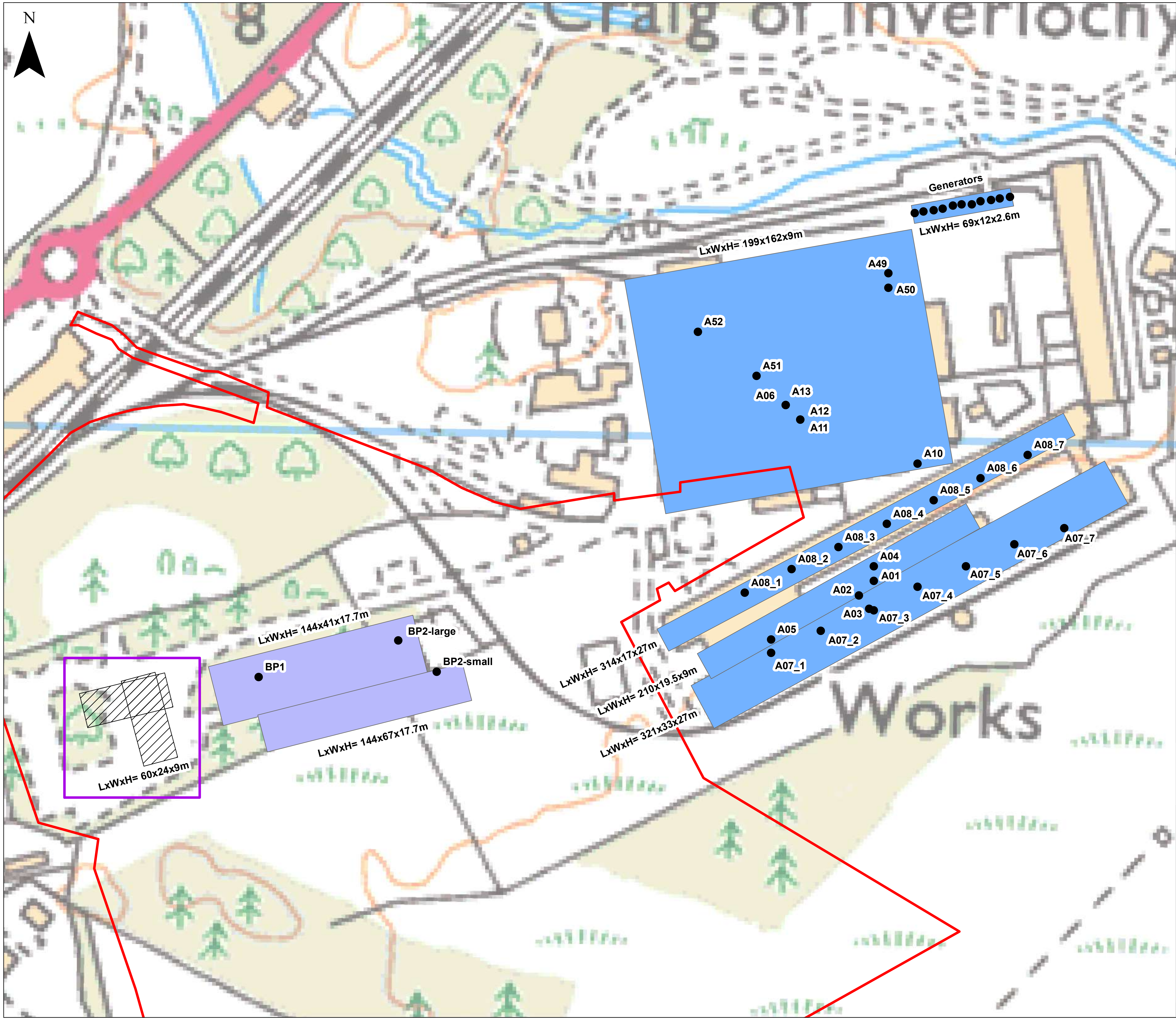
**Drawing 10.2**

**Modelled Operational Phase Noise Sources**

| Date: 25/02/2021 | Drawn by: SM | Checked by: SW | Version: V1 |
|---|---|---|---|

Project Number: 3539

## Chapter 11 Drawing 11.1 Modelled Buildings and Sources




**KEY**

Site Boundary

**Modelled Buildings**

Existing Building

Proposed Billet Building

Area Considered as part of the Canning Building Sensitivity Analysis:
- East-West (EW) Orientation
- North-South (NS) Orientation
- No Canning Building

Initial Canning Building EW or NS Orientations

Modelled Source

0 75 150 m

**Scale 1:2,500 @ A3**

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EIA Report

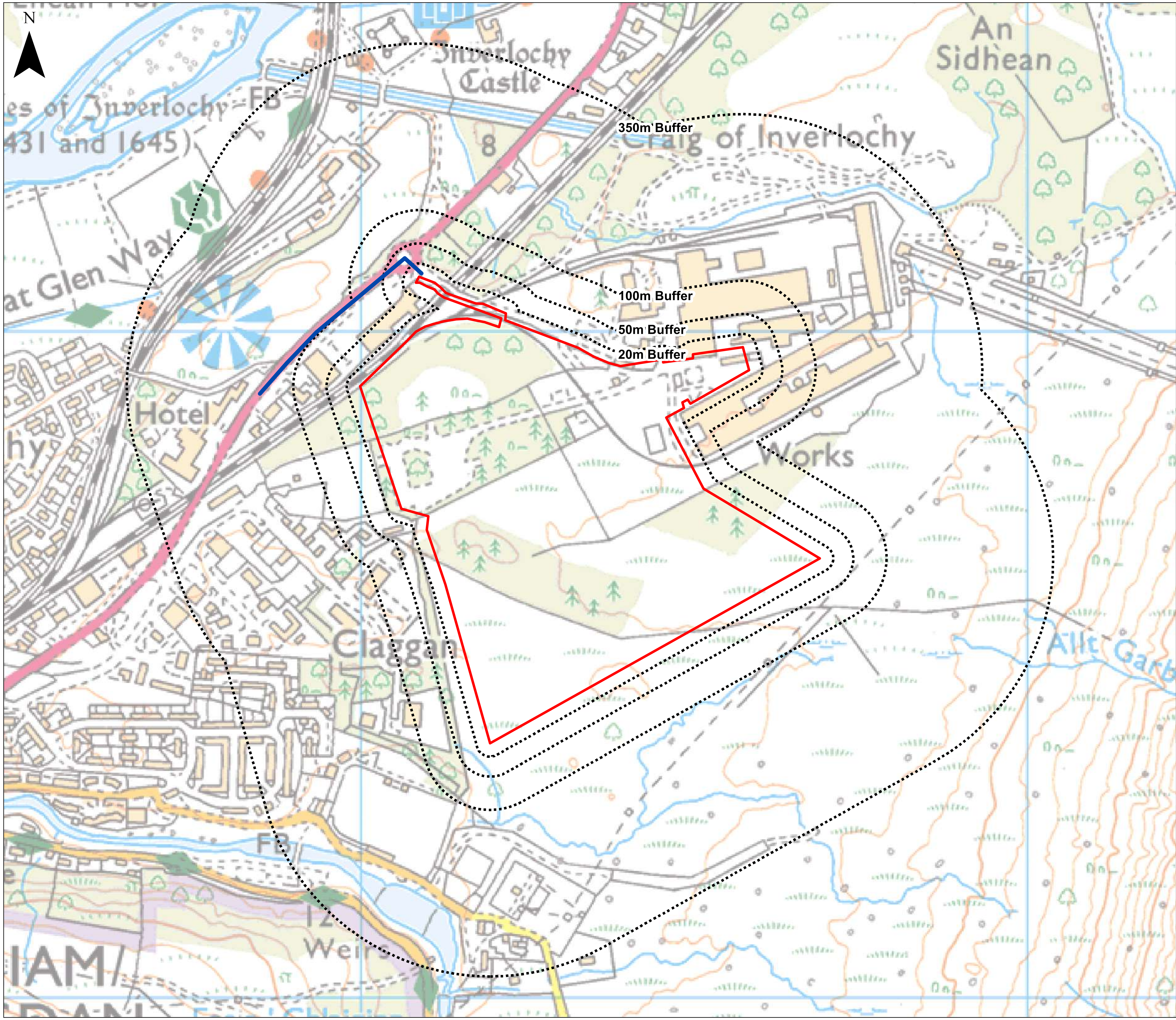
**Drawing 11.1**

**Modelled Sources & Buildings**

| Date: 04/05/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539

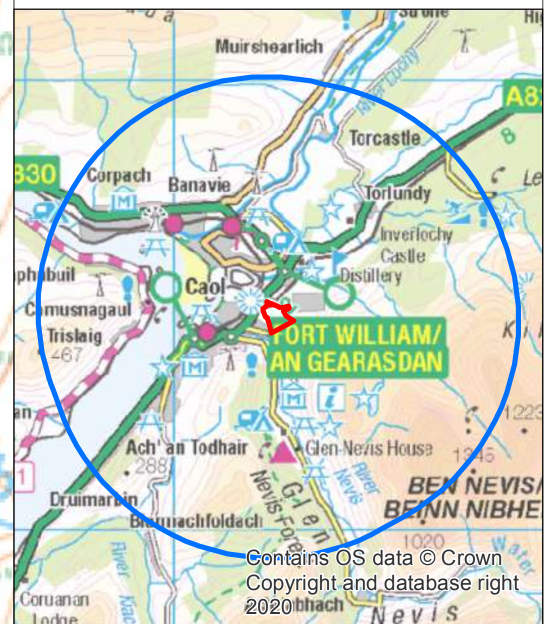
# Chapter 11 Drawing 11.2 Air Quality Study Areas




**KEY**

- Site Boundary
- Anticipated Track-out Route
- 20 to 350m Buffer Around Site Boundary
- 5km Buffer Around Site Boundary

Insert Map Not To Scale




0 150 300 m

Scale 1:5,500 @ A3

ALVANCE

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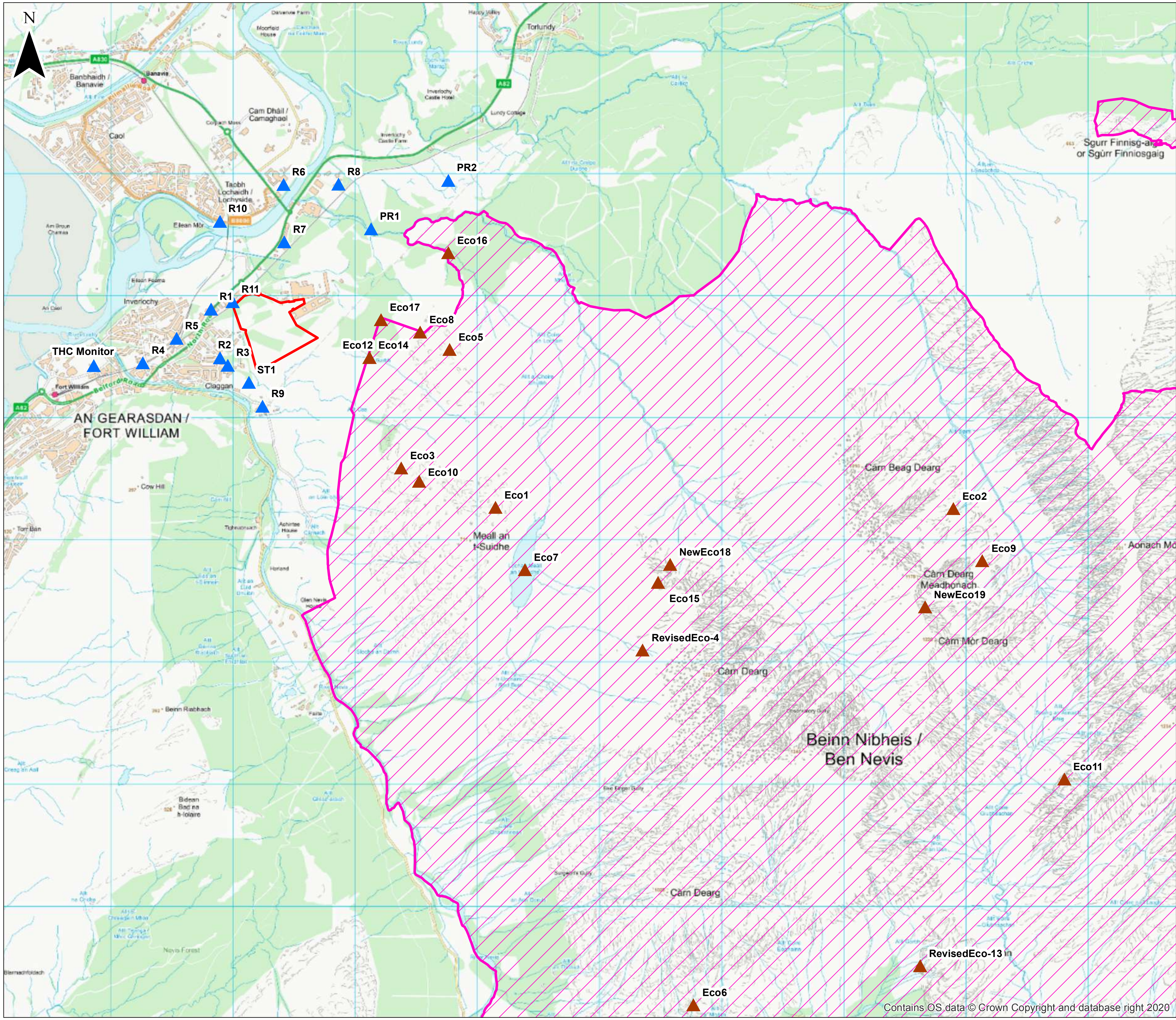
Alvance British Aluminium
EIA Report

**Drawing 11.2**
**Study Areas for Operational Road Traffic and Construction Dust Risk Assessments**

| Date: 04/05/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539

## Chapter 11 Drawing 11.3 Selected Receptors




**KEY**

- Site Boundary
- Selected Ecological Receptor
- Selected Human Receptor
- Ben Nevis Special Area of Conservation

0 0.75 1.5 km

Scale 1:30,000 @ A3

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EIA Report

**Drawing 11.3**
**Selected Receptors and Study Area for Operational Industrial Emissions**

| Date: | Drawn by: | Checked by: | Version: |
|---|---|---|---|
| 04/05/2021 | JB | AD | V1 |

Project Number: 3539

# Chapter 12 -

## Chapter 13 -

# Chapter 14 -

# Chapter 15 -

# Chapter 16 -

# Volume IV EIA Technical Appendices

# Appendix 1.1 Technical Team CVs

## Susan Irwine

**Position:**

Associate

**Qualifications:**

BA (Hons) Landscape Architecture

**Professional status/ Membership of Professional Body:**

Chartered Member of the Landscape Institute (CMLI)

**Relevant Project Experience:**
- Landscape Character Assessments for various local authorities
- A series of Landscape Capacity studies to identify Rural Opportunity areas throughout Argyll and Bute
- A wide range of LVIA and TVIA assessments for a range of clients

**Susan has been a Landscape Architect for approximately 30 years and involved with an extensive range of projects both in the Landscape Design and Landscape Planning and Assessment fields. Susan's broad range of experience demonstrates her ability to play a key role in a wide variety of projects, whether the emphasis is on hard or soft landscape design or undertaking landscape and visual assessment work. Susan works particularly well in a multi-disciplinary environment and enjoys the challenges associated with co-ordinating complex and exciting design projects.**

Susan has been involved with project managing, preparing, writing and co-ordinating a number of environmental assessments. Primarily focusing on landscape and visual assessments, (which has included detailed descriptions of local character zones), she has also contributed to SEA's, other sections of EIA's (e.g. planning, land-use, tourism) and acted as an expert witness at a Public Local Enquiry hearing as part of the SLC Community Growth studies and also for the Dumfries Whitesands Flood Protection Scheme, on behalf of Dumfries and Galloway Council.

**Relevant Experience:**

- LVIA for A90/A937 Laurencekirk Junction Improvement Scheme
- LVA for the proposed relocation of boat moorings and jetty at Glenmoriston Estate, Loch Ness
- LVA for proposed Solar Farm at Carbarns, North Lanarkshire
- LVA for proposed Waste Water Treatment Scheme, Easdale
- Scoping and LVIA for West Riverside proposed leisure development, Balloch, which included public consultation exercises and close liaision with LLTNP & SNH (now NatureScot) due to proposals being adjacent to a National Scenic Area
- LVIA for the new potato processing plant, near Airdire, which includes 28m high stack, parking facilities for staff and new perimeter woodland planting
- LVIA for 132kV overhead power lines between Gretna to Ewe Hill and Newfield substations, Dumfriesshire
- LVA for residential and mixed-use expansion to the east of Inverness
- LVIA for 600-megawatt windfarm, Shetland
- LVIA for Hydroelectric scheme, Evanton (Black Rock hydro scheme)
- LVIA for Fish Farms (on Arran and in the Highlands)
- A series of Landscape Capacity studies to identify Rural Opportunity areas throughout Argyll and Bute - requiring the understanding of sensitivities of local landscape character areas to determine the capacity of the landscape to accommodate development
- LVIA for 1500 new homes and mixed-use development at Pitgaveny Estate, Elgin
- LVIA for the proposed mixed-use (predominantly residential) development at Maidenhill, Newton Mearns
- TVIA's for two separate major developments as part of the Scotstoun and Govan shipyards on the River Clyde
- TVIA and subsequent reassessment of the revised protection proposals at Whitesands, Dumfries, assessing the impacts of the proposed scheme on the townscape resources and visual amenity
- LVIA, including a Cumulative Assessment, for mixed use development to the East of Kirkcaldy; and also p
- Preparing the methodology and assessment sections for the SEA for mixed use masterplan expansion (Abu Dhabi)

Susan has also been involved with writing and co-ordinating a number of other related reports and documents: Scoping Reports; Public Consultation, Overhead Route Selection Studies; Road Study Design Report (A8, Greenock); New Settlement Design Report (e.g. Smithills, Cumbernauld); Design support reports (e.g. Landscape strategy for the Water Treatment Works, Milngavie).

# Zak Ritchie

# Head of Civil Engineering & Hydrology

## Qualifications and Professional Memberships

- BEng(hons) Civil Engineering, Heriot-Watt University 2010
- MSc (with distinction) Hydrology & Water Resources, Heriot-Watt University 2011
- Full Member of The Chartered Institute of Water and Environmental Management (MCIWEM), 2018
- Chartered Water and Environmental Manager (C.WEM), 2018
- Engineering Council Chartered Engineer (C.Eng), 2018

## Career Summary

Zak Ritchie is the Head of Civil Engineering & Hydrology at ITPEnergised, leading this key Service Line which spans across a variety of key Sectors and supports ITPE's internal Teams and Service Lines.

Zak joined ITPEnergised in May 2020 from his previous role as a Principal Hydrologist & Civil Engineer at SLR Consulting Ltd, where he has gained significant experience in his area of expertise, whilst establishing a solid understanding of other Technical Disciplines which often have overlap with Zak's field, such as; Process Engineering, EIA, Landscape & Visual, Ecology, Geotechnical Engineering, Structural Engineering, Roads & Highways Design, Urban Masterplanning, Waste Management and Mining and Mineral extraction.

In his position as Head of Hydrology & Flood Risk at ITPE, Zak oversees a dedicated team of Hydrologists, Hydrogeologists and Civil Engineers who have significant experience in related projects such as; flood risk assessment; surface water management planning; SuDS design and performance assessment; 1D/2D hydraulic flood modelling; water balance and yield assessments; effluent dispersion modelling; mine water management and restoration; hydrometric installation and analysis; water quality monitoring & analysis; water / river engineering studies; water treatment design; construction environmental management plans; peat management plans; detailed construction drainage design (foul and surface water); and general Civil Engineering input to projects.

Zak has detailed knowledge and experience of the planning and design processes from project proposal stage, initial feasibility studies / due diligence and conceptual masterplanning through to the detailed construction design, consenting process and project completion sign off. Zak and his team have a track record of providing bespoke solutions in sensitive and constrained environments whilst maximising developable land and providing the necessary statutory / planning requirements to ensure that Clients aspirations are delivered.

Zak is an experienced Project Manager within ITPE and manages his own team taking on responsibilities such as technical design compliance, H&S / CDM, finances, QA and client / regulator liaison. He has a network of repeat clients due to his forward thinking, friendly nature, direct approach and high standard of deliverables. Having a wide-ranging understanding of regulatory, commercial, environmental and engineering application in his field of expertise he is able to provide support and lead projects of varying sizes and requirements across the majority of Key Sectors.

The majority of Zak's experience is UK & Ireland focused, however has notable international experience in North America providing flood risk and water engineering services to Industrial Manufacturing and Waste

Management clients, and recently has been providing construction design and site support for a mine water treatment and surface water management scheme at Neves Corvo Zinc & Copper Mine in Portugal.

Core to Zak's working values and practices is Health, Safety and Wellbeing of those he works alongside, internally and externally. Being a Chartered Engineer and spent much of his career on active / hazardous sites Zak is experienced with understanding and implementation of the Construction (Design and Management) Regulations 2015 and the various roles and responsibilities of everyone working within this key legislation. Zak ensures his knowledge and experience of H&S and environmental considerations in construction projects is passed onto junior colleagues through appropriate mentorship and training.

## Selected Project Experience

### Property & Urban Regeneration

### Large Scale

- **Newark South 3000 home Development, Urban & Civic, 2017-2020**: Lead hydrologist / engineer responsible for flood mitigation / drainage design inputs from RIBA Stages 1-7 for the various individual parcels of land developed in sequence as part of the masterplan. The overall development was constrained in drainage capacity terms is partly in a 'high' risk fluvial floodplain. These constraints were overcome through significant cross-party collaboration including individual interest developers, Environment Agency, principal and sub-contractors, stakeholder, members of public, local authority, and the wider technical team. Project is ongoing with various land parcels being built out.
- **Private Residential Development, South Lanarkshire, 2020 to present:** Lead engineer / hydrologist for a proposed multi-million pound sub-urban development located within the River Clyde functional floodplain. A detailed hydrodynamic linked 1D-2D flood model has been developed to determine accurately the baseline flood conditions, in which is then adapted to 'test' a range of flood mitigation and compensation scenarios to create a safe development platform outside the floodplain, without increasing flood risk to offsite receptors. As an added benefit, the flood mitigation scheme will also reduce existing off-site flooding to neighboring streets / properties surrounding the site. Works include detailed foul and surface water drainage designs to serve the development and a side wide earthworks specification to create the platforms. Scope of works to deliver this project is the full RIBA Stages 0-7 and is ongoing.
- **2x Private Residential Developments, Stirling City Centre, 2020-present:** Lead engineer / hydrologist currently progressing detailed flood studies and engineering design for 2x multi-million pound residential developments on the banks of the River Forth, Stirling City Centre. Detailed flood models are currently being undertaken to inform the development layout, levels and composition; each will include a public realm space with access to the riverscape providing valuable amenity space within the city centre. This public realm space 'doubles' up as flood compensation area due to proposed land raising to create a safe development platform. Detailed flood mitigation schemes are being developed for each site to ensure they are safe and sustainable for the development lifetimes. Works include detailed foul and surface water drainage designs to serve the development and a side wide earthworks specification to create the platforms. Scope of works to deliver this project is the full RIBA Stages 0-7 and is ongoing.
- **Private Retirement Village Development, West Lothian, 2018-present:** Lead engineer and project manager for retirement village development in West Lothian. Involvement in the project from concept, to securing planning and now currently in construction phase providing construction design package and site supervision. Duties during project lifetime include; Flood Risk and Drainage Assessment for planning, engineering design support and hydraulic analysis for culvert realignment on existing watercourse passing through the site, detailed drainage design, CAR applications for engineering works (culverting) and installation of field drainage system, design of filed drainage system, SuDS design, water quality monitoring, earthworks modelling and on-site ground investigations.

- **Queens Quay Urban Regeneration Scheme, Clydebank, 2018-2020:** Various engineering / hydrological design inputs to the multi-million pound Clyde waterside regeneration scheme located at the former John Brown shipyard, Glasgow. The urban regeneration scheme is mixed use comprising residential, health and leisure facilities, commercial, retail, and commercial facilities and civil spaces including extended riverside walk/cycleway. Primary involvement has been to support contractors in the design and construction phases (RIBA Stage 4 onwards) and principally assisting with flood risk considerations (resilient construction, mitigation measures etc) and foul / surface water drainage design. Construction / remediation of the scheme continues.
- **Land at Menzies Hotel, Irvine, Private Developer, 2015-2017:** Lead hydrologist to inform a multi-million pound re-development of the land at Menzies Hotel, Irvine. The site is situated on the banks of the Annick Water and partially located within the functional floodplain. Works included undertaking a detailed Flood Risk Assessment and flood modelling exercise to accurately determine the flood risk to the site, from which a flood mitigation scheme was incorporated into the proposed design to ensure it was safe and sustainable for it's anticipated lifetime. Detailed surface water and foul water drainage designs were also undertaken for the site. Close collaboration with the full project team and key stakeholders enabled the flood risk / drainage requirements to be appropriately accommodated within the development layout. Conditional planning permission was granted in 2015 and the scheme is currently being constructed.
- **Site of Former Yorkshire Post Building, YP Real Estate Ltd, 2014-2016:** Detailed flood risk assessment and drainage design undertaken to inform a multi-million pound development on the banks of the River Aire (Leeds City Centre) for a new multi-functional mixed use development including; residential, hotel, commercial, retail etc and the formation of public realm space on the edge of the River Aire. The site is located in the 'high risk' category and parts lie within the functional floodplain, therefore an overarching objective of the works was to incorporate detailed flood mitigation measures to the scheme to ensure the site was safe and sustainable for its anticipated lifetime. Conditional Planning Permission was granted in April 2015 and design evolution continues for the scheme.
- **Various Private Residential Developments, Nottinghamshire and Lincolnshire, 2017-2020:** Lead hydrologist and drainage engineer providing wide ranging planning, post planning construction design support, detailed flood risk assessment and preliminary site investigation to support various residential developments across the region. Development sizes ranging from 30 properties to c.500 properties.

### Industry Process and Manufacturing

- **Teesside Anaerobic Digestion Plant, BioConstruct, 2015-2017**: Provided technical engineering design input to the design and operation of the AD Plant, to assist with securing planning consent and obtaining the Environmental Permit from EA. Works involved undertaking a detailed Flood Risk and Drainage Assessment (FRDA) and developing an operational Drainage Containment Strategy to ensure no offsite pollution during a catastrophic failure scenario and the health and safety of site operatives. Works also included securing a trade effluent consent with Northumbrian Water, fundamental to the development viability of the site. Design and onsite construction support provided throughout the project - development is now fully constructed and operational.
- **South Milford Anaerobic Digestion Plant, AB Agri, 2015-2018**: Engineering and environmental design inputs to facilitate the planning, environmental permitting and construction of the AD plant. Responsibilities included securing Internal Drainage Board (IDB) and Highways Authority consents for upgraded road / access design for tankers and resulting changes to the IDB drainage network. A Drainage Containment Strategy in the form of a lined earthen engineered bund surrounding the process tanks was designed and successfully incorporated with the site SuDS strategy due to the significant space constraints. Design and onsite construction support provided throughout the project - development is now fully constructed and operational.
- **Newhouse Glass Recycling Centre, Viridor, 2017-2019:** Principal Designer services provided to retrofit an upgraded drainage system and flood alleviation scheme to the site. During heavy rainfall, the site was becoming frequently inundated and affecting its operational capacity. Works included

procurement of Principal Contractor, site supervision and lead engineering design services to mitigate the flood risk and included procurement of a suitable treatment plant to treat collected runoff prior to discharge to the water environment. Retrofit works are completed and site is now flood risk resilient.

- **Various MATTE Assessments, Whisky Distilleries and Maturation Storage Facilities, 2013-2020:** Lead water specialist providing technical input and environmental assessment to inform Major Accident to the Environment Assessments (MATTE) for new bonded warehouse developments at offsite / onsite premises. Driven by the HSE COMAH 2015 Regulations, MATTEs are required to enable construction of facilities creating potentially explosive environments, thus the design / assessment works involve developing a site conceptual model of Source-Pathway-Receptors and developing mitigation measures to reduce the offsite environmental impact to 'acceptable' levels during a fire / loss of containment scenario.

- **Various Flood Risk and Drainage Assessments, Industrial Storage-Manufacturing Facilities-Depots, Various Clients, 2012-present:** *Clients include: Smurfit Kappa, Brett Group, Breedon Group, Jaguar Land Rover, Paterson's of Greenoakhill, Saint-Gobain PAM, Forterra Building Products, Singleton Birch, Local Authorities and more*. Primary works entail Project Managing and undertaking Flood Risk and Drainage Assessments (FRDA) to support planning applications, EA Flood Defence Consents, Land Drainage Consents, Sewer Connection Applications and beyond planning level support, provision of detailed drainage designs (including SuDs) for construction.

- **Various Anaerobic Digestion Plants, Engineering and Environmental Services, Qila Energy, 2013-2019**: Engineering and environmental design inputs to facilitate the planning, environmental permitting and construction of various farm scale AD plants across the UK. Responsibilities include Project Managing and Technical Design / Assessment Lead, primarily assisting with the following: Construction Environment Management Plans (CEMP), Flood Risk Assessments, Detailed Construction Drainage / SuDs Designs, foul water management, design of containment strategies, site investigation, surface and groundwater risk assessments, access road / culvert / watercourse crossing designs and securing drainage discharge consents (trade effluents, land drainage, sewer connections etc).

- **Prudhoe Mill Water Intake Study, Essity UK, 2018-2020:** Lead designer / hydrologist for developing a detailed 2D hydrodynamic flood model of the River Tyne to assess the current performance of the existing water intake abstraction for the Mill and inform the design of a new multi-million pound configuration. The Mill is extremely sensitive to water availability in the Tyne and thus a series of detailed studies and concept designs were undertaken using the flood model and low flow scenarios to 'test' different configurations until an optimum cost-benefit ratio was reached.

### Energy Transmission and Generation

- **Fort Augustus Substation, Scottish and Southern Energy, 2014-2020**: Lead hydrologist / engineer and project manager responsible for undertaking detailed construction drainage design (foul and surface water) to support the construction of new electrical substation platforms. Foul drainage design was uniquely in the form of a bespoke Filter Mound configuration required to treat welfare flows from the facilities on site. Scope also included development of a bespoke detailed 1D/2D linked hydrodynamic flood model to determine the fluvial flood risk to the substation, and detailed construction design and model optioneering of flood mitigation and compensation scheme to remove the critical infrastructure outside the floodplain. Schemes were approved by SEPA and The Highland Council and is currently being constructed.

- **Grudie Bridge Substation, Scottish and Southern Energy, 2015-2019:** Lead hydrologist / hydrogeologist and project manager for a proposed substation extension bordering a fluvial floodplain which was also situated in an area at significant pluvial and groundwater flood risk. Project managed and coordinated multiple contractors to undertake detailed intrusive site investigations next to 33kV cables (OHL and buried) and developed a detailed flood mitigation design solution to address the know flood risks. This involved designing a subsurface 'cut off' trench with surface interception swale, backfilled with engineered clay to divert groundwater around the substation site to the watercourse. Detailed 1D/2D hydrodynamic flood model was developed to confirm the fluvial flood risk and thus microsite the development accordingly. Scheme is constructed and fully operational.

- **Solar PV Farms, Various Clients, 2014 to Present**: Lead engineer / hydrologist for technical input to support Solar Farm array installations across the UK. Experience includes design access tracks, watercourse crossings and culvert design, surface water drainage design and Flood Risk Assessment, hydrological modelling to inform siting and orientation of arrays and works to inform foundation type selection for metal frame structure footings.
- **Hydropower Feasibility Schemes, Various Clients, 2013 to Present:** Lead hydrologist for the undertaking of feasibility studies and design appraisals for various sized hydropower schemes across the UK. Works include detailed hydrological studies to determine potential power generation, infrastructure layout design, turbine type and efficiency analysis and yield and cost benefit analysis.
- **Kilgallioch Windfarm, Scottish Power Renewables, 2015-2019:** lead field engineer / hydrologist responsible for fulfilling the site's Water Quality Monitoring Programme (WQMP) (including Private Water Supplies (PWS)). This involved configuring continuous water quality monitoring probes on watercourses, in-situ field testing, setting up rain gauges, undertaking monthly sampling of monitoring locations, organising testing with 3rd party laboratories, analysing and interpreting result and preparing routine reports for SPR and Local Authority scrutiny.
- **Dalchork Substation, Scottish and Southern Energy, 2015 to 2018:** Lead engineer / hydrologist responsible for developing detailed construction designs of new substation platform drainage, access road design / drainage, SuDS, and bespoke private foul drainage treatment system. A detailed Flood Risk Assessment was undertaken to support the development including detailed hydrological and hydraulic modelling to size the flood risk mitigation measures. Works also included detailed design of watercourse crossings, access track alignment and key input to the Construction Environmental Management Plan and Peat Management Plan.
- **Tomatin, Substation, Scottish and Southern Energy, 2015 to 2017:** Lead engineer / hydrologist responsible for developing detailed construction designs of new substation platform drainage, SuDS, and bespoke private foul drainage treatment system. A detailed Flood Risk Assessment was undertaken to support the development including detailed hydrological and hydraulic modelling to size the flood risk mitigation measures. Works also included appropriate key input to the Construction Environmental Management Plan and Peat Management Plan.
- **Rothienorman, Substation, Scottish and Southern Energy, 2017 to 2020:** Lead engineer / hydrologist responsible for developing detailed construction designs of new substation platform drainage, SuDS, access road design / drainage and bespoke private foul drainage treatment system. A detailed Flood Risk Assessment was undertaken to support the development including detailed hydrological and hydraulic modelling to size the flood risk mitigation measures and a detailed 1D flood model of the nearby watercourse to provide floodplain extents. Works also included input to the Water Quality Monitoring Plan (WQMP) and Private Water Supplies (PWS) monitoring requirements, sampling, analysis and reporting.
- **Glenmuckloch Pumped Storage Hydro Scheme, 2020 Renewables, 2015-2017:** Initial role as Lead engineer / hydrologist included developing the River Nith water abstraction intake design, pumping arrangement and rising main to the coal mining void (upper reservoir) and associated engineering infrastructure. Scope also included liaising closely with key stakeholders (SEPA, River Nith Fisheries Trust etc) to design a sympathetic intake arrangement and undertake detailed hydrological analysis of the River Nith to develop an agreeable abstraction regime, which would not result in any detrimental impact to spawning salmon or downstream users. Work also included developing a detailed flood model to inform the intake infrastructure design and siting. Scheme was consented in 2016.
- **Gordonbush Windfarm Extension**, **Scottish and Southern Energy Renewables, 2016-2017:** Lead technical assessor for Hydrology, Geology and Hydrogeology chapters for EIA to support the planning application for the proposed windfarm extension which was granted permission in 2017. Inputs also provided for technical appendices such as drainage strategy, flood risk assessment and

engineering design of windfarm infrastructure. PWS were assessed thoroughly given the remoteness of the site and residents total reliance on their private supplies.

- **Wetherhill Windfarm Extension, 2015-2016, Scottish Power Renewables:** Lead hydrological, engineering design and environmental assessment works to inform the EIA application. Works included vast peat probing and sampling, catchment mapping, borrowpit identification, input to access track design, hydrological modeling of catchment flows and design of watercourse crossings, GWTDE investigation and identification and key input to the Construction Environment Management Plan and Peat Management Plan. Works also included design inputs to borrowpits and turbine foundations, including dewatering calculations and resulting water management.
- **South Kyle Windfarm, 2013-2014, Vattenfall:** Field hydrologist / hydrogeologist undertaking analysis of peat depth, sampling and drawdown tests to determine permeability (k). Scope also included completing associated environmental assessments, including EIA Hydrology, Hydrogeology and Geology chapters, as well as developing a detailed flood model of the Water of Deugh to inform a proposed substantial bridge crossing which was fundamental to the site access. Works also included design inputs to borrowpits and turbine foundations, including dewatering calculations and resulting water management.
- **Collieston Hill Windfarm, 2013-2014, RES:** Field hydrologist / hydrogeologist undertaking site wide peat probing, catchment mapping, GWTDE investigation, borrowpit identification etc. Provided key technical inputs to the Environmental Assessment chapters and the Peat Management Plan. Works also involved assessing watercourse crossings and undertaking hydrological analysis to inform the site design.
- **Longannet Power Station, 2012-2018 Scottish Power Generation:** lead field hydrogeologist / hydrologist and project manager undertaking routine environmental compliance monitoring at the site. This included surface water, ground water and supernatant water sampling and in-situ testing at the Ash Lagoon complexes, organising all sample analyses with laboratories and undertaking the routine monitoring reports to fulfil the PPC Permit requirements.
- **Cockenzie Power Station, 2012-2017 Scottish Power Generation:** lead field hydrogeologist / hydrologist and project manager undertaking routine environmental compliance monitoring at the site. This included surface water, ground water and supernatant water sampling and in-situ testing at the Ash Lagoon complex, organising all sample analyses with laboratories and undertaking the routine monitoring reports to fulfil the PPC Permit requirements.

## Employment History

- Head of Civil Engineering & Hydrology, ITPEnergised, Edinburgh, 2020-present
- Principal Engineer & Hydrologist, SLR Consulting, Edinburgh, 2012-2020

# Jenny Diack

# Senior Ecologist

## Qualifications and Professional Memberships

- BSc (Hons) Ecological Science, University of Edinburgh
- Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM)
- NatureScot Bat Roost Licence (including hibernacula) – 150746
- NatureScot Great Crested Newt Survey Licence – 150618
- NPTC Level 2 – Tree Climbing and Aerial Rescue
- CSCS Certified – Construction Site Visitor
- PTS Sentinel Card Holder (PTS AC, ICI, OLEC 1)

## Career Summary

Jenny is a Senior Ecologist with over 14 years of experience working in the consultancy sector. Jenny has worked with a wide range of clients from infrastructure (road and rail), local authority, renewable and conventional energy, residential and commercial property sectors.

She has a sound knowledge of protected species legislation and experience in planning, carrying out and reporting upon a wide variety of ecological surveys, ranging from Preliminary Ecological Appraisals to specialist protected species surveys. Jenny holds a bat survey licence and a Bat Low Impact (BLIMP) licence. She also holds a great crested newt licence and has worked as an Agent on development licences for badgers, otters and Scottish wildcat.

Jenny's academic background lies in ecology, where her graduate research included surveying freshwater aquatic invertebrate populations in lowland Scotland and tropical amphibian populations. Through her work as a consultant Jenny has specialised in mammals, amphibians and reptiles whilst maintaining an interest in all fields of ecology. Her experience working on a wide range of projects from small-scale residential developments to large-scale infrastructure projects has allowed her to gain a thorough and considered approach to providing ecological support on developments.

In recent years, Jenny has worked on large-scale transport infrastructure projects including the Borders Railway Project, the Highland Enhancement Project, the Edinburgh to Glasgow Improvement Project and the A9 Dualling Project. Jenny has held a variety of roles and responsibilities on these developments from Ecological Clerk of Works and specialist surveyor to being fully responsible for the planning, co-ordination and management of ecological support. Working in these roles has allowed Jenny to become highly experienced in the development and implementation of complex mitigation strategies for badgers, bats and great crested newts. Her experience and positive approach have enabled her to work successfully with developers, local authorities and statutory bodies to ensure works progress whilst minimising the impact on protected species and habitats.

## Selected Project Experience

### Renewables

- Bute Energy, 2020. Jenny is responsible for overseeing the bat survey programme and assessment for several proposed wind farms in Wales.
- Seagreen Wind Energy/Bam Nuttall, 2019. Jenny provided Ecological Clerk of Works support during site and ground investigation works relating to the construction of onshore transmission infrastructure between Carnoustie and Tealing to service the Seagreen Alpha and Seagreen Bravo offshore windfarms.
- ABO Wind UK, Hartwood, Schotts, 2012. Jenny was responsible for carrying out and reporting upon a bat survey programme including remote detector and transect surveys for a proposed windfarm development.
- Confidential Client, Three Sites, Fife, 2011. Jenny was responsible for carrying out and reporting upon a bat survey programme including remote detector and transect surveys for three proposed windfarm developments.
- Confidential Client, Mossmorran, Fife, 2008. Jenny was responsible for carrying out and reporting upon a bat survey programme including remote detector and transect surveys for a proposed windfarm development.

### Transport Infrastructure – Railways

- BAM Nuttall/Network Rail, Highland Enhancement Project, Aberdeen to Inverurie, 2016 -2018. On this project Jenny was responsible for the delivery, planning, co-ordination and management of ecological support. The project included the installation of double track system over 25km of line, construction of new stations and the extension of platforms at existing stations. Jenny's responsibilities included planning preconstruction and monitoring surveys of the route for bats, badgers, otters and reptiles, providing Ecological Clerk of Works support and managing ECoWs on site. Jenny was responsible for ensuring works were carried out in line with the route-wide protected species licenses for bats, otters and badgers and associated species protection plans and method statements. Mitigation for this project included the design and construction of two artificial badger setts. Jenny provided toolbox talks and ecology briefings to the site team and ensured that works were carried out under an ecology permit to work system developed with the client. Jenny was also responsible for producing an ecological constraints database and drawings.
- BAM Nuttall, Highland Mainline Project, Aviemore and Pitlochry Stations, 2016 – 2018. Jenny was responsible for carrying out protected species surveys at these stations prior to upgrade works. Surveys included Preliminary Ecological Appraisal, active season bat surveys, tree climb and inspect surveys for bats, reptiles, badgers and otters. Further works included an EPS licence for bats including the production of a bat species protection plan.
- Bam Nuttall, Forres Station, 2016. Jenny provided Ecological Clerk of Works support for this project which saw the construction of a new station at Forres and re-alignment of the railway track. Works included developing and implementing a reptile mitigation strategy including translocation of slow-worms and ensuring works were carried out in line with an invasive species management plan due to the extensive presence of giant hogweed and Himalayan balsam within the site.
- Morgan Sindall, Edinburgh to Glasgow Improvement Project, 2016 – 2018. Jenny provided Ecological Clerk of Works support on this project which saw the electrification of the line between Edinburgh to Glasgow. Jenny was responsible for ensuring works were carried out in line with route-wide protected species licences for bats, badgers and otters. Works included carrying out preconstruction surveys, active season bat surveys of structures and buildings, aerial inspections of trees for bats and nesting birds, and badger mitigation including temporary sett closures. Jenny

was also responsible for managing the site ecology team, issuing ecological permits to work, production of the ecological constraints database and drawings.

- BAM Nuttall/Network Rail, Borders Railway Project, Edinburgh to Tweedbank, 2013 – 2015. Jenny provided Ecological Clerk of Works support during this project which saw the reopening of a 47km section of the Waverley Line between Edinburgh and Tweedbank. Works included monitoring existing ecological constraints and carrying out preconstruction surveys. Jenny was responsible for ensuring works were carried out in line with the route-wide protected species licenses for bats, otters and badgers and associated species protection plans and method statements. Jenny provided toolbox talks and ecology briefings to the site team and ensured that works were carried out under an ecology permit to work system developed with the client.

### Transport Infrastructure – Roads

- Transport Scotland, A9 Dualling, Perth and Kinross, 2015-2016. Jenny was responsible for planning and carrying out bat surveys for the project on the section of the A9 between Pass of Birnam and Glen Garry. Surveys included preliminary roost appraisals of structures and building, tree aerial inspections and hibernation surveys. Jenny was also responsible for analysis of bat survey data and assisting with the production of the ES chapter.
- Transport Scotland, A96 Dualling, Inverness to Nairn, 2015-2016. Jenny was responsible for planning and carrying out bat surveys for the project on the section of the A96 between Inverness and Nairn. Surveys included preliminary roost appraisals of structures and building, tree aerial inspections and hibernation surveys. Jenny was also responsible for analysis of bat survey data and assisting with the production of the ES chapter.
- Capita Symonds, Inverness West Link, 2014-2015. Jenny was responsible for carrying out pre-construction protected species surveys including badger, otter, bats, reptiles and great crested newts. Further to the surveys, Jenny was responsible for the EPS (Bats) licence application including production of a detailed species protection plan.

### Local Authority

- South Lanarkshire Council, St Kentigern's Church, 2018. Jenny was responsible for managing a bat survey programme at the site including active season surveys and winter hibernation surveys prior to works to conserve the structure. Further to the surveys, Jenny was responsible for the EPS (Bats) licence application and production of a species protection plan. Mitigation included endoscope surveys, installation of exclusion devices, supervised works and compensatory bat boxes.
- South Lanarkshire Council, Cottage Flats (Douglas Water, Rigside, Glespin), 2017-2018. Jenny was responsible for managing a bat and nesting bird survey programme prior to the demolition of residential buildings at the three sites. Further to the bat surveys, Jenny was responsible for the EPS (Bats) licence application and produced a bat species protection plan. Mitigation included roost exclusion, supervised hand demolition and installation of compensatory bat boxes.
- South Lanarkshire Council, Carstairs Junction, 2017-2018. Jenny was responsible for managing a bat and nesting bird survey programme prior to the demolition of residential buildings at the site. Further to the bat surveys, Jenny was responsible for the EPS (Bats) licence application and produced a bat species protection plan. Mitigation included roost exclusion, supervised hand demolition and installation of compensatory bat boxes.
- South Ayrshire Council/Morrisons Construction, Dailly Community Campus, 2015-2016. Jenny was responsible for carrying out a Preliminary Ecological Appraisal of the site followed by active season bat surveys. Further work also included a BREEAM assessment, EPS (Bats) licence application and production of a bat species protection plan.
- South Ayrshire Council/Morrisons Construction, Tarbolton Community Campus, 2015-2016. Jenny was responsible for carrying out a Preliminary Ecological Appraisal of the site followed by active

season bat surveys.  Further work included a BREEAM assessment, EPS (Bats) licence application and production of a bat species protection plan.

### Transmission

- SP Energy Network, Galashiels to Gretna, 2017.  Jenny was responsible for carrying out protected species walkover surveys of the V-route prior to upgrade works.

### Minerals

- Scottish Coal, Clawfin, East Ayrshire, 2009.  Jenny was responsible for carrying out bat surveys including transect and roost emergence/re-entry surveys of a farm steading for a proposed open cast coal site.
- Scottish Coal, Airfield Farm, Cousland, 2009.  Jenny was responsible for carrying out bat surveys including transect and roost emergence/re-entry surveys of a farm steading for a proposed open cast coal site.
- Scottish Coal, House of Water, New Cumnock, 2008.  Jenny was responsible for carrying out bat surveys including transect and roost emergence/re-entry surveys of a farm steading for a proposed extension to an existing open cast coal mine.
- Scottish Coal, Lesmahagow, 2008.  Jenny was responsible for carrying out transect bat surveys for a proposed surface mine development.

### Industrial

- I&H Brown, Former Wrexham Gasworks, 2015.  Jenny was responsible for providing Ecological Clerk of Works support during remediation works at the site.  This included the design and implementation of a suitable mitigation strategy to minimise the impact on the local great crested newt population.  In consultation with NRW Jenny devised a mitigation strategy which included terrestrial trapping and translocation and habitat enhancement.

### Property Development

- ARM Architects, Langholm, 2020.  Jenny was responsible for undertaking bat surveys for the proposed conversion of a former nursing home for residential use.  Surveys undertaken included daytime assessment, active season surveys and winter roost surveys.  Further work included a NatureScot development licence application and production of supporting Bat Species Protection Plan.
- London and Scottish Developments, Braehead, 2020.  Jenny was responsible for carrying out badger surveys in relation to a proposed residential development.  Further work included badger sett exclusion and destruction which required consultation with NatureScot and production of a Badger Species Protection Plan for the site.
- APT Planning and Development, Musselburgh, 2020.  Responsible for carrying out a Preliminary Ecological Appraisal for a proposed road service area development.  Further work included an otter and bat surveys.
- Hansteen, Quedgeley, Gloucestershire, 2020.  Jenny oversaw the delivery of great crested newt eDNA and reptile surveys for a proposed residential development.  This included reporting and the production of a Reptile Species Protection Plan for the site.
- Farningham Planning, Galashiels, 2020.  Jenny was responsible for carrying out a Preliminary Ecological Appraisal for a proposed residential development including further badger survey.

- I&H Brown, Wallyford, 2018. Jenny was responsible for carrying out a protected species survey of a proposed soil storage area adjacent to a residential development site. Further work included badger sett exclusion and supervised destruction under licence and nesting bird surveys in advance of site clearance works. The works required consultation with NatureScot, the local authority and local community groups.
- Stewart Milne Homes, Gartcosh/Glenboig, 2013. Jenny was responsible for carrying out an extended Phase 1 habitat survey and protected species survey for a proposed residential development site. Surveys completed included a terrestrial survey and trapping programme for great crested newt in consultation with NatureScot due to the close proximity of the site to the Gartcosh Industrial site which holds the largest populations of great crested newts in Scotland.
- Brindley Associates, Former Lillyburn Works, Milton of Campsie, 2013. Jenny was responsible for carrying out protected species surveys including bats, otters, water voles and badgers for a proposed residential development.
- Brindley Associates, Ballingry Meadows, Fife, 2013. Jenny was responsible for carrying out an extended Phase 1 habitat survey and protected species surveys including great crested newts, reptiles, badgers, otters and water voles of a proposed residential development site.

# Alan DeVenny

## Projects Director

Alan DeVenny is a Project Director and Chartered Engineer with Systra specialising in development planning, transport strategy and the design of enabling infrastructure. He has a BEng (Hons) in Civil and Transportation Engineering, a PhD in Civil Engineering and is a chartered engineer with 21 years industry experience. Alan currently leads Systra's Development sector activities across the UK and Ireland. He has been involved in a high number of large high profile projects in both Scotland and Ireland for both the private and public sector.

### Career History

- Relevant Experience since 1999.
- JMP Consultants Limited (1999-2016)
- SYSTRA Ltd. 2016 – Present

### Education and Qualifications

- BEng (Hons) Civil and Transportation Engineering (1996)
- PhD Civil Engineering (1999)
- Chartered Civil Engineer (2004)
- Member of the Institution of Civil Engineers (2004)

### Key Skills

- Alan's key skills lie in the areas of development planning, transport assessment, active travel, EIA, infrastructure design, transport strategies to support major developments, car parking, travel planning and traffic management.

## Project Experience

**Alloy Wheel Plant, Fort William. Alvance (2018)**

Project director responsible for overseeing the production of a comprehensive Transport Assessment and Travel Plan to support new development at the existing Lochabr Smelter Site. Also responsible for overseeing the production of the access, traffic and transport chapter of the EIA Report looking at both the construction and operational phases of the development. Transport Assessment included a comprehensive Paramics traffic model of the Fort William Road network to assess development impacts.

**Gartnavel Hospital Masterplan, NHS GG&C, 2015-2017**

Project Director providing advice to NHS Greater Glasgow & Clyde on the transport implications of redeveloping parts of the hospital campus. Work included a review of sustainable transport links, junction capacity, car parking provision and travel plan arrangements. This built on previous (JMP / Systra Work) which included the development of a Travel Plan and the delivery of sustainable transport improvements on the site. Further inputs have also included the preparation of a full transport assessment to support a planning application for new development on the site.

**LIffey Valley Shopping Centre – Hines , 2016-2021**

Project Director responsible for the re-design of the existing car parking and traffic management arrangements associated with the shopping centre. Design work has included the re-design of a ringroad network to incorporate new Bus Connects infrastructure along with a new bus interchange. With a successful planning application achieved, work continues onto the delivery stage.

**Transport Scotland, 2008-2021**

Project Manager overseeing commission to review all EIA documents associated with major Wind Farm applications (S36 and T&CPA) affecting the trunk road network. Responsible for advising Transport Scotland in relation to Construction Stage Traffic Management Plans, movement of abnormal loads, site access requirements and management of environmental impacts.

**Golden Jubilee Hospital, Clydebank (2018)**

Project Director advising the NHS on a major hospital expansion programme. Responsible for advising on all transport matters including parking, servicing, travel planning, public transport enhancement and traffic imapcts. Overseeing the production of a complex Transport Assessment Travel Planning measures and car parking at the Golden Jubilee Hospital site in Clydebank.

**Beatrice Offshore Windfarm Transmission Works, SSE**

Project manager overseeing input to the onshore transmission works project associated with the Beatrice Off-shore Windfarm. Input included the preparation of an abnormal load study (related to the sub-station transformer units) to assess the route from Buckie Harbour to site, preparation of the EIA transport chapter and preparation of a Construction Stage Traffic Management Plan to offset the traffic impacts associated with the construction of the sub-station.

**NHS Ayrshire & Arran Transport Support (2017)**

Alan has provided on-going support to the NHS in relation to travel planning and transport issues associated with large development projects at a variety of hospital sites in Ayrshire. Alan has overseen the preparation of Travel Plans for Crosshouse, Ayr and Ayrshire Central Hospitals as Transport Assessments, Transportation Statements, Access Appraisals and Traffic Management Plans. He has also developed parking strategies for all of the sites including new car parking control strategies for Crosshouse Hospital and Ayr Hospital.

**WRC Recycling, Inchinnan (2020)**

Project Director responsible for overseeing the Transport Assessment and Travel Plan to support the expansion of a waste processing facility.

**Queen Elizabeth University Hospital, NHS Greater Glasgow & Clyde (2007-2019)**

Project manager responsible for the development of the transport strategy for the biggest healthcare facility in Europe. Responsible for overseeing the production of the Transport Assessment and Travel Plan for the hospital as well as acting as the key point of contact with Glasgow City Council and SPT through the development of new transport measures to support the development. Prepared a parking strategy for the campus as well as a public transport strategy. Recent commissions have included advising on ancillary development within the campus.

**Allander Leisure Centre, Milngavie**

Project Director overseeing production of Transport Assessment and Travel Plan to support a replacement leisure centre in East Dunbartonshire. The work was heavily focused on how to improve access to the site by sustainable transport modes. The final strategy included a number of infrastructure improvements aimed at walking and cycling and a number of travel planning measures aimed at reducing car use. Planning consent has now been granted and construction is underway.

**Heriot Watt University Riccarton Campus (2013-Present)**

Project Manager advising the University on transport planning matters. This has included the transport planning input to the new campus masterplan, development of a travel plan for the site and preparation of transport assessments to support new development proposals. Currently delivering a SUSTRANS funded study into improving the walking and cycling infrastructure between the site and Currie Railway station.

### Queen Street Station Redevelopment, Glasgow (2016-2019)

Project manager responsible for advising Network Rail on all construction and operational traffic and transport issues. The project involves significant demolition and construction works in a live city centre. Responsible for leading the transport strategy for the construction and operational phases and responsible for liaison with the Local Roads Authority and City Centre stakeholders. Work included the traffic management arrangements around the station during the construction process including the relocation of pedestrian, bus, taxi and service vehicle infrastructure. Alan was responsible for overseeing the production of the EIA transport chapter covering the construction and operational phases of the development.

### Kennoxhead Windfarm Extension, Brookfield (2018-2021)

Project Director overseeing traffic and transport input into a Section 36 application for a windfarm extension and to a Section36C application to rework an existing consent for larger turbines. Input to include EIA Chapter and abnormal loads assessment.

### Energy from Waste Development, Invergordon

Project Manager responsible for overseeing the preparation of a Transport Assessment for a high profile proposed EFW plant. Also responsible for the team responding to public consultation responses and preparation of rebuttal evidence for PLI. Development was granted consent on appeal.

### Seagreen Cable Corridor, SSE (2021)

Project Manager responsible for overseeing the production of the EIA chapter covering the access, traffic and transport aspects of the Seagreen windfarm on-shore works. The transport assessment undertaken as part of the EIA looked at the traffic impacts and associated environmental impacts for the cable installation, the construction of the landfall point and the construction of the sub-station.

### South Kilbraur Windfarm (2019)

Commissioned to produce an abnormal loads assessment, EIA Chapter and TMP for a new section 36 windfarm application.

### Newhouse Distribution Park

Preparation of the Transport Assessment to support the successful planning application for this 102,000m2 GFA storage and distribution development as well as overseeing the design of two access roundabouts. Responsible for advising on traffic management arrangements during construction.

### North Lowther Windfarm, 2020 Renewables (2017)

Project manager responsible for traffic and transport work in relation to a major Section 36 windfarm development by 2020 Renewables. Responsible for access assessments and EIA Chapter as well as preliminary bridge design and design of route modifications.

# Simon Waddell

# Principal Noise Consultant

## Qualifications and Professional Memberships

- Environmental Geoscience BSc Hons
- Acoustics and Noise Control PG Diploma
- Certification of Competence in Environmental Noise Measurement
- Member of Institute of Acoustics (MIOA)

## Career Summary

Simon Waddell, BSc, MIOA is an experienced environmental consultant, with over 9 years' experience.

A technical specialist in environmental noise, but with an appreciation of other environmental disciplines, Simon has extensive experience of noise assessment in accordance with various planning and permitting requirements across the UK, particularly in relation to power generation, industrial and waste related developments.

Simon also has extensive international ESIA experience to both local and international standards, including IFC/World Bank. Experience includes the specification, commissioning and analysis of baseline monitoring campaigns; and development of noise source inventories and computational models to international standards to determine potential environmental effects.

In addition to noise, Simon also has experience of site investigation covering geotechnical and geo-environmental aspects, from a considerable range of sites across Scotland. He has designed, supervised and reported on many site investigations, as well as having taken responsibility for supervision and validation of remedial works at contaminated sites. Simon's additional experience in this field includes environmental auditing and compliance monitoring and prioritisation of potentially contaminated sites.

## Selected Project Experience

### UK Project Management – Rockets and space

- Midlothian, Scotland. Project managed multi-disciplinary environmental support to planning application for rocket engine testing facility within former quarry in the Moorfoot Hills. Client liaison, meetings with planning officers, coordinated team and provided post-submission support to client.

### UK Noise – Rockets and space

- Midlothian, Scotland. Project managed multi-disciplinary
- Cockenzie, East Lothian, Scotland. Noise and assessment as part of planning application for operation of proposed rocket engine testing facility within former power station coal storage area. Consulted with Environmental Health, undertook baseline noise survey, predicted operational noise levels via noise modelling, evaluated in accordance with BS4142 and appropriate guidance, attended community consultation events, specified appropriate mitigation, reported on findings.
- Port of Rosyth, Fife, Scotland. Measured noise levels during test firing of a rocket engine. Post-processed measured data to determine sound power level of test and characterise noise emissions associated with testing activities.

## UK Noise – Manufacturing and waste

- Lochaber/Fort William, Highlands, Scotland. Noise assessment of proposed aluminum billet plant within Lochaber smelter complex. Consulted with SEPA, undertook baseline noise survey, predicted construction phase and operational phase noise levels. Evaluated predicted levels in accordance with BS5228 and BS4142, specified appropriate mitigation and reported on findings as a chapter within an EIA Report.
- Hillthorn Farm, Sunderland, England. Noise and vibration assessment of proposed business park adjacent to Nissan assembly plant. Consulted with Sunderland City Council, specified baseline monitoring campaign, predicted construction phase and operational phase noise levels, including noise from road traffic. Evaluated predicted levels in accordance with BS5228 and BS4142 and against DMRB criteria, specified appropriate mitigation and reported on findings as a chapter within an EIA Report.
- Winfrith, Dorset, UK. Noise assessment as part of EIA of construction and operation of proposed concrete batching plant associated with decommissioning of former nuclear test reactor. Consulted with Environmental Health, undertook baseline noise survey, predicted operational noise levels via noise modelling, evaluated in accordance with BS5228 and BS4142, specified appropriate mitigation, reported on findings.
- South Crosland Quarries, Huddersfield, UK. Noise assessments in support of planning applications and EIAs for quarrying and restoration of worked-out quarries using inert waste. Consulted with Environmental Health, specified and oversaw baseline surveys and noise and vibration source characterisation measurements. Predicted and evaluated operational noise and vibration levels. Specified appropriate mitigation and reported on findings.
- Tennents Wellpark Brewery, Glasgow, UK. Noise assessment to meet SEPA requirement for baseline monitoring before commissioning of new anaerobic digestion plant within existing brewery complex. Oversaw baseline noise survey, technical review of noise report.
- New distillery, Islay, UK. Noise assessment as part of EIA for proposed whisky distillery near Port Ellen. Undertook baseline noise survey, reviewed available information and developed noise model of proposed distillery complex, evaluated noise from construction and operations phases in accordance with BS5228 and BS4142 respectively, specified appropriate mitigation, reported findings for ES.
- New distillery, Highlands, UK. Noise assessment as part of EIA for proposed whisky distillery near Grantown-on-Spey. Consulted with Environmental Health, oversaw baseline noise survey, reviewed available information and developed noise model of proposed distillery complex, evaluated noise from construction and operations phases in accordance with BS5228 and BS4142 respectively, specified appropriate mitigation, reported findings for ES.
- New malt crushing and bagging facility, Alloa, Clackmannanshire, UK. Noise assessment of proposed malt processing facility. Consulted with Environmental Health, undertook baseline noise survey, reviewed available information and developed noise model of proposed development, evaluated noise from operations in accordance BS4142. Predicted and evaluated potential vibration from piling of foundations in accordance with BS5228. Reported on findings.
- IAMP TWO, Sunderland, UK. Noise assessment as part of EIA for large-scale multi-unit manufacturing complex. Contributed to Scoping and undertook detailed consultation with Environmental Health. Undertook baseline noise survey, predicted noise levels during construction and operation of the facility, and due to changes in road traffic flows. Vibration assessment considering vibration from piling and from road traffic.
- IAMP ONE, Sunderland, UK. Noise assessment as part of EIA for large-scale multi-unit manufacturing complex. Contributed to Scoping and undertook detailed consultation with EHO. Undertook baseline noise survey, predicted noise levels during construction and operation of the facility, and due to changes in road traffic flows. Specified appropriate mitigation and reported findings. Proposed development was consented, and is under construction.

- SNOP, IAMP ONE, Sunderland, UK. Detailed noise assessment of the first industrial unit constructed within the IAMP ONE manufacturing complex. Consulted with EHO, constructed detailed noise model of proposed building, using details provided by the construction contractor, determined that the facility would meet its proportionate share of the wider IAMP ONE cumulative noise limits.
- Ardross Distillery, Highlands, UK. Noise assessment for proposed whisky distillery. Consulted with EHO, reviewed baseline noise data provided by others, reviewed available information and developed noise model of proposed distillery, operations phases in accordance BS4142, specified appropriate mitigation and reported findings.
- Jed Forest Distillery, Scottish Borders, UK. Noise assessment as part of EIA for two proposed whisky and gin distilleries near Jedburgh. Consulted with EHO at Scottish Borders Council, undertook baseline noise survey, reviewed available information and developed noise model of proposed distillery complex, evaluated noise from construction and operations phases in accordance with BS5228 and BS4142 respectively, specified appropriate mitigation, reported findings for ES.
- Buckie Maltings, Moray, UK. Noise assessment of new grain drying shed at maltings complex. Consulted with EHO, specified plan of study for baseline noise survey, reviewed available information and developed noise model of proposed facility, evaluated noise from operations phases in accordance with BS4142 respectively, specified appropriate mitigation, reported findings.
- Carryduff, Northern Ireland. Noise assessment in support of planning application for change of use for warehouse at waste treatment and transfer site within former quarry. Undertook baseline noise survey, constructed noise model to predict operational noise levels, completed BS4142 assessment and reported findings, demonstrating no significant noise impacts.
- Orwell Crossing, Ipswich, UK. Noise assessment in support of EIA for commercial/industrial development on outskirts of Ipswich. Consulted with EHO, devised plan of study, provided technical oversight of baseline noise survey, assessment and reporting.
- Dale Farm, Cookstown, Northern Ireland. Continued noise support to client over multiple years. Site survey to produce noise source inventory and noise model. Prioritisation of noise sources, specification of attenuation to mitigate noise impact at neighbouring properties. Production of site noise management plan, traffic noise management plan. Noise assessment in support of PPC permit variation application, including modelling of new process and liaison with NIEA to agree appropriate noise limits. Specified suitable continuous monitoring system for client to meet NIEA requirement.
- British Gypsum Manufacturing Site, Nottinghamshire. Baseline noise monitoring, noise modelling prediction and assessment of noise impact of transportation noise associated with raw product deliveries from off-site storage.

### UK noise – Land development

- Giants on the Quayside (Whey Aye Wheel), Newcastle-upon-Tyne, UK. Noise and vibration assessment of proposed observation wheel and associated entertainment facilities as part of EIA. Input to Scoping and consultation with Environmental Health, specified and oversaw baseline noise survey, analysed baseline data, predicted construction noise and vibration levels at sensitive receptors, predicted operational noise levels due to operation of wheel and associated facilities and from changes road traffic flows. Evaluated noise and vibration impact in accordance with BS5228, BS4142 and CRTN, specified appropriate mitigation, reported on findings.
- Whitekirk, East Lothian, UK. Assessment in support of EIA of proposed redevelopment of golf course to holiday lodges. Input to Scoping and consultation with Environmental Health, baseline noise survey, analysis of baseline data, review of baseline and projected traffic flow data, modelling of post development traffic noise in accordance with CRTN. Evaluated noise levels against BS8233 target noise levels, determined noise impacts in accordance with PAN1/2011, specified appropriate outline mitigation, reported on findings.
- Thistle Street NW Lane, Edinburgh, UK. Noise assessment of proposed hotel development within existing commercial building. Constructed detailed noise model of building, including proposed air

handling plant, predicted noise levels at windows of neighbouring buildings, evaluation of plant noise against Noise Rating (NR) curves. Specified appropriate mitigation and reported on findings.

- Craigiehall Village, City of Edinburgh, UK. Assessment as chapter in EIA of proposed mixed commercial and residential development adjacent to Edinburgh Airport. Scoping and supplementary consultation with Environmental Health and Edinburgh Airport noise team, baseline noise survey, including long-term monitoring to consider aircraft noise, analysis of baseline data, prediction of post-development noise due to changes in road traffic on adjacent roads, evaluation of noise impacts using agreed target levels drawing on guidelines including BS5228, BS8233 and World Health Organization, determined significance of noise effects in accordance with PAN1/2011. Specification of appropriate mitigation to minimise noise from aircraft and reported on findings.

- Wilcoxholm, Linlithgow, UK. Assessment in support of proposed residential development EIA. Input to Scoping and consultation with EHO, baseline noise survey, analysis of baseline data, review of baseline and projected traffic flow data, modelling of post development traffic noise in accordance with CRTN. Consideration of railway noise. Evaluated noise levels against BS8233 target noise levels, determined noise impacts in accordance with PAN1/2011, specified appropriate outline mitigation, reported on findings.

- Tantallon Road, North Berwick, UK. Noise assessment in support of proposed residential care home development planning application. Consultation with Environmental Health, baseline noise survey, analysis of baseline data, BS4142 assessment of noise from deliveries at neighbouring Tesco superstore goods yard at proposed development, evaluation of road traffic noise against BS8233 criteria, specified appropriate mitigation and reported on findings.

- Etna Road, Falkirk, UK. Assessment in support of proposed residential development planning application. Liaison with EHO, baseline noise survey, analysis of baseline data, BS4142 assessment of noise from nearby industries at proposed development, evaluation against BS8233 criteria, specified appropriate mitigation and reported on findings.

- Goshen Farm, East Lothian, UK. Assessment in support of proposed mixed-use, residential-led development EIA. Liaison with EHO, baseline noise survey, analysis of baseline data, review of baseline and projected traffic flow data, modelling of post development traffic noise. Evaluation against BS8233 and BB93 (proposed school) criteria, determination of noise impacts in accordance with PAN1/2011, demonstrated no significant noise effects, reported findings.

- Brodie Road, Dunbar, East Lothian, UK. Assessment in support of proposed residential development planning application. Baseline noise survey, analysis of baseline data, liaison with EHO, review of baseline and projected traffic flow data, technical oversight of assessment of post development noise, including evaluation against BS8233 criteria and specification of appropriate mitigation, technical review of reporting.

- Delta Court, London, UK. Noise assessment in support of planning application for change of use from industrial to residential. Consulted with EHO, undertook baseline noise survey, evaluated measured noise levels in the context of BS8233 guidance, reported findings. Provided successful subsequent rebuttal to EHO objections.

- Strathblane, Stirlingshire, UK. Assessment in support of proposed residential development planning application. Liaison with EHO, baseline noise survey, analysis of baseline data, review of baseline and projected traffic flow data, evaluation of post development noise against BS8233 criteria and reported findings.

- Barbush, Stirlingshire, UK. Assessment in support of proposed residential development planning application. Liaison with EHO, baseline noise survey, analysis of baseline data, review of baseline and projected traffic flow data, evaluation of post development noise against BS8233 criteria and reported findings.

- Ferry Village, Renfrew, UK. Assessment in support of proposed residential development planning application. Liaison with EHO, baseline noise survey, analysis of baseline data, BS4142 assessment of noise from nearby shipyard at proposed development, specification of appropriate mitigation and report findings.

- Dirleton, East Lothian, UK. Assessment in support of proposed residential development planning application. Baseline noise survey, analysis of baseline data, liaison with EHO, review of baseline and projected traffic flow data, modelling of construction noise and post development traffic noise. Evaluation against BS8233 criteria and reporting.

### UK Noise - Power

- Peaking Power Plants, UK various. Noise assessment of gas-fired peaking plants comprising multiple gas engines at numerous sites across Scotland, England and Wales. Typically comprising consultation with Environmental Health, undertaking or overseeing the baseline noise survey, analysis of baseline data, prediction of operational noise by detailed modelling, BS4142 assessment and specification of appropriate mitigation if required.

- Grid-scale battery storage facilities, UK various. Assessment of proposed grid-scale battery storage facilities in Scotland and England. Consultation with Environmental Health departments, completion of baseline noise survey during daytime and night-time periods, prediction of operational noise levels within noise modelling software, evaluation of predicted levels in the context of appropriate guidance, specification of mitigation, if required, and reporting on findings.

- Energy Isles Wind Farm, Shetland, UK. Noise assessment in support of proposed wind farm on Yell. Consulted with Shetland Islands Council to agree approach to assessment, undertook baseline noise survey, analysed baseline noise and wind speed data, predicted construction and operational noise levels, evaluated proposed development's ability to meet derived noise limits and noise limits of identified cumulative wind farm and reported on findings. Consulted with Shetland Islands Council with regard to proposed noise conditions for development.

- Dalquhandy Wind Farm, South Lanarkshire, UK. Noise assessment in support of variation to consented development to larger model of turbine. Consulted with South Lanarkshire Council to agree approach to assessment and scope out further baseline monitoring. Detailed review of changes to cumulative noise environment (new and revised cumulative developments). Analysis of revised proposed development's ability to meet consented noise limits and cumulative noise limits. Supplementary consultation and discussion with South Lanarkshire Council to agree appropriate noise conditions.

- Mains of Hatton Wind Farm, Aberdeenshire, UK. Noise assessment to determine compliance with planning conditions. Consulted with Aberdeenshire Council, set up noise, wind speed and rainfall monitoring equipment at site. Analysed resultant data and prepared report on findings, demonstrating compliance with the noise limits.

- Sandy Knowe Wind Farm, Dumfries & Galloway, UK. Update to previous ES for consented development in support of Section 36 application for increased size of turbine. Undertook analysis of proposed candidate turbine source noise terms and provided recommendations, updated noise predictions at receptors using larger new source noise terms and determined compliance with consented noise limits, including requirement to apply valley correction, specified appropriate mitigation (curtailment/low noise mode operation) and updated ES (previously written by others).

- ERGC Wind Turbine, East Ayrshire, UK. Assessment of operational noise levels for a single turbine development. Assessment of cumulative issues with neighbouring proposed and operational schemes.

- Green Burn Wind Farm, Perthshire, UK. Assessment of operational and construction noise levels for proposed wind farm developed in accordance with ETSU-R-97 and BS5228. Baseline noise monitoring to determine noise limits in accordance with ETSU. Assessment of cumulative impacts with neighbouring wind farms.

- Wathegar II Wind Farm, Highlands, UK. Review of turbine planning noise condition and evaluation of proposed change to candidate turbine model for due diligence risk assessment.

- Barrel Law Wind Farm, Scottish Borders, UK. Predicted operational noise levels of proposed wind farm at noise sensitive receptors. Considered mitigation options and specified appropriate curtailment/low noise mode operation to meet noise limits.

- Bogenlea Wind Turbine, Aberdeenshire, UK. Assessment of operational noise following construction. Data analysis in accordance with IoA Good Practice Guide and evaluation in accordance with consented noise limits.
- Ardchyline Hydro, Argyll & Bute, UK. BS4142 assessment of nearly-complete in-stream hydro generation scheme. Consulted with EHO, measured baseline and operational noise levels, characterised noise source. Specified appropriate additional attenuation to demonstrate no significant noise impact.
- Acharn Biomass, Loch Lomond and the Trossachs National Park, UK. Noise assessment in support of Section 42 application to vary planning condition relating to operation of wood chipper. Consultation with National Park Authority and EHO of Stirlingshire Council, noise modelling of facility and evaluation of predicted noise from chipper against pre-agreed baseline noise levels in accordance with BS4142 method. Demonstrated no significant noise impact.

## Employment History

- 2005 – 2006 – Mason Evans Partnership – Graduate Engineer
- 2007 – 2012 – Enviros/SKM Enviros/SKM – Consultant
- 2012 – 2016 – Golder Associates – Consultant
- 2016 – Present – ITPEnergised – Principal Consultant

# Annie Danskin

# Associate – Air Quality

## Qualifications and Professional Memberships

- B.Eng. (Hons) Environmental Engineering
- CEnv - Chartered Environmentalist
- Member Institution of Environmental Sciences
- Member Institute of Air Quality Management
- Member of Environmental Protection Scotland Expert Advisory Group on Air Quality

## Career Summary

Annie Danskin has 22 years of experience in the field of air quality consultancy and research, managing projects for and providing introductory and advanced training courses to many local authorities, regulatory authorities (EA, SEPA, HSE), industrial operators and academic institutions. She has prepared expert witness reports for public inquiries and presented at public meetings, conferences and exhibitions on numerous occasions.

Key projects include air quality impact assessments for EIAs, planning applications and PPC and Environmental Permits; Local Air Quality Management studies for Local Authorities; odour and dust risk impact assessments and management plans; and assessment of accidental and emergency releases including fires and flares at onshore and offshore installations. She is an experienced project manager and is a specialist in atmospheric dispersion modelling, particularly using the full suite of ADMS models.

## Selected Project Experience

### Industrial & Manufacturing

- New boiler installation, Rainham – Client: Sharpsmart Limited – Technical lead for an air quality assessment and habitats risk assessment to accompany an application to the Environment Agency for a variation to an Environmental Permit for a new boiler installation. Included detailed dispersion modelling and calculations of nutrient nitrogen deposition and total acid deposition at a range of international and local designated sites in accordance with guidance AQTAG06 – under the Habitats Regulations.
- Shetland Space Centre, Lamba Ness, Shetland Islands – Client: SSC. Technical lead for an air quality impact assessment of a rocket launch facility and preparation of an EIA report chapter. Preparation of a dispersion modelling study to assess the potential short-term effects for local residents of exposure to carbon monoxide emissions from jet exhaust emissions during rocket launch events using an innovative "puff" model technique to calculate peak exposure concentrations during the lifetime of the release and a total concentration dose experienced at each receptor for the duration of release. Launch events were simulated for a range of meteorological conditions. Potential effects of construction and operational vehicle emissions were also included with consideration for effects at ecologically sensitive features.

- Hillthorn Business Park, Sunderland – Client: Legal & General. Technical lead for an air quality impact assessment of a large industrial business park and preparation of an ES report chapter. The air quality assessment included dispersion modelling with ADMS-Roads to predict the potential effects of traffic-generated pollutants on air quality at existing and proposed receptors included ecologically sensitive site. Assessment included a Construction Phase Dust Risk Assessment and cumulative assessment with several significant development projects in the local area.
- Rocket Engine Testing Facility, Cockenzie and Broadlaw – Client: Skyrora. Preparation of a dispersion modelling study to assess the potential short-term effects for local residents of exposure to carbon monoxide emissions from jet exhaust emissions during rocket launch events at a proposed rocket engine testing facility. Used the "puff" model to calculate peak exposure concentrations during the lifetime of the release and a total concentration dose experienced at each receptor for the duration of release. Launch events were simulated for a range of meteorological conditions.
- Coffee Roasting Factory, Dundee – Client: Aimers Coffee & Tea. Preparation of a detailed dispersion modelling study of emissions of odour, dust and oxides of nitrogen from a new coffee roasting factory in Dundee. Included analysis of a range of conditions dependent on the raw coffee bean source and the darkness of roasting. Included complex topography, sensitivity to building effects, time-varying emissions profiles and a range of operating scenarios and meteorological conditions. Involved extensive consultation Dundee City Council.
- Alloy Wheel Facility, Lochaber – Client: Liberty Lochaber Aluminium Ltd. Preparation of an EIA Report Air Quality Chapter submitted with the planning application. The Air Quality Impact Assessment (AQIA) included a detailed atmospheric dispersion modelling study to assess the potential impacts of emissions from a proposed new alloy wheel facility and adjacent biofuel generators at sensitive receptors for human health and ecology. Included complex topography, building effects, time-varying emissions profiles and a range of operating scenarios and meteorological conditions. Involved extensive consultation with SEPA, SNH and The Highland Council. Assessment included a Construction Phase Dust Risk Assessment.
- Rosebank Distillery – Client: Blyth and Blyth. Technical advisor on stack height analysis, screening of boiler emissions, odour risk assessment and odour management plan.
- Islay Distillery – Client: Blyth and Blyth. Technical advisor on stack height analysis, screening of boiler emissions, odour risk assessment and odour management plan.
- Expansion of Wood Pellet Manufacturing Facility, Girvan, South Ayrshire – Client: Land Energy. Project Manager to co-ordinate delivery of air quality, noise, ecology and landscape and visual impact assessments. Included liaison with SEPA and South Ayrshire Council environmental protection officers, site visits, detailed modelling of emissions from wood pellet manufacturing process and Biomass CHP exhaust gases. Complex building configurations and local topography were included in the study.
- Ambient Dust Monitoring at Scrap Metal Facility – Client: Dalton Metals Recycling. Undertaken to check compliance with IPC Permit conditions related to emissions from activities and processes within the site and the ambient concentrations at the site boundary and neighborhood sensitive receptors. Results submitted to SEPA with a dust management plan
- Granton Distillery, Edinburgh - Client: Halewood International. Odour impact assessment for a proposed new gin distillery adjacent to existing residential receptors. Included dispersion modelling with ADMS-5, and recommended abatement technologies appropriate for the scale of the plant. Submitted with the planning application to City of Edinburgh Council.
- PPC Permit Application for Enviroco at Albert Quay, Aberdeen. Project manager for the compilation of environmental assessments to support an application for a permit under the Pollution Prevention and Control (Scotland) Regulations 2000 (the PPC Regulations) for a Part A installation in the Waste Management Sector, administered by Enviroco at a site at Albert Quay, Aberdeen. The site is involved in the storage of hazardous waste received from offshore North Sea facilities pending transfer to a licenced disposal site, where it is processed in line with the PPC Regulations, where

these are appropriate. The project included pre-application meetings with the Scottish Environment Protection Agency and submission of the final application.

- Environmental Permit Variation Application for Enviroco, Great Yarmouth. Project manager for the compilation of environmental assessments to support an application for a permit variation under the Environmental Permitting Regulations (England and Wales) 2010 for a Part A installation in the Waste Management Sector, administered by Enviroco in Great Yarmouth. The site was undergoing extensive expansion and introducing significant improvements for pollution prevention and control. The permit variation consolidated the previous permit, waste management licence and previous exemptions that applied to the site. The project included pre-application meetings with the Environment Agency and submission of the final application.

### Oil & Gas

- Armada Kraken FPSO Vessel – Client: PI Ltd. Technical lead for assessment required to support an application to operate the vessel under Offshore Combustion Installations (Prevention and Control of Pollution) Regulations 2001. The purpose of the assessment was to predict pollutant concentrations of key substances at the nearest platforms within the North Sea, human receptors on the vessel and the nearest inhabited landfall point. The assessment considered the atmospheric emissions from the installation during normal gas and crude oil operations of the Steam Boiler Package (SBP) and the Power Generation Module (PGM).

- Montrose Alpha Offshore Installation – Client: PI Ltd. An assessment of atmospheric emissions from the existing installation and additional sources on a new bridge linked platform (BLP) adjacent to the Montrose platform, required to support an application to vary the PPC permit for the installation.

- Brent Removal and Dismantlement – Client: Shell (UK) Ltd. Management and technical delivery of Air Quality Environmental Statement chapter for the EIA to address the potential effects of the Brent Delta topside transfer to barge, inshore transit and onshore dismantlement project on air quality in Hartlepool.

- South Stream Russia to Bulgaria Pipeline. Member of project team that assessed the air quality impact of a proposed major gas pipeline between Russia and Bulgaria. The main focus of the assessment was the impact of construction phase emissions on sensitive receptors in close proximity to the landfall sections and pipeline corridor onshore. The assessment considered emissions from shipping, construction plant and road traffic within the affected areas.

- BAT Assessment of Odour Abatement Options and Odour Management Plan for PPC Compliance at Nigg Terminal. Review of potential odour emission sources on-site including jetty operations, ship-to-ship transfer, crude oil reception and separation, ballast tanks, API separators, settlement tanks and lagoons and recommendations for priority control. The study included a BAT assessment of options for odour control and abatement and the development of new management procedures.

### Renewables/Energy Transition

- Peaking Power Plants – Client: Forsa Energy. Technical advisor on detailed stack height analysis and dispersion modelling assessments of peaking power plants in Dundee and Greenock including assessment of Medium Combustion Plant Directive emissions limits. One site included consideration of the potential impacts of existing nearby wind turbine wakes on the dispersion of industrial emissions from new stacks.

- Gas-Fired Peaking Power Plant, Haydock – Client: LCFG Ltd. Assessment of the potential impacts on local air quality and in particular at a nearby Air Quality Management Area, of emissions from fourteen gas-fired engines. The assessment accounted for variable hours of operation and focused on the potential to exceed short-term air quality standards at sensitive receptors. The assessment also included stack height optimisation

- Biomass CHP Plant, Wellingborough – Client: Padd Energy. Technical lead on air quality assessment undertaken as part of an application for an Environmental Permit to the Environment Agency.

Includes risk assessment, dispersion modelling, BAT assessment and the development of management plans to minimise emissions to atmosphere from the operation of the plant.

- Biomass Installation at Blackcraig Castle – Client: John Noel Thompson. Preparation of an air quality assessment to assess suitability of a proposed site for a wood fired biomass system.
- River Tay District Heating Scheme – Client: Perth and Kinross Council – An assessment of the potential effects on local air quality of emissions of oxides of nitrogen ($NO_x$) from the use of gas-fired top-up boilers that are part of the scheme. Included an assessment of the potential net $NO_x$ reduction in tonnes/annum across the City as public sector properties connected to the scheme.
- Town Hall Energy Centre, Crawley – Client: Westrock. Assessment of the potential impacts on existing and proposed future residential receptors of emissions from each of two development phases of an energy centre comprising gas boilers and CHP units. Submitted to the local authority with the planning application. Included an assessment of the potential impact mitigation provided by options for low-$NO_x$ equipment.
- Sainsbury's CHP Plant, Dundee – Client: Sainsbury's. Assessment of the site suitability and potential impacts on local air quality from a proposed CHP plant, packaged back-up plant and associated substation do demonstrate no adverse impacts. Dispersion modelling using ADMS-5 included assessment for a range of stack heights.
- Glasgow Caledonian University CHP Plant – Client: GCU. Detailed atmospheric dispersion modelling assessment to assess the impact of the variable emissions profile from the GCU CHP plant on proposed and existing residential receptors at nearby development sites. Included complex topography, building effects and emissions from adjacent roads. Undertaken in order to discharge a planning condition imposed by Glasgow City Council
- Raigmore Hospital, Inverness – Client: NHS Highland. Management and delivery of an atmospheric dispersion modelling study submitted with the planning application to Highland Council for the installation of two 1.7MW wood pellet boilers at Raigmore Hospital in Inverness. The study assessed the potential environmental impact and risk to human health of emissions from the existing multi-flue stack in a number of possible power-generating scenarios at the hospital.

**Property & Urban Regeneration**

- Edinburgh Park Southern Phase, Residential-Led Mixed Use Development, Edinburgh – Client: Parabola Edinburgh LLP. Technical lead on an air quality impact assessment of a residential-led mixed-use development. Included dispersion modelling with ADMS-Roads to predict the potential effects of traffic-generated pollutants on air quality at existing and proposed receptors including a large number of projected cumulative impacts from allocated development sites included in the West Edinburgh Transport Appraisal (WETA). Additional assessment of impacts was undertaken within two nearby AQMAs. A comprehensive six-month ambient air quality monitoring survey was also undertaken at locations around the proposed development boundary, and the data used to verify the dispersion model. The study also included an odour risk assessment due to the proximity of the proposed development to a poultry farm and included several odour sampling surveys in a variety of meteorological conditions and operational scenarios at the poultry farm.
- Johnnie Walker Experience, Edinburgh – Client: DIAGEO. Air quality impact assessment of a visitor experience development including the potential effects on local air quality of development-generated traffic, combustion source emissions and kitchen extraction systems at existing and proposed receptors including within the adjacent Edinburgh Central AQMA.
- Residential Development, Balerno – Client: J S & R Mitchell. Technical lead for an air quality impact assessment of a residential development and preparation of an EIA report chapter. The air quality assessment included dispersion modelling with ADMS-Roads to predict the potential effects of traffic-generated pollutants on air quality at existing and proposed receptors including a construction phase dust risk assessment, assessing the potential risk of impacts on nearby sensitive receptors due to construction activities and a mineral dust screening assessment to consider to potential effects of Tarmac Ravelrig Quarry on the Proposed Development.

- Crofthead, Bishopbriggs – Client: Mactaggart & Mickel Homes. Preparation of a detailed dispersion modelling study and report assessing the effects of changes in traffic flow on the local road network and the impacts for air quality, particularly within the Bishopbriggs AQMA. Assessment included a Construction Phase Dust Risk Assessment and site suitability assessment for residential use.
- Lots Road, Kensington & Chelsea – Client: DP9/Metaform. Technical Lead for air quality assessment for the partial demolition and redevelopment of office premises. Included the impact of traffic and energy centre emissions on existing local receptors and proposed future occupants of the building. An Air Quality Neutral Assessment in accordance with London Council's Air Quality Guidance was included. Assessment included a Construction Phase Dust Risk Assessment.
- Bishopsgate Office Redevelopment, London – Client: Estates Office Shoreditch. Technical Lead for air quality assessment for the partial demolition and redevelopment of commercial premises to mixed office and retail use. Included the impact of traffic and energy centre emissions on existing local receptors and proposed future occupants of the building. An Air Quality Neutral Assessment in accordance with London Council's Air Quality Guidance was included. Assessment included a Construction Phase Dust Risk Assessment.
- Kenmuir, Carmyle – Client: Arm Architects. Technical lead for an air quality impact assessment of a residential masterplan development and preparation of an EIA report chapter. The air quality assessment included dispersion modelling with ADMS-Roads to predict the potential effects of traffic-generated pollutants on air quality at existing and proposed receptors. Three site access routes were assessed, and advice given to the design team regarding required distance of future residences from roadsides. Assessment included a Construction Phase Dust Risk Assessment and screening of the potential impacts at the development site from nearby industrial sources.
- Drive-Thru Development Dalkeith – Client: London and Scottish Investments Limited. Dispersion modelling study to predict short-term concentrations of traffic-generated pollutants at outside amenity areas to assess the suitability of the site for proposed use.
- Retail Development, Cupar – Client: London and Scottish Investments Limited. Preparation of a detailed dispersion modelling study and report assessing the effects of changes in traffic flow on the local road network and the impacts for air quality, particularly within the Cupar Bonnygate AQMA.
- Cammo Fields Residential Development, Maybury Road, Edinburgh – Client Cala Homes. Technical lead for an air quality impact assessment of a residential development and preparation of an EIA report chapter. The air quality assessment included dispersion modelling with ADMS-Roads to predict the potential effects of traffic-generated pollutants on air quality at existing and proposed receptors including a large number of projected cumulative impacts from allocated development sites included in the West Edinburgh Transport Appraisal (WETA). Additional assessment of impacts was undertaken within a nearby AQMA. Supplementary reports including an assessment of the potential for odour impacts from a nearby composting facility
- Commercial Development, Chapelhall, North Lanarkshire – Client: Gray Planning. Preparation of a detailed dispersion modelling study and report assessing the effects of changes in traffic flow on the local road network and the impacts for air quality, particularly within the Chapelhall AQMA. Assessment included a Construction Phase Dust Risk Assessment
- Wood Green and Haverstock Hill Mixed Retail and Commercial Developments, London – Client: PPR Estates – Technical Lead for air quality assessment for the redevelopment of former commercial premises to mixed residential and commercial use. Included the impact of traffic and energy centre emissions on existing local receptors and proposed future occupants of the building. An Air Quality Neutral Assessment in accordance with London Council's Air Quality Guidance was included. Assessment included a Construction Phase Dust Risk Assessment.
- Francis Crick Institute, London Borough of Camden – Client: CBRE. Air quality impact assessment to determine the impact of existing emissions from multiple flues from the roof of the Francis Crick Institute on proposed receptors at adjacent sites with planning applications for residential

development. Included preparation of an emissions inventory, time varying emissions profiles, the impact of buildings and the contribution to local air quality from adjacent roads.

- Clyde Waterfront & Renfrew Riverside and Glasgow Airport Improvement Area City Deals Projects- Client: Renfrewshire Council (2016-2018). Senior team member to undertake air quality impact assessment of both schemes individually and assess the cumulative impact of both in conjunction with development projected to be facilitated by the Proposed Development. Including advanced dispersion modelling and GIS techniques and extensive data management. Preparation of material for public exhibitions and culminating in the production of three separate Environmental Statement Chapters on Air Quality with detailed technical appendices plus contributions to Climate Change chapters.

A720 Sheriffhall Roundabout, Edinburgh – Client: Transport Scotland (2015). Senior team member to undertake DMRB Stage 2 Options Appraisal which involved a qualitative assessment of the various options based on the proximity to a range of identified sensitive receptors and the likely implications on traffic flows. Subsequent design and management of a baseline 6-month ambient air quality monitoring survey at 8 sensitive receptor locations and a detailed Stage 3 DMRB assessment of the preferred option, requiring detailed atmospheric dispersion modelling of road traffic emissions.

### Corporate Advisory

- Review and Assessment of Air Quality for Local Authorities. Project Manager for a series of assessments for Scottish Local Authorities required as part of the Local Air Quality Management regime implemented under the Environment Act 1995. Included collation of emissions inventories including industrial, commercial, domestic and road traffic sources across the Council areas and within hotspots and Air Quality Management Areas (AQMAs); detailed dispersion modelling studies to determine source contributions and inform Action Plans for improvement; advise on air quality monitoring campaigns and preparation of annual reports
- Assessing the Potential Air Quality Impact from Biomass Installations in the Planning Process, Workshop – Client Moray Council. Preparation and delivery of a half-day workshop for 4 personnel from the Moray Council Department of Public Health to assist the team in the assessment of planning applications for biomass installations within the Moray region with respect to local air quality impacts. Included practical exercises interpreting data supplied with the EPUK Biomass Boiler Information Request Form provided by applicants, and the use of spreadsheet screening assessment tools. Guidance was also given on when to ask applicants for more detailed assessments and how to consider cumulative impacts with other sources.

## Employment History

- URS/AECOM – Principal Consultant – 2014-2016 - Edinburgh
- TSI Scotland – Air Quality Specialist – 2010-2014 – Glasgow
- Self Employed – 2006-2010
- BMT Cordah – Principal Consultant – 2000-2006 – Edinburgh
- CERC – Graduate to Senior Consultant – 1995-2000 - Cambridge

# Gavin Bollan

# Technical Director

## Qualifications and Professional Memberships

- BSc (Hons.) Environmental Science
- Chartered Environmentalist (CEnv)
- Chartered Scientist (CSci)
- Member of the Institution of Environmental Sciences (MIEnvSc)
- Fellow of the Institute of Air Quality Management (FIAQM)

## Career Summary

Gavin has over 26 years of experience in the environment industry, more than 22 years of which has been in consulting. He has been active in EIA, air quality and climate change assessment during this time.

Gavin is an analytical chemist by training, having spent four years after graduation in industry as site environmental chemist, with responsibility for measuring emissions to air and water.

His work in consultancy was initially in air quality management, in the fields of industrial emissions, ambient air quality and occupational hygiene monitoring. Gavin has produced a suite of guidance for regulators in the UK on gaseous and particulate monitoring techniques which called on this direct experience.

In the 2000s he developed innovative major capital project carbon footprinting services for Atkins, with a focus on transparency and traceability in source data, emission factors and calculation methodologies. He has also worked on some of the UK's largest infrastructure projects including major highway upgrades, high speed rail and the development of the Olympic Park.

As might be expected for a long-serving leader of consulting teams, Gavin has overseen the delivery of well over 100 air quality impact assessments for local roads schemes, urban regeneration and commercial /residential developments for private and public sector clients.

He has been called as Expert Witness on air quality matters on several occasions in the UK (England, Scotland and Northern Ireland) and the Republic of Ireland.

## Selected Project Experience

### Transport and Infrastructure

- Air Quality Impact Assessment and Particulate Matter Monitoring Scheme, London, Olympic Delivery Authority and LOCOG, 2006 – 2012 Project Manager for the Environmental Statement chapter on air quality for the 2012 Olympic and Paralympics Games; included modelling of the effects from changes in transportation and logistics, on-site generation and construction and demolition dust effects. Acted as Air Quality Adviser for enabling works from 2007 to 2010. Duties included design and implementation of the continuous and passive sampling and monitoring network, reviews of contractor's method statements and consultant reports including modelling reports, investigation and resolution of dust episodes. QA procedures for data validation, PM10 comparison trials for alternative monitoring technologies, production of monthly summary reports for the public domain, liaison with Public Relations team. Development of air pollution inventory and key performance indicators under the Global Reporting Initiative for the London Organising Committee for the Olympic Games (LOCOG) in 2011 and 2012.

- Position Paper on Air Quality, Gatwick Airport Limited, 2015. Wide-ranging critical review of Heathrow Airports impact assessments and long term air quality projects to inform the Airports Commission's recommendations. Supplementary modelling work undertaken to investigate chronically polluted areas.
- Project Manager / Director for over 100 commercial and residential development schemes in the UK, Ireland and Gibraltar, 2003 - date
- Expert Witness Services, Northern Ireland, NI Road Service, 2006. Appeared as Expert Witness. Prepared and Delivered Air Quality Evidence on the Cookstown Junction Improvement Scheme to the NI Planning Appeals Commission.
- Expert Witness Services, Scotland, Aberdeen City Council, 2006. Appeared as Expert Witness Prepared and Delivered Air Quality Evidence related to the adoption of the local transport plan to a hearing by the Scottish Executive's Inquiry Reporters Unit.
- Expert Witness Services, England, Highways Agency 2006 – 2010. Appeared as Expert Witness. Prepared and Delivered Air Quality Evidence to the Planning Inspectorate on the Highways Agency's A1 Peterborough to Blyth Grade Separated Junctions Scheme in 2007 and the A14 Ellington to Fen Ditton Improvements Scheme in 2010, though the latter was abandoned just before the Public Inquiry as a result of the Government's Comprehensive Spending Review.
- Expert Witness Services, Republic of Ireland, Kerry County Council, 2009. Appeared as Expert Witness Prepared and Delivered Air Quality Evidence to An Bord Pleanála on the N22 Tralee Bypass Scheme in 2009.
- Environmental Impact Assessment, United Kingdom, HS2 Ltd, 2012-2018. Air Quality Discipline Lead (Atkins) for Phase 1. Deputy Air Quality Lead, Phase 2a. Air Quality Lead, Yorkshire section, Phase 2b. Management of EIA air quality inputs, monitoring surveys and team resourcing.
- Energy and Carbon Assessment, Thames Tideway Tunnel, 2011 – 2012. Tasks included a full lifecycle carbon model for the construction and operation of the tunnel, an Energy Statement to London Plan requirements and an options appraisal for renewable offsetting technologies. Project Director for the Health Impact Assessment studies.
- Giants on the Quayside, Newcastle, Golder Associates, 2018. Management of air quality chapter for a major development in a highly compressed timeframe.

## Impact Assessment

- Impact Assessment for Industrial City, Saudi Arabia, Royal Commission, 2013-2018. Full environmental and social assessment and regulatory review for Ras al Khair industrial city project in Eastern Province. Responsible for client liaison and technical governance for ERM's largest project in the Middle East your job experience with names of clients, date and our role.
- Aluminium Refinery and Smelter, Hydro/Qatalum (Qatar), 2008-2009. Project Manager for the Air Quality chapter in an Environmental Impact Assessment for the first primary aluminium production facility in Qatar. Air quality effects were modelled using the USEPA AERMOD model and compared with national and international air quality criteria. Duties included visits to Qatar to work with local contractors in establishing a temporary air quality monitoring station on the future site of the development to characterise baseline conditions.

## Technical Guidance / Capacity Building

- EU ETS Capacity Building, Scotland, SEPA, 2003 -2007 Project Manager. Development of monitoring and reporting strategy and templates with the Scottish Environmental Protection Agency (SEPA). Technical assessment of Scottish Monitoring and Reporting Plans. Design and implementation of procedural and technical assessment systems for the suitability of greenhouse gas Monitoring and Reporting plans for over 120 permit holders in Scotland. Personally, inspected over 10 sites to assess the quality of submissions.
- Air Quality Risk Management Guidance, Thames Water, 2012. Production of comprehensive corporate air quality management guidance for staff training and management system purposes.
- Carbon technical guidance, Atkins, 2008-2010. Principal Author of Atkins' internal guidance series on carbon measurement and management. The Carbon Manuals were intended for staff and clients to raise awareness of how our activities contribute to climate change, how the international community is legislating for it and what practical steps towards mitigation exist.
- Air Quality Technical Guidance, Environment Agency, 1998-2003. Several technical guidance manuals, many still currently available freely by searching by reference number (e.g. "M17" at www.environment-agency.gov.uk) as part of a two-person research team.
  - M1 Monitoring of source emissions to atmosphere: sampling, health and safety requirements (published in 2001). This document describes the physical requirements for successful sampling of gases and particulates to meet EU standards for not only technical performance but also operator safety
  - M2 Monitoring of source emissions to atmosphere: guidance, strategy and preferred methods (published in 2003). This document is a compendium of all monitoring methods commonly used in industrial emissions testing in the UK and beyond. It contains advice on practicality and application of techniques and comprehensive guidance on data quality
  - M13 Monitoring hydrogen sulphide and total reduced sulphur in atmospheric releases and ambient air (published in 2001). This is a specialised guidance note for the measurement of sulphides in stacks and ambient air. These compounds have particular effects on health and odour, as well as particular challenges when measuring.
  - M17 Monitoring of particulate matter in ambient air around waste facilities (published in 2004). This has become one of the standard texts adopted by the waste industry in the UK. It covers monitoring, design of an appropriate monitoring regime as well as practical guidance on dust mitigation.
  - "Guidance on Undertaking an Operator Monitoring Assessment (OMA) Audit" (published in 2001).

## Air Quality Monitoring

- Monitoring Design, King Abdulaziz International Airport (Saudi Arabia), 2012. Discipline lead for design of permanent on-site ambient air quality monitoring regime.
- Monitoring Regime Review and Holistic Data Quality Investigation, Confidential Client (Kazakhstan), 2016-2018. Deep dive into client air quality monitoring data following regulatory and media attention. Wholesale changes to data collection, quality control and reporting recommended.
- Occupational Hygiene and Indoor Air Quality Surveys, Multiple Clients, United Kingdom, 1998-2007
  - Assessment of styrene levels in social housing using UK HSE methodology. Assessment of particulate and VOC during spraying and welding works at air conditioner, marine buoy and laser etching factories. Assessment of particulate during the shredding of confidential documents for the Royal Navy.
  - Assessment of NOx, ozone, acid gases and obscure pollutants for the BBC.

- Indoor AQ investigations – Full investigative surveys into reported health effects, including assessment of building conditions, potential pollution sources and ventilation. Measurement of a wide range of chemical, physical and microbiological factors including traffic-derived and building fabric-derived pollutants, temperature, humidity, air movement, bacteria and fungi. Clients included the London Fire Brigade, London Underground, several London councils, various private companies and private individuals.

### Permitting and Industrial Pollution Control

- Environmental Permit application, Johnson Matthey, 2018. Development of complete bespoke permit application pack and post-submission support for a new manufacturing process
- Environmental Permit applications, Equinix, 2017-2018. Turnkey management of several permit applications for major data centres with on-site thermal power backup systems, among the first in the UK to follow the Draft Data Centre Permitting Guidance
- BAT assessment, Fluor (Guinea), 2017. Assessment of BAT to EU, US, Chinese, Brazilian and IFC standards and abatement plant cost-benefit analysis for a mineral calcining plant.
- Emissions Inventory, Permit Support, Process Safety Investigations, Aesica Pharmaceuticals, 2016-2018. Project manager for multiple event modelling exercises and a site-wide process a safety and human factors review.
- BAT assessment and Permit Variation, PQ Silicates, 2016-2018. Established BAT requirements for new thermal and inorganic chemical plants as part of Permit Variation process. Large Combustion Plant BAT compliance.
- Permit Support, Onshore Gas Processing, eni, 2013-2017. Project Manager for support around process characterisation, modelling and Variation administration.
- BAT assessment, ITW, France, 2014. Support to client in the specification and procurement of VOC abatement systems
- Environmental Permitting System Development Royal Commission for Jubail and Yanbu (Saudi Arabia), 2013 – 2018. Adviser on improvements to environmental regulation and international best practice in regulation and industrial permitting. Development of country-specific BAT guidance for power stations, primary aluminium, steel, copper and zinc facilities and fertiliser plant.
- Permit Support, Beverages, UCP, 2014-2015. Project Manager for services including process characterisation, modelling, improvement conditions, odour perception and Variation administration.
- Permitting and BAT Technical Review, 2013-2018. Technical review of Permit support documents for EP Applications from Total, SASOIL, Baker Hughes.
- Odour Management Plans, BAT Technical Review, Permit Variation Support, Archer Daniels Midland Company, 2015-2018. Modelling and monitoring plans for a large edible oil refinery. BAT assessment for a portfolio of abatement plant including scrubbers, biotreatment and thermal oxidation.
- Environmental Permitting Management, United Kingdom, Baird & Co. Ltd, 2002-2017 (Atkins / ERM) Long-term environmental and health & safety compliance management for a Part A process including Permit Application, Surrender, Re-Application and Variation. Support for specification of gaseous and particulate abatement systems.

## Employment History

- **ERM – London / Oxford (UK)**

  Technical Director (2012-2018),

  Regional authority on Air Quality and Climate Change services in Europe
- **Atkins – Epsom (UK)**

  Head of Business / Associate Director (2003-2012)

  Manager of air quality and climate change team
- **Stanger Science & Environment – London (UK)**

  Senior Consultant (1998 – 2003)

  Development of air quality monitoring services
- **British Cellophane – Bridgwater (UK)**

  Environmental Chemist (1994 – 1998)

  Air quality and effluent monitoring and analysis

CURRICULUM VITAE **GRAEME BLACKETT**

QUALIFICATIONS: BA Hons Economics, University of Strathclyde
Member Institute for Economic Development
Member Economic Development Association Scotland

CAREER SUMMARY:

| | |
|---|---|
| 2002- | Director, BiGGAR Economics |
| 2000-2001 | Senior Consultant, Deloitte |
| 1998-1999 | Consultant, Deloitte |
| 1993-1998 | Consultant, Segal Quince Wicksteed Limited |
| 1991-1992 | Parliamentary Researcher and Freelance Consultant |

Graeme Blackett founded BiGGAR Economics in 2002. He was previously manager of Deloitte's economic consulting practice in Scotland and Northern Ireland and a consultant with SQW Limited. Graeme is an economist with 30 years of experience in economic development. Graeme has also been a member of the Advisory Board of the leading think tank Reform Scotland and economic advisor to the Sustainable Growth Commission, established by the First Minister of Scotland to advise on improving Scotland's economic performance.

## Examples of Project Experience

- Baseline economic impact study and assessment of the potential economic impacts of a proposed manufacturing facility in Fort William for GFG Alliance;
- study of the potential socio-economic benefits to Iceland of developing an onshore wind energy sector and a review of international evidence on any implications for the tourism, on behalf of Landsvirkjun;
- economic impact assessment of expansion of the Norbord manufacturing facility near Inverness;
- economic impact assessment of proposals to develop a pumped storage hydro energy scheme at the site of the former Glenmuckloch surface coal mining site in Dumfries and Galloway;
- socio-economic assessment of a series of proposed hydro power projects in Lochaber, for Simic Green Highland Renewables;
- socio-economic and tourism assessment of Simec's proposals to develop Glenshero wind farm in the Highlands;
- baseline economic and exchequer impacts of the North Sea oil and gas sector and scenario analysis to assess potential future economic and exchequer impacts

as part of an assessment of the case for public sector support for R&D for the UK oil and gas sector;

- economic impact assessment of proposals to develop the Edinburgh Centre on Climate Change, to further develop masters levels courses on carbon management, law and finance and support research in areas of strength such as carbon capture and storage;
- economic impact assessment of the Power Networks Demonstration Centre a project involving grid operators, the University of Strathclyde and Scottish Enterprise to allow the testing and development of new electricity grid technologies on a test grid;
- economic impact assessment of the European research-intensive universities, based on analysis of the 23 members of the League of European Research Universities (LERU);
- economic impact assessment of the universities in Finland for Universities Finland (UNIFI);
- economic impact assessment of the Estonian Universities;
- assessment of the economic contribution of the Swiss Federal Institutes of Technology (ETH) Domain institutions: ETH Zurich, Swiss Federal Institute of Technology in Lausanne (EPFL), Paul Scherrer Institute (PSI), Swiss Federal Laboratories for Materials Science and Technology (Empa), Swiss Federal Institute of Aquatic Science and Technology (Eawag) and Swiss Federal Institute for Forest, Snow and Landscape Research (WSL);
- economic impact assessment of the University of the Highlands and Islands in each of the local economies in which it has physical campuses, in the Highlands and Islands as a whole and in the Scottish economy;
- economic impact assessment of Aberdeen Innovation Hub, which aims to facilitate innovation and collaboration in the three key sectors: life sciences, food and drink and oil and gas;
- economic impact assessment, followed by and socio-economic assessment, of the proposed Nigg Bay development at Aberdeen Harbour, focusing on its impact on the local and Scottish economy as well as on important sectors such as oil and gas;
- research on the forest and timber technologies sector on behalf of Scottish Enterprise in order to identify areas where Scottish Enterprise could most effectively target its intervention;
- economic impact assessment as part of the development of an ICT Action Plan for the Highlands & Islands for Highlands & Islands Enterprise.

# Ruth Fain

# Associate Director, Head of Sector: Corporate, Industrial & Manufacturing

## Qualifications and Professional Memberships

- MGeol (Hons) Environmental Geology
- Chartered Scientist (CSci)
- Member of the Institute of Environmental Sciences (MIEnvSc)
- Member of the Institute for Air Quality Management (MIAQM)
- NEBOSH General Certificate in Occupational Health and Safety (Distinction)
- IEMA accredited EMS Lead Auditor training course (Distinction)
- CSCS Environmental Manager, Construction Industry

## Career Summary

Ruth is a Chartered Scientist and Member of the Institute of Air Quality Management with over 18 years' experience in managing and delivering environmental impact assessment (EIA), with a focus on industrial air pollution permitting and control and wider regulatory compliance. In addition to her Project Management and co-ordination skills, which have been particularly commended by recent and current clients, Ruth's expertise is in supporting developers and operators through the planning and regulatory consent process, and her experience ranges from process control and innovation, through emissions monitoring and minimisation, to the development and implementation of Environment Social and Governance (ESG) strategies.

Ruth is knowledgeable in the latest UK EIA Regulations and their implementation, best available techniques, and conversant in international best practice guidance and standards for ESIAs issued by the International Finance Corporation and World Bank Group.

## Selected Project Experience

### Environmental Impact Assessment

- Shetland Space Centre, Unst – Project Management and co-ordination of major development EIA covering a proposed vertical launch space port and associated infrastructure on Unst, Shetland. Particular focus on the novel technologies and effects of space infrastructure in terms of noise and air quality, and specific interactions with marine, historic, ecological and ornithological receptors.
- Hillthorn Industrial Business Park, Sunderland – Project Management and delivery of technical inputs to planning and EIA process including production of Environmental Statement for 600,000 sqft industrial business park in Sunderland.
- Giants on the Quayside, World Wheel Company, Newcastle - Project Management and delivery of technical input to planning and EIA process including production of Environmental Statement for £100M urban regeneration project in Newcastle, comprising Europe's largest observation wheel and associated entertainment developments.

- International Advanced Manufacturing Park, Sunderland - Assessment and delivery of air quality input into Environmental Statement and Non-Technical Summary for Phase 1 and 2 of an advanced manufacturing park.
- Forsa Energy - Air Quality Impact Assessment and delivery of air quality input into Environmental Statement and Non-Technical Summary for a proposed peaking power plant site with approximate output of 19.9 Mwe and located in an area with particularly onerous council requirements.
- Jedburgh Distillery – Management of development EIA review and update for proposed distillery in Scottish Borders. Assessment of construction and operational effects in accordance with appropriate standards.
- Mining Development, Gabon - Baseline air quality monitoring (in-field) and assessment to support a World Bank standard environmental and social impact assessment for the construction and operational phase of a mine in Gabon, Africa. Responsible for set up of overseas air quality monitoring locations, managing collection of data by local subcontractors and baseline assessment and reporting into the EIA.
- Kosovo Motorway, Kosovo Ministry of Transport - Air quality assessment to support a World Bank standard environmental and social impact assessment for the construction and operational phase of the Kosovo Motorway Project. Project involved DMRB calculation and qualitative assessment of impacts on air quality of a 102 km dual carriageway road scheme. Responsible for management of a team undertaking overseas air quality and noise monitoring and baseline assessment and reporting into the EIA.

### Permitting and Industrial Pollution Control

PPC / EP permit application, variations and surrenders - Project management and delivery of PPC/ EP permit applications, variations and surrenders for clients in the Manufacturing, Power, Oil and Gas and Waste sectors including Cott Beverages, British Nuclear Group, Egdon Resources, National Oilwell Varco, AES Kilroot, Biffa, Shanks Waste Solutions, Princes, Thomas Hardy Brewery and Premier Foods. Support during negotiations with regulatory authorities, coordination of specialist studies in line with Horizontal Guidance methodologies, on ongoing compliance and community/stakeholder engagement work.

- Nestlé UK – Long term regulatory compliance support to various UK Sites including emissions dispersion modelling, odour impact assessment, Best Available Technique (BAT) assessment, cost benefit analysis and general EP compliance support during planning, permitting and divestiture stages of operation. Various sites across the UK. Regularly liaising between site contacts, regulators, client and external legal advisors and client commercial/PR teams regarding issues of nuisance, civil claims, EP permit breaches and transactional risk management.
- BAT Assessment - Assessment of particulate abatement plant for emissions from gas and coal fired boilers and other site process emissions for confidential manufacturing client. In addition to planning and permitting requirements, the investigation was submitted as a case study to an Environment Agency large combustion plant (LCP) BAT reference document working party.

### Air Quality and Odour Assessment and Modelling

- Odour Dispersion Modelling, Impact and BAT Assessments – odour impact assessment, BAT assessment and cost benefit analysis for planning, permitting and due diligence stages of operation in the waste and manufacturing sectors. Regularly working with client legal and commercial teams regarding issues of statutory and private nuisance and operational risk management.
- Co-author: “Guidance on the Assessment of Odour for Planning”, Institute of Air Quality Management.
- AERMOD and ADMS dispersion modelling and assessment of emissions from manufacturing, waste and power facilities. Site impact assessment (base case) and investigation into modelled impact of operational improvement scenarios, including varying stack designs, locations and heights and BAT assessment of various abatement technologies.

# Appendix 2.1 Consultation Response Log

*Consultation Log*

| Consultee / date received | Summary of Response | Where addressed in EIA Report |
|---|---|---|
| Landscape and Visual Impact | | |
| The Highland Council | No specific consultation for the Recycling and Billet Casting Facility Landscape and Visual Impact Assessment (LVIA) has been undertaken. Instead, as stated in the Screening text presented to The Highland Council (THC) in 2020, LDA Design intends to use the same 12 viewpoints agreed with NatureScot and (THC) during the Scoping Stage for the previous Alloy Wheel Plant (AWP) LVIA. These viewpoints have been taken forward because they are still relevant given that the Recycling and Billet Casting Facility is on the same site as the AWP and in the same orientation.<br><br>The viewpoints were agreed in a series of emails in August and September 2017 between LDA Design and Susan Macmillan (Planning Team Leader, THC), Lucy Prins (Principal Planning Officer, THC) and Corinna Mertens (NatureScot (South Highland) Fort William). | Landscape and Visual Impact Chapter of the EIA Report. |
| Hydrology and Hydrogeology | | |
| *SEPA – Susan Haslam, Senior Planning Officer / 10.12.2020* | *Due to the scale of the proposed plant, the applicant will be required to apply to us to make a substantial variation to the existing PPC permit due to the addition of a Schedule 1, Section 2.2, paragraph (b) (ii) Part A PPC activity.*<br><br>*A detailed Drainage Impact Assessment should form part of the planning submission. It should follow recognised best practice and guidance and set out the strategy for the management of foul drainage, any aqueous effluents and surface waters. We would be very happy to provide advice on a draft version prior to its formal submission.*<br><br>*The application should include information showing how connection to the public foul sewer will be made; the previously submitted Drainage Impact Assessment confirmed that connection was available to the west. As this was an issue with the previous application, we presume that the principle of connection has now been discussed and agreed with Scottish Water.*<br><br>*Confirmation should be provided as to whether the plant results in any other form of aqueous effluent and if so details (estimated volumes, chemical content etc) provided. Our preference is that this is also directed to the public foul drainage system. We ask that either confirmation is provided that Scottish Water have agreed the principle of accepting any such discharge or information on proposed private treatment, expected standards and discharge is required. Any direct discharges to the water environment should be subject to at least a H1 screening assessment which should ascertain the need for modelling. If detailed modelling of a discharge is required, then as outlined elsewhere we strongly encourage the developer to provide us with a method statement outlining the proposed approach prior to the work commencing.*<br><br>*'Information on surface water drainage should be provided. Proposals should follow recognised best practice such as The SuDS Manual, CIRIA C736 and the relevant BAT reference documents.*<br><br>*Roof rainwater should be harvested to help reduce overall water requirements and information should be provided on the pollution hazard level for different areas of the site (for example material handing storage and handling areas, working yard areas, roads, carparking) clearly demonstrating that suitable treatment is provided.* | Noted.<br><br>A Drainage Impact Assessment (DIA) has been carried out and is included as Technical Appendix 7.2.<br><br>Details on connection to the public foul sewer are included in the DIA – Technical Appendix 7.2. A Pre-Development Enquiry (PDE) was submitted to Scottish Water who confirmed there is adequate capacity in the public foul sewer on Ben Nevis Drive for disposal of site welfare foul flows.<br><br>Details on potential water emissions are outlined in Technical Appendix 7.2. The Recycling and Billet Casting Facility will operate a closed loop cooling water circuit with a cooling tower. A Water Treatment Plant (WTP) will treat backwash water from the auto backwash filter and re-circulate. There may be a requirement for the occasional discharge of 'blowdown' water from cooling process, this water would not be heavily contaminated and may be able to be discharged to the water environment through the WTP (final quality parameters to be determined). Other options for disposal include potentially to the public foul sewer or tankered off-site.<br><br>Details of the surface water drainage are included in the DIA (Technical Appendix 7.2) and follow best practice.<br><br>Not applicable as the Applicant has plentiful existing water supply to meet overall water requirements. |

| Consultee / date received | Summary of Response | Where addressed in EIA Report |
|---|---|---|
| | *If there is the potential for oil contamination then oil interceptors should be include as part of the design. Consideration should also be given to drainage from accidents and how that will be captured.*<br><br>*Note that under PPC we do not control the quantity of discharge of surface water. However, section 2.6 of the previous Flood Risk Assessment did identify a potential groundwater flooding issue and should the foot print of this development overlap with the area of potential flood risk shown in the previously submitted Flood Risk Assessment then information should be provided on how drainage will be designed to address the issue.* | Pollution hazard indices have been calculated in accordance with CIRIA C753 (The SuDS Manual). Details are included in the DIA. Bypass Separators are included as part of the design in relevant locations, details of which can be found in the DIA.<br><br>Groundwater flooding is addressed in the Flood Risk Assessment (FRA), included as Technical Appendix 7.1 and considered in the drainage design. |
| *THC – 22/01/2021* | In response to a Freedom of Information data request, THC provided details of nearby flood defence measures, details on historic flooding events in the area, details of nearby Private Water Supply (PWS) and locations of historic landfills. Confirmed that THC do not hold any information regarding surface water levels and water quality information and recommend SEPA are contacted regarding this. | Details provided will be used to establish the baseline and the sensitivity of receptors.<br><br>A Freedom of Information data request was made to SEPA (dated 12/01/2021) requesting any information SEPA holds regarding Controlled Activity Regulation Authorisations, surface water levels, quality and quantity, groundwater levels, quality and quantity, and rainfall data. |
| *Scottish Water – 05/02/21* | Confirmation that there is sufficient capacity in nearby water treatment works to service the development<br><br>Confirmation that there are no issues within the water or wastewater networks which would affect the demands of the development.<br><br>Confirmation of Access and Stand-off Distances as 6 m and 7.5 m respectively. | No development that will restrict access to the main location will be undertaken within 6m of the main. Buildings will be min. 7.5m from existing main.<br>Discussions ongoing with Scottish Water regarding crossing water main with foul sewer and cut-off ditch. |
| Ecology | | |
| *SEPA – Susan Haslam, Senior Planning Officer / 10.12.2020* | ***Disturbance and re-use of excavated peat and other carbon-rich soils:***<br><br>*Peat disturbance to be minimised. Scottish Environment Protection Agency (SEPA) have confirmed that sufficient survey information was collected for the previous consented application and no further survey is required. A revised Peat Management Plan is to be produced which includes:*<br>• *A layout plan overlain with peat survey results;*<br>• *Justification of the location of development in relation to the areas of peat on site;*<br>• *Measures to be taken to minimise peat disturbance;*<br>• *Estimated volume of peat that will be disturbed by the development broken down into acrotelmic and catotelmic;*<br>• *Proposed re-uses of disturbed peat - including detailed restoration plan (as proposed in screening report); and*<br>• *Proposed locations for temporary peat storage areas.*<br><br>***Ground Water Dependant Terrestrial Ecosystems:***<br><br>*SEPA have confirmed that they are content that information submitted with the previously consented AWP development demonstrated that peatland habitats within the Site are not significantly groundwater dependent and as a result require no further consideration.* | Detailed consideration is made in relation to peat and its management within the ecology chapter and the accompanying Draft Peat Management Plan (Technical Appendix 8.2).<br><br>Details of pollution prevention measures, site management plans and associated mitigation are presented in Technical Appendix 3.1: Outline Construction Environment Management Plan (CEMP). Additional best practice and mitigation measures pertinent to ecological receptors are presented in Section 8.7 of the Ecology chapter. |

| Consultee / date received | Summary of Response | Where addressed in EIA Report |
|---|---|---|
| | ***Pollution prevention and environmental management:***<br><br>*A schedule of mitigation must be submitted which outlines the measures to be taken to limit the impacts on the environment during the construction period.. These must include reference to best practice pollution prevention and construction techniques and regulatory requirements.* | |
| NatureScot, Corrina Mertens, Operations Officer / 17.02.2021 | NatureScot have confirmed that an appropriate approach will be to use the baseline ecological data from the 2017 surveys (completed to inform the AWP EIAR), supplemented with the 2021 update extended Phase 1 survey results, to inform the Ecology chapter. The draft PMP produced for the AWP is to be revised to be specific to the Proposed Development. | Extended Phase 1 habitat survey report presented as Technical Appendix 8.1.<br><br>Assessment completed using 2017 baseline and 2021 habitat and species data.<br><br>Draft Peat Management Plan included as Technical Appendix 8.2. |
| Access, Traffic and Transport | | |
| *The Highland Council*<br><br>*Roads Officer*<br><br>*02-Feb-2021* | *We note your comments that the Applicant will not be progressing their permitted (AWP) proposal (Planning Ref. 17/05202/FUL). To ensure that this can be fully excluded from the committed development considerations within the Transport Assessment (TA), your Client should ensure that their submission clearly sets out that this Billet proposal is a complete replacement to the previous permission and that there will be no overlap of proposals between the existing permission and any permission secured for this billet proposal.* | Addressed within planning submission. |
| | *With regards to sustainable access, your reference to the 2010 Highland Council Active Travel Plan for Fort William will need updating to the 2019 Fort William Active Travel Masterplan.* | Noted and reference updated within Transport Assessment. |
| | *[Regarding] site access, we note that the proposed vehicular egress into the adjacent Glen Nevis Business Park is not referenced. If this is no longer being proposed, we'd be looking for the new Application to be retaining the previously proposed active travel connection through to Ben Nevis Drive. We'd also need information clarifying whether the private access road in from the roundabout on the A82(T) will be suitable for all vehicle and active travel movements expected and if not, set out what improvements would be required to make it suitable for those movements.* | Addressed as part of the Transport Assessment. |
| | *With regards to parking, your submission should be clarifying any parking required for goods vehicles at the site. For completeness, it should also be justifying the adequacy of disabled car parking and cycle parking provisions within the site.* | |
| | *Your approach to establishing baseline travel conditions needs to reflect and take account of the fact that the existing public roads are heavily influenced by seasonal tourist traffic variations.* | |
| | *The Highland Council Planning Service should be approached for information on committed developments in the local area. This should follow you undertaking a review of the information published on the planning portal within THC website.* | |
| | *When compiling and reporting trip generations from this development, we'll be looking for the TA to set out daily and peak period traffic numbers predicted to and from this proposed development. This should be segregated to at least large goods vehicles and other vehicles but if data on additional vehicle types will be available, this should be set out in the TA.* | The assessment of significant effects presented within the EIA Report chapter (Section 9.8) is presented in terms of worst-case Annual Average Daily Traffic (AADT). This differentiates between general traffic and heavy goods vehicles. |

| Consultee / date received | Summary of Response | Where addressed in EIA Report |
|---|---|---|
| | | The Transport Assessment (Technical Appendix 9.1) assesses the impacts of the peak hour development traffic generation on the local road network. |
| | *If shift change times are to be used in the TA to demonstrate lower vehicle impacts during existing peak periods on the public road network in the area, it may be necessary to ensure that any permission issued includes a suitably worded Condition requiring changes in shift patterns to be agreed with the Planning Authority prior to being implemented. This would be to ensure that the traffic impacts used as the basis of any permission issued would be protected from such operational changes at the plant. To avoid this, we would expect the TA to have also tested the worst case predicted trip generations on the peak period flow networks. This whole issue would require input from Transport Scotland, as its likely to be their network that would be most impacted by any such future changes to shift change times at the plant*. | Noted. Transport Scotland has been approached for their input and comments on the proposed scope of assessments (TA & EIA Report). However, we await a response on the matter. |
| | *[Regarding] the comments about Measures to Support the Development, we'd expect this to make reference to the Travel Plan and the TA should set out what measures this development will benefit from through the Travel Plan being operated at the wider plant.* | Noted and agreed. This is as per the methodology identified by SYSTRA which is to provide a Framework Travel Plan as a chapter within the Transport Assessment (Technical Appendix 9.1). |
| | *Finally, we welcome that your EIA will be considering transport impacts during the construction stage. We'd be looking for this or the TA to include a framework Construction Traffic Management Plan (CTMP) that sets out what the likely construction access needs will be (including predicted vehicle number profiles through the works), the proposed routing of that construction traffic to and from the site, any works required to safely accommodate that construction traffic and how such construction access needs will be safely managed with the ongoing operational access needs for the wider foundry site.* | A Framework Construction Traffic Management Plan chapter was been included with the final Transport Assessment (Technical Appendix 9.1) addressing access, routing, safety and management of construction vehicles. |
| Noise | | |
| *SEPA – comment on Screening request* | *We consider that impacts on noise will also be a significant issue in this case with noise from handling of recycled metal and operation of any external plant (e.g. air handling, stacks and vehicle movements) being particularly relevant. A noise assessment will be required, and we encourage the developer to provide SEPA with a method statement outlining the proposed approach prior to the works being undertaken. We would welcome a design that will not lead to any increase in rated ambient sound levels.*<br><br>*Cumulative assessment for air quality (and noise and vibration) should consider future developments in the surrounding area. This should take into consideration developments which have gained approval but are not yet built. These sources should be indicated in the method statement indicated above. It is our understanding that it is not the intention of the developer to renew the planning consent for the wheel plant (17/05202/FUL) which expires soon. If it is not considered that a meaningful start has already been made on the development and the wheel plant consent expires prior to the new application being submitted then we are content with the approach of the wheel plant being excluded in terms of cumulative effects assessment.* | *Method statements sent to SEPA on 7th January. Call* from Al White at SEPA to confirm receipt of method statement & apologise for slow response (due to SEPA emails hack). Discussed approach with Al and he confirmed it was appropriate and had no further comments but could not confirm this in writing due to on-going issues with SEPA email system.<br><br>The approach to the assessment seeks to address SEPA's 'welcomed' approach to not increasing the rated ambient level in the setting of the target noise levels for the Proposed Development (as per approach previously agreed with SEPA for Alloy Wheel Plant). Setting of target noise limits is discussed in Section 10.4 and Section 10.5 of the noise and vibration chapter in the EIA Report.<br><br>Potential cumulative effects are addressed in Section 10.11 of the noise and vibration chapter in the EIA Report. |

| Consultee / date received | Summary of Response | Where addressed in EIA Report |
|---|---|---|
| *The Highland Council* | *THC have confirmed that SEPA are the appropriate consultee for noise and vibration scoping.* | - |
| Air Quality | | |
| *SEPA – Susan Haslam, Senior Planning Officer / 10.12.2020* | *Providing sufficient information on impacts of the production facility on air quality will be an important issue in relation to us being able to determine whether the proposal is capable of being authorised. Assessment of the previous application for the site indicated that consideration of potential impacts on local sensitive habitats and human health was especially important. We strongly encourage the developer to provide us with a method statement outlining the proposed approach to modelling the potential air quality impacts prior to the work commencing.* | Method statement has been prepared in accordance with SEPA guidance and sent to SEPA 08/02/21. |
| | *It is noted that it is anticipated that there will be less emissions sources form the Recycling and Billet Casting Facility compared to the alloy wheel facility but our initial discussions with the developer indicate that the furnaces could be notably larger. Consequently, there is the possibility that there may be greater mass emissions of pollutants from these sources and it is this that determines actual environmental impact and therefore potential consentability. However, we do appreciate that this may have been mitigated by recent improvements at the smelter. The method statement should clarify this and also enable us to compare these sources to those previously assessed for the wheel plant. In relation to this the reduction in biofuel generating plant operation is noted but the air quality assessment will need to take account of the permitted operating hours (500 hours) as a worst-case scenario. This would be consistent with the approach undertaken for the previous application.* | Technical Appendix 11.3 includes the emissions inventories used in the Air Quality Impact Assessment (AQIA) for the consented alloy wheel facility and those used for the current upgraded smelter and proposed Recycling and Billet Casting Facility. The bio-diesel generators have been be assessed at their maximum permitted operating hours of 500 per generator per year during hours of 0700-2300.<br>An additional scenario of the average recorded operating hours of the generators over the last three years has also be presented as a representative case. |
| | *The application should include an assessment of local baseline air quality focusing particularly on the air quality objectives outlined in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland.* | This is addressed in Section 11.5 of the EIA Report chapter 11. |
| | *If modelling is to be used then we encourage the Developer to use both AERMOD and ADMS modelling at the same time for comparison as this will increase confidence in the modelling results, providing a better understanding of any modelling uncertainties which may exist, and the air quality risks and impacts on the surrounding environment. If any potentially negative effects on air quality are identified, the assessment should also propose appropriate mitigation measures to deal with this.* | The choice of models is addressed in Technical Appendix 11.2. |
| | *The applicant should note that the method for determining stack indicated in Table 3.1 of the screening report is incorrect as the air quality impact assessment should demonstrate that the stack height for significant emissions sources has been optimised. The use of D1 is a basic tool for air quality mitigation but a higher stack may be required to satisfy Pollution and Prevention Control (PPC) requirements to show that potential impact from dispersion has been minimised. D1 also does not take into consideration potential impact on designated natural habitats which is an important consideration for this location.* | Reference to D1 is removed. The stack height analysis is described in Technical Appendix 11.2. |
| | *The assessment should also include other potential sources such as emergency relief devices, abnormal operating conditions and emissions from standby equipment. The proposed different phases of operation should be outlined, accompanied by an assessment of effects at each stage. Other emissions may require assessment depending on the techniques proposed.* | The potential for abnormal emissions is addressed in Section 11.4 of EIA Report chapter 11 and the potential effects from abnormal emissions is addressed in Section 11.8. |
| | *The meteorological data used to represent the local area should be carefully chosen and justified. We are content with the approach taken to the last application, but the data will need to be updated to cover the last five years.* | The choice of meteorological data is addressed in Technical Appendix 11.2 using consistent approach |

| Consultee / date received | Summary of Response | Where addressed in EIA Report |
|---|---|---|
| | | with last application updated to include 2016-2020 inclusive. |
| | *The submission should include an assessment of the impact of potential odour emissions from the proposed facility, including likely discharge concentrations where available, and the impact of discharges during routine, non-routine and abnormal activities to allow us to comment on the consentability of the proposals. An approach similar to that taken to the previous application will be acceptable with full details assessed at the PPC application stage .The applicant should refer to the following guidance: SEPA Odour Guidance Note, IPPC Horizontal Guidance Note H4 parts 1 and 2 in addition to any other guidance identified during the process design considerations.* | No odour emission is anticipated from the proposed Recycling and Billet Casting Facility, a screening assessment will be included in the EIA Report Chapter 11. |
| | *The application should demonstrate that the PPC requirements for the assessment of fugitive dust and particulate emissions are also met. The significant dust sources associated with the proposed plant could include air handling systems (including raw material handling, dust filtration plant, pressure relief systems, vehicle movement and handling of wastes). Any assessment of fugitive dust should include assessment of the normal anticipated operational emissions in addition to abnormal and non-routine operations.* | An assessment of potential fugitive dust emissions is included in Chapter 11, Section 11.8. |
| | *Cumulative assessment for air quality (and noise and vibration) should consider future developments in the surrounding area. This should take into consideration developments which have gained approval but are not yet built. These sources should be indicated in the method statement indicated above. It is our understanding that it is not the intention of the developer to renew the planning consent for the wheel plant (17/05202/FUL) which expires soon. If it is not considered that a meaningful start has already been made on the development and the wheel plant consent expires prior to the new application being submitted then we are content with the approach of the wheel plant being excluded in terms of cumulative effects assessment.* | Cumulative effects are considered in Chapter 11, Section 11.1 of the EIA Report. The alloy wheel plant is excluded. |
| *SEPA – Al Whyte, SEPA Officer / Various correspondence between February- April 2021* | In February 2021 ITPEnergised issued a method statement for the AQIA to SEPA.<br><br>ITPEnergised engaged with SEPA throughout the process keeping the officer updated with findings and proposed approach including virtual meetings during which the method statement was confirmed as acceptable with the additional request to include a section on model uncertainty in the AQIA.<br><br>SEPA confirmed in their email of the 15th of March 2021 that "*the critical consideration* [for the Proposed Development] *is whether there has been any increase in impact at any of the designated areas above* [ecological receptors] *what was predicted for the Alloy Wheel Plant.*"<br><br>ITPEnergised queried the use of the Benzene AQS to assess impacts associated with TVOC emissions. On the 16th of March 2021 SEPA confirmed that "*The benzene air quality standard should be used for assessing TVOC impacts unless it can be demonstrated that there are more appropriate AQS/EALs. The use of benzene is considered to cover the worst-case scenario."*<br><br>SEPA also confirmed the following:<br><br>*"a) The emission rates should be set using the emission limit values in the smelter permit not the latest sample data.*<br><br>*b) The sulphur dioxide release rate can be determined from using the anode content specified in the permit and the work the HSE team at the smelter did in establishing its relationship to the associated BAT-AEL in the Non-Ferrous Metals BAT conclusions. This was undertaken as part of last year's permit review.*<br><br>*c) The biofuel generators will need to be added as specified in the permit and operating using 500 hours annually."* | ITPEnergised used this response to prepare a method statement for the AQIA.<br><br>The Proposed Development design includes necessary abatement such that impacts at ecological receptors are less than those predicted for the previously consented AWP.<br><br>The assessment of TVOC has been undertaken using both the Benzene AQS and an alternative EAL of 0.3 mg/m$^3$. Justification for this approach is provided in Technical Appendix 11.1 Section 3.4.9.2 and Annex 2.<br><br>The emission rates for the Smelter have been calculated from the current permitted ELVs. Existing Smelter sources have been modelled assuming continuous 24/7 operation as there are no restrictions on hours of operation in the permit.<br><br>The sulphur dioxide release rate for the Smelter has been calculated based on the permitted maximum production value of 47,500 T per year |

| Consultee / date received | Summary of Response | Where addressed in EIA Report |
|---|---|---|
| | The above emails are provided in Technical Appendix 11.1 Annex 1. | and $SO_2$ permit limit of 15 kg/t (Refer to Technical Appendix 11.1 Annex 2).<br><br>The biofuel generators have been modelled at their permitted maximum number of hours of 500 hr/year and are modelled to reflect the permit restrictions to operate only between 0700-2300 hours. |
| *Nature Scot – Corrina Mertens, Area Officer South Highlands / 27.1.2021* | *Acceptance of ITPE proposed method for Habitats Risk Assessment within Ben Nevis Special Areas of Conservation (SAC) – with recommendation to confirm details with SEPA* | Included in method statement sent to SEPA on 08/02/21. |
| *Nature Scot – Corrina Mertens, Area Officer South Highlands / Various correspondence between February- April 2021* | In February 2021 ITPEnergised issued the method statement for the AQIA to NS.<br><br>ITPEnergised also sought to confirm that the list of ecological receptors used as part of the AQIA undertaken for the previously consented AWP remained appropriate and provided an updated table including receptor locations, baseline concentrations and critical loads.<br><br>NS confirmed their agreement with the proposed method and receptors list.<br><br>Following consultation with SEPA; ITPEnergised consulted with NS to request the habitat dataset for the Ben Nevis Special Area of Conservation (SAC) and to confirm the location of the selected sensitive receptors.<br><br>NS provided a link to the Habitat Map of Scotland (HabMoS) and in April 2021 requested that two receptors be added:<br>- NewEco18 – Oceanic Montane Bryophyte (H4060)<br>- NewEco19 – Snowbed Communities (H6150)<br><br>And two receptors moved: Eco13 and Eco4.<br><br>The above emails are provided in Technical Appendix 1 Annex 11.1. | Receptors Eco4 and Eco13 have been moved to the locations specified by NS and NewEco18 and NewEco19 have been added to the list of sensitive receptors considered in the AQIA and reported in chapter 11. |
| *The Highland Council* | ITPEnergised issued the method statement to THC for comments; however, to date no response has been received. | - |
| Socio-economic, Climate Change, Accident and Disasters | | |
| - | No consultations are necessary for the socio-economic assessment, the climate change assessment or the major accidents and disasters chapter. | - |

# Appendix 3.1 Outline Construction Environmental Management Plan

# Alvance Recycling and Billet Casting Facility EIA

## Appendix 3.1 Outline Construction Environmental Management Plan

| | |
|---|---|
| Client: | Alvance British Aluminium |
| Project/Proposal No: | 3539 |
| Version: | 1 |
| Date: | 2021-05-10 |

# Document Information

| | |
|---|---|
| Project Name: | Alvance Recycling and Billet Casting Facility EIA |
| Document Title: | Appendix 3.1 Outline Construction Environmental Management Plan |
| Client Name: | Alvance British Aluminium |
| Client Contact: | Mr James Tangney |
| Client Address: | North Road, Fort William PH33 6TJ |
| Document Status: | Final for Issue |
| Author: | Holly Backhurst |
| Reviewed: | Emanuele Stella |
| Approved: | Ruth Fain |
| Date: | 2021-05-10 |
| Version: | 1 |
| Project/Proposal Number: | 3539 |
| ITPEnergised Office: | 4th Floor, Centrum House, 108-114 Dundas Street, Edinburgh, EH3 5DQ |

## Revision History

| Version | Date | Authored | Reviewed | Approved | Notes |
|---|---|---|---|---|---|
| 1 | 2021-05-10 | H Backhurst | E Stella | R Fain | Final for Issue |
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# Contents

# 1. Introduction

This outline Construction Environmental Management Plan (CEMP) refers to the construction of the Proposed Development, a billet production facility, by Alvance British Aluminium Limited (hereafter referred to as 'the Applicant').

The Proposed Development comprises the following principal elements:

- Billet production facility; and
- Associated hardstanding, landscaping and drainage.

The impacts of each of these elements have been considered in this CEMP.

The CEMP will be updated and finalised post consent in line with any relevant planning condition and in agreement with The Highland Council (THC), NatureScot and Scottish Environment Protection Agency (SEPA).

All employees and contractors shall familiarise themselves with the content of this document and the CEMP will form part of the induction which is mandatory for all employees, contractors and visitors attending the site.

## 1.1 Purpose

The CEMP will be a key document assisting the Applicant and Principal Contractor in complying with set planning conditions. The aim of this outline CEMP is to establish the main mitigation and control measures that will be utilised to provide robust environmental management throughout the construction period to avoid or minimise the adverse effects of the Proposed Development.

The CEMP will be a live document and will be updated as required throughout the planning and construction process. The designated Principal Contractor, AARTEE Engineering & Construction, will update the outline CEMP to reflect specific proposed construction methods and the document will be reviewed and agreed with THC before construction works begin.

Throughout the planning and construction phases of the Proposed Development, the CEMP will be subject to continual review to address, for example:

- Any conditions stipulated in the Planning Permission;
- To ensure it reflects good practice during construction;
- To ensure it incorporates the findings of any pre-construction site investigations and surveys; and
- To accommodate the working practices of the appointed Principal Contractor.

## 1.2 Policy Context

This outline CEMP has been prepared to satisfy the conditions of relevant planning policies regarding the construction of the Proposed Development.

### 1.2.1 The Highland-wide Local Development Plan

Policy 27 of The Highland-wide Local Development Plan (HwLDP) (THC, 2012) requires developments in THC local authority area that necessitate an Environmental Impact Assessment (EIA) to fulfil the following condition:

*"Major Developments and developments that are subject of Environmental Impact Assessment will be expected to follow a robust project environmental management process, following the approach set out in*

*the Council's Guidance Note "Construction Environmental Management Process for Large Scale Projects" or a similar approach"* (THC, 2010).

Further to this, Policy 27 of HwLDP on 'Sustainable Design' places specific requirements on developers regarding construction waste:

*"Proposed developments will be assessed on the extent to which they demonstrate that they have sought to minimise the generation of waste during the construction and operational phases. (This can be submitted through a Site Waste Management Plan)"*.

### 1.2.2 Guidance Note: Construction Environmental Management Process for Large Scale Projects

The guidance note referred to in the above policy advises that a Construction Environmental Management Document (CEMD) covers the following elements:

- The approach the client has taken with regard to the environmental assessment thus far on the project;
- The updated Schedule of Mitigation (SM) including mitigation proposed in support of the planning application, other relevant authorisations under different regulatory regimes, and agreed mitigation (e.g. as required by agencies) and relevant planning conditions;
- Specific mitigation plans and associated documents, (to include good/best practice) e.g. species protection plans, habitat management plans, special area plans, landscape management plans, surface water management plans, site waste management plans and schedule of watercourse crossings, access arrangements and general environmental management plans;
- First level Construction and Environmental Management Plans (CEMPs);
- Roles and responsibilities for the environment including the Ecological Clerk of Works (ECoW)/Site Environment Manager;
- A change control process for proposed amendments/alterations to the agreed mitigations and CEMD;
- Statement of responsibility to 'stop the job / activity' if a potential breach of a mitigation or legislation occurs;
- Methods of monitoring, auditing, reporting and communication of environmental management on site and with the client, planning authority and other relevant parties; and
- Good practice and relevant legislation register.

### 1.2.3 The West Highland and Islands Local Development Plan

The West Highland and Islands Local Development Plan (WestPlan) (THC, 2019) guides future development in the Highlands by setting strategies and policies for specific areas of land within THC local authority boundary. With regards to the WestPlan, the site falls wholly within area FW25 'Aluminium Smelter and Adjoining Land' which is allocated for industrial use.

### 1.2.4 Planning Conditions

Planning permission 17/05202/FU was received in February 2018 for a proposed Alloy Wheel Plant (AWP) associated with the existingSmelter, which is situated in the same location as the Proposed Development. The following conditions were specified to be addressed in any forthcoming planning application in relation to construction:

Condition 2:

*"No development shall commence, including any site clearance, until a Construction Environmental Management Document (CEMD) has been submitted to, and approved in writing by, the Planning Authority in consultation with Scottish Environment Protection Agency (SEPA) and NatureScot (formerly Scottish Natural Heritage, SNH). The CEMD should include Construction Environmental Management Plans (CEMPs) for the construction phase, including provisions for habitat and species protection."*

Condition 6:

*"No development should commence until an Environmental Clerk of Works (ECoW) has been appointed by the developer following approval from the Planning Authority in consultation with SEPA and SNH."*

Condition 11:

*"No development shall commence until a Peat Management Plan (PMP), developed in consultation with SEPA and NatureScot, has been submitted to, and approved in writing by, the Planning Authority."*

The AWP was consented but has not been constructed. The Proposed Development supersedes and replaces the AWP application. Though not directly related to the Proposed Development, it has been assumed that similar conditions will be applied to the Proposed Development and as such, the above matters have been addressed in this CEMP.

## 1.3 Content

This document sets out the minimum standards to be adopted when constructing the Proposed Development. It also provides information about the associated Management Plans which should be read in conjunction with this CEMP.

- Outline Pollution Prevention Management Plan;
- Outline Construction Noise Management Plan;
- Outline Dust and Air Quality Management Plan;
- Outline Site Waste Management Plan;
- Outline Water Quality and Pollution Management Plan;
- Draft Peat Management Plan; and
- Framework Construction Traffic Management Plan.

## 1.4 Site and Surroundings

The Proposed Development is located approximately three km north-east of Fort William town centre in Lochaber, West Highlands of Scotland and is situated within THC local authority area. The site is currently comprised of unused peatland and is located within the boundary of the existing Smelter.

The Proposed Development is located directly adjacent to the Ben Nevis and Glen Coe National Scenic Area (NSA) and the Ben Nevis Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC).

The location and layout plan of the Proposed Development are shown respectively in drawings 3.1 and 3.2 of chapter 3 of the EIA Report.

## 1.5 Proposed Development Description

The Proposed Development comprises the construction of the following buildings and infrastructure, the impact of which have been considered in this CEMP:

- Billet plant building with approx. 12,600 square metres ($m^2$) floor area:
- Casting pit of approx. 25 metres (m) in depth and 7x7 m wide;
- Secondary metal storage areas;
- Fume abatement systems;
- Melting furnaces;
- Auxiliary plant equipment;
- Approximately 3.7 ha of developed land surrounding the building:
  - Hard standing area of 10,200 $m^2$ is proposed to store the final product storage for transportation;
  - LPG/SNG gas storage;
  - Oxygen, nitrogen and argon systems;
- Landscaping and planting; and
- Drainage and Sustainable Urban Drainage System (SuDS).

# 2. Document Control

The CEMP is a "live" document and will be subject to periodic review and updating. The document is intended for use by the Applicant and their contractors specifically involved in the construction of the Proposed Development. When this document is amended, the document control table will be updated (Table 1) and it will be issued to all personnel specified on the distribution list below (Table 2).

***Table 1 Document Control***

| Status | Date issued | Prepared by | Summary of alterations |
|---|---|---|---|
| Version 1.0 | May 2021 | ITPEnergised | Outline CEMP |
| | | | |
| | | | |
| | | | |
| | | | |

***Table 2 Distribution List***

| Organisation | Contact Name | Email | Telephone Number |
|---|---|---|---|
| Applicant - Alvance British Aluminium Limited | TBC | TBC | TBC |
| Principal Contractor – AARTEE Engineering & Construction | TBC | TBC | TBC |
| Ecological Clerk of Works (ECoW) | TBC | TBC | TBC |
| Project Manager (PM) | TBC | TBC | TBC |
| The Highland Council (THC) | TBC | TBC | TBC |
| Scottish Environmental Protection Agency (SEPA) | TBC | TBC | TBC |
| NatureScot | TBC | TBC | TBC |

# 3. Responsibilities

## 3.1 Environmental Policy and Management Systems

The Principal Contractor will ensure that copies of their environmental policies are clearly displayed on site notice boards during the construction period. All employees are expected to comply with the requirements of the Environmental Policy and the requirements of the Environmental Management System (EMS) under a suitable accreditation such as ISO14001.

The Applicant and its Principal Contractor expects its employees and support staff to actively promote and administer a strong environmental culture. To achieve this, a number of initiatives will be implemented during the construction phase including environmental inductions.

As part of the EMS for the site, a Project Environmental File (PEF) will be maintained. Within this PEF, a legislation register will be stored which will be reviewed periodically and updated as necessary. Any changes to relevant environmental legislation will be disseminated to project management immediately.

## 3.2 Roles and Responsibilities

It is the responsibility of all staff involved with the Proposed Development, including the Applicant, Principal Contractor, PM and subcontractors, to ensure the correct implementation of the CEMP and the environmental mitigation contained within the EIA Report.

During the construction phase of the Proposed Development the key environmental responsibilities are summarised below:

- **The Applicant** – responsible for ensuring that the Proposed Development is built in accordance with the planning conditions and that all environmental mitigation measures stated within the EIA Report and this outline CEMP are implemented.
- **Principal Contractor** – responsible for implementing the CEMP and the environmental mitigation measures outlined in the EIA Report, regularly reviewing and updating the CEMP and ensuring that all staff and subcontractors abide by the CEMP.
- **Project Manager (PM)** − the PM shall have overall responsibility for the environmental management of the construction phase, such as ensuring that all mitigation measures and commitments are implemented effectively, organising any required pre-construction surveys, and monitoring the environment during construction. The PM will set up a Project Liaison Group and act as the main point of contact between the Applicant, the Principal Contractor, regulators, local communities, local community councils, the public and visitors.
- **Ecological Clerk of Works (ECoW)** – reports to the Applicant and is responsible for overseeing all construction activities, providing toolbox talks to all site personnel with regards to priority species and habitats, undertaking monitoring, overseeing the relocation of significant stands of nationally important plant species, and briefing relevant staff and contractors as appropriate. The ECoW will be, or will be supported by, a Suitability Qualified Ecologist.
- **All construction staff** – responsible for understanding the requirements of the CEMP and the environmental sensitivities of the Proposed Development. All staff have an obligation to abide by the CEMP and the relevant environmental legislation for the protection of receptors.

## 3.3 Subcontractor Management

The project will engage various subcontractors to carry out project construction related activities. These subcontractors are responsible for performing all work in conformance with relevant environmental legislation and other environmental requirements, the requirements of the CEMP, and contractual environmental requirements.

Subcontractors are required to develop suitable, adequate and effective method statements that explicitly define the measures to be taken to manage significant environmental risks associated with their scope of works. No works will be permitted to commence until such method statements have been developed and approved by site management. Additionally, subcontractors are required to provide sufficient and competent resources to monitor conformance with their own defined method statements.

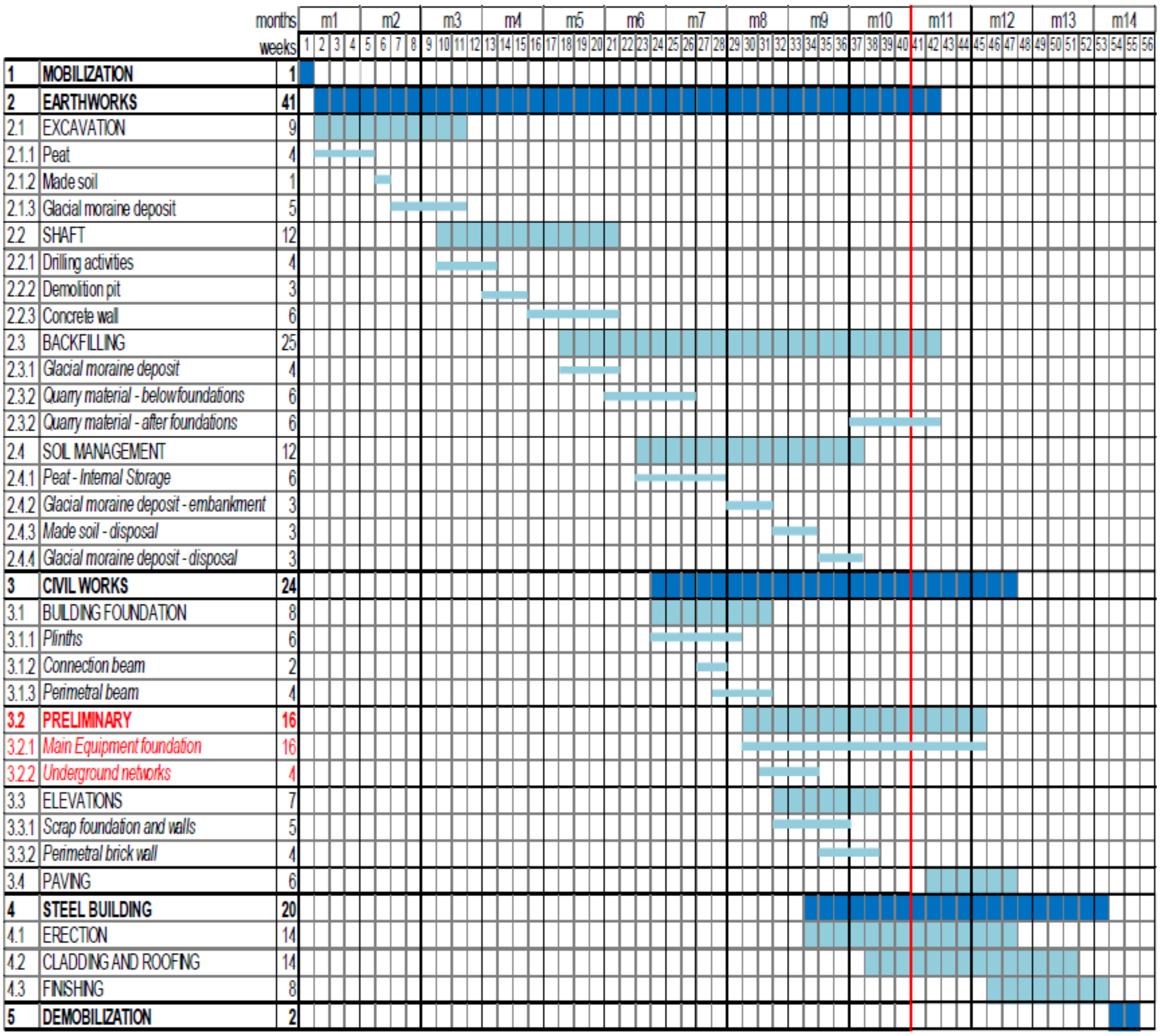
# 4. Program of Works

The construction of the Proposed Development will be undertaken over a 14 month period and the project schedule can be summarised into five main stages:

- 1 week for mobilisation;
- 11 months for all earthworks;
- 6 months for civil works;
- 5 months for the whole metal building construction; and
- 2 weeks for demobilisation.

The chart below shows the activities foreseen for each item and the relative durations in weeks.

***Figure 1 – Duration of construction activities estimated by AARTEE Engineering & Construction (2021)***



# 5. Safety and Security

## 5.1 Site safety

Site specific risk assessments and method statements will be undertaken in accordance with the applicable legislation prior to the commencement of construction activities; to identify any potential risks, assess their likelihood and significance, and to identify mitigation measures to be implemented to ensure the safety of workers and the general public.

The Applicant will ensure that adequate arrangements are in place for the discharge of all duties under the Construction (Design and Management) Regulations 2015 (UK Government, 2015).

A Health and Safety Plan will be prepared by the Principal Contractor which will set out how all health and safety matters on site are to be managed and how risks are to be identified and managed in accordance with current good practice and legal requirements.

## 5.2 Emergency response

A project emergency plan will be developed by the Principal Contractor, providing telephone contact details for the emergency services, local authorities, and maps showing the location of local hospitals. The project emergency plan will be displayed within the construction areas and will form part of the site induction. This plan should be deployed in the incident of fire, flooding, and spills of dangerous substances.

### 5.2.1 Fire

All construction areas and associated accommodation and welfare facilities will have in place appropriate plans and management controls to prevent fires. The site fire plans will be prepared, regularly reviewed, and updated as necessary, and will have due regard to the following guidance documents:

- Fire Prevention on Construction Sites (Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation); and
- Fire Safety in Construction Work (HSG 168).

### 5.2.2 Spills

Spill kits will be provided to contain accidental spills of diesel fuel or solvents during refuelling or transfer. Contaminated clean-up materials will be disposed of by a suitable registered waste contractor.

### 5.2.3 Flooding

Granular material (cement, sand etc) will not where possible be stockpiled in large quantities on site and will be stored to avoid potential washing away by flood waters. Stockpiles of less granular material (e.g. stone, aggregate and building materials) will be less affected. The emergency plan will include outline measures to pump out flood waters in the event of a serious inundation which could affect the construction programme.

## 5.3 Site Security

The existing Smelter facility has a secure perimeter and established security measures to prevent unauthorised access so there is no need for the installation of temporary security fencing.

The Principal Contractor will ensure that the construction site is secure. Access to the Proposed Development will be limited to specified entry points only and all personnel entrances and exits will be recorded and monitored for both security and health and safety purposes.

A Permit to Work system (or equivalent) will be introduced during construction to ensure that only authorised construction personnel are allowed within the construction area and that an accurate record of site-based personnel is available in case of emergency.

Visitors to the Proposed Development site during construction will be required to report to the construction site office (location to be confirmed) and will only be permitted to access the construction area under escort by appropriately authorised staff or following successful completion of specific safety induction training.

Compounds for the temporary storage of equipment or materials will be provided. These will be locked with restricted access.

# 6. Construction Operations

## 6.1 Site Access

Construction traffic will access the site from the A82 trunk road, as per the existing access to the Smelter. The adjoining junction on the A82 has recently been upgraded with a roundabout. Changes will be made to the internal road network within the Smelter to serve the Proposed Development.

### Construction and Delivery Hours

To minimise the potential impacts on residents, the core construction working hours will be limited to weekday daytimes and Saturday mornings, as defined in BS5228, the Code of Practice for Noise and Vibration Control on Construction and Open Sites (British Standards Institution, 2014). Working and delivery hours will be agreed with THC prior to construction, but are expected to be:

- 07:00 – 18:00 hours on weekdays;
- 07:00 – 12:00 hours on Saturdays; and
- No working on Sundays, Bank or Public Holidays.

Should any work need to be undertaken outside of the agreed hours, dispensation will be obtained from THC prior to the commencement of such works.

The majority of deliveries will be programmed to arrive during normal working hours only. Night-time deliveries will be minimal and will only be undertaken with special consideration. Care will be taken to minimise noise when unloading vehicles, and construction traffic will be prohibited from un-necessary idling within the site boundary or at the site access points.

Works will be phased to minimise effects on the surrounding environment and local communities by:

- Avoiding any weekend events using recreational routes (and their diversions where relevant);
- Avoiding any noisy critical path activities such as blasting during the breeding bird season, to minimise ecological effects;
- Scheduling construction activities to minimise the area and period of time that soil will be exposed, particularly during wetter periods;
- Timing soil handling and overburden stripping to suit weather conditions;
- Timing noise, vibration and dust producing activities to avoid key sensitive times most disturbing to the local residential and commercial properties; and
- Scheduling works to minimise disruption to pastoral farming activities.

## 6.2 Construction Site Housekeeping

Good construction site housekeeping practice will be applied at all times. As far as reasonably practicable, the site will be maintained using the following measures:

- All work areas will be secured;
- Any fuels or liquid materials will be stored and bunded in compliance with the relevant regulations;
- Signage and boundary fences, where required, will be regularly inspected, repaired and replaced as necessary;

- All working areas will be kept in a clean and tidy condition;
- Wheel washing and dust suppression facilities will be provided when and where required;
- All practicable measures will be taken to minimise the risk of fire and the Contractor will comply with the requirements of the local fire authority;
- Waste will be removed at frequent intervals;
- Construction waste susceptible to spreading by wind or liable to cause litter will be stored in secure containers;
- The Principal Contractor shall take all necessary and practicable precautions to prevent the occurrence of smoke emissions or fumes from site plant or stored fuel oils for safety reasons and to prevent, as far as is reasonably practicable, such emissions or fumes drifting into residential areas, nearby workplaces or areas of public open space. In particular:
    - Plant shall be well maintained, regularly serviced and measures taken to ensure that engines are not left running for long periods when not directly in use;
    - Plant which emits visible emissions after warm-up shall be taken out of service and either repaired or replaced; and
    - Vehicle exhausts will be directed away from the ground and other surfaces and preferably upwards to avoid road dust being re-suspended to the air and should be positioned at a sufficient height to ensure adequate local dispersal of emissions.
- The Principal Contractor will ensure that all construction vehicles will conform to at least Euro 4 emissions standards;
- Open fires will be avoided on site;
- To minimise the production of black smoke particles minimum acceptable temperatures will be used e.g. when heating bitumen, avoiding heating with open flame burners where possible. Pots or tanks containing hot bitumen will be covered; and
- All works, at all phases of the Proposed Development, will be undertaken in accordance with SEPA Pollution Prevention Guidelines (PPG) (SEPA et al., 2010 and 2013) and Guidance on Pollution Prevention (GPP) (which will ultimately replace PPGs) (SEPA et al., 2017 and 2018).

## Pre-construction Enabling Works

Soil is likely to be exposed due to enabling groundworks and earthworks such as land clearing, excavation, backfilling, soil management, and reprofiling. Precipitation events can mobilise suspended solids, nutrients and trace metals which can cause off-site pollution.

The following phases for the excavation, backfilling and soil management activities are anticipated:

- Excavation of the peat and temporary storage in a dedicated area inside the plant premises;
- Excavation of the made soil material and temporary storage inside the plant premises;
- Excavation of the entire glacial moraine layer and temporary storage in a dedicated area inside the plant premises;
- Rock drilling and demolition activities for the construction of the vertical casting machine;

- Backfilling of part of the glacial moraines, after selecting and sieving them;
- Backfilling activities, up to the bottom of the plinths, with quarry material;
- Permanent deposit of the peat in a designated area inside the plant, according to the recommended layers;
- Use of half of the moraine not utilized for backfilling activities, for auxiliary works inside the plant, such as embankments or yards;
- Disposal of the made soil; and
- Disposal of the remaining part of the glacial moraines.

All groundworks will take into consideration the Guidance contained within SEPA's Supporting Guidance (WAT-SG-75) Sector Specific Guidance: Construction Sites (SEPA, 2018), which provides guidance on good management practice for pollution control:

- Limit exposed soil by ensuring access tracks are not located on unstripped vegetation or ground; and
- Run-off containing suspended soils will pass through a SuDs treatment system; and
- Prior to any enabling or pre-construction works, no topsoil or subsoil stripping will be undertaken without the written permission of THC in consultation with the appropriate stakeholders.

See section 11.5.5 of this outline CEMP 'Proposed Mitigation for Sediment Management' for measures relating specifically to water pollution from particulates and sediments in run-off.

## 6.3 Construction Compound

Temporary site infrastructure is expected to consist of construction site facilities (welfare cabins, stores, skips, etc.) and fuel and chemical storage. Due to the presence of existing infrastructure associated with the Smelter, temporary security fencing and lighting will not be required. Power for the temporary facilities will be secured through the existing on-site mains electricity supply. The exact location of the construction compound will be confirmed in a later revision to this document.

The Construction Compound will meet standard good management practices which include but are not limited to:

- Compound design and layout will align with standards for distances from watercourses (at least 10 metres);
- The footprint of the compounds will be minimised where possible;
- Bunds will be used where required to meet the requirements of the SEPA PPGs and oil storage regulations;
- Adequate parking will be provided to ensure that the safety and efficient operation of the public road network is not reduced;
- Welfare facilities will be provided to minimise the need for offsite trips by staff during the working day; and
- Compound design and layout will ensure that dust emission sources are located away from sensitive receptors.

## 6.4 Welfare Facilities

Prior to construction, the Principal Contractor will prepare the arrangements for welfare provision and will be responsible for the maintenance of the facilities throughout the construction of the Proposed Development. Facilities are expected to include toilets, washing facilities, drinking water, changing rooms, facilities for rest, and canteen and kitchen facilities.

It is expected that a suitably sized foul waste storage tank will be provided and will be periodically pumped out by a specialist contractor. All foul waste will be disposed of by an appropriate contractor to a suitably licenced facility. Wastewater facilities will be arranged with appropriate sewerage provisions and all necessary consents obtained from THC and SEPA.

The risk of infestation by pests or vermin will be minimised by the appropriate collection, storage and regular collection of waste, the prompt treatment of any pest infestation and effective preventative pest control measures.

Workers' Safety Information Sheets and Control Of Substances Hazardous to Health (COSHH) safety data sheets will be kept on site.

## 6.5 Artificial Lighting

During periods of darkness, directional security lighting will be used to maintain the safe and efficient construction of the Proposed Development.

The Principal Contractor will comply with the requirements of the Environmental Protection Act (UK Government, 1990). As well as implementing relevant measures set out in the Guidance Notes for the Reduction of Obtrusive Light GN01:2011 (Institute of Lighting Professionals, 2011). Measures to reduce the impacts of artificial lighting include:

- Unnecessary lighting will be avoided and, following completion of the task, lighting will be switched off and/or removed. All lighting will be switched off during daylight hours;
- All lighting will be designed to avoid visual intrusion and/or light spillage. Lighting will be positioned and directed to avoid nuisance to residents and wildlife and/or causing distractions to drivers on adjacent roads. Lighting will also avoid spillage onto neighbouring habitats; and
- Wherever possible, lighting will be powered by the current mains electricity supply, rather than portable generators.

## 6.6 Crane Arcs

Crane arcs will be confined within the construction areas and cranes will be operated in accordance with the requirements of BS 7121, Code of Practice for Safe Use of Cranes (British Standards Institution, 2016).

## 6.7 Parking

Parking for construction workers, deliveries and site visitors will be accommodated in the existing car park for the Smelter site.

## 6.8 Site Demobilisation

After the main construction activities have been finalised, temporary infrastructure will be removed.

# 7. Communication

## 7.1 Internal Communication

Internal construction meetings with Health, Safety and Environmental matters on the agenda shall be held regularly during the construction phase and attended by the PM and ECoW. Any issues resulting from daily or weekly audits shall be raised and appropriate corrective actions agreed.

Environmental performance meetings will be arranged as necessary and attended by the PM, ECoW and representatives of the workforce.

Notice Boards will display the Environmental Policy of the Applicant and the Principal Contractor, Emergency Contacts List, and relevant statutory and non-statutory advice and guidance. These Environmental Notice Boards will be situated in prominent positions.

## 7.2 External Communication

The PM will set up a Project Liaison Group and act as the main point of contact between internal and external stakeholders, such as regulators, local communities, local community councils, the public and visitors. The PM and ECoW will arrange and attend meetings with relevant statutory bodies as necessary.

## 7.3 Community Liaison

At the earliest possible stage, the Applicant will actively engage with local residents to discuss the programme of work, learn of any concerns they may have, and determine how the Principal Contractor can minimise the impacts of construction on local residents.

The PM will be the first point of contact for any queries and/or grievances regarding the construction of the Proposed Development and will be responsible for:

- Recording all queries and/or issues raised;
- Responding in an appropriate and timely manner,
- Liaising with the planning authority in connection to any complaints; and
- Monitoring any actions that need to be implemented.

# 8. Environmental Training

## 8.1 Inductions

All project personnel and sub-contractors will receive an Environmental Induction. No personnel, including sub-contractors, will be permitted to undertake any work on site without undertaking a site induction. The site induction will evolve to reflect changes in the CEMP as the project develops. Environmental topics covered in the induction shall include, but will not be limited to:

- Water Resources;
- Pollution Prevention;
- Emergency Response Procedures;
- Waste Management and Housekeeping;
- Management Structure;
- Duties and Responsibilities;
- Relevant Procedures;
- Ecologically and Ornithological Sensitive Areas and Times;
- Incident and Non-Conformance Reporting;
- Consents and Licenses and compliance;
- Legislation; and
- Environmental Good Practice.

## 8.2 Toolbox Talks

Toolbox Talks (TBT) on specialised topics shall supplement the induction course. Toolbox talks shall be used to highlight issues of concern and to disseminate any new information or responsibilities. They will also be used as a means of providing basic environmental training to crews on a specialised topic, e.g. water management. The TBT also offer site personnel the opportunity to provide feedback.

TBTs will be provided routinely, but also when:

- There is a change to existing legislation, which requires an operational change;
- Site inspections or audits have identified corrective actions which require rolling out;
- Work is being undertaken in particularly sensitive areas; and
- There are significant changes in environmental conditions, e.g. heavy rainfall.

Records of all TBTs undertaken, including attendance, will be maintained.

## 8.3 Specialist Training

Specialist training for specific members of the construction crews will be provided as required. This may include, but will not be limited to:

- Emergency Environmental Crews;
- Confined spaces;
- Working at height;

- Water management;
- Waste Representatives;
- Working near and in water; and
- Fuel Tanker Drivers and Refuellers.

# 9. Incident Response

## 9.1 Environmental Incidents and Corrective Actions

All environmental incidents and near misses shall be investigated and reported by the PM. Copies of incident investigation reports shall be supplied by the PM to the Principal Contractor and the Applicant and action taken to prevent recurrence.

Any incident that may result in an environmental impact, will be reported immediately to the appropriate statutory authority with details of date, time, location, type, potential impact and person calling.

All corrective action, incident and near miss report forms shall be held in a register maintained at the construction site office.

## 9.2 Complaints Procedure

The Principal Contractor will provide contact details to which all written complaints should be addressed.

The Applicant will ensure that a system is introduced for the logging and recording of any complaints and a copy made available to the Principal Contractor, PM and the relevant department of THC.

Any complaints received will be acknowledged within 24 hours during all hours when works or deliveries are taking place. The PM shall ensure that all complaints receive a written response, to include details of any action undertaken if such action is deemed appropriate. The PM shall provide the Applicant with a monthly report that details all complaints, who they were filed by and the actions taken.

# 10. Environmental Monitoring

Environmental monitoring will be undertaken during construction works to check compliance with the planning conditions, environmental legislation, environmental policies, CEMP and mitigation contained within the EIA Report. Should deficiencies or opportunities for improvement be identified, the Principal Contractor will agree the actions required with the responsible staff, record the incident, and report to the Applicant and statutory bodies as required. Work will be stopped immediately if a potential breach of environmental mitigation or legislation is identified.

## 10.1 Inspections and Audits

The Principal Contractor will carry out daily site inspections and monthly site environmental audits to record performance of staff and subcontractors and identify any corrective actions required.

## 10.2 Specific Environmental Monitoring

Table 3 presents the specific environmental parameters that may require environmental monitoring and where further details will be provided.

*Table 3 Parameters for environmental monitoring during construction*

| Environmental Monitoring | Phase | Purpose | Frequency | Responsibility | Further Details |
|---|---|---|---|---|---|
| Site Inspections | Construction | Inspection of general site housekeeping (e.g. storage of materials and waste) to ensure health and safety risks and environmental considerations are being effectively managed. | Daily | Principal Contractor | CEMP |
| Environmental Audits | Construction | Detailed audit of general environmental performance of staff and subcontractors to identify any misconduct and any corrective actions required. Subcontractors to monitor conformance with their own defined method statements. | Monthly | Principal Contractor, subcontractors | CEMP |
| Waste Monitoring | Construction | Check waste is being appropriately monitored, treated, handled, managed and disposed of, in accordance with the SWMP. | Daily | Principal Contractor | Site Waste Management Plan |
| Pollution Monitoring | Construction | Monitor construction procedures to ensure pollution risk is being managed and the mitigation outlined in the Pollution Prevention Management Plan is being effectively implemented. | Daily inspections, weekly recording | Principal Contractor | Pollution Prevention Management Plan |
| Traffic Monitoring | Construction | Monitor construction traffic movements to ensure CTMP is being effectively implemented. | Daily inspections, weekly recording | Principal Contractor | Construction Traffic Management Plan |
| Noise Monitoring | Construction | Ensure that mitigation measures are appropriate and are being applied rigorously. Provide early warning of increased noise emissions to inform the modification of activities prior to impacts occurring. | Daily inspections, weekly recording | Principal Contractor | Construction Noise Management Plan |
| Dust Monitoring | Construction | Monitor compliance with the DMP. The frequency of site inspections for air quality and dust issues should be increased when activities with a high dust potential are undertaken during prolonged dry or windy conditions. | Daily inspections, weekly recording | Principal Contractor | Construction Dust and Air Quality Management Plan |

| Environmental Monitoring | Phase | Purpose | Frequency | Responsibility | Further details |
|---|---|---|---|---|---|
| Protected Species Monitoring | Pre-Construction and Construction | Surveys for protected species to be undertaken pre-construction to identify evidence of protected species near the works areas to inform the implementation of additional mitigation. Protected species monitoring will continue throughout the construction phases. | As and when required in accordance with good practice. | ECoW | EIA Report Chapter 6 on Ecology and Biodiversity |
| Peat Monitoring | Construction | Walkover survey to note vegetation recovery, as well as noting the cover of *Sphagnum* mosses and other peatland species, within 25 permanent plots spread across the receptor areas. After year 5, the requirement for further monitoring will be reviewed. | Years 1, 2, 3 and 5 post peat reinstatement | ECoW | Peat Management Plan |

# 11. Environmental Management Plans and Mitigation

The Applicant and the Principal Contractor will adhere to environmental mitigation measures during the construction of the Proposed Development. The following sections provide further information on topic specific Management Plans. For topics in which a Management Plan is not required, construction mitigation measures specified in the EIA Report are detailed.

## 11.1 Outline Pollution Prevention Management Plan

A Pollution Prevention Management Plan (PPMP) will be prepared post consent by the Principal Contractor and agreed with THC, SEPA and NatureScot. This section provides an overview of what will be included within the PPMP in order to minimise the risk of pollution from fuels, equipment and construction materials and effectively respond to pollution incidents. The PPMP will take into consideration the guidance contained within SEPA's Supporting Guidance (WAT-SG-75) Sector Specific Guidance: Construction Sites (SEPA, 2018), which outlines good practice techniques in relation to pollution control.

### 11.1.1 Storage and Handling of Fuels and Chemicals

- Storage of hazardous material containers on secondary containment systems that will contain 110% of the contents of the largest container or 25% of the total volume, whichever is greater;
- Protection of hazardous materials in locked containers to minimise the ingress of rainwater and secure them against accidental damage;
- Storage of hazardous materials no less than 20 m away from watercourses and drainage gullies;
- Development of a Spill Response Plan;
- Provision and maintenance of spill response equipment e.g. spill kits with absorbent pads, absorbent granules, absorbent booms;
- The PM will check spill response equipment on a weekly basis to ensure that it is adequately maintained;
- Training of site personnel and subcontractors in the use of spill kits and the correct disposal of used material; and
- Maintenance of a log of any incidents.

### 11.1.2 Control of Substances Hazardous to Health (COSHH)

All COSHH materials will be stored and handled in accordance with the COSHH Regulations 2002 (UK government, 2002).

- Completion of a COSHH assessment for hazardous materials;
- Development of a COSHH Register documenting materials stored and handling requirements;
- Segregation of COSHH raw materials and waste in secure stores;
- Training of site personnel and subcontractors in how to comply with the COSHH Regulations; and
- Maintenance of a log of any incidents.

### 11.1.3 Plant and Machinery

It is anticipated that the plant and machinery assemblage will include, but will not be limited to, the following:

- Excavators;
- Concrete pump and mixer truck;
- Wheeled backhoe excavator;
- Road wagons;
- Dump trucks;
- Crane;
- Generator;
- Road roller;
- Dozer; and
- Telehandlers.

The plant assemblage will be managed in accordance with the following methodology to prevent pollution:

- All plant and machinery shall be regularly maintained to ensure good working order;
- Inspection of construction plant and machinery will be carried out on a daily basis before works commence to check for fuel and oil leaks and, where necessary, drip trays or plant nappies will be used to collect leaks;
- Site vehicles and mobile plant to be equipped with spill kits;
- Static plant such as pumps and generators will be self-bunded or placed on drip trays wherever practicable;
- No washing out of concrete and cement delivery vehicles will take place on-site without suitable provision for the washing out water. Wash water will be prevented from flowing into drains or infiltrating the ground, and will be adequately contained and disposed of at a suitably licenced waste facility; and
- If on-site concrete batching facilities are required, batching will be conducted at least 50 m from any watercourse, on flat ground, and suitable impermeable hardstanding so that surface water run-off can be intercepted for treatment or disposal.

### 11.1.4 Pollution Incident Response

An emergency environmental crew to deal with pollution incidents will be provided by the Principal Contractor, and an emergency contact list and spill response instructions will be displayed on notice boards and fuel bowsers.

## 11.2 Outline Construction Noise Management Plan

The noise impact levels resulting from the construction of the Proposed Development must be compliant with the threshold limits defined in the Environmental Impact Assessment. The following threshold noise levels have been set using the 'ABC method' provided in BS 5228 (British Standards Institution, 2014):

- Weekday daytimes (weekdays 07:00 – 19:00 and Saturdays 07:00 – 13:00) – 65 dB;

- Evenings and weekends (weekdays 19:00 – 23:00, Saturdays 13:00 – 23:00 and, Sundays 07:00 – 23:00) – 55 dB; and
- Night-time (23:00 – 07:00) – 45 dB

Outlined below are recommendations for mitigation measures to be implemented during construction to control noise impact. These recommendations are consistent with the standard noise mitigation measures specified in the BS 5228 standard (British Standards Institution, 2014).

### 11.2.1 Specification and substitution:

- Be cognisant of noise when choosing plant and activities to be employed on site; and
- If noise problems arise during construction of the Proposed Development, where reasonably practicable, replace noisy plant or activities with quieter alternatives.

### 11.2.2 Modification of plant and equipment:

- Seek to modify existing plant and equipment or apply improved sound reduction methods, to reduce noise generated;
- Consult the original equipment manufacturer and a specialist in noise reduction techniques when undertaking any modifications;
- Fit all pneumatic tools with silencers or mufflers;
- Noise from diesel engines can be reduced by fitting a more effective exhaust silencer system or by designing an acoustic canopy to replace the normal engine cover;
- If necessary, reduce noise caused by resonance of body panels and cover plates by stiffening with additional ribs or by increasing the damping effect with a surface coating of special resonance damping material; and
- Minimise direct metal-to-metal contact.

### 11.2.3 Timing of operations:

- Move plant onto and around the site within core construction working hours;
- Ensure that any plant and equipment required for operation at night-time (23:00 - 07:00) is mains electric powered where practicable, or suitably silenced and shielded; and
- If a deviation from the standard working hours is required, apply for dispensation from THC.

### 11.2.4 Noise enclosures:

- Where practicable and necessary, contain fixed plant and equipment (e.g. compressors and generators) within suitable acoustic enclosures or behind acoustic screens; and
- Ensure that a reflecting surface, such as a parked lorry, is not located opposite the open side of noise enclosures. Any openings in complete enclosures (e.g. for ventilation) should be effectively sound-reduced. The effectiveness of partial noise enclosures and screens is reduced if they are used incorrectly.

### 11.2.5 Location of plant and equipment:

- Position noisy plant and equipment away from noise-sensitive areas; and
- Wherever practicable, orientate plant so that the noise generated is directed away from noise sensitive areas.

### 11.2.6 Loading and unloading of materials:

- Take care when loading and unloading vehicles to minimise noise;
- Lower rather than drop materials whenever practicable. If it is necessary to drop materials, minimize the drop height; and
- Cover surfaces on to which materials are being moved with resilient material.

### 11.2.7 Engine noise reduction:

- Prohibit unnecessary idling of construction traffic within the site boundary or at the site access points;
- Assess and implement as appropriate speed restrictions for construction traffic passing through residential areas;
- Switch plant off when not in use (including during breaks and down times of more than 30 minutes);
- Avoid operating plant simultaneously or close together to avoid cumulative noise impacts;
- Avoid unnecessary revving of engines;
- Keep internal haul routes well maintained and avoid steep gradients; and
- Close engine acoustic covers when engines are in use and idling.

### 11.2.8 Maintenance of plant and equipment:

- Ensure that trained personnel regularly maintain equipment and plant, as increases in noise are often indicative of future mechanical failure;
- Frictional noise from the cutting action of tools and saws can be reduced if the tools are kept sharp;
- Noises caused by friction in conveyor rollers, trolleys and other machines can be reduced by proper lubrication; and
- Noise caused by vibrating machinery having rotating parts can be reduced by attention to proper balancing.

## 11.3 Outline Construction Dust and Air Quality Management Plan

Outlined below are recommendations for mitigation measures to be implemented by the Principal Contractor during construction to control dust and air quality impacts. These mitigation measures are proportionate to the level of risk assessed using the methodology set out in Institute of Air Quality Management Guidance on the assessment of dust from demolition and construction (Institute of Air Quality Management, 2014). The recommendations for dust and air quality are reiterated in Technical Appendix 11.3 of Chapter 11 of the EIA Report.

### 11.3.1 Proposed mitigation for communications:

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary; and
- Display the head or regional office contact information.

### 11.3.2 Proposed mitigation for dust management:

- Approve and implement the Construction Dust and Air Quality Management Plan.

### 11.3.3 Proposed mitigation for site management:

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the local authority when asked; and
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook.

### 11.3.4 Proposed mitigation for monitoring:

- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Local Authority when asked;
- Increase frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions; and
- Agree dust deposition, dust flux, or real-time $PM_{10}$ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences.

### 11.3.5 Proposed mitigation for preparing and maintaining the site:

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible;
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Avoid site run-off of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site; and
- Cover, seed or fence stockpiles to prevent wind whipping.

### 11.3.6 Proposed mitigation for site operations:

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes and conveyors and covered skips;

- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event, using wet cleaning methods.

#### 11.3.7 Proposed mitigation for waste management:

- Avoid bonfires and burning of waste materials.

#### 11.3.8 Operating vehicle/machinery and sustainable travel:

- Ensure all vehicles switch off engines when stationary;
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable;
- Impose and signpost a maximum speed limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas; and
- Issue all suppliers and contractors with delivery routes and access times/restrictions.

#### 11.3.9 Proposed mitigation specific to earthworks:

- Re-vegetate earthworks and exposed areas/soils stockpiles to stabilise surfaces as soon as practicable;
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable; and
- Only remove the cover in small areas during work and not all at once.

#### 11.3.10 Proposed mitigation specific to construction:

- Avoid scabbling (roughening of concrete surfaces) if possible;
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate control measures are in place;
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.

#### 11.3.11 Proposed mitigation specific to track-out:

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. this may require a sweeper being continuously in use;
- Avoid dry sweeping of large areas;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; and

- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- Record all inspections of haul routes and any subsequent action in a site logbook; and
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

## 11.4 Outline Site Waste Management Plan

The Site Waste Management Plan (SWMP) will be prepared by the Principal Contractor and will set out the practices to be put in place to ensure the control of waste on site, in a manner that is not detrimental to the local and wider environment. This encompasses the minimisation of waste and the removal of waste from site where necessary.

The SWMP will set out measures to ensure compliance with the Duty of Care responsibilities as prescribed in Section 34 of the Environmental Protection Act (UK Government, 1990) and amended by The Waste (Scotland) Regulations (Scottish Government, 2012) including:

- Implementation of the waste hierarchy;
- Classification and segregation of waste;
- Waste storage; and
- Waste documentation and transport.

Appendix 1 sets out an outline SWMP Template from the Waste and Resources Action Programme which will be updated by the Principal Contractor prior to and during construction.

### 11.4.1 Primary waste streams

Excavated material is anticipated to be the most significant waste stream generated by the construction of the Proposed Development and the primary materials will be peat, made ground and glacial moraine deposits.

An estimated 50% of excavated moraine deposits will be re-used for secondary activities inside the plant, such as embankment or yards. Moraines will be judged as suitable for backfill if they are uncontaminated by peat and can be suitably sieved and selected. The remaining 50% will be disposed of at landfill approximately 25 km from the Proposed Development.

Peat will be temporarily stored on site and then permanently deposited in a designated area inside the site. Made ground will be stored at the Proposed Development Site before being disposed of at landfill.

### 11.4.2 Strategy for Waste Reduction

The Principal Contractor will employ the following strategy to achieve maximum reuse and reduce landfill waste:

- Sub-contractors will be contractually obliged to cooperate with the SWMP as part of their tender;
- All staff must participate in site inductions and relevant environmental training;
- Waste management will be incorporated into the design process, including planning for high volumes of waste, consideration of suitable manufacturers and appropriate storage measures;
- The Principal Contractor will identify and segregate waste streams;
- The Principal Contractor will reuse and recycle where possible;

- The Principal Contractor will use suitable storage methods for all materials;
- Unauthorised waste disposal will be treated as an environmental incident and the Pollution Incidence Response will be implemented; and
- Under no circumstances will waste material be burned or buried on the Proposed Development site.

### 11.4.3 Elimination

- The Proposed Development will aim to avoid the creation of waste through the detailed design stages. The control of design will reduce the risk of late stage changes which will require rework and therefore reduce overall waste.

### 11.4.4 Reduction

- The Procurement Manager will undertake accurate measurement and ordering of required materials to reduce the volume of waste generated during construction (e.g. ordering standardised sizes to reduce onsite cutting);
- Order materials on a just-in-time basis to reduce onsite storage time;
- The Principal Contractor will ensure the effective and appropriate storage of materials to protect against damage and adverse weather conditions;
- Ensure suppliers have a take-back option for packaging and surplus;
- Maintain good communication with suppliers to reduce the amount of packaging included in deliveries;
- The Principal Contractor will ensure the use of enclosed containers to store waste susceptible to spreading by wind or liable to cause litter; and
- Remove general waste at frequent intervals and keep the site kept clean and tidy.

### 11.4.5 Storage

- All waste will be stored at the location in which it is generated, or within a designated central waste storage area;
- These designated waste storage areas will be isolated from surface water drains and areas that discharge directly to the water environment;
- Waste will be stored in suitable containers of sufficient capacity to avoid loss, overflow or spillage;
- Storage of liquid wastes will be on impermeable bunds that hold 110% of the contents of the largest container;
- Waste will be segregated by waste stream;
- Storage containers will be clearly labelled with the waste that they will hold e.g. wood, metal, plastics or other appropriate waste stream;
- Storage containers will be secure, covered or enclosed;
- There will be separate containers for special waste;
- Skips will be monitored, and action taken if waste levels are too high; and
- Burning of waste will be prohibited.

### 11.4.6 Segregation

- The SWMP will list all the Proposed Development site waste streams as identified and classified by the Principal Contractor in line with the methods and categories set out in the Waste Classification Technical Guidance WM3 (SEPA et al. 2015); and
- The identified waste streams will be segregated and the storage and management of each will be set out within the SWMP including measures for special waste and organic material.

### 11.4.7 Special waste

Special waste is any waste which contains properties that might make it harmful to human health or the environment and arises during construction from the maintenance of plant and machinery, oily water waste, and environmental spill recovery. Measures will be set out within the WMP to ensure that:

- All special waste will be segregated by type from other waste streams;
- All waste oil will be stored in a bunded facility until such times that it is collected; and
- Used filters, rags and absorbents will be stowed in the special waste container in drums or waste oil bags.

### 11.4.8 Re-use

- Re-use uncontaminated excavated material for secondary activities inside the plant such as backfill, embankment or yards; and
- Where possible, the Procurement Manager will purchase reclaimed or recycled materials or procure materials from sustainable sources.

### 11.4.9 Recycling

- The Principal Contractor will designate areas or containers for materials which can be recycled such as plastics, timber, steel, general waste, dry recyclables, batteries, aerosols, etc.

### 11.4.10 Off-site Disposal of Site Waste Streams

- Use the GT Non-Hazardous Waste Transfer Note (WTN) for the off-site disposal of all non-hazardous wastes;
- Use Special Waste Consignment Notes (SWCNs) for the off-site disposal of all hazardous wastes;
- Retain all WTNs for at least two years and SWCNs for at least three years;
- Only use licensed waste carriers to transport wastes from site and obtain documentation to demonstrate registration;
- Obtain full copies of the Waste Management Licences or Exemptions for the disposal locations of site waste streams; and
- Waste contractors will be checked periodically (bi-annually) to ensure they maintain valid licences.

### 11.4.11 Keep Legislative Records

- Retain copies of all relevant permits or licences for both carriers and disposal sites;
- Record contact details for all waste carriers and disposal sites;
- Keep audit reports;
- Maintain recycling receipts for non-hazardous waste; and

- Record a description of all waste removed from site including volume and consignment route number.

#### 11.4.12 Monitoring

- Track the volumes of waste produced using key performance indicators (KPIs) and compare this against targets which will be set at the beginning of the project.

## 11.5 Outline Water Quality and Pollution Management Plan

Outlined below are recommendations for mitigation measures to be implemented during construction to control water quality impacts. These mitigation measures take due cognisance of the Water Resources Act 1991 (UK Government, 1991) and the Construction Industry Research and Information Association Report C532 (CIRIA, 2001).

Good practice measures set out in the relevant Pollution Prevention Guidance (PPGs) or Guidance for Pollution Prevention (GPPs) have been followed. A review plan for Pollution Prevention Guidance documents (PPGs) is currently underway by the Scottish Environment Protection Agency (SEPA), Natural Resources Wales (NRW), and the Northern Ireland Environment Agency (NIEA), replacing them with a new series of guidance: Guidance for Pollution Prevention (GPPs). GPPs provide environmental good practice guidance for the whole UK, and environmental regulatory guidance directly to Scotland, Northern Ireland and Wales. The relevant guidance includes:

- PPG1: General guide to the prevention of pollution (SEPA et al., 2013);
- GPP2: Above ground oil storage tanks (SEPA et al., 2018);
- GPP5: Works and maintenance in or near water (SEPA et al., 2017);
- PPG6: Working at construction and demolition sites (SEPA et al., 2010); and
- GPP21: Pollution incidence response planning (SEPA et al., 2017).

### 11.5.1 General Mitigation

- Undertake a pollution risk assessment of the site and the proposed activities;
- Identify all Controlled Waters that may be affected by the works and temporary discharge points to the on-site drainage ditches and the marine environment;
- Implement a pollution control system during earthworks and construction; and
- Monitor construction procedures to ensure management of risk is maintained.

### 11.5.2 Proposed Mitigation for Excavations

- Take relevant precautions to ensure no services are struck during excavations. Ensure relevant emergency response and contacts are in place in the event services are stuck which could impact the water environment, e.g. oil line, water main, sewer;
- Scan excavation areas for potential unrecorded culverts/field drains. De-watering measures to be present in the event of a leak;
- Existing culverts/field drains to be protected to prevent potentially polluted site run-off discharging to them prior to treatment;
- Plan and design dewatering activities to minimise the local drawdown of perched groundwater in peatland habitat, and maintain the hydrology of identified sensitive habitats;

- Prevent site run-off entering excavations and regular de-water to prevent infiltration to groundwater. Ensure that dewatering of excavations is directed away from drainage ditches and the marine environment; and
- Any deep excavations (e.g. boreholes, piled foundations) must be protected to prevent infiltration of site run-off and a direct pathway to groundwater.

### 11.5.3 Proposed Mitigation for Concrete Works

- If concrete is brought to site, provide dedicated concrete washout skip/basin to prevent any uncontrolled spilling of material in-site or nearby public roads;
- Concrete washout facilities to be regular maintained and solids to be disposed of safely;
- If on-site concrete batching is needed, ensure necessary containment measures are in place and suitable disposal and cleaning methods;
- Robust emergency response in place for any concrete spillage on site;
- Correct disposal of any waste or surplus concrete in agreed suitable locations both onsite and offsite;
- Where applicable, shuttered pours should be used to prevent on concrete losses to ground;
- Ensure excavations ae sufficiently dewatered before concreting begins and that dewatering continues while concrete sets; and
- Cover freshly poured concrete surfaces to prevent any polluted run-off attributed with wet weather.

### 11.5.4 Fuel and Chemical Storage Measures

- Follow measures set out in the 'Outline Pollution Prevention Management Plan' section 11.1 of the outline CEMP;
- Maintain oil booms and absorbent pads within all work areas;
- Fuel and oil deliveries to take place on an impermeable transfer area with a bunding facility capable of handling a major spill;
- Assign designated refuelling areas where appropriate and site them as far as practicably possible and at least 20 m from adjacent field drains and public sewers; and
- Install operational drainage as early as possible with the inclusion of oil separators.

### 11.5.5 Proposed Mitigation for Sediment Management

- Control and divert surface water entering site from surrounding land (via cut-off drains) to reduce potential impacted water volumes;
- Minimise use of stockpiles and/or cover and contain stockpiles and provide sediment interception measures at their bases, e.g. silt fencing or cut-off drains and check dams;
- If topsoil is to be stored, avoid constructing stockpiles more than 2m high. This will ensure anaerobic conditions do not occur and that the soil will remain fertile and capable of being re-seeded. It will also be less susceptible to erosion;
- Temporary drainage measures to be installed which provide filtration (filter drains or filter strips) and settlement (ponds/basins) to collect sediments prior to offsite discharge;

- Avoid mass overburden stripping on the site, expose parts of the site only when essential for operation;
- Temporary drainage measures and silt fencing to be installed around large areas of exposed soils;
- Ensure a robust site traffic management plan is in place to reduce sediment run-off risks. Good practices include; minimise turning of tracked vehicles where possible and manage dedicated turning areas appropriately (hard surfacing, silt fencing etc.), avoid unnecessary turning of large site plant and minimise overall routes on site to better manage sediment run-off;
- Prevent/reduce offsite sediment impacts to public roads. Good practices include; wheel was facilities, site-road sweeping, vehicles only permitted on site not to use public roads, formally surfaced site car park and separate access points for cars and plant/deliveries;
- Bowsers to be used to keep exposed earth and soils damp preventing dust generation reaching nearby watercourses (sediment build-up can be managed on-site); and
- Dedicated plant washing areas to control sediment run-off.

### 11.5.6 Contingency Planning and Emergency Procedures

All pollution prevention consumables and plant to be made readily available at all times. Keep spill kits in all vehicles to enable a rapid and effective response to any accidental spillage or discharge; and

Train all construction staff in the effective use of spill kits and raise awareness of all preventative measures for water pollution.

## 11.6 Habitat and Protected Species Mitigation

A formal Species Protection Plan (SPP) is not required at this stage. However, the Applicant is committed to pre-construction protected species surveys and if any are found near works areas then additional mitigation measures will be agreed and implementation of a formal SPP will be considered.

To protect important ecological features during the construction of the Proposed Development, the good practice and mitigation measures outlined in the EIA Report Chapter 8 on Ecology and Biodiversity will be adhered to. These measures follow the “mitigation hierarchy” as described in CIEEM guidance (CIEEM 2018) which follows a sequence of avoidance, mitigation, compensation and enhancement measures.

### 11.6.1 Design and layout mitigation

- A minimum 50 m buffer for any infrastructure or construction activity around all watercourses. No watercourse crossings are anticipated;
- Existing tracks have been used where possible, in order to reduce the footprint of the Proposed Development;
- Avoidance of areas of deeper peats (i.e. areas of >1 m depth);
- Areas of disturbed ground preferentially selected over intact peatland; and
- Avoidance of habitats of significant conservation value and consideration of areas with the potential to support protected species in relation to the Billet Plant and associated infrastructure, as far as practicable.

### 11.6.2 Pre-construction mitigation

A pre-construction survey for protected species will be carried out. If evidence of a protected species presence is identified, additional mitigation may be identified and implemented such as a SPP to prevent impacts on individuals.

### 11.6.3 Construction mitigation

The Developer will appoint a suitably qualified ECoW prior to the commencement of any construction activities. The ECoW will oversee all construction activities, as well as providing toolbox talks to all site personnel with regards to priority species and habitats, undertaking monitoring works, overseeing the relocation of significant stands of nationally important plant species, and briefing relevant staff and contractors as appropriate.

A Peat Management Plan (PMP) will be implemented to minimise excavation of peat and to ensure the re-use of excavated peat within the site for biodiversity benefits.

## 11.7 Framework Construction Traffic Management Plan

A Framework Construction Traffic Management Plan (CTMP) has been prepared in order to manage traffic during the construction of the Proposed Development and is presented in Appendix 2. The Management Plan provides details on the access arrangements for construction traffic to and from the Development site and provides details of the mitigation measures required to ensure that disruptions are minimised.

## 11.8 Draft Peat Management Plan

A Peat Management Plan (PMP) will be implemented during the construction phase of the Proposed Development to manage and reinstate the peat resource present in the area of works. The Draft PMP is presented in Appendix 3 and Technical Appendix 8.2 of Chapter 8 of the EIA Report which covers the following areas:

- Peat depths within the site and immediately adjacent areas;
- Surplus peat quantities;
- Principles of peat re-use;
- Receptor locations for the reinstatement of peat and the quantities of peat that can be accommodated within them;
- Method Statement detailing how peat will be excavated, temporarily stored, reinstated and monitored.

The Draft PMP will be updated and finalised post consent and following further site investigation and stakeholder consultation. It will then remain a live document, which may be subject to revision throughout the project as needed.

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# Appendix 1 – Outline Site Waste Management Plan

# Billet Production Facility

# Site Specific Site Waste Management Plan

Document no.: 1

Revision: v0.1

| Revision | Date | Author | Checked by | Approved by | Revision Details: |
|---|---|---|---|---|---|
| v0.1 | 02/02/2020 | H. Backhurst | R. Fain | R.Fain | Template as Appendix X to Outline CEMP |
| | | | | | |
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**SECURITY CLASSIFICATION: OFFICIAL**

Site Specific Site Waste Management Plan
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**Add a row for each new effect assessed under a design change / option. This should go below the relevant line where it was originally assessed below. See example on same file path as this document.**

| Date | Completed by | CFA | Summary | Excavated material types | Estimated quantity of excavated material (tonnes) | Estimated quantity of surplus excavated material for disposal to landfill (tonnes)48 | Construction | Operation | Source |
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Site Specific Site Waste Management Plan
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## Site Specific SWMP Template Guidance

This spreadsheet complies the site specific SWMP information. The site specific information is summarised in the 'To Export' tab for each site and will fed into the Overarching SWMP. The Overarching SWMP will cover waste generated and managed in package C1

When entering data into the SWMP template there are two main methods:
- **Free entry** - this allows information to be typed into the cell
- **Drop down menu** - clicking on the cell (highlighted in orange) and a drop down menu will open.
You only need to enter information into unshaded cells, green shaded cells populate automatically

## SWMP Template Definitions

**Activities**
**Demolition** – removal of existing buildings and/or structures
**Construction** – all construction activities

**EWC code -** The European Waste Catalogue (EWC) is a list of waste codes and descriptions. It classifies/categorises waste material according to the type of waste and how it was generated.
**Class -** for the SWMP this is defined as inert, hazardous or non hazardous
**Description -** for the SWMP this is the EWC code description
**Waste Type -** this is description of the waste type i.e. concrete, brick

| Excel Tab | Notes |
|---|---|
| **Site Details & Responsibilities** | This is where information on the site should be entered along with who is responsible for waste management onsite. Details on the location of any training records also need to be recorded here |
| **SWMP checklist** | This is a checklist of questions that need to be answered. There is a drop down menu for each question requiring a 'yes' or 'no' answer. Additional comments should be provided. |
| **Waste Reduction Measures** | This is where information on the waste reduction measures identified when planning and implementing the SWMP should be recorded. Waste reduction measures might be on the nature of the project construction method or materials employed in order to minimise the quantity of waste produced on site. Record decisions that relate to onsite waste management and recovery of waste for example establishing a plasterboard take back scheme with suppliers. |
| **Waste Segregation Procedures** | This is where information on the waste segregation procedures should be entered |
| **Carriers and Facility Checks** | This sheet is where the carriers and waste facilities information you intend to use should be recorded. Information on this sheet feeds through to "EM&W Forecast and Destinations", and "Actual Waste Movements" sheets |
| **Waste Forecast & Destinations** | This is where all forecast excavated materials and waste arisings for the site should be entered using a combination of drop down menus and free entry cells. It is also where the planned destination should be selected from the drop down menu (planned destinations are selected via a drop-down list populated from "Carrier and Facility Checks"). Most cells on this sheet use drop down menus. Free entry cells are used for entering estimated quantity numbers, material type and recording which project team member provided the forecast. |
| **Actual Waste Movements** | This sheet is where the actual waste arisings and movements are recorded. |
| **Reporting** | The beginning of this sheet provides a summary of the performance of the site and is automatically populated from information provided from other sheets. This sheet shows all the data recorded in the SWMP |
| **KPI Summary** | The beginning of this sheet provides a summary of the performance of the site and is automatically populated from information provided from other sheets. Details in the second table need to be provided on the reasons for the difference between forecast and actual figures to understand any variance between these and implications / benefits for this project / future stages, together with lessons learnt and any cost savings / increases. |
| **To Export** | This sheet summarises the specific SWMP information that will be used to fed into the Overarching SWMP |

## Site Information

**Please provide details below on site information and responsibilities for waste management**

| | |
|---|---|
| Site Name | Billet Production Facility |
| Site Number | 1 |
| Site Address / Location | Lochaber Smelter, Fort William, PH33 6TH |
| Site Location Description | Part of the site of the existing Lochaber Smelter. Approximately 3km north east of Fort William town centre in Lochaber, West Highlands of Scotland. |
| Project value | |
| Client | Alvance British Aluminium |
| Contractor | TBC |
| Document Number | 1 |
| Revision Number | v0.1 |
| Date prepared | 02/02/2020 |
| Date updated | |
| Start Date (dd/mm/yy) | |
| Completion Date (dd/mm/yy) | |

## Responsibility

| | Name | Company | Contact details |
|---|---|---|---|
| Client | James Tangney | vance British Aluminiu | James.Tangney@lochabersmelter.com |
| Contractor | TBC | TBC | TBC |
| Person responsible for waste management at the site | TBC, Principal Contractor | TBC | TBC |
| Person responsible for completing the SWMP | TBC, Principal Contractor | TBC | TBC |
| On site waste management coordinator | TBC, Principal Contractor | TBC | TBC |
| Person responsible for document control | TBC, Principal Contractor | TBC | TBC |

| | |
|---|---|
| Where will the SWMP be kept? (A copy should be kept on site) | Construction Site Office |
| Electronic or paper based copy? | |

| | |
|---|---|
| Has a Materials Management Plan (MMP) been produced for the site? | Yes |
| Where will the MMP be kept? | Construction Site Office |

| | |
|---|---|
| Where are training records held? | TBC |

**Confirm that the plan has been monitored on a regular basis to ensure that work is progressing according to the plan**

## Declaration statement:

The client and contractor will take reasonable steps to ensure waste duty of care is complied with, materials are handled efficiently and waste is managed appropriately.

### Contractor

| | |
|---|---|
| Signature | |
| Print Name | |
| Organisation | |
| Date | |

### Client

| | |
|---|---|
| Signature | |
| Print Name | |
| Organisation | |
| Date | |

| | A | B | C | D |
|---|---|---|---|---|
| 1 | **Designing out waste measures / SWMP checklist** | | | |
| 2 | | | | |
| 3 | **Please complete the checklist below and provide further comments where appropriate, this may include further evidence to be appended to the SWMP** | | | |
| 4 | | | | |
| 5 | | **Questions** | **Yes / No** | **Comment** |
| 6 | | | | |
| 7 | **Design** | | | |
| 8 | 1 | Has the project programme been developed to facilitate waste minimisation? | Yes | The proposed development will aim to avoid the creation of waste through the detailed design stages. |
| 9 | 2 | Has full consideration been given to the use of secondary and recycled materials? | Yes | Where possible, the Principal Contractor will purchase reclaimed or recycled materials or procure materials from sustainable sources. |
| 10 | 3 | Have opportunities been considered for re-use of materials on-site or off-site? | Yes | Consider re-using uncontaminated excavated material arising during construction and rubble and concrete as backfill, subsoil in landscaping areas and timber offcuts as temporary form work. |
| 11 | 4 | Have opportunities been considered for off-site reprocessing of materials? | | TBC |
| 12 | **Procurement** | | | |
| 13 | 5 | Has material requirements been evaluated to minimise over-ordering and site wastage? | Yes | The Principal Contractor will undertake accurate measurement and ordering of required materials to reduce the volume of waste generated during construction (e.g. ordering standardised sizes to reduce onsite cutting) |
| 14 | 6 | Have targets and incentives been set to encourage waste minimisation, re-use and recycling? | | TBC |
| 15 | 7 | Has full consideration been given to the use of secondary and recycled materials? | Yes | Where possible, the Principal Contractor will purchase reclaimed or recycled materials or procure materials from sustainable sources. |
| 16 | 8 | Have targets been set for the different types of waste likely to arise from the project? | | TBC |
| 17 | 9 | Can unused materials be returned to the purchaser or used at another site? | Yes | Ensure suppliers have a take-back option for surplus. |
| 18 | 10 | Is unwanted packaging to be returned to the supplier for recycling or re-use? | Yes | Ensure suppliers have a take-back option for packaging and maintain good communication with suppliers to reduce the amount of packaging included in deliveries. |
| 19 | **Construction** | | | |
| 20 | 11 | Has the infrastructure benchmark of 7.1 tonnes/£100,000 project value been achieved? | | TBC following appointment of Principal Contractor. |
| 21 | 12 | Where relevant, has discharge consent been obtained from the Environment Agency? | | |
| 22 | 13 | Has agreement been sought from the local water company for trade effluent discharge? | | |
| 23 | 14 | Has disposal of liquid wastes such as wash-down water and lubricants been considered? | | |
| 24 | 15 | Have opportunities been considered for on-site processing and re-use of materials? | | |
| 25 | 16 | Have all site staff undertaken appropriate training with regards materials and waste mangement? | | |
| 26 | 17 | Have you identified the most appropriate sites for disposal of residual waste? | | |
| 27 | 18 | Do any of the waste management activities require an environmental permit/exemption? | | |
| 28 | 19 | Have relevant sub-contractors producing significant waste streams been identified/trained? | | |
| 29 | 20 | Is there a designated area waste management, including segregation of waste? | | |
| 30 | 21 | Have measures been put in place to reduce packaging waste? | | |
| 31 | 22 | Have measures been put in place to deal with expected (and unexpected) hazardous waste? | | |
| 32 | 23 | Are selected waste materials segregated and stored to allow best value to be obtained? | | |
| 33 | 24 | Have best practice logistic techniques been implemented for the management of materials and waste? | | |
| 34 | 25 | Are containers/skips clearly labelled to avoid confusion? | | |
| 35 | 26 | Are the Duty of Care procedures complied with? | | |
| 36 | 27 | Are checks made that waste is received at the intended site? | | |
| 37 | 28 | Have copies of all relevant Duty of Care documentation been obtained and filed? | | |
| 38 | 29 | Has a completion report on the use of secondary materials, waste reduction, recovery and disposal been prepared? | | |
| 39 | 30 | Have waste management issues/lessons learned been identified for dissemination? | | |

## Waste Reduction Measures

**Please use the table below to record decisions for onsite waste reduction measures identified when planning and implementing the SWMP for the site for inert, non-hazardous and hazardous wastes. This should include procedures and commitments for minimising non-hazardous waste in line with the benchmark (7.1 tonnes/£100,000 project value). This might include waste prevention, reduction and recovery actions.**

| Project Phase | Waste reduction measure | Action taken/Date of action | Action owner | Date action complete | EWC code | Class | Material type | Estimated cost savings | Anticipated waste reduced | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | volume ($m^3$) | tonnes (t) |
| | TBC following appointment of Principal Contractor. | | | | | | | | | |
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## Waste Segregation Procedures

| Details of waste storage area |
|---|
| *TBC following appointment of Principal Contractor.* |

| Details of waste segregation arrangements, bins and colour coding bins |
|---|
| *TBC following appointment of Principal Contractor.* |

| Details of storage areas for off cuts and materials to minimise waste |
|---|
| *TBC following appointment of Principal Contractor.* |

## Carriers and Facility Checks

**Please record the carriers and waste facilities information you intend to use to remove waste from site.**
**When selecting from the drop down box "Carrier / Waste facility" the cells that need to be completed will stay shaded white and those that do not need to be populated will be shaded grey.**

| Carrier / Waste facility | Carrier | Contractor | Site name and address including postcode | Management Method | Carrier registration / permit number | Permitted waste type(s) | Expiry date | WCR/WML/Permits checked with EA | | Location of relevant documentation |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Yes | Date / Name | |
| | TBC following appointment of Principal Contractor. | | | | | | | | | |
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## Summary of Forecast Excavated Material and Waste Arisings and Planned Destination

**The table below provides a summary on the forecast waste movements. It will be populated automatically once data is entered in the Forecast Waste Arisings table**

| | | Construction and Demolition Waste Totals | | | | |
|---|---|---|---|---|---|---|
| | | volume ($m^3$) | tonnes (t) | Forecast total cost (£) | £/ $m^3$ | £/ t |
| Reuse - on-site | | - | - | £ - | £ - | £ - |
| Reuse - off-site | | - | - | £ - | £ - | £ - |
| Recycling | | - | - | £ - | £ - | £ - |
| Recovery | | - | - | £ - | £ - | £ - |
| Disposal | | - | - | £ - | £ - | £ - |
| **Total** | | **-** | **-** | **£ -** | **£ -** | **£ -** |

## Forecast Waste Arisings and Planned Destination

**Please record your forecast waste arising's once the construction team has mobilised on site and identify the planned destination (planned destinations are selected via a drop-down list populated from "Carrier and Facility Checks")**

| Date | Waste description | EWC code | EWC description | Classification | Construction or Demolition activity | Waste totals | | Carrier | Contractor | Contractor Site name & address | Management method | Costs | | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | volume ($m^3$) | tonnes (t) | | | | | Forecast total cost (£) | £/ $m^3$ | £/ t | |
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| | | Construction and Demolition Waste Totals | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | volume ($m^3$) | tonnes (t) | Forecast total cost (£) | £/ $m^3$ | £/ t | | | | | | | | | |
| Reuse - on-site | | - | - | £ - | £ - | £ - | | | | | | | | | |
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## Summary of Actual Waste Arisings and Movements

**The table below provides a summary on the actual waste arisings and movements. It will be populated automatically once data is entered in the Actual Waste Arisings and Movements table**

| | Construction and Demolition Waste Totals | | | | |
|---|---|---|---|---|---|
| | volume ($m^3$) | tonnes (t) | Actual cost | £/ $m^3$ | £/ t |
| Reuse - on site | 0 | 0 | £ - | £ - | £ - |
| Reuse - off site | 0 | 0 | £ - | £ - | £ - |
| Recycling | 0 | 0 | £ - | £ - | £ - |
| Recovery | 0 | 0 | £ - | £ - | £ - |
| Disposal | 0 | 0 | £ - | £ - | £ - |
| **Total** | **0** | **0** | **£ -** | **£ -** | **£ -** |

## Actual Waste Arisings and Movements

**Please record your actual waste arisings and movements**

| Date | Waste description | EWC code | EWC Description | Classification | Construction or Demolition activity | Carrier | Contractor | Contractor Site name & address | Management method | WTN reference | Weighbridge ticket reference | Quantities | | Total Cost (£) | £/ $m^3$ | £/ t | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | volume ($m^3$) | tonnes (t) | | | | |
| | | | | | | | | | | | | | | | £ - | £ - | |
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## Reporting

**This table compares the forecasted waste quantities with the actual waste quantities (this table populates automatically)**

| | | | Total Construction and Demolition Waste Arisings | | | | Reuse - on site | | | | Reuse - off site | | | | Recycling | | | | Recovery | | | | Disposal | | | | Cost of waste disposal (off-site) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Forecast (F)/Actual (A) | | | Forecast | | Actual | | Forecast | | Actual | | Forecast | | Actual | | Forecast | | Actual | | Forecast | | Actual | | Forecast | | Actual | | Forecast | | Actual | |
| Unit (tonnes) | | | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | £/ $m^3$ | £/ t | £/ $m^3$ | £/ t |
| Class | Inert | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Non hazardous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Hazardous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EWC Code | Class | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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## Summary

**This is a summary table of the performance of the site**

| | Construction and Demolition Waste Totals | | | |
|---|---|---|---|---|
| | Forecast | | Actual | |
| | $m^3$ | t | $m^3$ | t |
| Total waste | - | - | - | - |
| Total reuse on site | - | - | - | - |
| Total reuse off site | - | - | - | - |
| Total recycling | - | - | - | - |
| Total to recovery | - | - | - | - |
| Total to disposal | - | - | - | - |
| % diverted for reuse on-site | 0.0% | 0.0% | 0.0% | 0.0% |
| % diverted for reuse off-site | 0.0% | 0.0% | 0.0% | 0.0% |
| Total % diverted for reuse | 0.0% | 0.0% | 0.0% | 0.0% |
| % diverted for recycling | 0.0% | 0.0% | 0.0% | 0.0% |
| % diverted from landfill | 0.0% | 0.0% | 0.0% | 0.0% |

## Comparison of forecast and actual waste streams

**Please provide details on the reasons for the difference between forecast and actual figures to understand any variance between these and implications / benefits for this project / future projects, together with lessons learnt and any cost savings / increases.**

| | Reasons |
|---|---|
| **Explanation for deviations from original / previous plan** | N/A |
| **Lessons learnt** | N/A |
| **Details of any cost savings made or increases to costs** | N/A |
| **Revisions to plan (revision number, date, details)** | N/A |

**This tab will be populated automatically. It is not necessary to enter any data on this sheet.**
**The summary in this tab will feed in to the overarching SWMP**

## Summary

### Summary of roles and responsibilities

| Site number | Project site name | Site Address | Contractor | Person responsible for waste management at the site | SWMP author | On site waste management coordinator |
|---|---|---|---|---|---|---|
| 1 | Billet Production Facility | Lochaber Smelter, Fort William, PH33 6TH | TBC | TBC, Principal Contractor | TBC, Principal Contractor | TBC, Principal Contractor |

### Summary of site information

| Site number | Project site name | Forecast costs | | Actual costs | | Forecast Quantities | | Actual | | Start date | Completion date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | £/ $m^3$ | £/ tonnes (t) | £/ $m^3$ | £/ t | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | | |
| 1 | Billet Production Facility | £ - | £ - | £ - | £ - | - | - | 0 | - | 00/01/1900 | 00/01/1900 |

### Summary of waste actions

| Waste Reduction Measure | Action owner | EWC code | Material type | Action taken | Estimated cost savings | Anticipated Waste Reduced | |
|---|---|---|---|---|---|---|---|
| | | | | | | volume ($m^3$) | t |
| TBC following appointment of Principal Contractor. | - | - | - | - | £ - | 0 | 0 |
| - | - | - | - | - | £ - | 0 | 0 |
| - | - | - | - | - | £ - | 0 | 0 |
| - | - | - | - | - | £ - | 0 | 0 |
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| - | - | - | - | - | £ - | 0 | 0 |
| - | - | - | - | - | £ - | 0 | 0 |
| - | - | - | - | - | £ - | 0 | 0 |
| - | - | - | - | - | £ - | 0 | 0 |
| - | - | - | - | - | £ - | 0 | 0 |

### Forecast - Summary of estimated waste types and quantities

| Forecast quantities for inert | | Forecast quantities for non hazardous | | Forecast quantities for hazardous | | Total ($m^3$) | Total (t) |
|---|---|---|---|---|---|---|---|
| volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | | |
| - | - | - | - | - | - | - | - |

### Actual - Summary of actual waste movements

| Actual waste quantities for inert | | Actual waste quantities for non hazardous | | Actual waste quantities hazardous | | Total ($m^3$) | Total tonnes (t) |
|---|---|---|---|---|---|---|---|
| volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | | |
| - | - | - | - | - | - | - | - |

### Summary of forecasted and actual waste arisings

| | | Total Waste Arisings | | | | Reuse - on site | | | | Reuse - off site | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Forecast (F)/Actual (A) | | Forecast | | Actual | | Forecast | | Actual | | Forecast | | Actual | |
| Unit | | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) |
| Class | Inert | - | - | - | - | - | - | - | - | - | - | - | - |
| | Non hazardous | - | - | - | - | - | - | - | - | - | - | - | - |
| | Hazardous | - | - | - | - | - | - | - | - | - | - | - | - |

| | | Recycling | | | | Recovery | | | | Disposal | | | | Cost of waste disposal (offsite) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Forecast (F)/Actual (A) | | Forecast | | Actual | | Forecast | | Actual | | Forecast | | Actual | | Forecast | | Actual | |
| Unit | | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) | volume ($m^3$) | tonnes (t) |
| Class | Inert | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | £ - | £ - | £ - | £ - |
| | Non hazardous | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | £ - | £ - | £ - | £ - |
| | Hazardous | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | £ - | £ - | £ - | £ - |

### Comparison of forecast and actual waste streams

| | Reasons |
|---|---|
| Explanation for deviations from original / previous plan | N/A |
| Lessons learnt | N/A |
| Details of any cost savings made or increases to costs | N/A |
| Revisions to plan (revision number, date, details) | N/A |

### Summary of carriers and waste facilities

| Carrier / Waste facility | Carrier | Contractor | Site name and address including postcode | Management Method | Carrier registration / permit number | Permitted waste type(s) | Expiry date | WCR/WML/Permits checked with EA | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Date and name |
| - | TBC following appointment of Principal Contractor. | - | - | - | - | - | 00/01/1900 | - | - |
| - | - | - | - | - | - | - | 00/01/1900 | - | - |
| - | - | - | - | - | - | - | 00/01/1900 | - | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 13 01 01* | Hazardous | hydraulic oils, containing PCBs (1) | password | Thames | Yes | Combined EWC | Carriers | Index | Order | Ordered Destination list |
| 13 01 04* | Hazardous | chlorinated emulsions | | | No | 0 | TBC following | 1 | 1 | TBC following appointment of Principal Contractor. |
| 13 01 05* | Hazardous | non-chlorinated emulsions | | | | 0 | | | 2 | |
| 13 01 09* | Hazardous | mineral-based chlorinated hydraulic oils | | | paper | 0 | | | 3 | |
| 13 01 10* | Hazardous | mineral based non-chlorinated hydraulic oils | | | electronic | 0 | | | 4 | |
| 13 01 11* | Hazardous | synthetic hydraulic oils | | | Reuse - on site | 0 | | | 5 | |
| 13 01 12* | Hazardous | readily biodegradable hydraulic oils | | | Reuse - off site | 0 | | | 6 | |
| 13 01 13* | Hazardous | other hydraulic oils | | | Recycling | 0 | | | 7 | |
| 13 02 04* | Hazardous | mineral-based chlorinated engine, gear and lubricating oils | | | Recovery | 0 | | | 8 | |
| 13 02 05* | Hazardous | mineral-based non-chlorinated engine, gear and lubricating oils | | | Disposal | 0 | | | 9 | |
| 13 02 06* | Hazardous | synthetic engine, gear and lubricating oils | | | | 0 | | | 10 | |
| 13 02 07* | Hazardous | readily biodegradable engine, gear and lubricating oils | | | | 0 | | | 11 | |
| 13 02 08* | Hazardous | other engine, gear and lubricating oils | | | | 0 | | | 12 | |
| 13 03 01* | Hazardous | insulating or heat transmission oils containing PCBs | | | | 0 | | | 13 | |
| 13 03 06* | Hazardous | mineral-based chlorinated insulating and heat transmission oils other than those mentioned in 13 03 01 | | | | 0 | | | 14 | |
| 13 03 07* | Hazardous | mineral-based non-chlorinated insulating and heat transmission oils | | | | 0 | | | 15 | |
| 13 03 08* | Hazardous | synthetic insulating and heat transmission oils | | | | 0 | | | 16 | |
| 13 03 09* | Hazardous | readily biodegradable insulating and heat transmission oils | | | Design | 0 | | | 17 | |
| 13 03 10* | Hazardous | other insulating and heat transmission oils | | | Procurement | 0 | | | 18 | |
| 13 04 01* | Hazardous | bilge oils from inland navigation | | | Construction | 0 | | | 19 | |
| 13 04 02* | Hazardous | bilge oils from jetty sewers | | | | 0 | | | 20 | |
| 13 04 03* | Hazardous | bilge oils from other navigation | | | Development site | 0 | | | 21 | |
| 13 05 01* | Hazardous | solids from grit chambers and oil/water separators | | | Carrier | 0 | | | 22 | |
| 13 05 02* | Hazardous | sludges from oil/water separators | | | Waste facility | 0 | | | 23 | |
| 13 05 03* | Hazardous | interceptor sludges | | | | 0 | | | 24 | |
| 13 05 06* | Hazardous | oil from oil/water separators | | | Construction | 0 | | | 25 | |
| 13 05 07* | Hazardous | oily water from oil/water separators | | | Demolition | 0 | | | 26 | |
| 13 05 08* | Hazardous | mixtures of wastes from grit chambers and oil/water separators | | | Excavation | 0 | | | 27 | |
| 13 07 01* | Hazardous | fuel oil and diesel | | | | 0 | | | 28 | |
| 13 07 02* | Hazardous | petrol | | | | 0 | | | 29 | |
| 13 07 03* | Hazardous | other fuels (including mixtures) | | | | 0 | | | 30 | |
| 13 08 01* | Hazardous | desalter sludges or emulsions | | | | 0 | | | 31 | |
| 13 08 02* | Hazardous | other emulsions | | | | 0 | | | 32 | |
| 13 08 99* | Hazardous | wastes not otherwise specified | | | | 0 | | | 33 | |
| 15 01 01 | Non Hazardous | paper and cardboard packaging | | | | 0 | | | 34 | |
| 15 01 02 | Non Hazardous | plastic packaging | | | | 0 | | | 35 | |
| 15 01 03 | Non Hazardous | wooden packaging | | | | 0 | | | 36 | |
| 15 01 04 | Non Hazardous | metallic packaging | | | | 0 | | | 37 | |
| 15 01 05 | Non Hazardous | composite packaging | | | | 0 | | | 38 | |
| 15 01 06 | Non Hazardous | mixed packaging | | | | 0 | | | 39 | |
| 15 01 07 | Non Hazardous | glass packaging | | | | 0 | | | 40 | |
| 15 01 09 | Non Hazardous | textile packaging | | | | 0 | | | 41 | |
| 15 01 10* | Hazardous | packaging containing residues of or contaminated by dangerous substances | | | | 0 | | | 42 | |
| 15 01 11* | Hazardous | metallic packaging containing a dangerous solid porous matrix (for example asbestos), including empty pressure containers | | | | 0 | | | 43 | |
| 15 02 02* | Hazardous | absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances | | | | 0 | | | 44 | |
| 15 02 03 | Non Hazardous | absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02 | | | | 0 | | | 45 | |
| 16 01 03 | Non Hazardous | end-of-life tyres | | | | 0 | | | 46 | |
| 16 01 04 | Non Hazardous | discarded vehicles; NB: This entry is not part of the proposal submitted for opinion to the Committee. The necessary changes to this entry will be made on the basi | | | | 0 | | | 47 | |
| 16 01 06 | Non Hazardous | end-of-life vehicles, containing neither liquids nor other hazardous components | | | | 0 | | | 48 | |
| 16 01 07* | Hazardous | oil filters | | | | 0 | | | 49 | |
| 16 01 08* | Hazardous | components containing mercury | | | | 0 | | | 50 | |
| 16 01 09* | Hazardous | components containing PCBs | | | | 0 | | | 51 | |
| 16 01 10* | Hazardous | explosive components (for example air bags) | | | | 0 | | | 52 | |
| 16 01 11* | Hazardous | brake pads containing asbestos | | | | 0 | | | 53 | |
| 16 01 12 | Non Hazardous | brake pads other than those mentioned in 16 01 11 | | | | 0 | | | 54 | |
| 16 01 13* | Hazardous | brake fluids | | | | 0 | | | 55 | |
| 16 01 14* | Hazardous | antifreeze fluids containing dangerous substances | | | | 0 | | | 56 | |
| 16 01 15 | Non Hazardous | antifreeze fluids other than those mentioned in 16 01 14 | | | | 0 | | | 57 | |
| 16 01 16 | Non Hazardous | tanks for liquefied gas | | | | 0 | | | 58 | |
| 16 01 17 | Non Hazardous | ferrous metal | | | | 0 | | | 59 | |
| 16 01 18 | Non Hazardous | non-ferrous metal | | | | 0 | | | 60 | |
| 16 01 19 | Non Hazardous | plastic | | | | 0 | | | 61 | |
| 16 01 20 | Non Hazardous | glass | | | | 0 | | | 62 | |
| 16 01 21* | Hazardous | hazardous components other than those mentioned in 16 01 07 to 16 01 11 and 16 01 13 and 16 01 14 | | | | 0 | | | 63 | |
| 16 01 22 | Non Hazardous | components not otherwise specified | | | | 0 | | | 64 | |
| 16 01 99 | Non Hazardous | wastes not otherwise specified | | | | 0 | | | 65 | |
| 16 02 09* | Hazardous | transformers and capacitors containing PCBs | | | | 0 | | | 66 | |
| 16 02 10* | Hazardous | discarded equipment containing or contaminated by PCBs other than those mentioned in 16 02 09 | | | | 0 | | | 67 | |
| 16 02 11* | Hazardous | discarded equipment containing chlorofluorocarbons, HCFC, HFC | | | | 0 | | | 68 | |
| 16 02 12* | Hazardous | discarded equipment containing free asbestos | | | | 0 | | | 69 | |
| 16 02 13* | Hazardous | discarded equipment containing hazardous components (2) other than those mentioned in 16 02 09 to 16 02 12 | | | | 0 | | | 70 | |
| 16 02 14 | Non Hazardous | discarded equipment other than those mentioned in 16 02 09 to 16 02 13 | | | | 0 | | | 71 | |
| 16 02 15* | Hazardous | hazardous components removed from discarded equipment | | | | 0 | | | 72 | |
| 16 02 16 | Non Hazardous | components removed from discarded equipment other than those mentioned in 16 02 15 | | | | 0 | | | 73 | |
| 16 03 03* | Hazardous | inorganic wastes containing dangerous substances | | | | 0 | | | 74 | |
| 16 03 04 | Non Hazardous | inorganic wastes other than those mentioned in 16 03 03 | | | | 0 | | | 75 | |
| 16 03 05* | Hazardous | organic wastes containing dangerous substances | | | | 0 | | | 76 | |
| 16 03 06 | Non Hazardous | organic wastes other than those mentioned in 16 03 05 | | | | 0 | | | 77 | |
| 16 04 01* | Hazardous | waste ammunition | | | | 0 | | | 78 | |
| 16 04 02* | Hazardous | fireworks wastes | | | | 0 | | | 79 | |
| 16 04 03* | Hazardous | other waste explosives | | | | 0 | | | 80 | |
| 16 05 04* | Hazardous | gases in pressure containers (including halons) containing dangerous substances | | | | 0 | | | 81 | |
| 16 05 05 | Non Hazardous | gases in pressure containers other than those mentioned in 16 05 04 | | | | 0 | | | 82 | |
| 16 05 06* | Hazardous | laboratory chemicals, consisting of or containing dangerous substances, including mixtures of laboratory chemicals | | | | 0 | | | 83 | |
| 16 05 07* | Hazardous | discarded inorganic chemicals consisting of or containing dangerous substances | | | | 0 | | | 84 | |
| 16 05 08* | Hazardous | discarded organic chemicals consisting of or containing dangerous substances | | | | 0 | | | 85 | |
| 16 05 09 | Non Hazardous | discarded chemicals other than those mentioned in 16 05 06, 16 05 07 or 16 05 08 | | | | 0 | | | 86 | |
| 16 06 01* | Hazardous | lead batteries | | | | 0 | | | 87 | |
| 16 06 02* | Hazardous | Ni-Cd batteries | | | | 0 | | | 88 | |
| 16 06 03* | Hazardous | mercury-containing batteries | | | | 0 | | | 89 | |
| 16 06 04 | Non Hazardous | alkaline batteries (except 16 06 03) | | | | 0 | | | 90 | |
| 16 06 05 | Non Hazardous | other batteries and accumulators | | | | 0 | | | 91 | |
| 16 06 06* | Hazardous | separately collected electrolyte from batteries and accumulators | | | | 0 | | | 92 | |
| 16 07 08* | Hazardous | wastes containing oil | | | | 0 | | | 93 | |
| 16 07 09* | Hazardous | wastes containing other dangerous substances | | | | 0 | | | 94 | |
| 16 07 99 | Non Hazardous | wastes not otherwise specified | | | | 0 | | | 95 | |
| 16 08 01 | Non Hazardous | spent catalysts containing gold, silver, rhenium, rhodium, palladium, iridium or platinum (except 16 08 07) | | | | 0 | | | 96 | |
| 16 08 02* | Hazardous | spent catalysts containing dangerous transition metals (3) or dangerous transition metal compounds | | | | 0 | | | 97 | |
| 16 08 03 | Non Hazardous | spent catalysts containing transition metals or transition metal compounds not otherwise specified | | | | 0 | | | 98 | |
| 16 08 04 | Non Hazardous | spent fluid catalytic cracking catalysts (except 16 08 07) | | | | 0 | | | 99 | |
| 16 08 05* | Hazardous | spent catalysts containing phosphoric acid | | | | 0 | | | 100 | |
| 16 08 06* | Hazardous | spent liquids used as catalysts | | | | 0 | | | 101 | |
| 16 08 07* | Hazardous | spent catalysts contaminated with dangerous substances | | | | 0 | | | 102 | |
| 16 09 01* | Hazardous | permanganates, for example potassium permanganate | | | | 0 | | | 103 | |
| 16 09 02* | Hazardous | chromates, for example potassium chromate, potassium or sodium dichromate | | | | 0 | | | 104 | |
| 16 09 03* | Hazardous | peroxides, for example hydrogen peroxide | | | | 0 | | | 105 | |
| 16 09 04* | Hazardous | oxidising substances, not otherwise specified | | | | 0 | | | 106 | |
| 16 10 01* | Hazardous | aqueous liquid wastes containing dangerous substances | | | | 0 | | | 107 | |
| 16 10 02 | Non Hazardous | aqueous liquid wastes other than those mentioned in 16 10 01 | | | | 0 | | | 108 | |
| 16 10 03* | Hazardous | aqueous concentrates containing dangerous substances | | | | 0 | | | 109 | |
| 16 10 04 | Non Hazardous | aqueous concentrates other than those mentioned in 16 10 03 | | | | 0 | | | 110 | |
| 16 11 01* | Hazardous | carbon-based linings and refractories from metallurgical processes containing dangerous substances | | | | 0 | | | 111 | |
| 16 11 02 | Non Hazardous | carbon-based linings and refractories from metallurgical processes others than those mentioned in 16 11 01, | | | | 0 | | | 112 | |
| 16 11 03* | Hazardous | other linings and refractories from metallurgical processes containing dangerous substances | | | | 0 | | | 113 | |
| 16 11 04 | Non Hazardous | other linings and refractories from metallurgical processes other than those mentioned in 16 11 03 | | | | 0 | | | 114 | |
| 16 11 05* | Hazardous | linings and refractories from non-metallurgical processes containing dangerous substances | | | | 0 | | | 115 | |
| 16 11 06 | Non Hazardous | linings and refractories from non-metallurgical processes others than those mentioned in 16 11 05 | | | | 0 | | | 116 | |
| 17 01 01 | Inert | concrete | | | | 0 | | | 117 | |
| 17 01 02 | Inert | bricks | | | | 0 | | | 118 | |
| 17 01 03 | Inert | tiles and ceramics | | | | 0 | | | 119 | |
| 17 01 06* | Hazardous | mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing dangerous substances | | | | 0 | | | 120 | |
| 17 01 07 | Inert | mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06 | | | | 0 | | | 121 | |
| 17 02 01 | Non Hazardous | wood | | | | 0 | | | 122 | |
| 17 02 02 | Non Hazardous | glass | | | | 0 | | | 123 | |
| 17 02 03 | Non Hazardous | plastic | | | | 0 | | | 124 | |
| 17 02 04* | Hazardous | glass, plastic and wood containing or contaminated with dangerous substances | | | | 0 | | | 125 | |
| 17 03 01* | Hazardous | bituminous mixtures containing coal tar | | | | 0 | | | 126 | |
| 17 03 02 | Non Hazardous | bituminous mixtures other than those mentioned in 17 03 01 | | | | 0 | | | 127 | |
| 17 03 03* | Hazardous | coal tar and tarred products | | | | 0 | | | 128 | |
| 17 04 01 | Non Hazardous | copper, bronze, brass | | | | 0 | | | 129 | |
| 17 04 02 | Non Hazardous | aluminium | | | | 0 | | | 130 | |
| 17 04 03 | Non Hazardous | lead | | | | 0 | | | 131 | |
| 17 04 04 | Non Hazardous | zinc | | | | 0 | | | 132 | |
| 17 04 05 | Non Hazardous | iron and steel | | | | 0 | | | 133 | |
| 17 04 06 | Non Hazardous | tin | | | | 0 | | | 134 | |
| 17 04 07 | Non Hazardous | mixed metals | | | | 0 | | | 135 | |
| 17 04 09* | Hazardous | metal waste contaminated with dangerous substances | | | | 0 | | | 136 | |
| 17 04 10* | Non Hazardous | cables containing oil, coal tar and other dangerous substances | | | | 0 | | | 137 | |
| 17 04 11 | Non Hazardous | cables other than those mentioned in 17 04 10 | | | | 0 | | | 138 | |
| 17 05 03* | Hazardous | soil and stones containing dangerous substances | | | | 0 | | | 139 | |
| 17 05 04 | Inert | soil and stones other than those mentioned in 17 05 03 | | | | 0 | | | 140 | |
| 17 05 05* | Hazardous | dredging spoil containing dangerous substances | | | | 0 | | | 141 | |
| 17 05 06 | Non Hazardous | dredging spoil other than those mentioned in 17 05 05 | | | | 0 | | | 142 | |
| 17 05 07* | Hazardous | track ballast containing dangerous substances | | | | 0 | | | 143 | |
| 17 05 08 | Non Hazardous | track ballast other than those mentioned in 17 05 07 | | | | 0 | | | 144 | |
| 17 06 01* | Hazardous | insulation materials containing asbestos | | | | 0 | | | 145 | |
| 17 06 03* | Hazardous | other insulation materials consisting of or containing dangerous substances | | | | 0 | | | 146 | |
| 17 06 04 | Non Hazardous | insulation materials other than those mentioned in 17 06 01 and 17 06 03 | | | | 0 | | | 147 | |
| 17 06 05* | Hazardous | construction materials containing asbestos | | | | 0 | | | 148 | |
| 17 08 01* | Hazardous | gypsum-based construction materials contaminated with dangerous substances | | | | 0 | | | 149 | |
| 17 08 02 | Non Hazardous | gypsum-based construction materials other than those mentioned in 17 08 01 | | | | 0 | | | 150 | |
| 17 09 01* | Hazardous | construction and demolition wastes containing mercury | | | | 0 | | | 151 | |
| 17 09 02* | Hazardous | construction and demolition wastes containing PCB (for example PCB-containing sealants, PCB-containing resin-based floorings, PCB-containing sealed glazing uni | | | | 0 | | | 152 | |
| 17 09 03* | Hazardous | other construction and demolition wastes (including mixed wastes) containing dangerous substances | | | | 0 | | | 153 | |
| 17 09 04 | Non Hazardous | mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03 | | | | 0 | | | 154 | |
| 20 01 01 | Non Hazardous | paper and cardboard | | | | 0 | | | 155 | |
| 20 01 02 | Non Hazardous | glass | | | | 0 | | | 156 | |
| 20 01 08 | Non Hazardous | biodegradable kitchen and canteen waste | | | | 0 | | | 157 | |
| 20 01 10 | Non Hazardous | clothes | | | | 0 | | | 158 | |
| 20 01 11 | Non Hazardous | textiles | | | | 0 | | | 159 | |
| 20 01 13* | Hazardous | solvents | | | | 0 | | | 160 | |
| 20 01 14* | Hazardous | acids | | | | 0 | | | 161 | |
| 20 01 15* | Hazardous | alkalines | | | | 0 | | | 162 | |
| 20 01 17* | Hazardous | photochemicals | | | | 0 | | | 163 | |
| 20 01 19* | Hazardous | pesticides | | | | 0 | | | 164 | |
| 20 01 21* | Hazardous | fluorescent tubes and other mercury-containing waste | | | | 0 | | | 165 | |
| 20 01 23* | Hazardous | discarded equipment containing chlorofluorocarbons | | | | 0 | | | 166 | |
| 20 01 25 | Non Hazardous | edible oil and fat | | | | 0 | | | 167 | |
| 20 01 26* | Hazardous | oil and fat other than those mentioned in 20 01 25 | | | | 0 | | | 168 | |
| 20 01 27* | Hazardous | paint, inks, adhesives and resins containing dangerous substances | | | | 0 | | | 169 | |
| 20 01 28 | Non Hazardous | paint, inks, adhesives and resins other than those mentioned in 20 01 27 | | | | 0 | | | 170 | |
| 20 01 29* | Hazardous | detergents containing dangerous substances | | | | 0 | | | 171 | |
| 20 01 30 | Non Hazardous | detergents other than those mentioned in 20 01 29 | | | | 0 | | | 172 | |
| 20 01 31* | Hazardous | cytotoxic and cytostatic medicines | | | | 0 | | | 173 | |
| 20 01 32 | Non Hazardous | medicines other than those mentioned in 20 01 31 | | | | 0 | | | 174 | |
| 20 01 33* | Hazardous | batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries | | | | 0 | | | 175 | |
| 20 01 34 | Non Hazardous | batteries and accumulators other than those mentioned in 20 01 33 | | | | 0 | | | 176 | |
| 20 01 35* | Hazardous | discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components (6) | | | | 0 | | | 177 | |
| 20 01 36 | Non Hazardous | discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35 | | | | 0 | | | 178 | |
| 20 01 37* | Hazardous | wood containing dangerous substances | | | | 0 | | | 179 | |
| 20 01 38 | Non Hazardous | wood other than that mentioned in 20 01 37 | | | | 0 | | | 180 | |
| 20 01 39 | Non Hazardous | plastics | | | | 0 | | | 181 | |
| 20 01 40 | Non Hazardous | metals | | | | 0 | | | 182 | |
| 20 01 41 | Non Hazardous | wastes from chimney sweeping | | | | 0 | | | 183 | |
| 20 01 99 | Non Hazardous | other fractions not otherwise specified | | | | 0 | | | 184 | |
| 20 02 01 | Non Hazardous | biodegradable waste | | | | 0 | | | 185 | |
| 20 02 02 | Inert | soil and stones | | | | 0 | | | 186 | |
| 20 02 03 | Non Hazardous | other non-biodegradable wastes | | | | 0 | | | 187 | |
| 20 03 01 | Non Hazardous | mixed municipal waste | | | | 0 | | | 188 | |
| 20 03 02 | Non Hazardous | waste from markets | | | | 0 | | | 189 | |
| 20 03 03 | Non Hazardous | street-cleaning residues | | | | 0 | | | 190 | |
| 20 03 04 | Non Hazardous | septic tank sludge | | | | 0 | | | 191 | |
| 20 03 06 | Non Hazardous | waste from sewage cleaning | | | | 0 | | | 192 | |
| 20 03 07 | Non Hazardous | bulky waste | | | | 0 | | | 193 | |
| 20 03 99 | Non Hazardous | municipal wastes not otherwise specified | | | | 0 | | | 194 | |
| N/A | N/A | N/A | | | | 0 | | | 195 | |

# Appendix 2 – Framework Construction Traffic Management Plan

# FRAMEWORK CONSTRUCTION TRAFFIC MANAGEMENT PLAN

## 1.1 Purpose of the Framework CTMP

1.1.1 The purpose of a CTMP is to minimise traffic impacts during the construction works associated with the proposed development and to minimise traffic impacts (and associated environmental impacts) on local residents and users of the area.

1.1.2 This Framework CTMP seeks to define the mechanisms for managing the movement of construction related vehicular traffic associated with the development and also the processes for monitoring of the CTMP and consultation with parties who may be affected by construction traffic and construction activities.

1.1.3 The CTMP only applies to the construction stage of the development and does not apply to the future ongoing operation of the development. It is the responsibility of the main contractor for the construction of the facility to implement the CTMP as well as monitoring its application and making any modifications to the CTMP that may be required. Any sub-contractors employed on the site would fall under the umbrella of the CTMP.

## 1.2 Scope of the Framework CTMP

1.2.1 This Framework CTMP focuses on outlining potential measures which could be introduced to address any issues of safety and the control of risks that may arise from the use of HGVs for the delivery of plant and materials. The Health and Safety Executive (HSE) expect to see CTMPs that include the following elements:

- Planning and managing both vehicles and pedestrian routes;
- The elimination of reversing where possible;
- Safe driving and working practices;
- Protection of the public;
- Adequate vision and lines of sight;
- The provision of signs and barriers; and
- Adequate parking and off-loading/storage areas.

1.2.2 This Framework CTMP has been prepared taking into account the above elements and also ensuring that other environmental impacts such as noise and dust are also considered due to the location of the proposed development and the available access routes.

1.2.3 The CTMP is intended to be a working document that evolves during the detailed construction planning stage for project and during the construction period itself. Monitoring of the CTMP will be undertaken and any necessary modifications will be made in consultation with THC as the local roads authority.

## 1.3 Potential Construction Impacts

1.3.1 Estimates of traffic generation associated with the construction phase of the development have been identified from a first principles approach and have taken account of the following activities:

- Delivery and removal of plant / materials in relation to site mobilisation and set up of site compound;
- Site clearance;
- Delivery of quarry materials and removal of peat for earthworks;
- Delivery of construction materials (such as concrete, steel, etc.);
- Delivery of fit-out kits (such as windows, doors, fixtures and fittings);
- Delivery of paving and carriageway surfacing;
- Delivery of hard landscaping materials;
- Delivery and removal of cranes for building erection;
- Delivery and removal of plant;
- Miscellaneous deliveries; and
- Construction worker travel movements.

## 1.4 Construction Traffic Generation

1.4.1 Construction traffic generation associated with the proposed development includes both construction HGV traffic and staff travel. Due to the varying characteristics of each in terms of a daily profile for arrivals and departures, both have been considered for traffic impacts on their own merits.

**Heavy Goods Vehicles**

1.4.2 The main traffic movements during the construction stage will occur during the earthworks activities. It is estimated that approximately 40,000m$^3$ of quarry material is to be brought to the site.

1.4.3 This activity is programmed for an 11-week period in which approximately 450 m$^3$ of material will be brought to site per day (using eight-wheel tippers with an approximate load capacity of 15 m$^3$ per tipper). This will result in an approximate 30 HGV loads per day (60 two-way movements) for the 11-week programme. This level of HGV traffic has been assessed as the worst-case scenario as part of the corresponding Environmental Impact Assessment Report (EIAR) Transportation chapter.

**Staff Trips**

1.4.4 Staff travel includes the two-way travel to and from site by staff and site operatives. Based upon general construction site working hours of 07:00 – 18:00 (Mon – Fri), it can be assumed that all staff journeys to the site will occur between 06:30 and 07:30, and all staff journeys from site will occur between 18:00 and 18:30. The Operative and Staff trips are therefore likely to occur out with the peak times.

1.4.5 It is understood that the maximum number of staff on-site at any one time during the construction phase will be approximately 50 – 60. If all staff were to travel by private car (single occupancy) this would equate to a maximum of 120 two-way trips during the construction phase.

1.4.6 The maximum trip generation during the construction phase of the project will therefore be approximately 210 two-way vehicle movements.

## 1.5 Construction Vehicle Impact

1.5.1 It is generally considered that an increase in traffic of 30% or less in all areas, or an increase of 10% or less in sensitive locations (such as, areas with high pedestrian activity and limited pedestrian infrastructure can be considered to be a negligible impact.

1.5.2 The maximum trip generation during the construction phase of 210 two-way vehicle movements per day results in a maximum impact of 2.5% on the public road network (A82 north of Fort William). Within Fort William, the maximum impact will be approximately 1.4% and occurs at the A830. This is below the adopted thresholds and therefore unlikely to cause any potential environmental impacts.

1.5.3 The maximum HGV trip generation of 90 two-way daily movements is around a 5.2% increase within Fort William. Out with Fort William, the maximum increase will be in the region of 15.5% in an area that is not considered to be a sensitive receptor. Again, this level of trip generation is below the adopted thresholds and unlikely to cause any environmental impacts.

1.5.4 Notwithstanding this, the developer will still be required to ensure the safety of all road users and to mitigate where possible the risks associated with construction traffic. These measures are discussed below.

## 1.6 Measures Proposed to Mitigate Impacts

1.6.1 As there is currently a roundabout junction for access into the proposed development site (which is fit for construction HGV traffic), it is considered that there are no physical measures required to accommodate construction traffic accessing the site. There are, however, a number of traffic management measures which are available to the contractor to help reduce the impact of general construction traffic during the construction works.

1.6.2 Some of the traffic management measures which could be adopted by the contractor are set out below:

- Delivery Control;
- Banksmen;
- Contractor Speed Limit;
- Designated Construction Routes;
- Promotion of Car Share and Works Transport;
- Measures to Reduce Dust and Debris (such as wheel wash facilities);
- Appropriate Signage;
- Construction Site Operating Hours;
- Workforce Travel and Parking Arrangements;
- Measures to Maintain Pedestrian Safety;
- Travel Notice Board;
- Staff Induction Process;
- Road Condition Survey; and
- Vehicle Movement Monitoring.

1.6.3 This is not an exhaustive list and, where appropriate, other measures than those set out above could be implemented, if identified as necessary by the site contractor.

## 1.7 Implementation and Monitoring of the CTMP

1.7.1 The implementation of the CTMP will be the responsibility of the main contractor who will also be responsible for the monitoring of the plan. Further evolution of the CTMP will be required during the detailed project planning stages and during the construction period itself.

1.7.2 The main contractor may employ a number of sub-contractors on the site who will fall under the guidance of the CTMP and will have an obligation to adhere to the plan written in to their contracts.

1.7.3 Responsibilities of Contractor:

- Primary Point of Contact
- Transport Co-ordination
- Monitoring of the CTMP
- Liaison with Local Community
- Letters / Telephone Calls / Meetings etc.

## 1.8 Summary of Measures

1.8.1 The purpose of the CTMP is to provide detail on the proposed traffic management measures and procedures that will be put in place to support the development during the construction phase, and to minimise disruption to local residents while maintaining road safety on the surrounding road network.

1.8.2 Management measures have been identified for both the movement of general construction traffic and also for the movement of HGVs. It is considered that when these measures are implemented, a safe environment will be created for local residents affected by the development, existing road users and also employees at the construction site.

1.8.3 The CTMP coordinator will be responsible for all elements of transport during the construction process. The coordinator will review and update the number of site personnel, traffic numbers, and the construction programme as the project progresses. Any significant changes will be discussed and agreed with the Local Authority. The coordinator will also act as the liaison officer responsible for communication with external parties.

1.8.4 Discussions with sub-contractors at the tender stages will allow for traffic management policies to be written into the contractual agreements by the main contractor. It is anticipated that through the introduction of the CTMP (including measures such as the promotion of car share and works transport), a reduction in the number of car trips to the site can also be achieved.

1.8.5 It is considered that the impact of construction traffic associated with the construction of the Proposed Development can be appropriately mitigated with measures put in place to minimise the impact on local residents and maintain the safe environment currently enjoyed by users of the area surrounding the existing Smelter site.

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# Appendix 4.1 -

## Appendix 5.1 -

# Appendix 6.1 LVIA Glossary

***Cumulative effects.*** The additional changes caused by a proposed development in conjunction with other similar developments or as the combined effect of a set of developments, taken together.[1]

***Landscape Character Areas (LCAs).*** These are single unique areas which are the discrete geographical areas of a particular landscape type. Each has its own individual character and identity, even though it shares the same generic characteristics with other types.[2]

***Landscape character type.*** These are distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation, historical land use, and settlement pattern.[2]

***Landscape effects.*** Effects on the landscape as a resource in its own right.[1]

***Landscape character.*** A distinct and recognisable pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.[2]

***Landscape quality (or condition).*** A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.[1]

***Landscape receptor.*** Defined aspects of the landscape resource that have the potential to be affected by a proposal. [1]

***Landscape value.*** The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons. [1]

***Magnitude (of effect).*** A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term, in duration. [1]

***Mitigation.*** Measures which are proposed to prevent, reduce and where possible offset any significant adverse effects (or to avoid, reduce and if possible, remedy identified effects).[1]

***Sensitivity.*** A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor. [1]

***Susceptibility.*** The ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences. [1]

***Visual amenity.*** The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of people living, working, recreating, visiting or travelling through an area. [1]

***Visual effect.*** Effects on specific views and on the general visual amenity experienced by people. [1]

***Visual receptor.*** Individuals and/or defined groups of people who have the potential to be affected by a proposal. [1]

***Zone of Theoretical Visibility (ZTV).*** A map, usually digitally produced, showing areas of land within which, a development is theoretically visible.[1]

[1] The Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Landscape Institute with the Institute of Environmental Management and Assessment, 2013

[2] An Approach to Landscape Character Assessment Guidance for England and Scotland, Natural England, 2014.

# Appendix 6.2 LVIA Reference

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6. Landscape Institute Technical Advice Note 06/19 – Visual Representation of Development Proposals.
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15. Lochaber Landscape Character Assessments, NatureScot, 2019
16. Special Qualities of the National Scenic Areas: Ben Nevis and Glen Coe, SNH, 2010.
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18. Historic Environment Policy Scotland (HEPS), 2019

# Appendix 6.3 LVIA Methodology

# 1. Introduction

This Technical Appendix contains additional detail regarding the assessment methodology, supplementing the information provided within the LVIA text.

### *Baseline*

- The baseline study establishes the planning policy context, the scope of the assessment and the key receptors. It typically includes the following key activities:
- Size and design – Approximately 10,000 $m^2$ building and 20,000 $m^2$ of developed land surrounding the building.
- A desk study of relevant current national and local planning policy, in respect of landscape and visual matters, for the site and surrounding areas.
- Agreement of the main study area radius with the local planning authority. For this assessment, a study area of 10 km was agreed.
- A desk study of nationally and locally designated landscapes for the site and surrounding areas.
- A desk study of existing landscape character assessments and capacity and sensitivity studies for the site and surrounding areas.
- A desk study of historic landscape character assessments (where available) and other information sources required to gain an understanding of the contribution of heritage assets to the present-day landscape.
- Collation and evaluation of other indicators of local landscape value such as references in landscape character studies or parish plans, tourist information, local walking & cycling guides, references in art and literature.
- The identification of valued character types, landscape elements and features which may be affected by the proposal, including rare landscape types.
- Exchanging information with other consultants working on other assessment topics for the development as required to inform the assessment.
- Draft Zone of Theoretical Visibility (ZTV) studies to assist in identifying potential viewpoints and indicate the potential visibility of the proposed development, and therefore scope of receptors likely to be affected. The methodology used in the preparation of ZTV studies is described below.
- The identification of, and agreement upon, through consultation, the scope of assessment for cumulative effects.
- The identification of, and agreement upon, through consultation, the number and location of representative and specific viewpoints within the study area.
- The identification of the range of other visual receptors (e.g. people travelling along routes, or within open access land, settlements and residential properties) within the study area.
- Site visits to become familiar with the site and surrounding landscape; verify documented baseline; and to identify viewpoints and receptors.
- Input to the design process.

The information gathered during the baseline assessment is drawn together and summarised in the baseline section of the report and reasoned judgements are made as to which receptors are likely to be significantly affected. Only these receptors are then taken forward for the detailed assessment of effects, with others 'scoped out' (ref. GLVIA 3rd edition, 2013, para 3.19).

Correspondence with the planning authority and consultees, when undertaking the AWP LVIA, regarding study area, methodology and viewpoints are included as Technical Appendices 6.7a and 6.7b. The same study area, methodology and viewpoints have been used for the Alvance Billet LVIA as the Proposed Development is located in the same part of the smelter site and the same orientation.

## Design

The Landscape Architect plays a leading role in the site design. The design and assessment stages are necessarily iterative, with stages overlapping in parts.

Details of any mitigation measures incorporated within the proposals to help reduce identified potential landscape and visual effects are set out in Section 6.6.4 of the EIA Report.

## Assessment

The assessment of effects includes further desk and site-based work, covering the following key activities:

- The preparation of a ZTV based on the finalised design for the development.
- An assessment, based on both desk study and site visits, of the sensitivity of receptors to the proposed development.
- An assessment, based on both desk study and site visits, of the magnitude and significance of effects upon the landscape character, designated and recreational landscape and the existing visual environment arising from the proposed development.
- An informed, professional, judgement as to whether each identified effect is positive, neutral or adverse.
- A clear description of the effects identified, with supporting information setting out the rationale for judgements.
- Identification of which effects are judged to be significant based on the significance thresholds established in Section 6.3 of the EIA Report.
- The production of photomontages from a selection of the agreed viewpoints showing the anticipated view following construction of the proposed development.

## Preparation and use of visuals

The ZTVs and visualisations are used to inform the field study assessment work, providing additional detail and accuracy to observations made on site. The preparation of the ZTVs (and photomontages where applicable) is informed by the Landscape Institute's Advice Note 06/19 – 'Visualisation Representation of Development Proposals' and Visualisation Standards for Wind Energy Developments, Highland Council, July 2016.

The following points should be borne in mind in respect of the ZTV study:

- Areas shown as having potential visibility may have visibility of the development obscured by local features such as trees, hedgerows, embankments or buildings.

A detailed description of the methods by which ZTVs and visualisations are prepared is included below.

## 2. Methodology for preparation of ZTV and Visualisations

### *ZTV Studies*

ZTV studies are prepared using the ESRI ArcGIS Viewshed routine. This creates a raster image that indicates the visibility (or not) of the points modelled. LDA Design undertake a ZTV study that is designed to include visual barriers from settlements and woodlands (with heights derived from NEXTMAP 25 surface mapping data). If significant deviations from these assumed heights are noted during site visits, for example young or felled areas of woodland in key locations, the features concerned will be adjusted within the model or the adoption of a digital surface model will be used to obtain actual heights for these barriers. In this instance this has not been required.

The model is also designed to take into account both the curvature of the earth and light refraction, informed by the SNH guidance. LDA Design undertake all ZTV studies with observer heights of 2 m.

The ZTV analysis begins at 1 m from the observation feature and will work outwards in a grid of the set resolution (on a standard LDA Design assessment this will be at 12.4 sqm) until it reaches the end of the terrain map for the project.

For all plan production LDA Design will produce a ZTV that has a base and overlay of the 1:50,000 Ordnance Survey Raster mapping or better. The ZTV will be reproduced at a suitable scale on an A3 template to encompass the study area.

### *Ground model accuracy*

Depending on the project and level of detail required, different height datasets may be used. Below is a table detailing the different data products and their specifications.

| Product | Distance Between Points | Vertical RMSE Error |
|---|---|---|
| LiDAR | 50 cm – 2 m | up to +/- 5 cm |
| Photogrammetrically Derived Heights | 2 m – 5 m | up to +/- 1.5 m |
| Ordnance Survey OS Terrain 5 | 5 m | up to +/- 2.5 m |
| NextMap25 DTM | 25 m | +/- 2.06 m |
| Ordnance Survey OS Terrain 50 | 50 m | +/- 4 m |

Site-specific topographical survey data may also be used where available. For most purposes, the NextMap25 data will be used, but on certain more detailed analysis of areas close to the site may be required, in which case, more detailed ZTVs using more detailed surface mapping products such as Photogrammetrically Derived Heights (from Getmapping or Bluesky), or LiDAR may be used. For this assessment NextMAP25 data was used.

### *Visualisations*

Photowires and photomontages are produced in seven stages with the last two stages representing the development of the photomontage from the photowire stage, as follows:

1. Photography is undertaken using a digital SLR camera and 50 mm equivalent lens. A tripod is used to take overlapping photographs which are joined together using an industry standard application to create a single panoramic image for each viewpoint. These are then saved at a fixed height and resolution to enable correct sizing when reproduced in the final images. The photographer also notes the GPS location of the viewpoint and takes bearings to visible landmarks whilst at the viewpoint.
2. Creation of a ground model and 3D mesh to illustrate that model. This is created from OS Terrain 5 DTM point data (or occasionally other terrain datasets where required, such as site-specific topographical data or Photogrammetrically Derived Heights) and ground modelling software.

3. The addition of the proposed development to the 3D model. The main components of the proposed development are accurately modelled in CAD and are then inserted into the 3D model at the proposed locations and elevations.

4. Wireline generation – The viewpoints are added within the 3D CAD model with each observer point being inserted at 1.5 m above the modelled ground plane. The location of the landmarks identified by the photographer may also be included in the model. The view from the viewpoint is then is then replicated using virtual cameras to create a series of single frame images, which also include bearing markers. As with the photographs, these single frame images are joined together using an industry standard application to create a single panoramic image for each viewpoint. These are then saved at a fixed height and resolution to ensure that they are the same size as the photographs.

5. Wireline matching – The photographs are matched to the wirelines using a combination of the visible topography, bearing markers and the landmarks that have been included in the 3D model.

6. For the photomontage, an industry standard 3D rendering application is used to produce a rendered 3D view of the proposed development from the viewpoint. The rendering uses materials to match the intended surface finishes of the development and lighting conditions according to the date and time of the viewpoint photograph.

7. The rendered development is then added to the photograph in the position identified by the wireline (using an image processing application) to ensure accuracy. The images are then layered to ensure that the development appears in front of and behind the correct elements visible within the photograph. Where vegetation is proposed as part of the development, this is then added to the final photomontage.

# 3. Landscape Character Considerations

The European Landscape Convention (2000) provides the following definition:

*'Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.'*

And notes also in Article 2 that landscape includes *"natural, rural, urban and peri-urban areas. It includes land, inland water and marine areas".*

An Approach to Landscape Character Assessment (Natural England, 2014) defines landscape character as:

*'a distinct and recognisable pattern of elements, or characteristics, in the landscape that make one landscape different from another, rather than better or worse.'*

The susceptibility of landscape character areas is judged based on both the attributes of the receiving environment and the characteristics of the proposed development as discussed under 'susceptibility' within section 6.3 of the EIA Report. Thus, the key characteristics of the landscape character types/areas are considered, along with scale, openness, topography; the absence of, or presence, nature and patterns of development, settlement, landcover, the contribution of heritage assets and historic landscape elements and patterns, and land uses in forming the character. The condition of the receiving landscape, i.e. the intactness of the existing character will also be relevant in determining susceptibility. The likelihood of material effects on the landscape character areas can be judged based on the scale and layout of the proposal and how this relates to the characteristics of the receiving landscape.

The introduction of any development into a landscape adds a new feature which can affect the 'sense of place' in its near vicinity, but with distance, the existing characteristics reassert themselves.

The baseline is informed by desk study of published landscape character assessments and field survey. It is specifically noted within An Approach to Landscape Character Assessment (Natural England, 2014) that:

*'Our landscapes have evolved over time and they will continue to evolve – change is a constant, but outcomes vary. The management of change is essential to ensure that we achieve sustainable outcomes – social, environmental and economic. Decision makers need to understand the baseline and the implications of their decisions for that baseline.'*

At page 51 it describes the function of Key Characteristics in landscape assessment, as follows:

*'Key characteristics are those combinations of elements which help to give an area its distinctive sense of place. If these characteristics change, or are lost, there would be significant consequences for the current character of the landscape. Key characteristics are particularly important in the development of planning and management policies. They are important for monitoring change and can provide a useful reference point against which landscape change can be assessed. They can be used as indicators to inform thinking about whether and how the landscape is changing and whether, or not, particular policies – for example - are effective and having the desired effect on landscape character.'*

*It follows from the above that in order to assess whether landscape character is significantly affected by a development, it should be determined how each of the key characteristics would be affected. The judgement of magnitude therefore reflects the degree to which the key characteristics and elements which form those characteristics will be altered by the proposals.*

## 4. Viewpoints and Visual Receptors - considerations

*A wide variety of visual receptors can reasonably be anticipated to be affected by the proposed development. Within the baseline assessment, the ZTV study and site visits will be used to determine which visual receptors are likely to be significantly affected and therefore merit detailed assessment. In line with guidance (GLVIA, 3rd Edition, 2013, paragraph 6.19); both representative and specific viewpoints may be identified to inform the assessment. In general, the majority of viewpoints will be representative – representing the visual receptors at the distance and direction in which they are located and of the type(s) that would be present at that location. The representative viewpoints have generally been selected in locations where significant effects would be anticipated; though some may be selected outside of that zone – either to demonstrate the reduction of effects with distance; or to specifically ensure the representation of a particularly sensitive receptor.*

## 5. Residential Amenity

*Paragraph 6.17 of GLVIA, 3rd edition notes that:*

*"In some instances, it may also be appropriate to consider private viewpoints, mainly from residential properties…. Effects of development in private property are frequently dealt with mainly through 'residential amenity assessments. These are separate from LVIA although visual effects assessment may sometimes be carried out as part of a residential amenity assessment, in which case this will supplement and form part of the LVIA for a project. Some of the principles set out here for dealing with visual effects may help in such assessments but there are specific requirements in residential amenity assessment".*

*When dealing with effects on residential properties, the outlook from a private property is essentially a private matter. The difference between that private interest and what should be protected in the public interest has been the subject of particular focus at Public Inquiries in relation to wind farm cases and the lessons learnt from Inspector's decisions have informed how effects on views from residential properties influence a planning decision.*

*Wind farms are much taller developments than the proposed building with a greater chance that they could have such an effect. For the proposed development to cause effects of such a high magnitude to render a property an unattractive place in which to live it would have to be very close to the property.*

*Residential properties closest to the site have been viewed on site and from aerial photography. Parts of the proposed development are likely to be visible from some residential properties, but no properties would be affected to the degree that they would become an unattractive place in which to live. Therefore, a detailed residential amenity assessment has not been undertaken.*

# Appendix 6.4 LVIA National Planning Policy

# 1. Scottish Planning Policy (SPP), Revised December 2020

The SPP introduces a 'presumption in favour of sustainable development' and lists principles which should guide formulation of policy and decisions on individual projects. Policy principles relating to the natural environment are set out at paragraph 194 which states:

'The planning system should:

- Facilitate positive change while maintaining and enhancing distinctive landscape character;
- Conserve and enhance protected sites and species, taking account of the need to maintain healthy ecosystems and work with the natural processes which provide important services to communities;
- Promote protection and improvement of the water environment, including rivers, lochs, estuaries, wetlands, coastal waters and groundwater, in a sustainable and co-ordinated way;
- Seek to protect soils from damage such as erosion or compaction;
- Protect and enhance ancient semi-natural woodland as an important and irreplaceable resource, together with other native or long-established woods, hedgerows and individual trees with high nature conservation or landscape value;
- Seek benefits for biodiversity from new development where possible, including the restoration of degraded habitats and the avoidance of further fragmentation or isolation of habitats; and
- Support opportunities for enjoying and learning about the natural environment.'

It goes on to note (in paragraph 196) that when producing development plans:

'*International, national and locally designated areas and sites should be identified and afforded the appropriate level of protection in development plans. Reasons for local designation should be clearly explained and their function and continuing relevance considered when preparing plans. Buffer zones should not be established around areas designated for their natural heritage importance. Plans should set out the factors which will be taken into account in development management. The level of protection given to local designations should not be as high as that given to international or national designations.*

In paragraph 197 it states that, *Planning authorities are encouraged to limit non-statutory local designations to areas designated for their local landscape or nature conservation value:*

- The purpose of areas of local landscape value should be to:
  - *Safeguard and enhance the character and quality of a landscape which is important or particularly valued locally or regionally; or*
  - *Promote understanding and awareness of the distinctive character and special qualities of local landscapes; or*
  - *Safeguard and promote important local settings for outdoor recreation and tourism.'*

Development management guidance from paragraphs 202 and 203 notes that:

*'The siting and design of development should take account of local landscape character. Development management decisions should take account of potential effects on landscapes and the natural and water environment, including cumulative effects. Developers should seek to minimise adverse impacts through careful planning and design, considering the services that the natural environment is providing and maximising the potential for enhancement.*

*Planning permission should be refused where the nature or scale of proposed development would have an unacceptable impact on the natural environment. Direct or indirect effects on statutorily protected sites will be an important consideration, but designation does not impose an automatic prohibition on development.'*

# Appendix 6.5 LVIA Landscape Character Types

SNH National Landscape Character Assessment

Landscape Character Type 233

# MOUNTAIN MASSIF - LOCHABER

## Location and Context

The *Mountain Massif - Lochaber* Landscape Character Type occurs in three areas, encompassing its most prominent peaks, including the ranges of Ben Nevis, Glen Coe and Glen Etive. It includes the highest summits and the deepest glens and encompasses some of Lochaber's most spectacular and romantic scenery, attracting hikers, climbers and sight-seers.

## Key Characteristics

- Grey craggy peaks of vast and imposing scale with sweeping concave slopes of steep, smooth rock faces which plummet into glaciated valleys.
- Strong visual force created by the slope profile and accentuated by fans of scree and bracken, which draws the eye up and down the slopes.
- Typical glacial forms such as aretes and carries within the hills, and moraine and erratics along the glen floors.
- Dense patches of coniferous woodland along the base and sides of the glens, often broken by brown plots of clear-felled forest.
- Deep rocky clefts within the hillside carved and highlighted by silvery burns and shadows, sometimes packed with birch trees, forming meandering mossy veins on the rock face.
- Glens affording a small scale refuge from the vast mountainous masses and often containing roads, footpaths, settlement and picnic areas.
- Rivers along the glen floor that are wide and shingly near the mouth, steep and rocky higher up the glen; these are often highlighted by clumps of alder, rowan and birch.
- Single track roads, often with dead ends, small bridges and stone dykes, concentrated along the small scale glens; their scale provides a contrast to the experience of the vast scale of the landscape.

## Landscape Character Description

*Landform*

The *Mountain Massif - Lochaber* Landscape Character Type includes the most prominent of

Lochaber's peaks. Of volcanic origin, the hills are composed of granite that rose as magma to fill the void left by a sinking plug of overlying rock. Like all of the area's landscapes they have been lowered and smoothed by ice and weathering.

*Landcover*

Landcover follows a transition from the relatively lush grazed rocky meadows and woodland pockets on the glen floors to the bare grey or pink craggy summits. Bracken and heather form an intermediate patchwork up the slopes between screes, and swathes of birch wood follow sheltered gullies up the hill sides. Remnants of charcoal-burning platforms occur in clusters along a number of these steep slopes, such as those on the west of Loch Etive. Primarily coniferous forest occurs as dark patches on the slopes, sometimes encroaching into and across the glen floor and providing sudden enclosure for the traveller.

*Settlement*

Settlement is sparse comprising isolated farmhouses, outbuildings and bothies whose prominence is often accentuated by whitewashed walls and enclosing shelterbelts. Occasional remnants of earlier farming in the form of farmsteads and field systems along the glens can also be seen, such as those dotted along Glen Coe, with shieling huts amongst the mountain pasture. Tourism is focussed in the smaller scale glens, which form some of the most popular visitor attractions in the area. The hills are very popular for recreation all year round. Both the Nevis Range and Glencoe Mountain Resort ski centres are within this Landscape Character Type with their associated buildings, car parking and ski lifts introducing a human influence into this predominantly wild landscape.

*Perception*

The shapes and forms of this landscape have tremendous visual force, with steep smooth rock faces that sweep down from summits into the broad u-shaped glens such as Glen Nevis and Glen Coe. This power is emphasised by tumbling burns and waterfalls, especially when these are swollen with rain and meltwater. It is a landscape of a vast and imposing scale; glen sides rear up dramatically from a flat base and grazing sheep on the slopes or glen floor provide a marked scale of reference. The strong landscape pattern and sweeping landscape form is emphasised by triangular formations of bracken and scree. Woodland on the glen slopes is frequently dwarfed by the rock faces.

This is one of 390 Landscape Character Types identified at a scale of 1:50 000 as part of a national programme of Landscape Character Assessment republished in 2019.

The area covered by this Landscape Character Type was originally included in the Lochaber LCA (Environmental Resources Management ), published 1998.

SNH National Landscape Character Assessment

Landscape Character Type 234

# LOCHS WITH SETTLED EDGES

## Location and Context

The *Lochs with Settled Edges* Landscape Character Type includes the inland sections of Loch Linnhe, Loch Leven and Loch Eil along the Great Glen. While these 'ribbon lochs', created by flooding of ice-scoured fault lines, are common in Lochaber, they are distinguished by their relatively high density of settlement, including farms and crofts, towns (including Fort William) and villages, and main road links.

## Key Characteristics

- Flat landscape contained between steep loch sides and open water.
- Extensive agriculture and settlement confined within a narrow lochside fringe, whose foreshore is subject to tidal influence.
- Loch heads and river mouths that permit more extensive farming and built development, including housing and small industrial estates.
- Communications confined to narrow loch edges where shingly beaches, rocky headlands, wooded banks and marshy platforms form a diverse water's edge.
- Extensive tracts of oak-birch woodland climbing from the lochside up into the foothills, often engulfing the settled edge and providing an enclosed microlandscape.
- Dense commercial forests descend to loch shore in some locations.
- Occasional policy grounds of big houses along the loch edge give rise to a proliferation of rhododendron and other ornamentals in some places, providing a lush and sheltered character.
- Linearly arranged crofting communities with vivid green croft fields contrast with the more subdued duller colours of surrounding hills.

## Landscape Character Description

*Landform*

The *Lochs with Settled Edges* Landscape Character Type occupies a narrow fringe, squeezed between the loch edge and the steep hillsides, which prevailed after sea levels fell after the last Ice Age. It is usually enclosed by the *Smooth Moorland Ridges* landscape.

*Landcover*
Broadleaf woodland proliferates along some sections of loch edge and provides a sense of enclosure which contrasts with the expansive views across the loch. The Ballachulish slate quarries, once the most important in Scotland, remain prominent features in the landscape. Grazing land forms the context for much of the settlement of the area.

*Settlement*
These areas encompass along their edges some of the principal settlements in Lochaber including Fort William and its suburbs of Caol, Corpach and Banavie; North Ballachulish and surrounding villages; and Kinlochleven, at the head of Loch Leven. The type also includes the major industrial areas in Fort William and Kinlochleven as well as core industrial estates. Remnants of the industrial planned villages of Ballachulish and Glen Coe are still visible amidst later housing. Between these centres, houses and crofts are scattered along the edge often set within grazing land. The spatial pattern of these pastures and crofts is distinctive along undeveloped sections of shoreline. The longevity of settlement in the area is evidenced by occasional prehistoric sites such as the fort of Cnocan Dubh and the archaeological features and artefacts discovered under the peat in North Ballachulish. Historic houses sit in prominent lochside landmark positions. Roads circumnavigate the loch edges along the settled strips or cut through rocky headlands where these penetrate to the water's edge. These often main roads are particularly busy in the summer months due to the high volume of tourist traffic.

*Perception*
The character of the loch edge is generally small-scale and diverse. The loch heads are sensitive in visual terms where views are channelled down lochs and their glens to them. Given its narrow spatial extent within the glen, the settled edge has a strong influence both on landscape character and on one's experience of it. Buildings are often white-washed, sometimes suburban in character, and stand out prominently against the hills and lochs and at night a string of lights seems to hang over dark loch waters. This landscape is frequently experienced amidst settlement when the detail and variety of built development along the loch edge is apparent and contrasts with the scale and homogeneity of the hillside and loch waters that enclose it. Views across the lochs to the opposite settled edges and hillsides above provide attractive visual detail.

This is one of 390 Landscape Character Types identified at a scale of 1:50 000 as part of a national programme of Landscape Character Assessment republished in 2019.

The area covered by this Landscape Character Type was originally included in the Lochaber LCA (Environmental Resources Management ), published 1998.

SNH National Landscape Character Assessment

Landscape Character Type 235

# BROAD FORESTED STRATH

## Location and Context

The *Broad Forested Strath* Landscape Character Type extends between Loch Linnhe and Loch Lochy, and along Glen Spean, and in the area around Strontian in Lochaber. This is a gently undulating landscape with a broad mosaic of coniferous and deciduous woodland and open pasture

## Key Characteristics

- Broad, low-lying straths with rolling relief and sculptural glacial landforms.
- Simple, large scale mosaic of forested ridges, rolling pastures and heather moorland, but dominated by swathes of forestry.
- A comparatively densely settled landscape with villages, houses and sporadic commercial development.
- Quarries hidden amongst the woodland cover.
- Strong communication and service corridors.
- Long distance views from surrounding hills over the glens, which are framed by steep glen sides.
- Lochs, rivers or canals on glen floor have often been engineered or substantially altered by man.

## Landscape Character Description

*Landform*

The *Broad Forested Strath* Landscape Character Type was influenced by the vast ice sheet of the Spean Glacier and other northward flowing glaciers from Rannoch Moor. Further areas at the mouth of Glengarry were also scoured by ice flows which created more subdued terrain compared to the surrounding relief, creating low smooth ridges and broad drumlins within a rolling landform between the high sides. In the Great Glen, sediments from a subsequent ice-dammed lake left fertile soils that now support a densely afforested and farmed landscape. A small pocket of Broad Forested Strath also occurs at the head of Loch Sunart around Strontian. It is unrelated in its geological origin and extent to the main areas in the Great Glen, but exhibits the same smooth landform and land use pressures.

*Landcover*

While relief is predominant in defining the landscape character of most other areas in Lochaber, the *Broad Forested Strath* is identified as a particular mix of land uses superimposed on gently undulating landform. Landcover forms a broad mosaic of coniferous and deciduous woodland and open pasture. Small broadleaf woods occur below the more sheltered ridges and within steep river gullies, and scattered birch extends onto the rough sward and marshy grassland of the strath floor. Strips of improved pasture enclosed by post and wire fencing are associated with crofts and small farms situated along roads which cross the glen floor. In terms of landcover, coniferous forests are strong influence on this landscape character; they form vast swathes which carpet the land, alternating with open land which is characteristic of the glen floor. Clear-felling creates open brown patches.

*Settlement*

Present settlement has developed a linear pattern, concentrated along roads through the strath. Croft houses form loose patterns of settlement, while occasional pockets of closely spaced new housing sometimes occur where crofts have been subdivided. Larger villages, such as Spean Bridge, Roybridge and Strontian, sit in open areas surrounded by the forests. Strategically located defensive fortifications, such as Invergarry Castle, also punctuate this Landscape Character Type. Linear infrastructure occurs within these straths in the form of roads, railway, transmission lines and the Caledonian Canal, which remains the single largest construction work to have been undertaken in the highlands.

This is one of 390 Landscape Character Types identified at a scale of 1:50 000 as part of a national programme of Landscape Character Assessment republished in 2019.

The area covered by this Landscape Character Type was originally included in the Lochaber LCA (Environmental Resources Management ), published 1998.

SNH National Landscape Character Assessment

Landscape Character Type 236

# SMOOTH MOORLAND RIDGES

## Location and Context

The *Smooth Moorland Ridges* Landscape Character Type comprises gently sloping hills which are mostly found alongside the wide glaciated valleys flanking much of the Great Glen in Lochaber.

## Key Characteristics

- Gently undulating hills with smooth elongated ridge profiles, developing a more undulating landform in transitional areas with *Rugged Massif - Lochaber*.
- Simple, large scale landscape pattern dictated by uniform landcover and uncomplicated landform.
- Plateau summits generally draped in a mixture of grasses, heather and sedges, with exposed peat hags.
- Large blocks of conifer forests along the hill sides and lower foothills.
- Broadleaf woods on lower slopes and along loch edges, often framing crofts.
- Scattered croft settlements with stone dykes concentrated on lower slopes, particularly along roads and south-facing slopes.
- Roads and transmission lines following the base of the hills.
- Smooth open slopes highly visible.

## Landscape Character Description

*Landform*

The character of the *Smooth Moorland Ridges* Landscape Character Type derives less from geology than from glacial action which has hewn a distinctive profile from the original, higher hills. The ridges, which are quite low-lying at 600-700 metres, may be recognised by their smooth undulating topography. They often occur as a transition into *Rugged Massif - Lochaber*, when the typically smooth edge begins to adopt a more rugged profile, and the boundary between Landscape Character Types may often be indistinct. A good example of such a transition occurs to the north of Loch Eil between Druim Fada and Beinn an t-Sneachda.

The presence of dolerite and basalt dykes, formed by igneous intrusions, gives rise to indistinct parallel ridges along some slopes. Other more marked ridges within Glen Roy are known as 'Parallel Roads', and were formed by successive shore lines of a receding glacial lake.

*Landcover*
On the flat plateaux of the *Smooth Moorland Ridges* retention of rain water has led to the accumulation of peat, and the surfaces are riven with exposed peat hags (a hollow moss left after digging peat). The rounded hills support swathes of heather moorland which form a purple drape over some hills during the summer. The heather is often interspersed with a rough grass sward and, on lower slopes; small blocks of pasture are often associated with stone dykes and fences.

Scrubby trees such as rowan and birch follow the burns and gullies which cut through the grain of the ridges and disrupt the smooth landform. Thicker growths of oak and birch wood occupy some lower slopes and loch edges such as Loch Arkaig and Loch Lochy. Coniferous forests also occur along the hillsides and, while generally avoiding ridgelines, often cover the lower foothills.

*Settlement*
There are occasional traditional stone croft dwellings and houses and hotels on the edges of the areas, especially along the southern banks of Loch Lochy. Remains of Medieval and post Medieval settlement and agriculture are widely dispersed along the banks of rivers.

*Perception*
This is a large scale landscape with simple landcover pattern giving it a uniform appearance. The smooth open slopes are highly visible.

This is one of 390 Landscape Character Types identified at a scale of 1:50 000 as part of a national programme of Landscape Character Assessment republished in 2019.

The area covered by this Landscape Character Type was originally included in the Lochaber LCA (Environmental Resources Management ), published 1998.

SNH National Landscape Character Assessment

Landscape Character Type 238

# RUGGED MASSIF - LOCHABER

## Location and Context

Areas of *Rugged Massif - Lochaber* Landscape Character Type are found in seven different areas in Lochaber, from Rannoch Moor in the south east to Glen Garry in the north and Loch Nevis and the Knoydart peninsula in the west. This Landscape Character Type also links with *Rugged Massif – Skye and Lochalsh* identified to the north.

## Key Characteristics

- Rugged character, a crinkled skyline and a landform accentuated by rocky outcrops and glacial debris.
- Large rocky masses drawing the eye upwards to ice-scoured rounded summits.
- Often a transitional landscape with indistinct boundaries with other Landscape Character Types.
- Often in remote, unsettled and inaccessible locations which, combined with the rugged relief, accentuates the wild character of these areas.
- Thin soils supporting sparse cover of grasses and heather on higher, drier slopes.
- Birch scrub and some oak woodland on lower slopes and within burn gullies and hanging valleys.
- Extensive sheep and deer grazing with stalking and hill walking as popular activities.
- Forestry occurring over small areas on flatter, lower slopes.

## Landscape Character Description

*Landform*

Areas of *Rugged Massif – Lochaber* Landscape Character Type are found extensively across Lochaber. It is a complicated landscape type both due to its underlying geology and its transitional character. It forms a transition between the lower, smoother hills of the *Smooth Moorland Ridges* and the higher, more mountainous *Interlocking Sweeping Peaks - Lochaber*.

*Rugged Massif - Lochaber* occurs predominantly on the Moine group of metamorphic rocks, consisting of quartz, feldspar and granulite. Its deeply folded form, like so much of Lochaber, has been denuded by glacial action. Rounded masses of rock with an uneven, rugged landform and a craggy silhouette are littered with erratics and other glacial debris. Deep narrow gullies form cracks in the terrain and other glacial features such as corries (typically facing north and north east) are abundant.

*Landcover*

Rocks protrude everywhere through thin, infertile soils which support a scant landcover of patchy grassland and heather supporting meagre grazing. Birch woods with occasional stands of oak, some remnants of ancient Caledonian forest, occur on the lower slopes or in gullies where a more sheltered aspect protects deeper richer soils from the persistent leaching by rain, and the steep slopes deter intense grazing. There are some small areas of conifer forest on the lower slopes of the Knoydart peninsula

*Settlement*

Built development and settlement are minimal, although remnants of shielings, charcoal burning platforms and early farming occur sporadically along loch sides and glens. Land masses tend to be rugged, remote and inaccessible with communication routes confined to lower lying glens, such as the A830 which passes through Glenfinnan. Isolated dwellings occur at the base of slopes. Two disused lead mines survive north of Strontian, which was an important lead mining area in the 18th and 19th Centuries.

*Perception*

The undeveloped, rugged and remoteness of this Landscape Character Type gives it very strong wild character.

This is one of 390 Landscape Character Types identified at a scale of 1:50 000 as part of a national programme of Landscape Character Assessment republished in 2019.

The area covered by this Landscape Character Type was originally included in the Lochaber LCA (Environmental Resources Management ), published 1998.

# Appendix 6.6 LVIA Extracts from SNH 2010 Report

*Extracted from:* Scottish Natural Heritage (2010). The special qualities of the National Scenic Areas. *Scottish Natural Heritage Commissioned Report No.374*

# THE SPECIAL QUALITIES OF THE NATIONAL SCENIC AREAS



* Also includes a small part within Stirling Council Area
** Parts are also within Perth & Kinross Council and Argyll & Bute Council Areas

## BEN NEVIS AND GLEN COE NATIONAL SCENIC AREA
## SPECIAL QUALITIES

- A land of mountain grandeur
- A land of classic highland vistas
- Human settlement dwarfed by mountain and moorland
- The expansive Moor of Rannoch
- The spectacular drama of Glen Coe
- The wooded strath of lower Glen Coe
- The narrow and enclosed Loch Leven
- The impressive massif of Ben Nevis
- The wild Mamores and secretive Glen Nevis
- The fjord-like upper Loch Leven
- Long and green Glen Etive
- The dark heritage

| Special Quality | Further Information |
|---|---|
| • ***A land of mountain grandeur*** | |
| This is a landscape of massive proportions, breathtaking grandeur and great variety. It offers the highest altitude and greatest vertical relief in Britain. | Ben Nevis at 1343 metres (4406 feet) is the highest mountain in the British Isles, and the neighbouring Aonach Mor and Aonach Beag are both over 1200 metres. Numerous other Munros are present, particularly in the massifs of the Grey Corries, the Mamores and Glencoe. |
| • ***A land of classic highland vistas*** | |
| With each crossing of a glen or watershed, the scenery dramatically changes, from open moor to mountain pass, from smooth hillside to towering crags, from enclosed glen to long sea loch.<br><br>The journey by road northwards across the open Moor of Rannoch Moor, past the sentinel of Buachaille Etive, and down through spectacular Glen Coe to the sea at Loch Leven, is a journey of great contrasts – one of the classic Highland journeys.<br><br>The mountains, moors and glens are visited by many of those in search of the outstanding scenic experience, or | It is the inter-relationships as well as the individual qualities of the mountains, moors, glens and lochs that elevate the landscape scenery of Ben Nevis and (particularly) Glen Coe, to iconic status.<br><br>Much of the core mountain area lies within SNH Wild Land Search Areas. |

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| outdoor exhilaration and challenge. It is not remote by distance or time from major settlement, particularly Fort William, and a sense of true remoteness must be searched for, with human contact in the upper glens and moors to be expected. | |
| • ***Human settlement dwarfed by the mountain and moorland*** | |
| Although in places humans have left a marked impression on the landscape, particularly around Loch Leven, overall this is a landscape where human endeavour and activity is dwarfed by the mountain grandeur.<br><br>Where houses and settlements are present, they appear small amongst the large scale surrounds of mountain, moor, glen and sea loch. Scenic quality and drama prevail. | Human settlement is sparse, highly concentrated around the shores of Loch Leven, with only occasional houses elsewhere. Around the loch, human impact can itself be a dominant feature of the landscape, for example the old Ballachulish slate quarries; Ballachulish itself and its bridge; Glencoe Village; Kinlochleven with its previous aluminium works (now only a hydro-electric power station); and the surrounding forestry plantations. The coast of Loch Leven is characterised by aquaculture, inshore fishing and pleasure-craft activities.<br><br>In some places the road and ski infrastructure penetrate deeply into the mountains and moorlands. In most other inland areas human influence comes across as minimal. However, populations have come and gone, with evidence of former occupation in many locations. |
| *Location-specific qualities* | |
| • ***The expansive Moor of Rannoch*** | |
| Rannoch Moor is a wide open expanse of barren, wet peat moorland and peaty lochans which seems primeval in its character.<br><br>The framing of the moor by the highland peaks which funnel towards Glen Coe is striking. The Black Mount range rises ominously to the south, gradually encroaching upon the moor until the entrance of the glen presents a striking contrast to the openness of Rannoch Moor. | The most striking landscape drama, contrast and juxtaposition of moor, mountain and seascape is experienced as the visitor crosses from south-east to north-west across the NSA along the A82. The route from Bridge of Orchy rises gradually from the Tulla basin to the lip of Rannoch Moor.<br><br>The road bisects the moor on a true and straight line; there is a sense that departure from its line would lead to isolation and exposure in an inaccessible, intricate mosaic of high, but gently profiled, wet moorland and shallow peaty lochans. |
| • ***The spectacular drama of Glen Coe*** | |
| The soaring, dramatic splendour of Glen Coe alters the traveller's experience and a sense of deep enclosure prevails, | Access to the foot of the mountain slopes is straightforward, but their high, vast, sheer slopes require skill, energy and |

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| whilst the scenery increases yet in splendour and drama as the glen is descended.<br><br>The pyramidal profile of the mountain of Buachaille is striking as it stands sentry to the glen's entrance, but is challenged by numerous other distinctive peaked summits along the glen's twin ridges, one of which is the ten kilometres long, notched ridge of Aonach Eagach.<br><br>From here the steep and high sided rocky, rugged mountains soar from the generously proportioned, flat valley floor, adorned with burns, waterfalls, scree fans, vertical outcrops and hanging valleys. This gives rise to one of the most iconic views in Scotland – the dramatic buttresses of the Three Sisters. | determination to scale.<br><br>The usually broad glen floor of grassland and heather falls gradually to the north-west and the river Coe masks its seasonal powers as it cascades through gorges and across stony washlands, fed by many waterfalls and lively mountain burns which spill almost vertically into the glen from their lofty source. The view across Loch Achtriochtan to the cottage of Achnambeithach, dwarfed by the mountain above, is another iconic Scottish view.<br><br>In the lower reaches of the glen the river plays only a minor role in the summer-time scenery, but its broad and braided gravel beds and boulder debris tell of a thundering power in spate. |
| • ***The wooded strath of lower Glen Coe*** | |
| Glen Coe's splendour is not diminished as it falls to sea level and meets Loch Leven, albeit some way from the open sea. The meeting of the glen and the loch is enhanced by the suddenness of the transition between high mountain pass and the lightly wooded strath which separates the two dominant landscape elements. Population and human influence on the landscape begins to increase markedly. | The twisting line of the glen afforded by the western sentinels of Meall Mor and Sgorr nam Fiannaidh emphasises the suddenness of the transition and from the north serves to obscure the entrance to the mighty breach through the mountains.<br><br>The deep enclosure of the glen is relieved by the narrow, lightly wooded strath with meadows and plantations, aside the loch which prevails as the dominant element in the coastal scene. |
| • ***The narrow and enclosed Loch Leven*** | |
| Loch Leven is a fjord-like sea loch which strikes deep into the upland of the NSA's core.<br><br>The wooded slopes of the north shore, the peak of the Pap of Glencoe and the forested southern valley sides provide a sense of enclosure, which the bridge contributes to by affording a visual barrier to the openness of the outer loch. The abandoned slate quarries above are an impressive reminder of human endeavour.<br><br>The expanse of calm waters affords a far brighter light to pervade than across the | The A82 meets the loch close to its opening out to the sea beyond the distinctive bridge and narrows, and enters a concentration of settlement: Glencoe and Ballachulish villages, with old slate quarries above.<br><br>Here the islands of the middle loch add to the detail of the waterscape and provide natural refuge and shelter for mooring pleasure craft and fishing boats. |

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| moor or within the Glen, and this glistening reflection, particularly in early or evening hours adds a magical air to the place. The hills of Ardgour with their distinctive, irregular profile often stand out across the water. | |
| • ***The impressive massif of Ben Nevis*** | |
| The huge Ben Nevis range dominates the setting of Fort William. The brooding mountain, with its massive rolling shoulders and dramatic eastern cliffs, attracts a wide variety of walkers and climbers. Some are drawn to the challenging rocky precipices and snow-filled gullies of Coire Leis Dearg, while others are simply wanting to reach the highest point in Britain.<br><br>The eastern ridge of Ben Nevis links to the grand, high-level hill walking country of Aonach Mòr and the Grey Corries. | Ben Nevis is a rolling rounded massif when viewed from the west. Vegetation is simple, grass and heather moorland flowing over convex slopes. Boulder fields and outcrops proliferate with increasing altitude, but this remains a simple, exposed, open massive mountain landscape. The prospect from the east is very different, with the precipices and gullies of Coire Leis Dearg.<br><br>The massif of Ben Nevis continues eastwards with a range of high hills, generally scree-covered with narrow ridges. From the north the hills named collectively 'The Grey Corries' appear as a series of high corries.<br><br>About 100,000 people a year ascend Ben Nevis. |
| • ***The wild Mamores and secretive Glen Nevis*** | |
| The Mamore Forest consists of open rolling moorland and rounded, rocky mountains exhibiting an unspoilt character and a wild integrity.<br><br>Penetrating between the Ben Nevis range and Mamores, Glen Nevis offers a striking transition from the pastoral and wooded lower valley, through a boulder-strewn gorge of Himalayan proportions, into a secretive upper glen bounded by steep rocky slopes and waterfalls. | In the pastoral lower valley where the river Nevis meanders into Fort William, lined with alder woodlands and stands of mature oak, flanked by gentle meadow, but bounded by the mass of the Ben's foothills. Tenuous groups of willow and birch cling to burn sides in vertical green fingers.<br><br>Travelling eastwards into the mid glen the valley floor narrows and the steepness and the broken character of the glen sides gradually increases, the hillside profiles become more rugged, with rocky outcrops prevailing. Here the lightly forested glen sides are complemented by remnants of ancient, gnarled Scots pine woods, clinging precariously between boulder and outcrop, and dominating the less dramatic willow, birch and alder woodlands. Here the river energetically tumbles through an increasingly rocky, boulder-strewn and secretive gorge, affording, in the words of *Scotland's Scenic Heritage*, a Himalayan character to the scene. The previous use of the woods in this area for charcoal production highlights the relationship between the natural and cultural aspects of the landscape.<br><br>The upper glen is secretive inviting exploration of its extremely flat alpine meadow, bounded by steep upper slopes of the |

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| | Ben and the Mamores. The drama of the Steall waterfalls is complemented by the peacefulness of the enclosure and detail of the cotton grass and broad, gravelly river beds. |
| • ***The fjord-like upper Loch Leven*** | |
| Loch Leven, a long, linear, narrow, fjord-like sea loch penetrates deep into the mountain setting.<br><br>Vistas from sea level, or from its upper slopes, are stunning, with the distinct conical peaks betraying its point as transition between the more rounded northern ranges and the pinnacles and drama of the Glen Coe range.<br><br>At its head lies the isolated settlement of Kinlochleven, a small town built on the aluminium industry. The settlement has a particular charm enhanced by its long access route and its enclosed setting amongst wooded slopes. | Its sides are often concave and banded from the water's edge through thick broadleaved and coniferous woodland, to the open moors of the Mamores and northern Glen Coe ridge. Woods in this area were once used for charcoal production.<br><br>Before the arrival of the aluminium smelter in 1907, Kinlochleven consisted of two small hamlets – Kinlochmore and Kinlochbeag. The smelter closed in 2000, with the associated large Blackwater Reservoir and its power-plant in Kinlochleven now feeding hydro-electricity into the national grid. |
| • ***Long and green Glen Etive*** | |
| Glen Etive, a long and dramatic glen with a fast-flowing rocky river, is generally green and grassy, affording tranquillity and peacefulness. Surrounded by high mountains, its narrow, sinuous single track road extends to the shores of Loch Etive, where it abruptly ends at the disused pier.<br><br>From here the narrow, elegant Loch Etive stretches seawards, free of obvious human infrastructure, settlement or intrusion.<br><br>The upper reaches of the River Etive offer interesting and sharply contrasting detail to the overall simplicity of the landscape. Its shallow, gorged profile within the sweeping, smooth grassland draws attention, emphasised by the crystal pools and waterfalls over a complex geological bedrock.<br><br>Settlement in this glen is limited to the occasional cottage and a single hunting lodge, but it is influential with the policies | This glen runs south from the upper reaches of Glen Coe flanked by the towering peaks of the Buachailles and the great slabs of Ben Starav. It is a generally smooth-sided and extremely long, cleft valley, gradually sloping to the head of Loch Etive, a remote, relatively inaccessible sea loch.<br><br>There is a harmonious transition from the broad lower valley floor of the braided river Etive to the open water of the sea loch.<br><br>The simple profile of the glen is nevertheless dramatic, with smooth, high, U-shaped valleys meeting the main glen. The upper slopes give way from grass to rocky conical summits, and their sides characterised by steep streambeds opening out to rocky fans of scree.<br><br>The glen's vegetation is predominantly of smooth grassland, with trees in small, sporadic stands or plantations, particularly in its lower reaches; there are extensive conifer plantations immediately north of the loch end. In places rhododendron colonises the western glen sides detracting from the semi-natural vegetation but adding striking colour in the early summer months. |

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| of the lodge dominating the lower reaches. | |
| • ***The dark heritage*** | |
| The grandeur and drama of the NSA is undeniable and irresistible, and modern development seems not to have diluted this grand scenery. However the village of Glencoe at the foot of the glen witnessed an historical betrayal and massacre which is still an integral part of the area's character and ambience.<br><br>Whilst infamous for the massacre the glen also carries with it legend of cattle rustling and banditry between clans and government, secret refuges in hidden valleys and tales of incredible hardship. All weave together with the scenery of the area to present a dramatic and fascinating experience to the visitor. | The murder of 38 of the Clan Macdonald in 1692 by order of the Crown, and the subsequent loss of life of women and children from exposure after the King's soldiers had lodged within the village for several nights, engenders feelings of sorrow and disquiet.<br><br>In later years, the village of Glencoe was populated by workers from the nearby slate quarries, and, later still, the Kinlochleven aluminium works. |

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Whittow, J. B.1977. *Geology and Scenery in Scotland.* Penguin.

# Appendix 6.7 LVIA Viewpoint Agreement Correspondence

| | |
|---|---|
| **From:** | Susan Macmillan |
| **To:** | Mary Fisher; Lucy Prins |
| **Cc:** | Corrina.Mertens@snh.gov.uk |
| **Subject:** | RE: Lochaber Smelter application - design viewpoints |
| **Date:** | 08 September 2017 13:58:51 |

Hi Mary

Thanks for that – we have discussed and think this is a fair compromise. Thanks also for the confirmation regarding the woodland in the ZTV as this came up this morning – it would be useful to have the updated bare ground ZTV as soon as it is available.

Thanks
Susan

**Susan Macmillan**
**Planning Team Leader - Lochaber**



**From:** Mary Fisher [mailto:Mary.Fisher@lda-design.co.uk]
**Sent:** 08 September 2017 13:32
**To:** Lucy Prins; Susan Macmillan
**Cc:** 'Corrina.Mertens@snh.gov.uk'
**Subject:** RE: Lochaber Smelter application - design viewpoints

Having scouted around on aerial photos and the internet in general – it looks to me like we may be able to get a view from the West Highland Way somewhere between that red circle and Dun Deardail, as I think our ZTV may include some woodland that has been felled (we'll make sure you get a bare ground ZTV in the LVIA).
The walkers blog here: http://www.scottishhills.com/html/modules.php?name=Forums&file=viewtopic&t=15774 shows two views towards the site: one from somewhere near the top of Bidean Bad na h-Iolaire (entitled "North up the Great Glen") and one from further down (last image titled "Glen Nevis").

Can I suggest we aim for a viewpoint somewhere in this section of the West Highland Way – aiming for something like the "Glen Nevis" view in the blog, but reverting to the one around the red circle if we cannot find a decent view higher up. Hopefully this represents a fair compromise between achieving height and sticking to well visited areas where views will be seen by lots of people? My research indicates that Bidean Bad na h-Iolaire is one of the less visited peaks.

regards,

Mary

Mary Fisher
Associate

LDA Design

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Read our short essay on landscape-led development

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**From:** Lucy Prins [mailto:Lucy.Prins@highland.gov.uk]
**Sent:** 08 September 2017 12:41
**To:** Mary Fisher <Mary.Fisher@lda-design.co.uk>; Susan Macmillan <susan.macmillan@highland.gov.uk>
**Cc:** 'Corrina.Mertens@snh.gov.uk' <Corrina.Mertens@snh.gov.uk>
**Subject:** RE: Lochaber Smelter application - design viewpoints

Hi Mary
Yes – that's the one – there's parking at the café at the end of the road

**This advice is given without prejudice to the future consideration of, and decision on, any application received by The Highland Council.**
**Thathar a' toirt seachad na còmhairle seo gun chlaon-bhreith do bheachdachadh air agus co-dhùnadh a thaobh tagradh sam bith a tha Còmhairle na Gàidhealtachd a' faighinn san àm ri teachd.**

*Lucy Prins*
**Principal Planning Officer - Lochaber**

The Highland Council
Planning and Building Standards
Fulton House, Gordon Square, Fort William PH33 6XY
Tel.01397 707030

**If you are emailing about a planning matter, please include the correct planning case reference number in the subject line – thank you**

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---

**From:** Mary Fisher [mailto:Mary.Fisher@lda-design.co.uk]
**Sent:** 08 September 2017 11:22
**To:** Susan Macmillan
**Cc:** Corrina.Mertens@snh.gov.uk; Lucy Prins
**Subject:** RE: Lochaber Smelter application - design viewpoints

Susan,

Following on from our call earlier… Regarding the potential viewpoint near the restaurant – do you mean in the vicinity of the red circle in the attached document?

thanks,

mary

Mary Fisher
Associate

Sovereign House, 158 West Regent Street, Glasgow, G2 4RL
tel: +44(0)141 222 9780 | mob: +44(0)7818 513451
email: Mary.Fisher@lda-design.co.uk | www.lda-design.co.uk


---

**From:** Susan Macmillan [mailto:susan.macmillan@highland.gov.uk]
**Sent:** 06 September 2017 16:35
**To:** Mary Fisher <Mary.Fisher@lda-design.co.uk>
**Cc:** Corrina.Mertens@snh.gov.uk; Lucy Prins <Lucy.Prins@highland.gov.uk>
**Subject:** RE: Lochaber Smelter application - design viewpoints

Hi Mary

Thanks for your email and apologies for the delay responding.

All seems fine, with the exception of the loss of viewpoints 11 and 12. I have spoken to Corrina and we are in agreement that we want to keep one of the higher viewpoints from within the NSA. Two alternatives have been suggested – a view from Bidean Bad na h-Iolare and one from the track leading up from the bar/restaurant at the campsite in Glen Nevis at a point just before it goes into the trees.

Hope this helps.

Regards
Susan

**Susan Macmillan**
**Planning Team Leader - Lochaber**

**This advice is given without prejudice to the future consideration of and decision on any application received by The Highland Council**
**Thathar a' toirt seachad na comhairle seo gun chlaon-bhreith do bheachdachadh air agus co-dhùnadh a thaobh tagradh sam bith a tha Comhairle na Gàidhealtachd a' faighinn san àm ri teachd**



---

**From:** Mary Fisher [mailto:Mary.Fisher@lda-design.co.uk]
**Sent:** 22 August 2017 12:41
**To:** Susan Macmillan
**Cc:** 'Corrina.Mertens@snh.gov.uk'; Lucy Prins
**Subject:** RE: Lochaber Smelter application - design viewpoints

Susan,

We went out to site last week and have visited all of the viewpoints except 4a and those which were above the clouds on Thursday and Friday (4, 6, 6a, 11, 12). Based on this and a review of wireline visualisations which we have been using to test how much of the development is likely to be visible (as the ZTV indicates visibility even for just one corner) – I would like to propose the following:

01 – agreed
02 – located as requested
03 – located as requested
04 – agreed.
04a – although we have not yet visited this location, our site work enabled us to look towards it, and we are content on that basis to accept it will make a good viewpoint for assessment.
05/5a/5b – having visited this group, 5a makes an excellent viewpoint; 5b looks away from the site, and 5 has only partial visibility. As this group are all at a similar distance and direction and represent the same receptors we propose to use 5a only.
06/6a – based on a review of wireframes and the ZTV study, 6a is likely to have only partial visibility

and 6 has the more open views towards the site. Given that these are both quite distant views from a similar distance and direction which represent the same receptor group and are unlikely to relate to significant effects, we propose to use 6 only.
07 – omitted
08/8a – access to the base of the mast requires either following a track through an active quarry or climbing barbed wire fences to ascend from Old Banavie Road. On this basis we do not consider this a suitable viewpoint for assessment given the barriers to public access. We visited a viewpoint lower down the slope between the mast and the war memorial. This has open views but is very similar in terms of distance and direction to viewpoint 8. Given that Viewpoint 8 is much visited, and viewpoint 8a shows evidence of little use by the public we propose to use viewpoint 8 only.
09 – agreed.
9a – agreed. This is quite similar to viewpoint 9, however we consider there is merit in including both the more open view from the cemetery and the more visited location at the locks.
10/10a – our initial work indicates very limited visibility of the proposal is likely from 10, so we propose to include this as an illustrative view only and use 10a for assessment.
11 – Access to this viewpoint would travelling some distance across difficult terrain from the main paths to a very small area of visibility indicated by the ZTV. We consider that it is not likely to relate to significant effects and will entail health and safety risks for our team and for others seeking to visit the location to consider our assessment. On this basis we propose to exclude this as an assessment viewpoint, but would propose to provide an illustrative wireline view to indicate the scale and composition of the proposal from the location.
12 – The ZTV study and a review of wirelines indicates that there would be no visibility of the proposal from this location as visibility would be blocked by intervening terrain. We propose to exclude this viewpoint.

This would leave us with 11 viewpoints as follows:
01, 02, 03, 04, 04a, 05a, 06, 08, 09, 09a, 10a
plus an illustrative view (annotated photograph) from viewpoint 10; and an illustrative wireframe from viewpoint 11.

Could you consider this proposal and let me know if you are content with this set of viewpoints? We are hoping to get these agreed slightly ahead of the main scoping process to provide as long a window as possible for photography, so that we can get photos taken in good visibility conditions.

If you have any queries or want to discuss further, please get in touch, my contact details are below.

regards,

Mary

Mary Fisher
Associate

Sovereign House, 158 West Regent Street, Glasgow, G2 4RL
tel: +44(0)141 222 9780 | mob: +44(0)7818 513451
email: Mary.Fisher@lda-design.co.uk | www.lda-design.co.uk


---

**From:** Susan Macmillan [mailto:susan.macmillan@highland.gov.uk]
**Sent:** 15 August 2017 15:33
**To:** Mary Fisher <Mary.Fisher@lda-design.co.uk>
**Cc:** 'Corrina.Mertens@snh.gov.uk' <Corrina.Mertens@snh.gov.uk>; Lucy Prins <Lucy.Prins@highland.gov.uk>
**Subject:** RE: Lochaber Smelter application - design viewpoints

Dear Mary

Please find below our initial feedback on the view points – The advice provided is given in the context of the short time frame provided for comment. The ones highlighted in yellow are considered to be key viewpoints for the design testing purposes as described in your email.

01 - OK
02 Cow Hill Core path – move this VP slightly east to path junction (path up from Braveheart car park meets bottom of the "lumpy bumpy" path
03 Achintee – probably better a short distance back down the road from the Inn (view otherwise blocked by trees)
04 OK
04a New – top of subsidiary summit which is top of race route and popular local walk/run, alternative descent off Ben Nevis – approx. NGR. NN13867413
05 OK
05a New –bench on new path from North Face car park to Allt a Mhuillin – approx. NN147756; 5b New – signed view point above this path approx. NN149754
06 OK
06a – other viewpoint from top of gondola at Aonach Mor at Meall Beag – approx. NN178754
07 – Not considered necessary
08 – OK
08a New - from mast adj to Banavie quarry
09 - OK
09a New – top of cemetery at Drumfada, Corpach
10 - OK
10a New – view point at top of path which leads uphill from a point just east of Achaphubuil
11 – Carn Dearg
12 – Carn Beag Dearg

I hope this helps

Regards
Susan

**Susan Macmillan**

**Planning Team Leader - Lochaber**

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Follow up documentation for existing planning applications

-
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---

**From:** Mary Fisher [mailto:Mary.Fisher@lda-design.co.uk]
**Sent:** 14 August 2017 15:55
**To:** Susan Macmillan; 'Corinna Mertens (Scottish Natural Heritage (South Highland (Fort William)))'
**Cc:** Mark Evans
**Subject:** Lochaber Smelter application - design viewpoints

Susan, (and Corrina)

Following on from our earlier conversation, please find attached a draft ZTV for the proposed factory at Lochaber Smelter with some suggested viewpoint locations. As discussed, a version of this – with the relevant explanation and rationale will be coming to you with the scoping request soon, however in the meantime it would greatly assist if we could agree the key viewpoints for design testing purposes. We'd like to get out later this week to capture views from these to use in our augmented reality software as we'll be using this in working with the architects on the design. We normally use a subset of the LVIA viewpoints for this purpose – typically those which are either of particular importance, nearest and/or most likely to be affected by alterations to the shape, size or position of a building.

Given the nature of the views and the scale of the building, we feel that views which look down onto the proposed factory building are likely to be the most important ones in terms of design – given that those include views from the NSA and are also those in which the building is likely to be most visible. So I suggest that the key views for design testing will be viewpoints 2 (core path on Cow Hill), 4 (Meall an t-Suidhe), 5 (convergence of a number of routes up Ben Nevis) and 7 (Meall Bhanbhaidh). However, I'd like your and Corinna's views on this topic – so if you could let me know (by Wednesday if possible) that would be most helpful.

If at the same time you have any comments on the viewpoint selection or have alternative locations that you'd like us to scout out, then it would be helpful if you could let me know, as we will try and get out to capture as many of these as we can later in the week. This is less urgent than getting the design viewpoints agreed – so if you don't have time for both, please prioritise the design viewpoints.

If you have any queries please get in touch – my contact details are below. If you find the attachment too low a resolution then let me know – high res. one is just under 6MB and I wasn't sure what your email limit was.

Many thanks,

Mary Fisher

Mary Fisher
Associate

Sovereign House, 158 West Regent Street, Glasgow, G2 4RL
tel: +44(0)141 222 9780 I mob: +44(0)7818 513451
email: Mary.Fisher@lda-design.co.uk I www.lda-design.co.uk

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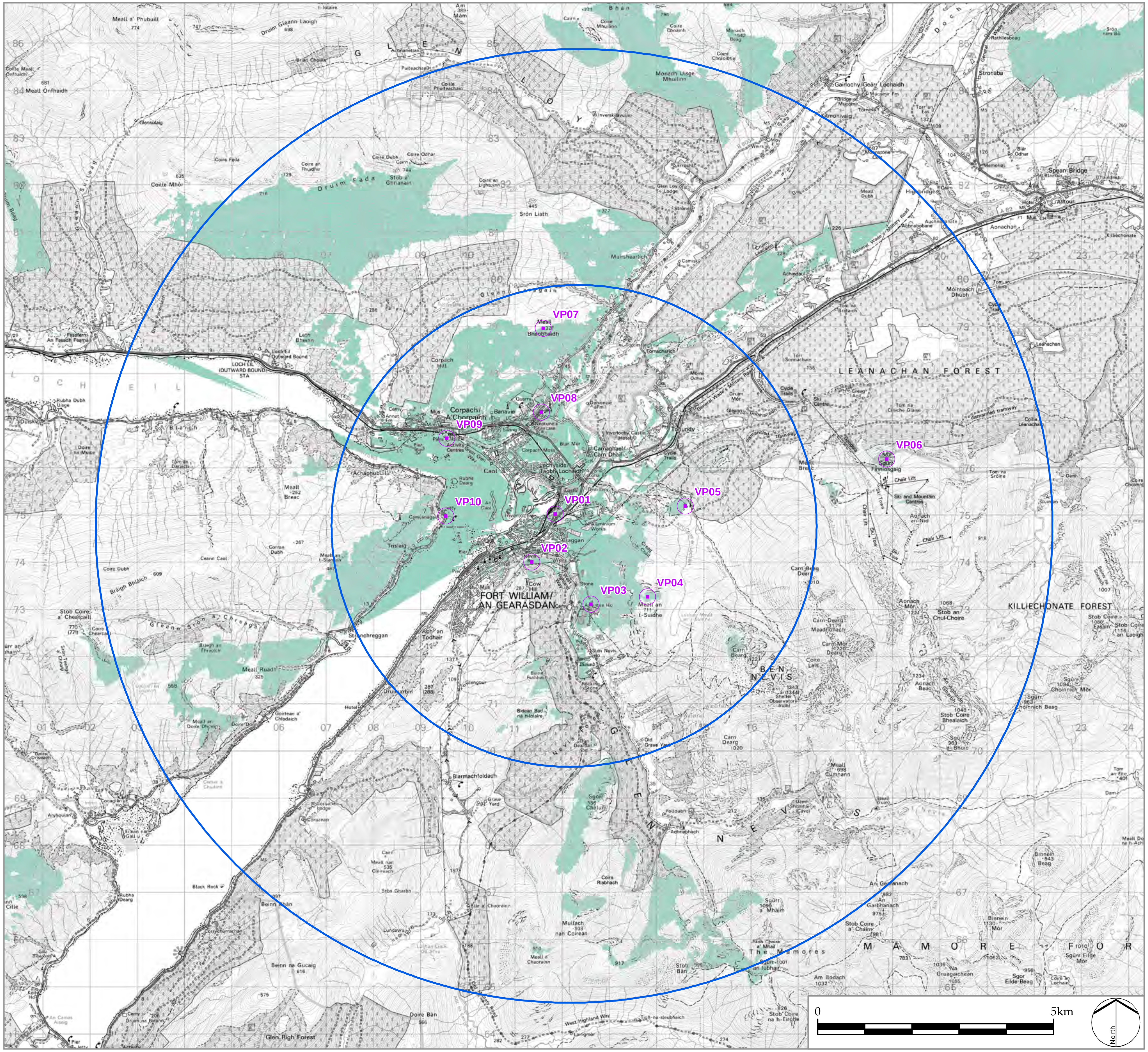


LEGEND

Distance from proposed building (5km, 10km)

Proposed viewpoints

Zone of Theoretical Visibility (building modelled at 15m height)

This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the viewshed routine in the ESRI ArcGIS Suite. The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and settlements, which have been included in the model with the heights obtained from Nextmap 25. It should be noted that in some areas woodlands included within the ZTV may comprise active forestry, resulting in the felling and replanting of some areas modelled in the ZTV study. The ZTV study reflects this pattern at a specific point in time, as it is based on real height information. Whilst the felling cycle will alter the heights of different areas of forestry over time, altering localised visual effects, the wider pattern will remain relatively constant.

The model does not take into account any localised features such as small copses, hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.

The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on Nextmap 25 terrain data and has a $25m^2$ resolution.

LDĀ DESIGN

PROJECT TITLE

LOCHABER SMELTER - DOWNSTREAM WORKS

DRAWING TITLE

Zone Theoretical Visibility (ZTV) Study
and Proposed Viewpoints

| | | | |
|---|---|---|---|
| ISSUED BY | Glasgow | T: | 0141 222 9780 |
| DATE | July 2017 | DRAWN | ME |
| SCALE @A3 | 1:80,000 | CHECKED | XX |
| STATUS | Draft | APPROVED | XX |

**DWG. NO. 6024_ZTV_Scoping**

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.



Sources: Ordnance Survey

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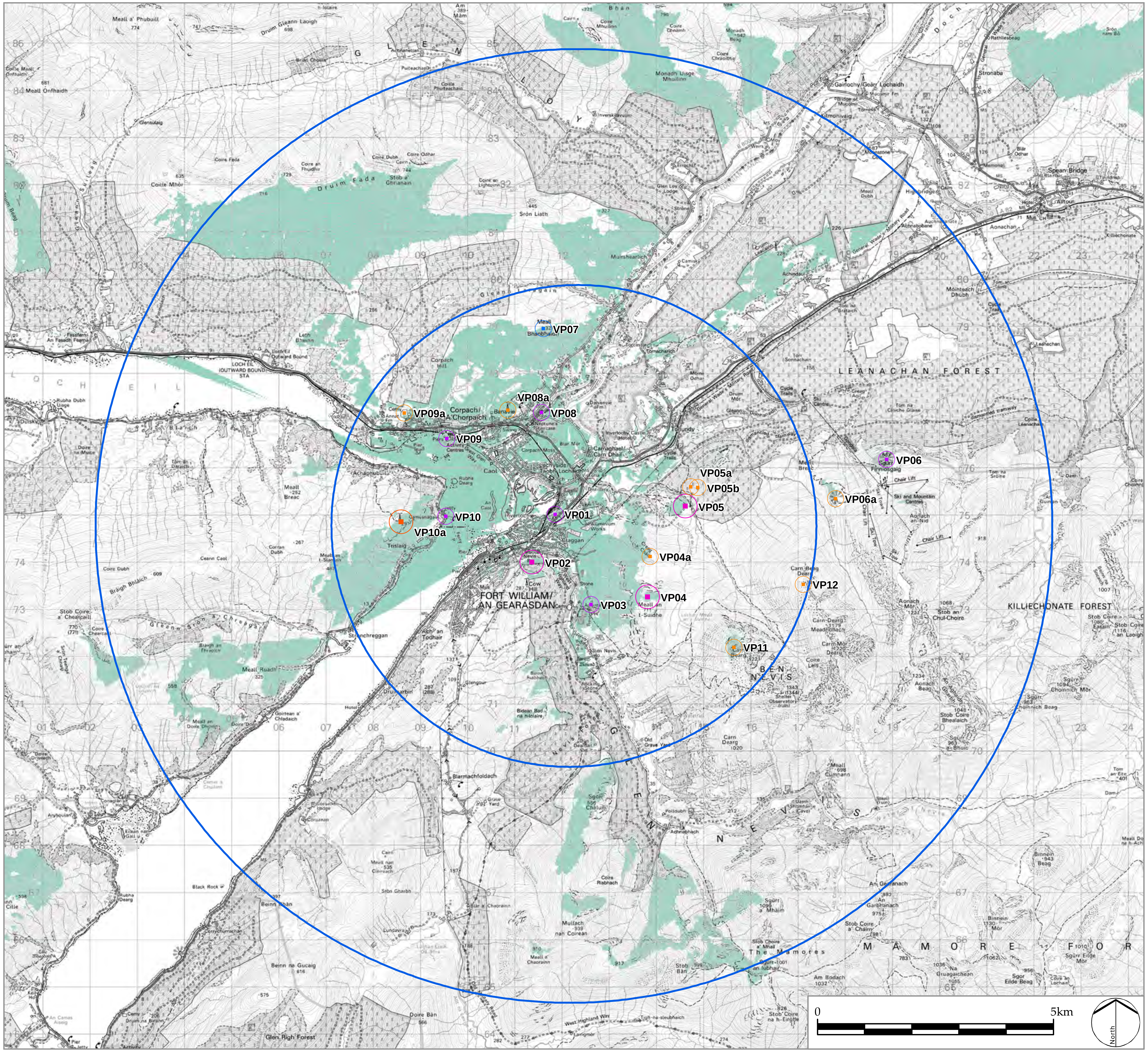



LEGEND

Distance from proposed building (5km, 10km)

Viewpoint Status

- Proposed LVIA and Design Viewpoints
- Proposed LVIA viewpoints
- THC + SNH Request - Design and LVIA viewpoint
- THC + SNH request - LVIA viewpoint
- Proposed but THC response indicates not required

Zone of Theoretical Visibility (building modelled at 15m height)

This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the viewshed routine in the ESRI ArcGIS Suite. The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and settlements, which have been included in the model with the heights obtained from Nextmap 25. It should be noted that in some areas woodlands included within the ZTV may comprise active forestry, resulting in the felling and replanting of some areas modelled in the ZTV study. The ZTV study reflects this pattern at a specific point in time, as it is based on real height information. Whilst the felling cycle will alter the heights of different areas of forestry over time, altering localised visual effects, the wider pattern will remain relatively constant.

The model does not take into account any localised features such as small copses, hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.

The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on Nextmap 25 terrain data and has a $25m^2$ resolution.

LDĀ DESIGN

PROJECT TITLE

LOCHABER SMELTER - DOWNSTREAM WORKS

DRAWING TITLE

Zone Theoretical Visibility (ZTV) Study
and Proposed Viewpoints

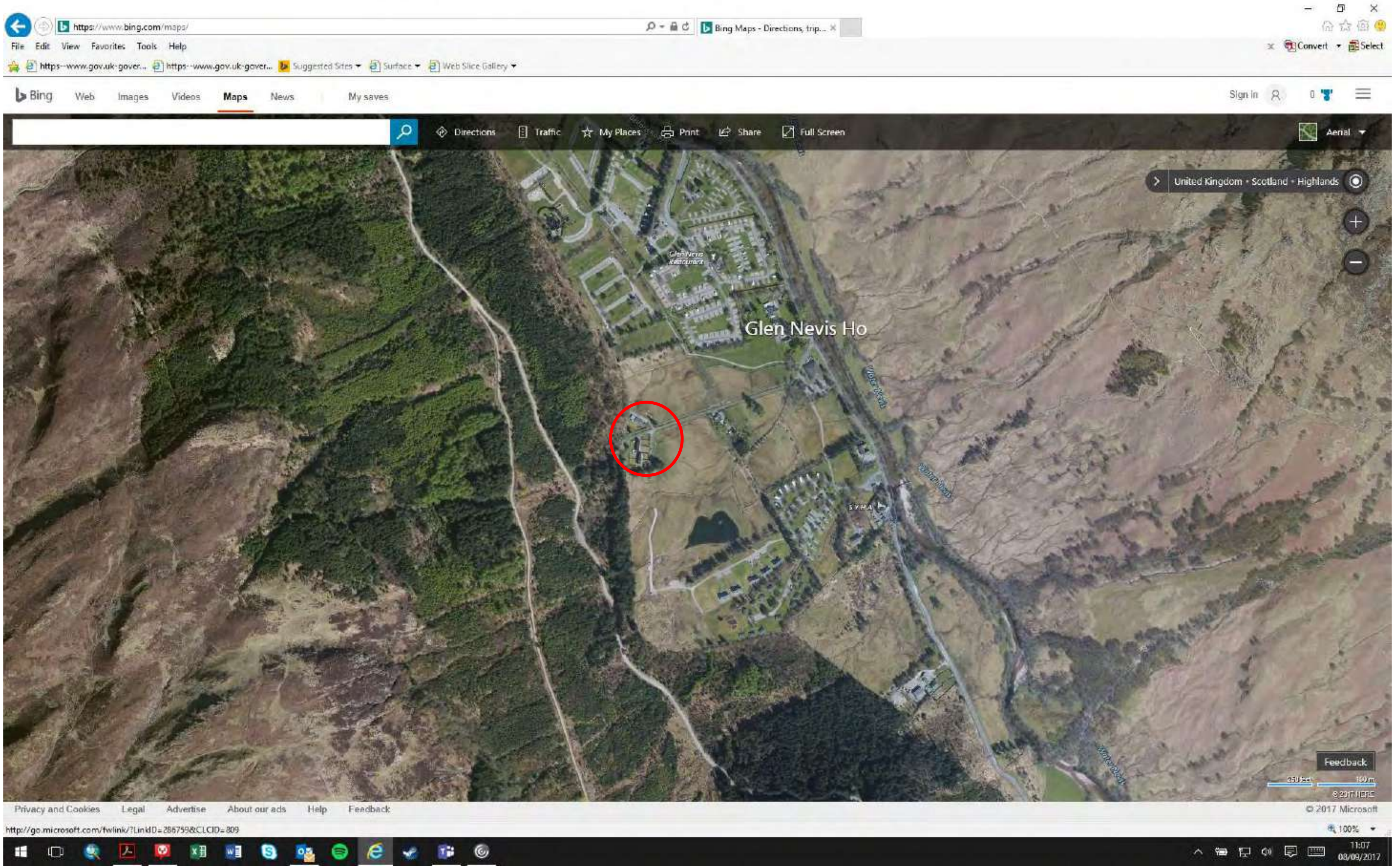
| | | | |
|---|---|---|---|
| ISSUED BY | Glasgow | T: | 0141 222 9780 |
| DATE | 16 Aug 17 | DRAWN | ME |
| SCALE @A3 | 1:80,000 | CHECKED | MFi |
| STATUS | Discussion draft | APPROVED | MFi |

**DWG. NO. 6024_ZTV_Scoping**

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.



Sources: Ordnance Survey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03/09/2017

# Appendix 7.1 Flood Risk Assessment

# Alvance Recycling and Billet Casting Facility EIA

## Appendix 7.1 Flood Risk Assessment

| | |
|---|---|
| Client: | Alvance British Aluminium |
| Project/Proposal No: | 3983 |
| Version: | 1 |
| Date: | 2021-05-10 |

# Document Information

| | |
|---|---|
| Project Name: | Alvance Recycling and Billet Casting Facility EIA |
| Document Title: | Appendix 7.1 Flood Risk Assessment |
| Client Name: | Alvance British Aluminium |
| Client Contact: | Mr. James Tangney |
| Client Address: | North Road, Fort William PH33 6TJ |
| Document Status: | Final for Issue |
| Author: | Katie Brydie |
| Reviewed: | Stephen Donnan |
| Approved: | Zak Ritchie |
| Date: | 2021-05-10 |
| Version | 1 |
| Project/Proposal Number: | 3983 |
| ITPEnergised Office: | Centrum House, 108-114 Dundas Street, Edinburgh, UK, EH3 5DQ |

## Revision History

| Version | Date | Authored | Reviewed | Approved | Notes |
|---|---|---|---|---|---|
| 1 | 2021-05-10 | Katie Brydie | Stephen Donnan | Zak Ritchie | |
| | | | | | |
| | | | | | |
| | | | | | |

# Contents

# Document References

## Tables



## Figures



## Drawings



## Appendices

# 1. Introduction

## 1.1 Context

ITPEnergised has been appointed by Alvance British Aluminium to provide support and input to the Environmental Impact Assessment submission to support a planning application for a proposed Recycling and Billet Casting Facility adjacent to the existing Lochaber Smelter, Fort William.

This Flood Risk Assessment (FRA) has been prepared as Technical Appendix 7.1 to Chapter 7: Hydrology and Hydrogeology within the Environmental Impact Assessment Report.

This report addresses any potential flood risk to the proposed development from all possible sources.

The site was visited by an experienced ITPEnergised Hydrologist/ Civil Engineers in January 2021 to inform this assessment.

## 1.2 Policy and Guidance

This assessment has been completed in accordance with guidance presented within Scottish Planning Policy (SPP)[1], the National Planning Framework for Scotland 3 (NPF3)[2] and taking cognisance of the Flood Risk Management (Scotland) Act 2009.

The assessment also references and takes due consideration (where appropriate) of the following principal guidance and policy documents:

- CIRIA (2004) Development and Flood Risk – Guidance for the Construction Industry, Report C624;
- The Highland Council (2012) Highland-wide Local Development;
- The Highland Council (2013) Supplementary Guidance: Flood Risk and Drainage Impact Assessment
- The Highland Council (2019) West Highland and Islands Local Development Plan;
- Scottish Environment Protection Agency (2015) Flood Risk and Land Use Vulnerability Guidance (Reference: LUPS-GU24), Version 4, July 2018;
- Scottish Environment Protection Agency (2017) SEPA Development Plan Guidance Note 2a: Development Management Guidance: Flood Risk (Reference: LUPS-DM-GU2a), Version 2, July 2018;
- Scottish Environment Protection Agency (2019) Climate Change Allowances for Flood Risk Assessment in Land Use Planning (Reference: LUPS-CC1), Version 1, April 2019;
- Scottish Environment Protection Agency (2019) Technical Flood Risk Guidance for Stakeholders (Reference: SS-NFR-P-002) May 2019; and

## 1.3 Site Location and Context

The site is located on the outskirts of Fort William at the foot of Ben Nevis adjacent to the existing Lochaber Smelter at approximate National Grid Reference (NGR): NN 12319 74815. The site entrance is accessed off the A82 utilising the existing access to the smelter.

[1] The Scottish Government (2020) Scottish Planning Policy, 2020
[2] The Scottish Government (2014) National Planning Framework 3, June 2014

The site predominantly comprises peatland scrub with an existing track from the smelter to the west of the proposed development. The western extent of the proposed development is located upon the site of a previous development for the production of carbon anodes. This development has since been demolished with only the concrete slab remaining.

The existing Lochaber Smelter is located adjacent to the site to the northeast. The surrounding areas to the west and southwest comprises residential and industrial areas associated with Fort William and surrounding settlements. Areas of forestry are also located in the surrounding areas.

A site location plan is included as Drawing FRA-001.

## 1.4 Proposed Development

The proposed development is for an industrial manufacturing plant for the production of aluminium billets. The development area will comprise the main Recycling and Billet Casting Facility, outdoor storage areas, site roads and yard, soft landscaping, water treatment plant and ancillary storage areas for gas storage etc.

A copy of the proposed development plan is included as Appendix A.

## 1.5 Topography

Review of the site topographic data indicates that the proposed location of the development is at an elevation between 19.0 to 20.0 mAOD along the southern boundary, falling to between 16.0 to 16.5 mAOD along its northern boundary, with areas to the east of the existing railway line falling to approximately 14.5mAOD. Generally, the topographic profiler of the wider study is a net fall in a northern direction to the minor watercourse adjacent to the railway line. Approximately 100 m to the south of the development there is a topographic divide where the land then slopes south towards the Allt Garbh at the foot of Ben Nevis.

## 1.6 Geology and Hydrogeology

### 1.6.1 Geology

#### 1.6.1.1 Superficial

Review of the British Geological Survey (BGS) online geology maps[3] indicates that superficial deposits peat and hummocky (moundy) glacial deposits of sands and gravels are present at the site. Peat is mostly found at the area of the site being developed.

#### 1.6.1.2 Bedrock

Review of the BGS online geology maps indicates that the bedrock geology at the study site is the Fort William Formation consisting of micaceous psammite and semipelite. This unit was originally sedimentary rock then later altered by low-grade metamorphism.

#### 1.6.1.3 Site Investigation

A comprehensive site investigation was undertaken in 2019 to inform a previously proposed development at the site. The intrusive site works comprised 55 rotary boreholes and 60 trial pits, providing an extensive overview of the underlying geology at the proposed site location and wider local area.

The results of the investigation broadly concur with the published geology from BGS. Made ground was encountered to depths between 0.20 m and 6.00 m in several of the exploratory holes primarily in the western extents of the proposed development area. This was seen to comprise a mix of ash,

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[3] British Geological Survey (2020) Natural Environment Research Council – online Geology of Britain Viewer, available at: http://mapapps.bgs.ac.uk/geologyofbritain/home.html (accessed 28th January 2021)

soil, concrete and brick fragments, although other materials were also identified. Where made ground was not observed pseudo-fibrous peat was encountered from ground levels to depths between 0.20 m and 6.00 m. The made ground and / or peat was observed to be underlain by granular deposits comprising primarily cobbly fine to coarse sand, or sand and gravel with low to medium boulder content.

The solid bedrock geology was observed to comprise weak to medium strong schist, pelite, semipelite and psammite. Solid geology was proven to a maximum depth of 15.00m.

Findings of the SI were therefore consistent with the natural recorded deposits reported by BGS.

### 1.6.2 Hydrogeology

Review of the BGS Geoindex Hydrogeological map (1:625,000 scale) indicates that the wider bedrock aquifer in the area is the Grampian Group and is classified as a low productivity aquifer. The superficial deposits of peat would be expected to have low permeability and inhibit groundwater flow.

SEPA classifications identify the site to be within the Fort William groundwater body which has an overall status of 'Good' under the definitions set out in the Water Framework Directive.

During the site investigation, groundwater was encountered in 35 of the 60 trial pits undertaken. The depth to water in these trial pits was variable and groundwater encountered in both the made ground and underlying superficial deposits. Due to the groundwater elevation variability, it is deduced that groundwater is both perched within the made ground deposits overlying impermeable peat, and small quantities confined within the sandy / granular glacial deposits underlying the peat.

## 1.7 Hydrological Context

### 1.7.1 Local Hydrology

There are no natural watercourses present within the proposed development area. Attributed to the previous development, there are existing land drainage ditches and culverts within the development area draining north to a minor watercourse adjacent to the railway line. This watercourse flows to the north east via a 900mm diameter concrete culvert beneath the railway line. There is also surface water drainage infrastructure within the main smelter access road. Boh the 900mm concrete culvert and the access road infrastructure discharge to the Tail Race (discharge channel from adjacent hydropower scheme) which in turn discharges to the River Lochy.

To the south of the development, the Allt Garbh and Caochan Dubhaig flow generally to the west, likely fed by surface water flows on the western slope of Ben Nevis, converging 500 m from the site. Both streams appear to be discharging to the River Nevis, though OS mapping indicates the converged watercourse has been culverted.

Drawing FRA-002 presents the existing hydrological overview of the site and local area.

A hydrological summary and characteristics of the Site are shown in Table 1 below. The data is taken form the FEH Web Service and the point of the site has been delineated from NGR: NN 12195 74835.

*Table 1 Hydrological Summary*

| Point Location (NGR) | BFIHOST[1] | BFIHOST19[2] | PROPWET[3] | SAAR[4] |
|---|---|---|---|---|
| NN 12195 74835 | 0.332 | 0.315 | 0.810 | 1916 mm |

*[1]BFIHOST= Base Flow Index derived using the UK Hydrology of Soil Types (Host) classification (released 1999)*
*[2]BFIHOST19 = Base Flow Index derived using the UK Hydrology of Soil Types (Host) classification (released 2019)*
*[3]PROPWET = Proportion of Time the Soil Moisture Deficit (SMD) was equal to, or below, 6mm during 1961-1990*
*[4]SAAR= Standard Annual Average Rainfall*

From the FEH Web Service point data it is shown that the site has a high SAAR and that the local soils are indicated to be wet most of the time.

# 2. Planning and Guidance Context

## 2.1 Scottish Planning Policy

This report has been prepared in accordance with Scottish Planning Policy (SPP) relating to Managing Flood Risk and Drainage, which states that the planning system should promote:

- “a precautionary approach to flood risk from all sources, including coastal, water course (fluvial), surface water (pluvial), groundwater, reservoirs and drainage systems (sewers and culverts), taking account of the predicted effects of climate change;
- flood avoidance: by safeguarding flood storage and conveying capacity, and locating development away from functional flood plains and medium to high risk areas;
- flood reduction: assessing flood risk and, where appropriate, undertaking natural and structural flood management measures, including flood protection, restoring natural features and characteristics, enhancing flood storage capacity, avoiding the construction of new culverts and opening existing culverts where possible;
- avoidance of increased surface water flooding through requirements for Sustainable Drainage Systems (SuDS) and minimising the area of impermeable surface”; and,
- "To achieve this, the planning system should prevent development which would have a significant probability of being affected by flooding or would increase the probability of flooding elsewhere."

SPP presents a risk framework for planning decision making relating to flood risk. A summary of this risk framework is replicated in Table 2 below.

*Table 2 SPP Flood Risk Framework*

| SPP Flood Risk Framework |
|---|
| **Little or No Risk** – annual probability of coastal or watercourse flooding is less than 0.1% (1:1000 years):<br>➢ No constraints due to coastal or watercourse flooding. |
| **Low to Medium Risk** – annual probability of coastal or watercourse flooding is between 0.1% - 0.5% (1:1,000 – 1:200 years):<br>➢ Suitable for most development. A flood risk assessment may be required at the upper end of the probability range (i.e. close to 0.5%), and for essential infrastructure and the most vulnerable uses. Water resistant materials and construction may be required.<br>➢ Generally, not suitable for civil infrastructure. Where civil infrastructure must be located in these areas or is being substantially extended, it should be designed to be capable of remaining operational and accessible during extreme flood events. |
| **Medium to High Risk** – annual probability of coastal or watercourse flooding is greater than 0.5% (1:200 years):<br>➢ May be suitable for: |

| | |
|---|---|
| | o residential, institutional, commercial and industrial development within built-up areas provided flood protection measures to the appropriate standard already exist and are maintained, are under construction, or are a planned measure in a current flood risk management plan;<br>o essential infrastructure within built-up areas, designed and constructed to remain operational during floods and not impede water flow;<br>o some recreational, sport, amenity and nature conservation uses, provided appropriate evacuation procedures are in place; and<br>o job-related accommodation, e.g. for caretakers or operational staff.<br>➢ Generally, not suitable for:<br>o civil infrastructure and the most vulnerable uses;<br>o additional development in undeveloped and sparsely developed areas, unless a location is essential for operational reasons, e.g. for navigation and water-based recreation, agriculture, transport or utilities infrastructure (which should be designed and constructed to be operational during floods and not impede water flow), and an alternative, lower risk location is not available; and<br>o new caravan and camping sites.<br>➢ Where built development is permitted, measures to protect against or manage flood risk will be required and any loss of flood storage capacity mitigated to achieve a neutral or better outcome.<br>➢ Water-resistant materials and construction should be used where appropriate. Elevated buildings on structures such as stilts are unlikely to be acceptable. |
| **Surface Water Flooding** | |
| | ➢ Infrastructure and buildings should generally be designed to be free from surface water flooding in rainfall events where the annual probability of occurrence is greater than 0.5% (1:200 years).<br>➢ Surface water drainage measures should have a neutral or better effect on the risk of flooding both on and off the site, taking account of rain falling on the site and runoff from adjacent areas. |

The SPP Flood Risk Framework above uses the designations from SEPAs online indicative Flood Map to categorise the fluvial (and coastal) flood risk and these are defined as follows:

- **High Likelihood:** A flood event is likely to occur in the defined area on average once in every ten years (1:10) or a 10% chance of happening in any one year (i.e. Annual Exceedance Probability (AEP));
- **Medium likelihood:** A flood event is likely to occur in the defined-on average once in every two hundred years (1:200) or a 0.5% AEP chance of happening in any one year; and
- **Low likelihood:** A flood event is likely to occur in the defined area on average once in every thousand years (1:1000) or a 0.1% AEP chance of happening in any one year.

## 2.2 THC Highland-Wide Local Development Plan

The Highland-wide Local Development Plan (HwLDP) is a plan for the Highland Council Area as a whole and addresses the wider needs of the Highland Council. Of relevance to this report is Policy 64 Flood Risk which states the following;

*"Development proposals should avoid areas susceptible to flooding and promote sustainable flood management.*

*Development proposals within or bordering medium to high flood risk areas, will need to demonstrate compliance with Scottish Planning Policy (SPP) through the submission of suitable information which may take the form of a Flood Risk Assessment.*

*Development proposals outwith indicative medium to high flood risk areas may be acceptable. However, where:*

- *better local flood risk information is available and suggests a higher risk;*
- *a sensitive land use (as specified in the risk framework of Scottish Planning Policy) is proposed, and/or;*
- *the development borders the coast and therefore may be at risk from climate change;*

*a Flood Risk Assessment or other suitable information which demonstrates compliance with SPP will be required.*

*Developments may also be possible where they are in accordance with the flood prevention or management measures as specified within a local (development) plan allocation or a development brief. Any developments, particularly those on the flood plain, should not compromise the objectives of the EU Water Framework Directive.*

*Where flood management measures are required, natural methods such as restoration of floodplains, wetlands and water bodies should be incorporated, or adequate justification should be provided as to why they are impracticable."*

## 2.3 THC West Highland and Islands Local Development Plan

Greater detail on how the outcomes set out in the HwLDP can be delivered at a more local level are provided in three additional Area Local Development Plans. These address local policy and spatial issues. The Proposed Development is located within the West Highland and Islands Local Development Plan area. This document makes specific reference to the existing Smelter and adjoining land in Fort William. Of relevance to this chapter, it states that additional proposals must address/prepare a Flood Risk and Drainage Impact Assessment with no development in areas shown to be at risk of flooding.

## 2.4 SEPA Flood Risk and Land Use Vulnerability Guidance

### 2.4.1 Context

This guidance outlines how SEPA assess the vulnerability to flooding of different land use with the following categories:

- Most Vulnerable Uses;
- Highly Vulnerable Uses;
- Least Vulnerable Uses;
- Essential Infrastructure; and
- Water Compatible uses.

The classification above is linked to the Flood Risk Framework in SPP (see Table 2 previously) by a matrix of flood risk. In producing this guidance, SEPA has sought to refine and enhance the vulnerability classification and definitions identified in the SPP risk framework.

The following paragraphs are extracted from the guidance for context:

*"This guidance classifies land uses according to how they are impacted by flooding, i.e. their relative susceptibility and resilience to flooding, and any wider community impacts caused by their damage or loss.*

*The classification recognises that certain types of development, and the people who use and live in them, are more at risk from flooding than others (e.g. children, the elderly and people with mobility problems that may have more difficulty in escaping fast flowing water).*

*The term 'land use vulnerability' is used in this guidance to differentiate between a range of land uses, taking account of flooding impacts on land uses in terms of their relative susceptibility and resilience to flooding. It also reflects wider community impacts caused by their damage or loss. For example, a police station is not more likely to suffer damage (be susceptible) or less able to recover (be resilient) than a comparable office building. However, it is in a more vulnerable category than an office use because a higher value is placed upon the wider community impacts that would be caused by its potential loss or damage during a flood event. Similar considerations apply to the inclusion of hazardous waste facilities within the highly vulnerable category and other waste treatment facilities being within the less vulnerable category."*

### 2.4.2 Proposed Development Suitability

With reference to Table 1 (SEPA Land Use Vulnerability Classification)[4] of the guidance the proposed developed is considered *Least Vulnerable Uses* category.

With reference to Table 2 (SEPA Matrix of Flood Risk) of the guidance, the proposed *Least Vulnerable* development is suitable in little or no risk (<0.1% AEP) and generally suitable in low to medium risk (0.1% - 0.5 AEP). Anything that is medium to high risk within a built-up area (>0.5% AEP) is classified as generally not suitable unless one of the following applies;

- *"Redevelopment of an existing building, including changes of use to an equal or less vulnerable use to the existing use.*
- *Redevelopment of a previously developed site where it involves the demolition of existing buildings and/or erection of additional buildings within a development site, and the proposed land use is equal or less vulnerable than the existing land use.*
- *Where the principle of development on the site has been established in an up-to-date, adopted development plan or the National Planning Framework and flood risk issues were given due consideration as part of the plan preparation process and our assessment of risk has not changed in the interim.*
- *The site is protected by a flood protection scheme of the appropriate standard that is already in existence and maintained, is under construction, or is planned for in a current flood risk management plan."*

### 2.4.3 Proposed Flood Design Criteria

With reference to the preceding sections, the proposed flood design criteria for the development is to be free from flood risk (from all sources) for up to and including the 0.5% AEP event and the relevant allowance for climate change uplifts where appropriate.

[4] Scottish Environment Protection Agency (2018): Flood Risk and Land Use Vulnerability Guidance

# 3. Flood Risk Assessment

## 3.1 Sources of Information

### 3.1.1 National Floodplain Mapping and Risk Assessment

Strategic level information regarding the current flood risk at the Site has been obtained from SEPA via the online Indicative Flood map and National Flood Risk Assessment (NFRA) Portal[5].

### 3.1.2 Mapping and Terrain Data

Ordnance Survey (OS) Mapping, LiDAR data, the site topographic survey and satellite imagery have been used to set the context of the application site and its immediate surroundings.

### 3.1.3 Site Observations and Records

The site and surrounding area have been visited by ITPEnergised personnel in January 2021. Observations have been included within this assessment.

### 3.1.4 Freedom of Information Data Request

A Freedom of Information (FOI) data request response was received in January from THC. Relevant to this FRA, records of historic flooding incidents were received for the local area.

## 3.2 Screening Assessment of Potential Source of Flood Risk

### 3.2.1 Overview

There are a number of potential sources of flooding which should be evaluated in accordance with best practice and SPP such as:

- Flooding from rivers or fluvial flooding;
- Flooding from the sea or tidal / coastal flooding;
- Flooding from land;
- Flooding from groundwater;
- Flooding from sewers; and
- Flooding from reservoirs, canals, and other artificial sources.

The flood risk from each of these potential sources is discussed in the following sections and a 'screening assessment' is presented in Section 3.2.9 which confirms any potential flood risk sources requiring a more detailed analysis and specification of bespoke mitigation measures.

Flood 'risk' definitions are based on a qualitative technical assessment taking into account the information reviewed, risk to site users and the development itself.

### 3.2.2 Historic Flooding

Review of data received in response to the FOI data request confirms THC does not hold any report of flooding on the site. Within the surrounding area, the closest record of historic flooding to the site was located at the mouth of the River Lochy (X 211949 Y 775528), over 475 m north of the site

[5] Scottish Environment Protection Agency (2020): NFRA data explorer tool, available at: https://www.sepa.org.uk/data-visualisation/nfra2018/ (accessed 19th January 2021)

boundary. Multiple incidents of historic flooding are recorded in the residential area of Inverlochy, over 500 m west of the site.

Review of SEPAs online Indicative Flood map and National Flood Risk Assessment (NFRA) Portal shows no records of historic flooding at the site.

### 3.2.3 Fluvial Flooding

Review of SEPAs Fluvial Flood Map for the Site confirms that it is situated in an area of **'Little or No Risk'** (less than 0.1% AEP) from river sources.

The River Nevis is included within SEPA's fluvial flood mapping, but any associated flooding potential is suitably down gradient of the application site. The flooding extent is appropriately 55 m from the site boundary and approximately 330 m from any proposed infrastructure. The proposed infrastructure is also approximately 8 mAOD above the indicative flood extent.

Flooding from this source is therefore not considered further.

### 3.2.4 Tidal / Coastal Flooding

Review of SEPA's Flood Map confirms that the site is not at risk of coastal / tidal flooding as it is located approximately 250 m inland from the coastal flooding extent at the "Tail Race" and therefore, is designated as **'No Risk'** to the site.

Flooding from this source is therefore not considered further.

### 3.2.5 Flooding from Land (Pluvial or Surface Water Flooding)

Review of SEPA's Surface Water Flood Map shows isolated accumulations of high risk surface water flooding / ponding within the site boundary in the southwest corner of the site, the north of the site and the east of the site. Surface water flooding is shown at and around the proposed infrastructure in the northern areas of the development.

The isolated incidents of Surface Water Flood Risk at the site are due to local topographic depressions / pathways for 'uncontrolled' surface water runoff to accumulate / flow. Site observations confirm areas of standing water, informal preferential surface water flow paths and the presences of land drainage ditches, which ultimately drain the site to the minor watercourse to the north (see Drawing FRA-002).

Development of the site will inherently 'design out' the current informal surface water runoff at site via implementation of a formal surface water drainage system designed to current industry standards and incorporate an upgradient 'cut off' drain around the site, to intercept minor catchment flows to the south. Full details of the proposed site drainage measures are presented in Technical Appendix 7.2 "Drainage Impact Assessment" of the EIA Report Chapter 7.

Taking the above into account it is considered that there is **'Low Risk'** of flooding to the site from land and therefore must be considered further.

### 3.2.6 Groundwater Flooding

Review of SEPA's Groundwater Flood Map shows that the site is not located in an area potentially at risk of groundwater flooding.

Review of the local site geology / hydrogeology (see Section 1.6) confirms that the site is widely underlain with Peat which inhibits the vertical movement of any groundwater. Furthermore, the bedrock at the site is classed as a low productivity aquifer.

As outlined in Section 1.6.2, groundwater was encountered in the detailed site investigations at varying elevations. Due to the groundwater elevation variability, it is deduced that groundwater is both perched within the made ground deposits overlying impermeable peat, and small quantities confined within the sandy / granular glacial deposits underlying the peat.

To establish a suitable load bearing formation for the development, the existing made ground, peat and accumulations of glacial deposits will largely be removed and bedrock exposed. The formation would then be built up in compacted engineered layers.

The proposed surface water drainage design for the site (and upgradient cut off drain) as outlined in Technical Appendix 7.2 “Drainage Impact Assessment” will provide inherent mitigation and create a natural pathway for any accumulations of groundwater upgradient of the site, to flow around / through in a controlled manner.

The groundwater table in the superficial deposits is not a homogenous unit and likely to be in small / isolated quantities, and thus the ability for groundwater to periodically rise and flood the site is considered highly unlikely.

Taking the above site investigations into account it is considered that the development site is at **‘Low Risk’** of groundwater flooding and thus not considered further at this stage. It is noted however that further investigations / consideration / review should be given at the detailed design / post planning stages, once the final design / construction details are established.

### 3.2.7 Flooding from Sewers / Drainage Systems

Review of Scottish Water asset plans shows that foul sewers run approximately 60m north of the site and 130 m west of the site, serving the residential area of Inverlochy, both downgradient of the site elevation.

The development would be served by an appropriately designed sustainable drainage system in accordance with industry best practice (i.e. the SuDS Manual – CIRIA Report C753) and Sewers for Scotland 4th Edition. The drainage systems would be designed as such that the development is not at risk of flooding for up to the standard design events required.

A bespoke drainage maintenance and management plan will be developed for the site and incorporated into the site operating plan to ensure continued effectiveness and design performance of the proposed site drainage system.

Taking the above into account it is considered that there is ‘**Low Risk’** of flooding to the site from sewers and drainage systems.

### 3.2.8 Flooding from Infrastructure Failure

Review of the SEPA reservoir inundation map indicates the possible flood risk to the area northwest of the site from Loch Treig, Loch Lochy, Quoich Reservoir and Loch Laggan with the closest extent to the site coming from Loch Treig. This shows the *“indicative area that may flood from an uncontrolled release of water from all possible dam failure scenarios”.* The site boundary is adjacent to the extent of this possible flood risk. However, the infrastructure of the proposed development is over 200m from the flooding extent of Loch Trieg and approximately 5 mOAD above the flood risk.

An existing Scottish Water supply main runs adjacent to the western site boundary and an existing on-site fire main and on-site potable water infrastructure also runs through the site – refer to Drawing FRA-002. With regards to the former, failure of this asset would result is a sudden surge of pressurised potable water being released, however resulting flows would be time limited and northwards away from the development area. With respect to the latter, this asset would be integrated into the design of the site, likely within a formal services trench along the main E-W site access road. Failure of this water main would also result in a time-limited sudden release of pressurised water, which would be readily captured by the onsite drainage system and discharged northwards.

There are no other significant infrastructure i.e. canals, pumping stations, aqueducts etc located upstream or in hydraulic continuity / proximity to the site which may pose a flood risk during a failure scenario.

As such it is considered that the development site is at **'Low Risk'** of flooding resulting from any offsite / onsite infrastructure failure.

### 3.2.9 Flood Risk Screening Assessment Review

A summary of the potential flood risk to the site from the sources reviewed is presented in Table 4 below.

This 'Screening Assessment' is used to identify if any sources of flood risk are required to be investigated in more detail i.e. a 'Technical' more detailed assessment which would include consideration / specification of bespoke flood mitigation measures for the site development.

*Table 3 Flood Risk Screening Assessment*

| Potential Flood Source | Screening Assessment of Flood Risk at Site[1] | Requiring Further Consideration i.e. Technical Assessment? |
|---|---|---|
| Fluvial flooding | No Risk | No |
| Tidal flooding | No Risk | No |
| Flooding from land | Low Risk | No |
| Groundwater flooding | Low Risk | No |
| Flooding from sewers / artificial drains | Low Risk | No |
| Flooding due to infrastructure failure / blockage | Low Risk | No |

*Notes: [1]only Flood Risks designated and screened as being 'medium' or 'high' warrant further investigation*

The Screening Assessment confirms that there are no significant flood risks identified, and thus the requirement for further detailed assessment at this stage, or inclusion of bespoke flood mitigation measures is not warranted.

## 3.3 Climate Change

### 3.3.1 Overview

The most recent Climate Change (CC) projections published by The UK Climate Impacts Programme are presented in report 'UKCP18'. Central estimates published in UKCP18 indicate marked increases in winter rainfall and decrease in summer rainfall but with more intense storms under all CO2 emissions scenarios across the majority of the country.

SEPA's most recent climate change allowances were published in April 2019[6] and are based on UKCP18 findings in conjunction with The Centre for Ecology and Hydrology's (CEH) 2011 study[7] that is based on UKCP09 projections.

A climate change allowance in drainage and flood risk assessment terms is a prediction of anticipated change in peak river flow, peak rainfall intensity and sea level rise caused by future climate change.

[6] Scottish Environment Protection Agency (2019) Climate change allowances for flood risk assessment in land use planning (Ref: LUPS-CC1)

[7] Centre for Ecology & Hydrology (2011) An assessment of the vulnerability of Scotland's river catchments and coasts to the impacts of climate change

The type of allowance used will depend upon the type of flooding being considered and, for fluvial flooding, the size of the catchment (See Figure 1 below).

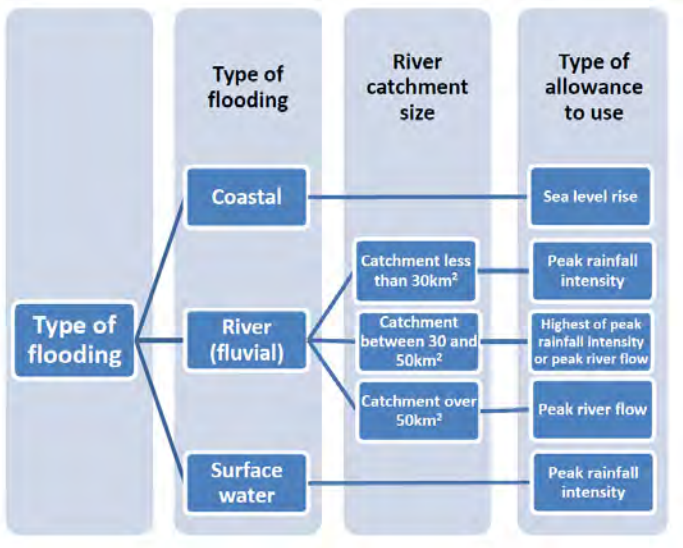



*Figure 1 Climate Change Allowance Flow Chart*

The allowances applied for sea level rise and/or peak river flow are determined by river basin regions across Scotland. Peak rainfall intensity allowances are categorised into two regions of Scotland, east and west. SEPA have developed a web map to allow any location in Scotland to be identified for its applicable climate change uplift allowances[8].

Taking the above into account, the design for surface water flooding will apply a peak rainfall intensity climate change uplift. The climate change uplifts for Coastal and Fluvial flooding will not alter the flood risk classifications outlined in Table 4 previously.

### 3.3.2 Peak Rainfall Intensity Climate Change Allowance

Using SEPA's online map service, the site is located within the Western region of Scotland. The peak rainfall intensity allowance until 2100 for this region is a 55% uplift on design rainfall intensities.

The proposed site surface water drainage system, and upgradient 'cut off' drain (refer to Technical Appendix 7.2 of the EIA Report) have been hydraulically designed to accommodate the 1:200yr + 55% climate change event, and thus future climate change impacts on rainfall intensities have been duly accommodated for.

# 4. Conclusions

ITPEnergised has been appointed by Alvance British Aluminium to provide support and input to the Environmental Impact Assessment submission to support a planning application for a proposed Recycling and Billet Casting Facility adjacent to the existing Lochaber Smelter, Fort William.

The site has been visited on by an experienced ITPEnergised Hydrologist /Civil Engineer in January 2021 to inform this assessment.

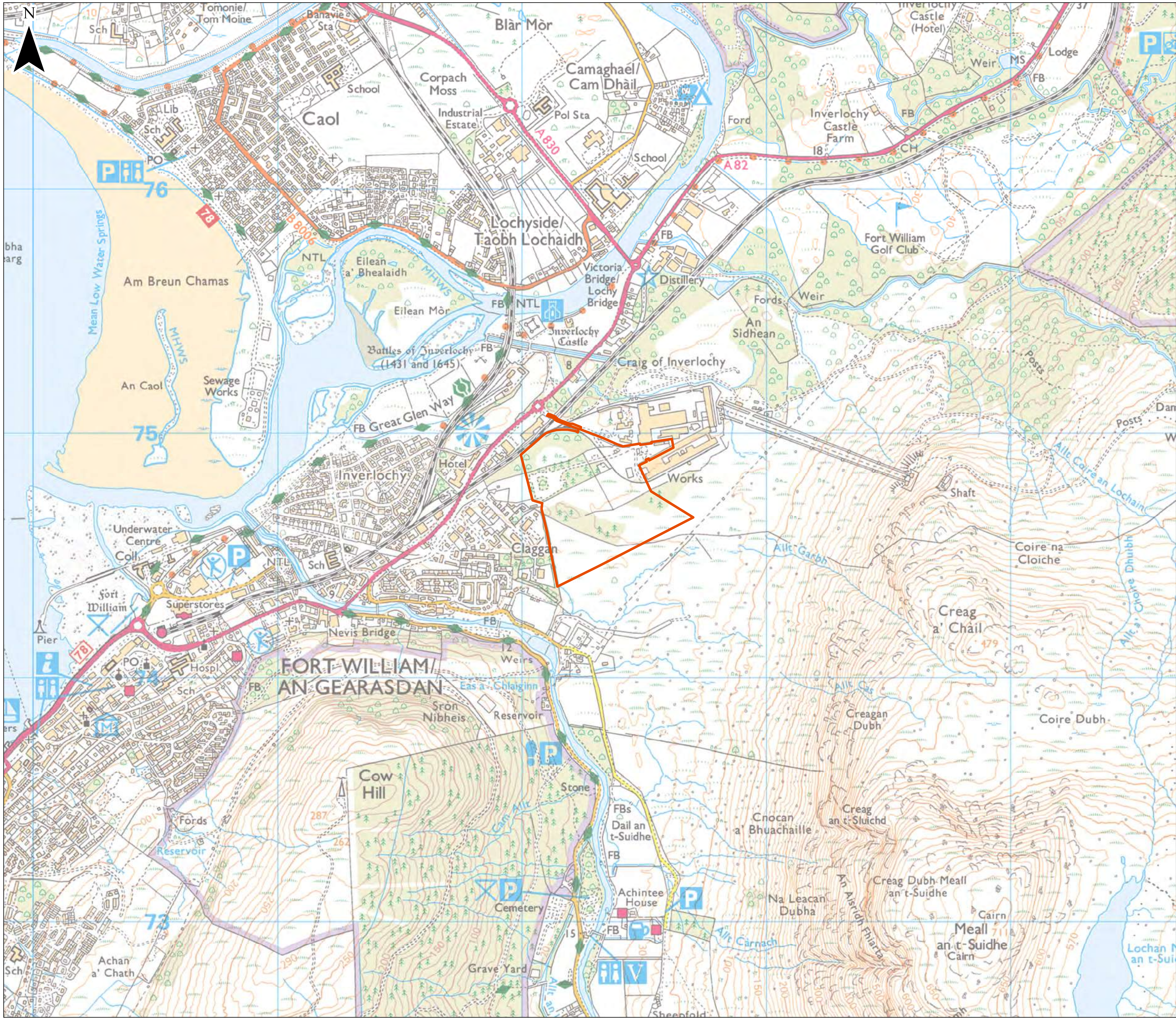
In accordance with Scottish Planning Policy and other relevant technical guidance, all potential sources of flooding to the site have been considered and no history of flooding at the site has been identified.

The FRA undertaken herein demonstrates that the proposed development, with inclusion of standard design / mitigation measures, is not at any significant flood risk from all sources.

The proposed development is considered to be ‘Least Vulnerable’ and located in the “Low to medium risk category” (0.1% -0.5% AP), and thus in accordance with SEPA Guidance and Scottish Planning Policy and thus is considered entirely suitable in land use development terms.

As such it is considered that the proposed development is suitable in flood risk planning terms and there is no overriding impediment to the proposals being granted planning permission on the grounds of flood risk.

# DRAWINGS




**KEY**

Site Boundary

0 0.35 0.7 km

**Scale 1:15,000 @ A3**

ALVANCE

ITPENERGISED

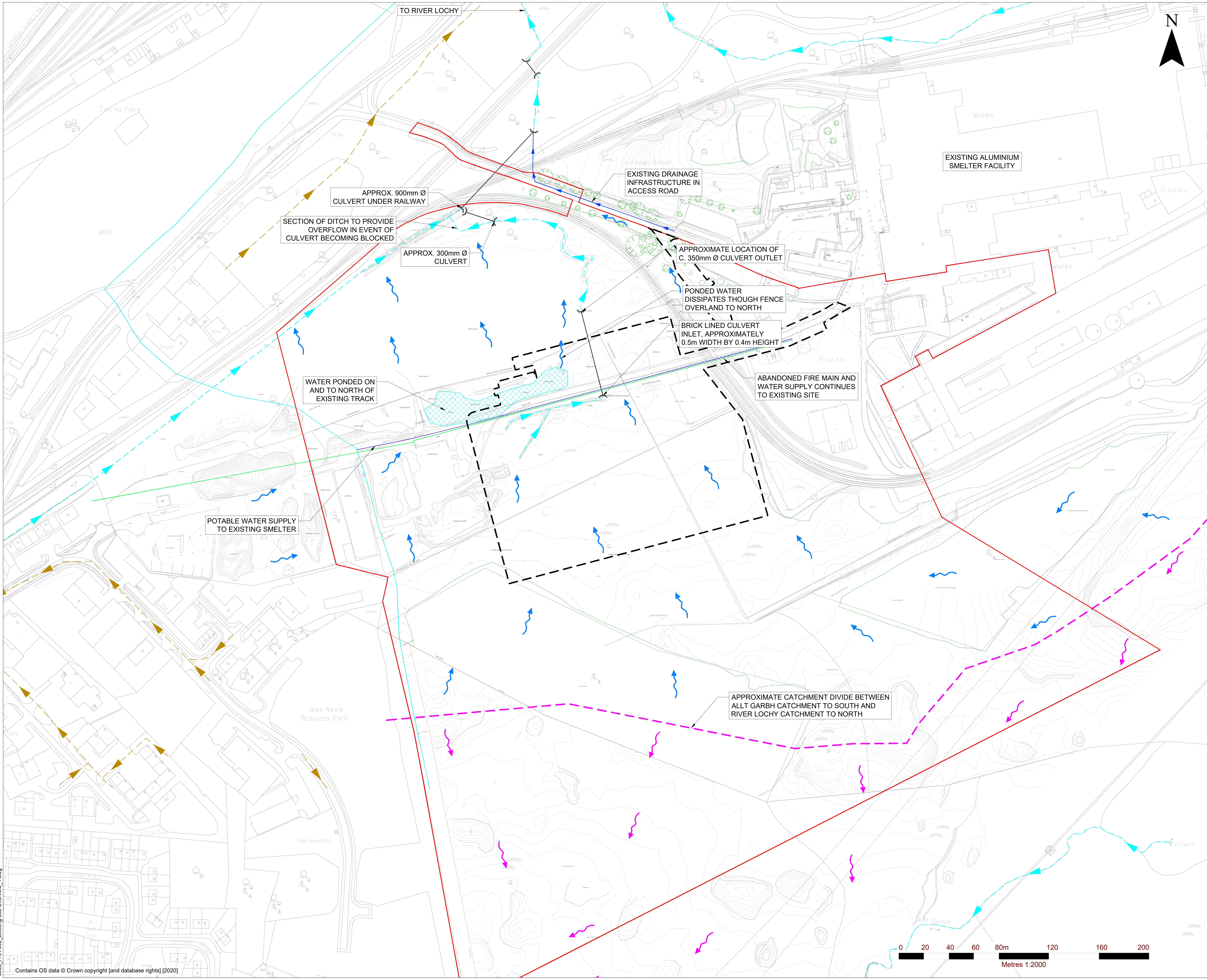
Alvance British Aluminium
Flood Risk Assessment

**Drawing FRA-001**

**Site Location Plan**

| Date: 31/03/2021 | Drawn by: KB | Checked by: ZR | Version: V01 |
|---|---|---|---|

Project Number: 3539




NOTES

1. SITE LAYOUT BASED ON DRAWING 'XX-XX-DR-A-601003_Site Plan' (REV P5) PROVIDED BY KEPPIE DESIGN ON 5TH APRIL 2021.
2. TOPOGRAPHIC SURVEY BASED ON DRAWING '11576.dxf' PROVIDED BY ALVANCE BRITISH ALUMINIUM ON 12TH JANUARY 2021.
3. EXISTING ON-SITE SERVICES BASED ON DRAWING 'services.dwg' PROVIDED BY ALVANCE BRITISH ALUMINIUM OF 12TH JANUARY 2021.
4. EXISTING SCOTTISH WATER SERVICE ALIGNMENTS BASED ON SCOTTISH WATER DRAWINGS '354041 Land Near Lochaber Smelter fresh' AND '354041 Land Near Lochaber Smelter waste' PROVIDED BY PAUL HODGSON ON 16TH JANUARY 2020
5. EXACT EXISTING DITCH AND PIPEWORK ALIGNMENTS APPROXIMATED FROM AVAILABLE INFORMATION

LEGEND

RED LINE BOUNDARY

APPROXIMATE EXTENT OF PROPOESD HARDSTANDING

UTILITIES

EXISTING ON-SITE POTABLE WATER INFRASTRUCTURE

ABANDONED ON-SITE FIRE MAIN

ABANDONED PIPEWORK

EXISTING SCOTTISH WATER SUPPLY MAIN

EXISTING SCOTTISH WATER FOUL SEWER

EXISTING HYDROLOGY

EXISTING DITCH / MINOR WATERCOURSE

EXISTING CULVERT

EXISTING SURFACE WATER PIPEWORK

OVERLAND FLOW ROUTE - RIVER LOCHY CATCHMENT

OVERLAND FLOW ROUTE - ALLT GARBH CATCHMENT

AREA OF PONDED WATER

APPROXIMATE CATCHMENT DIVIDE BETWEEN ALLT GARBH AND RIVER LOCHY

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| 1 | 04/21 | UPDATED TO SUIT NEW LAYOUT | RL | ZR |
| 0 | 02/21 | INITIAL ISSUE | RL | ZR |

CLIENT:
ALVANCE BRITISH ALUMINIUM

ALVANCE

PROJECT:
ALUMINIUM BILLET PLANT

DRAWING TITLE:
**EXISTING SITE OVERVIEW**

SCALE: 1:2000 @ A2

DATE: APRIL 2021

DRAWING NUMBER: **FRA-002**

REV: **1**

DRAWING STATUS:
FLOOD RISK ASSESSMENT

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# APPENDIX A

## Proposed Development Plan


## Proposed Site Plan (Extract)

Scale - 1 : 1000



Figured dimensions only are to be taken from this drawing.
All dimensions are to be checked on site before any work is put in hand. IF IN DOUBT ASK.

CDM:
Hazard Elimination & Risk Reduction has been undertaken and recorded where appropriate, in accordance with the requirements of "The Construction (Design and Management) Regulations 2015" and the associated "Industry Guidance for Designers"

0 20 40 60m
Scale 1:1000

N

**Legend**

Proposed Site Boundary (Recycling & Billet Casting Facility)

**Site Key**

1 Proposed Recycling & Billet Casting Facility

2 Proposed Yard & Laydown Area

3 Proposed SUDS and Swale

4 Proposed Car Park with dedicated pedestrain route to Main Entrance.
*20 car parking spaces proposed, including 2 ambulant disabled and 2 active electric vehicle spaces (+10 passive electric vehicle spaces.)*

5 MV/ LV Electrical Plant
*circa 15x10m footprint, circa 4m high*

6 Water Treatment Plant
*-Water Cooling Plant*
*circa 25x20m footprint, circa 4m high with 3 no. cooling tanks (circa 9m high.)*

*-Waste Water Treatment Plant*
*circa 25x20m footprint, circa 4m high*

7 Gas Facility
*circa 22x16m footprint, circa 4m high with bunded earth sides and green roof*

8 Process Gases Storage

9 Weigh Bridge

10 Existing Smelter Facility

| REV | DESCRIPTION | DR'N | CHK'D | DATE |
|---|---|---|---|---|
| P03 | Planning | EF | AJM | 01.04.21 |
| P02 | For Information | EF | AJM | 17.03.21 |
| P01 | For Information | EF | AJM | 25.02.21 |

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Client
ALVANCE

Project
Recycling & Billet Casting Facility

Drawing
Proposed Site Plan (Extract)

Project No.
P20095

Drawing No. XXX-KEP-XX-XX-DR-A-601004 Rev P03

Status Planning Status Code S4

Created: EF Checked: AM
Date: 25.02.21 Scale: As indicated @ A1

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## Appendix 7.2 Drainage Impact Assessment

# Alvance Recycling and Billet Casting Facility EIA

## Appendix 7.2 Drainage Impact Assessment

| | |
|---|---|
| Client: | Alvance British Aluminium |
| Project/Proposal No: | 3983 |
| Version: | 1 |
| Date: | 2021-05-10 |

# Document Information

| | |
|---|---|
| Project Name: | Alvance Recycling and Billet Casting Facility EIA |
| Document Title: | Appendix 7.2 Drainage Impact Assessment |
| Client Name: | Alvance British Aluminium |
| Client Contact: | Mr. James Tangney |
| Client Address: | North Road, Fort William PH33 6TJ |
| Document Status: | Final for Issue |
| Author: | Richard Lucey |
| Reviewed: | Stephen Donnan |
| Approved: | Zak Ritchie |
| Date: | 2021-05-10 |
| Version | 1 |
| Project/Proposal Number: | 3983 |
| ITPEnergised Office: | Centrum House, 108-114 Dundas Street, Edinburgh, UK, EH3 5DQ |

## Revision History

| Version | Date | Authored | Reviewed | Approved | Notes |
|---|---|---|---|---|---|
| 1 | 2021-05-10 | Stephen Donnan | Richard Lucey | Zak Ritchie | Final for Issue |
| | | | | | |
| | | | | | |
| | | | | | |

# Contents

# Document References

## Tables



## Figures



## Drawings



## Appendices

# 1. Introduction

## 1.1 Context

ITPEnergised has been appointed by Alvance British Aluminium to undertake an Environmental Impact Assessment for a proposed Aluminium Billet plant development adjacent to the existing Fort William smelter.

This Drainage Impact Assessment (DIA) has been prepared as Technical Appendix 7.2 to Chapter 7: Hydrology and Hydrogeology, within the Environmental Impact Assessment Report.

The site was visited by experienced ITPEnergised Hydrologist / Civil Engineer personnel in January 2021 to inform the drainage design.

This report assesses the increase in surface water runoff attributed to the development and proposes a surface water management strategy to manage this. The DIA also includes a review of site 'run-on' from surrounding land and puts measures in place to manage this. The strategy is in accordance with the sustainable drainage principles and allows the site to remain operational during design storm events, whilst ensuring no increase of flood risk to offsite receptors and ensures no deterioration of the water environment.

In addition to the above, a foul water drainage strategy has been included to detail how flows generated from the on-site welfare facilities will be managed (Section 4), and a brief description of potential water emissions from the plant process is outlined in Section 5.

## 1.2 Policy and Guidance

This assessment has been completed in accordance with the following principal guidance and policy documents:

- CIRIA (2004) Development and Flood Risk – Guidance for the Construction Industry, Report C624;
- CIRIA (2015) The SuDS Manual, Report C753;
- Highland Council (2013) Flood Risk & Drainage Impact Assessment: Supplementary Guidance;
- Scottish Environment Protection Agency (2018) SEPA Development Plan Guidance Note 2a: Development Management Guidance: Flood Risk (Reference: LUPS-DM-GU2a), Version 2, July 2018;
- Scottish Water (2018) Sewers for Scotland 4th Edition, October 2018.

## 1.3 Site Location and Context

The site is located on the outskirts of Fort William at the foot of Ben Nevis adjacent to the existing Lochaber Smelter at approximate National Grid Reference (NGR): NN 12319 74815. The site entrance is accessed off the A82 utilising the existing access to the smelter.

The site predominantly comprises peatland scrub with an existing track from the smelter to the west of the proposed development. The western extent of the proposed development is located upon the site of a previous development for the production of carbon anodes. This development has since been demolished with only the concrete slab remaining.

## 1.4 Proposed Development

The Proposed Development is for an industrial manufacturing plant for the production of aluminium billets. The development area will comprise the main billet plant, outdoor storage areas, site roads and yard, soft landscaping, water treatment plant and ancillary storage areas for gas storage etc.

A copy of the Proposed Development plan is included as Appendix A.

## 1.5 Topography

Review of the site topographic data indicates that the proposed location of the development is at an elevation between 19.0 to 20.0 m AOD along the southern boundary, falling to between 16.0 to 16.5 m AOD along its northern boundary, with areas to the east of the existing railway line falling to approximately 14.5 m AOD. Generally, the topographic profile of the wider area is a net fall in a northerly direction to the minor watercourse adjacent to the railway line. Approximately 100m to the south of the development there is a topographic divide where the land then slopes south towards the Allt Garbh at the foot of Ben Nevis.

## 1.6 Geology and Hydrogeology

### 1.6.1 Geology

#### 1.6.1.1 Superficial

Review of the British Geological Survey (BGS) online geology maps[1] indicates that the underlying superficial deposits at the study site are predominantly Peat with the surrounding area being Hummocky Glacial Deposits of sands and gravels.

#### 1.6.1.2 Bedrock

Reference to the BGS online geology maps indicates that the bedrock geology underlying the site drift geology is the William Formation consisting of Micaceous Psammite and Semipelite (metamorphic bedrock).

#### 1.6.1.3 Site Investigation

A comprehensive site investigation was undertaken in 2019 to inform the previously Proposed Development at the site. The intrusive site works comprised no.55 rotary boreholes and no.60 trial pits, providing an extensive overview of the underlying geology at the proposed site location and wider local area.

The results of the investigation broadly concur with the published geology from BGS. Made ground was encountered to depths between 0.2 m and 6.0 m in several of the exploratory holes primarily in the western extents of the Proposed Development area. This was seen to comprise a mix of ash, soil, concrete and brick fragments, although other materials were also identified. Where made ground was not observed pseudo-fibrous peat was encountered from ground levels to depths between 0.2 m and 6.0 m. The made ground and / or peat was observed to be underlain by granular deposits comprising primarily cobbly fine to coarse sand, or sand and gravel with low to medium boulder content.

The solid bedrock geology was observed to comprise weak to medium strong schist, pelite, semipelite and psammite. Solid geology was proven to a maximum depth of 15.0 m.

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[1] British Geological Survey (2016) Natural Environment Research Council – online Geology of Britain Viewer, available at: https://mapapps.bgs.ac.uk/geologyofbritain/home.html (accessed on 28th January 2021)

### 1.6.2 Hydrogeology

Review of the BGS Geoindex Hydrogeological map (1:625,000 scale) indicates that the wider bedrock aquifer in the area is the Grampian Group and is classified as a low productivity aquifer. The superficial deposits of peat would be expected to have low permeability and inhibit groundwater flow.

SEPA classifications identify the site to be within the Fort William groundwater body which has an overall status of 'Good' under the definitions set out in the Water Framework Directive.

During the site investigation, groundwater was encountered in 35 of the 60 trial pits undertaken. The depth to water in these trial pits was variable and groundwater was encountered in both the made ground and underlying superficial deposits. Due to the groundwater elevation variability, it is deduced that groundwater is both perched within the made ground deposits overlying low permeability peat, and small quantities confined within the sandy / granular glacial deposits underlying the peat.

## 1.7 Hydrological Context

There are no natural watercourses present within the Proposed Development area. Attributed to the previous development, there are existing land drainage ditches and culverts within the development area draining north to a minor watercourse adjacent to the railway line. This watercourse flows to the north east via a 900mm diameter concrete culvert beneath the railway line. There is also surface water drainage infrastructure within the main smelter access road. Both the 900 mm concrete culvert and the access road infrastructure discharge to the Tail Race (discharge channel from adjacent hydropower scheme) which in turn discharges to the River Lochy.

To the south of the development, the Allt Garbh and Caochan Dubhaig flow generally to the west, likely fed by surface water flows on the western slope of Ben Nevis, converging 500m from the site. Both streams appear to be discharging to the River Nevis, though OS mapping indicates the converged watercourse has been culverted.

Drawing DIA-001 presents the existing hydrological overview of the site and local area.

A hydrological summary and characteristics of the Site are shown in Table 1 below. The data is taken from the FEH Web Service and the point of the site has been delineated from NGR: NN 12195 74835.

*Table 1 Hydrological Summary*

| Point Location (NGR) | BFIHOST[1] | BFIHOST19[2] | PROPWET[3] | SAAR[4] |
|---|---|---|---|---|
| NN 12195 74835 | 0.332 | 0.315 | 0.810 | 1916 mm |

*[1]BFIHOST= Base Flow Index derived using the UK Hydrology of Soil Types (Host) classification (released 1999)*
*[2]BFIHOST19 = Base Flow Index derived using the UK Hydrology of Soil Types (Host) classification (released 2019)*
*[3]PROPWET = Proportion of Time the Soil Moisture Deficit (SMD) was equal to, or below, 6mm during 1961-1990*
*[4]SAAR= Standard Annual Average Rainfall*

From the FEH Web Service point data it is shown that the site has a high SAAR and that the local soils are indicated to be wet most of the time.

# 2. Surface Water Management Strategy

## 2.1 Sustainable Drainage Systems (SuDS)

To satisfy the requirements of current best national / local flood risk and surface water management guidance, SuDS are required to be incorporated into the design proposals to manage, attenuate and treat surface water runoff before discharging from the site.

Current best practice guidance relating to sustainable surface water management is outlined in the SuDS Manual (CIRIA Report C753) which provides details on the use of SuDS for managing surface water runoff.

There are four main categories of SuDS which are referred to as the 'four pillars of SuDS design' as depicted in Figure 1 below.

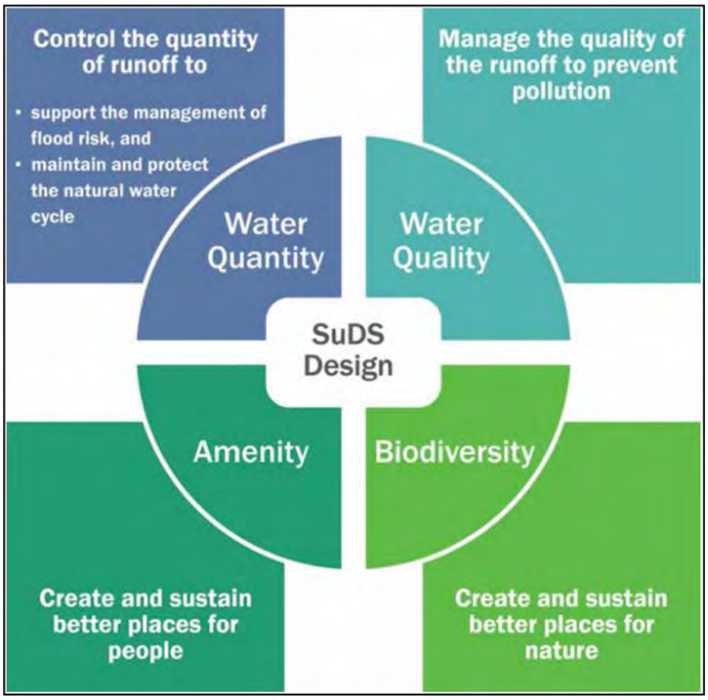


*Figure 1 Four Pillars of SuDS (CIRIA Report C753)*

The SuDS Manual identifies a hierarchy of SuDS for managing runoff, which is commonly referred to as a 'management train' as depicted in Figure 2.

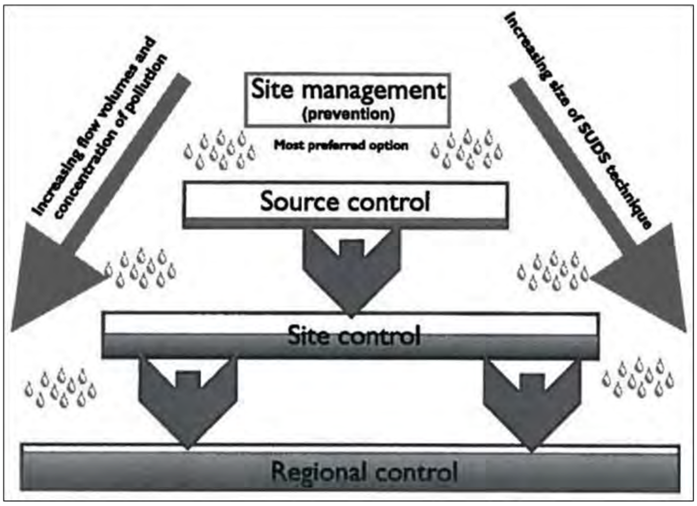


*Figure 2 SuDS Management Train*

- **Prevention** – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution (e.g. minimise areas of hard standing).
- **Source Control** – control of runoff at or very near its source (such as the use of rainwater harvesting, permeable paving and green roofs).
- **Site Control** – management of water from several sub-catchments (including routing water from roofs and car parks to one / several soakaways or attenuation ponds for the whole site).
- **Regional Control** – management of runoff from several sites, typically in a retention pond or wetland.

It is generally accepted that the implementation of SuDS as opposed to conventional drainage systems, provides several benefits by:

- reducing peak flows to watercourses or sewers and potentially reducing the risk of flooding downstream;
- reducing the volumes and frequency of water flowing directly to watercourses or sewers from developed sites;
- improving water quality over conventional surface water sewers by removing pollutants from diffuse pollutant sources;
- reducing potable water demand through rainwater harvesting;
- improving amenity through the provision of public open spaces and providing biodiversity and wildlife habitat enhancements; and
- replicating natural drainage patterns, including the recharge of groundwater so that base flows are maintained.

## 2.2 Proposed Design - Overview

The management of surface water drainage from developed areas (positive runoff) of the site will comprise the conveyance of runoff through a combination of conventional roof drainage, linear drains, and filter drains. Collected runoff from areas to the west of the railway line will drain to a formal constructed (SuDS) wetland feature prior to controlled discharge to the existing ditch located to the north of the site (via a short section of proposed swale). This existing ditch flows north and eventually discharges to the tail race which in turn discharges to the River Lochy as described in Section 1.7 above.

Collected runoff from the catchment to the east of the railway line (comprising the weighbridge and access road) will drain to a SuDS pond via filter drains prior to controlled discharge to the existing drainage infrastructure within the access road via a hydrobrake.

In addition to the above, interception drainage has been proposed to collect and convey upgradient catchment 'run-on' to the site. These upgradient catchment areas will be managed by a perimeter cut-off drain, independent of the development drainage and discharged to land north of the development maintaining the current baseline hydrological continuity.

An overview of the proposed surface water drainage design is provided in Drawing DIA-002.

## 2.3 Upgradient Interception Drainage

### 2.3.1 Overview and Strategy

An effective strategy to intercept, manage and direct overland flow from the upgradient catchment away from the development is the incorporation of an interception perimeter cut-off ditch. This would be in the form of an open ditch situated approximately parallel to the southern development extent as indicated on Drawing DIA-002.

The perimeter cut-off ditch will convey upgradient overland flow (or 'run-on') around the western extents of the site to allow for a discharge to be made to the land to the north of the development, mimicking the existing hydrological regime of the area albeit in a more formalised manner. Given that this runoff originates from undeveloped land, discharge at the outfall is unattenuated.

### 2.3.2 Catchment Runoff Analysis

Hydrological modelling of the upgradient catchment has been undertaken to determine the design 0.5% AEP +55% climate change event using the ReFH2 methodology. The catchment area and estimated design flow are as follows:

- Catchment Area – 5.85ha (see Drawing DIA-001 for catchment delineation)
- 200yr +55% Climate Change Peak Flow – 438 l/s

The estimated design flow is used to hydraulically size the perimeter cut-off ditch.

### 2.3.3 Cut-off Ditch Outline Sizing

Specification of minimum sizing of the perimeter cut-off ditch is necessary to ensure sufficient hydraulic capacity to convey anticipated overland flows for the design event determined above.

The channel geometry required to convey the anticipated peak flow has been determined through application of Manning's Equation:

$$Q = \frac{1}{n}\frac{A^{5/3}}{P^{2/3}}{S_O}^{1/2}$$

| | | | |
|---|---|---|---|
| *Where* | *Q* | = | *Flow (m3/s)* |
| | *n* | = | *Manning's coefficient* |
| | *A* | = | *Flow area (mm/hr)* |
| | *P* | = | *Wetted perimeter (m)* |
| | *$S_O$* | = | *Slope* |

The Manning's 'n' coefficient of the proposed ditch, established from experience and referenced to respected literature, has been conservatively estimated to be 0.04 (allows for seasonal vegetation growth).

For ease of construction, a standard uniform minimum ditch sizing has been proposed which provides ample capacity to convey the design flow. The proposed ditch will have a bed width and channel depth of 1 m with a bank slope gradient of 1:1 and a minimum longitudinal gradient of 1:1,000.

The associated channel capacity calculations and geometry are outlined in Appendix B.

## 2.4 Development Surface Water Drainage

### 2.4.1 Proposed Surface Water Discharge Location(s)

In accordance with CIRIA Report C753, the hierarchy for favoured disposal options of surface water runoff from development sites is as follows:

1. Infiltration to Ground;
2. Discharge to Surface Waters; or
3. Discharge to Sewer.

Table 2 below discusses the disposal method suitability in the context of the site and Proposed Development.

*Table 2 Suitability of Surface Water Disposal Methods*

| Surface Water Disposal Method | Suitability Description | Method Suitable? (Y/N) |
|---|---|---|
| Infiltration to Ground | Review of the online geology mapping indicate superficial deposits of mostly peat with pockets of hummocky glacial deposits. The site investigation report confirmed the BGS map findings, with varying depths of made ground, peat and underlying superficial deposits. Given the variability of the underlying geology and variable perched / pockets of groundwater, discharge to ground is not possible. | N |
| Surface Water Discharge | An existing land drain is present to the immediate north of the Proposed Development area. Existing private surface water infrastructure is also present in the smelter access road. The ditch and existing surface water infrastructure is hydraulically connected to the Tail Race which eventually discharges to the River Lochy (see Section 1.7 and Drawing DIA-001). | Y |
| Sewer Discharge | An existing Scottish Water surface water sewer network is present in the adjacent Glen Nevis Business Park. The closest potential connection to this existing asset is approximately 300m south west of the development extents. | Y |

Taking the above into account it is proposed that controlled surface water runoff from the western catchment of the developed site is positively discharged to the land drain immediately north of the development and runoff from the eastern catchment of the developed site is positively discharge to the existing surface water infrastructure in the access track. This mimics the existing hydrological regime at site albeit in a more formalised manner.

### 2.4.2 Water Quantity

Current best practice for surface water management and SuDS Design (CIRIA Report C753) states the following with respect to the control of post development 'Peak Runoff Rates' and 'Runoff Volume' from 'greenfield' sites:

> **SuDS Manual (CIRIA Report C753) – Section 24.10.1:**
>
> *"Additional runoff volumes from developments can cause increases in flood risk downstream of the site, even where peak flows from the site are controlled to greenfield rates.*
>
> *Therefore, for extreme events, in addition to the standard for controlling the peak rate of runoff, there is also a standard that requires runoff volume control for the 1:100 year, 6 hour event. This is particularly critical for catchments that are susceptible to flooding downstream of the proposed development.*
>
> *The difference in runoff volume between the development state and the equivalent greenfield (or possibly pre-development state where this is considered to be acceptable) is termed the Long-Term Storage Volume. It is this volume that should be prevented from leaving the site (via rainwater harvesting and/or infiltration) or, where this is not possible, controlled so that it discharges at very low rates that will have negligible impact on downstream flood risk. Only the greenfield (or pre-developed) runoff volume should be allowed to discharge at greenfield (or pre-developed) rates.*
>
> *Where there is extra volume generated by the development that has to be discharged (because there are no opportunities for it to be infiltrated and/or used on site), this volume should be released at a very low rate (e.g. <2/l/s/ha or as agreed with the local drainage approving body and/or environmental regulator) and the 1:100 year greenfield allowable runoff rate reduced to take account of this extra discharge (Kellagher, 2002).*
>
> *An alternative approach to managing the extra runoff volumes from extreme events separately from the main drainage system is to release all runoff (above the 1 year event) from the site at a maximum rate of 2 l/s/ha or $Q_{BAR}$, whichever is the higher value (or as agreed with the drainage approving body and/or environmental regulator). This avoids the need to undertake more detailed calculations and modelling.*
>
> *Kellagher (2002) demonstrates that if discharges are not limited to less than 3 l/s/ha, the drainage system will generally not be effective at retaining sufficient water on the site to prevent an increase in flood risk in the receiving catchment. A discharge limit of 2 l/s/ha (or $Q_{BAR}$, which allows for higher discharge rates for specific soil types) has generally been accepted as an appropriate industry standard in the UK, unless alternative site or catchment specific limits are agreed based on local risk evaluation."*

*Note: as per SPP and surface water management design in Scotland, reference to the 1:100-year event in the above extract is replaced with 1:200-year event.*

Therefore, taking the above into account it is proposed to limit surface water discharge from each of the catchments of the developed site area to the mean annual peak flood (i.e. $Q_{BAR}$) rate of runoff thus controlling the 'peak' discharge and discharge volume for all storm events up to and including the design 1:200-year plus climate change event.

It is noted that this proposal is more conservative than the discharge limit criteria set out in Highland Council's Flood Risk and Drainage Guidance which only requires the 1:30-year event to be limited to the greenfield runoff rate (Section 6.18 of the Guidance) and as much of the site is considered 'brownfield', limiting to Qbar for all return period design events is significant betterment to the current hydrological baseline context at site.

Greenfield runoff rates for both catchments have been estimated through application of the methodology outlined in IH R124 [2] (1994) as set out within the Interim Code of Practice (ICP) for catchment areas of 50 ha or less.

The IH R124 method can be used to estimate Greenfield runoff release rates for a range of Annual Exceedance Probability (AEP) events, or return periods, by applying regional growth curve factors to the mean annual peak runoff (i.e. Qbar). The UK hydrological region for the Fort William area is Region 1, therefore the appropriate growth curve factors for this region have been incorporated into the analysis undertaken in the MicroDrainage (2020) software suite[3].

The IH R124 Method of runoff estimation is an approved and recommended methodology as set out in CIRIA Report C753 (The SuDS Manual).

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[2] Institute of Hydrology Report No.124 (1994) (IH R124), Flood estimation for small catchments, June 1994

[3] MicroDrainage (2020), Innovyze Drainage Design and Modelling Software (Version 2020.1)

Greenfield runoff modelling results for the are presented below in Table 3 for a range of AEP storm events.

*Table 3 Estimation of the Greenfield (Pre-Development) Rate of Runoff*

| AEP (%) | Return Period (1 in X Years) | Unit Greenfield Runoff Rate (l/s/ha) |
|---|---|---|
| 50 | 2 | 12.75 |
| QBAR | | **15.00** |
| 3.3 | 30 | 28.35 |
| 1 | 100 | 37.21 |
| 0.5 | 200 | 42.16 |
| 0.1 | 1000 | 54.47 |

The Qbar 'Unit Greenfield Runoff Rate' has been estimated to be **15.00 l/s/ha**. Multiplying this unit value by the total positively drained catchment area from the proposed western and eastern catchments of the development footprint (**3.386 ha** and **0.289 ha** respectively) provides the limiting post development peak runoff rate of **50.8 l/s** and **4.3 l/s** for the western and eastern catchments respectively for all storm events up to and including the design 0.5% AEP plus climate change.

### 2.4.3 Water Quality Design Criteria

In accordance with CIRIA Report C753 it is necessary to undertake a 'Water Quality Risk Management' assessment to determine the suitability of SuDS methods from a water quality perspective. The approach outlined below is based on the 'Simple Index Approach' for groundwater and surface water as detailed in the SuDS Manual (Section 26.7).

Table 4 below compares the SuDS Mitigation Indices against the Pollution Hazard Indices for the development. This is based on the application of filter drains (M1 in Table), wetland (M2 in Table) and swale (M3 in Table) as the proposed SuDS strategy to manage post development runoff from the Site.

*Table 4 SuDS Water Quality Design Criteria: Index Approach Review*

<table>
<tr><th rowspan="3">Land Use</th><th colspan="6">Pollution Hazard and SuDS Mitigation Indices Comparison</th></tr>
<tr><th colspan="2">Total Suspended Solids (TSS)</th><th colspan="2">Metals</th><th colspan="2">Hydro-Carbons</th></tr>
<tr><th>Pollution Index</th><th>Mitigation Index</th><th>Pollution Index</th><th>Mitigation Index</th><th>Pollution Index</th><th>Mitigation Index</th></tr>
<tr><td colspan="7">Western Catchment</td></tr>
<tr><td>Industrial Roofs</td><td>0.3</td><td rowspan="2">M1 = 0.4<br>M2 = 0.8<br>M3 = 0.5<br>(1.05)</td><td>0.2</td><td rowspan="2">M1 = 0.4<br>M2 = 0.8<br>M2 = 0.6<br>(1.10)</td><td>0.05</td><td rowspan="2">M1 = 0.4<br>M2 = 0.8<br>M2 = 0.6<br>(1.10)</td></tr>
<tr><td>Industrial Sites</td><td>0.8</td><td>0.8</td><td>0.9</td></tr>
<tr><td colspan="7">Eastern Catchment</td></tr>
<tr><td>Industrial Sites</td><td>0.8</td><td>M1 = 0.4<br>M2 = 0.4<br>M3 = 0.7<br>(0.95)</td><td>0.8</td><td>M1 = 0.4<br>M2 = 0.4<br>M3 = 0.7<br>(0.95)</td><td>0.9</td><td>M1 = 0.5<br>M2 = 0.4<br>M3 = 0.5<br>(0.95)</td></tr>
</table>

Notes: **Western Catchment**: **M1** = Filter Drain, **M2** = Wetland, **M3** = Swale
**(Combined Mitigation Index)** = M1 + 0.5(M2) + 0.5(M3)
**Eastern Catchment**: **M1** = Filter Strip, **M2** = Filter Drain, **M3** = Pond
**(Combined Mitigation Index)** = M1 + 0.5(M2) + 0.5(M3)

The *SuDS Mitigation Index* offered by the proposed SuDS for both western and eastern catchments is ≥ *Pollution Hazard Index* therefore the water quality assessment criteria are considered to be satisfied.

In addition, proprietary pollution prevention infrastructure is proposed for the more heavily trafficked storage areas to the south of the billet plan. Surface runoff from these areas will pass through a bypass separator (Klargester NSBE010 or similar approved) prior to discharge to the constructed wetland.

### 2.4.4 SuDS Storage Hydraulic Performance Analysis

The proposed SuDS wetland and pond have been modelled within the industry standard MicroDrainage Source Control software to demonstrate the layout and provisional design details (subject to final site levels) are sufficiently sized and that a viable SuDS scheme is feasible within the proposed site layout. The key design parameters for the proposed wetland feature and eastern SuDS pond are detailed in Table 5 and Table 6 below.

***Table 5 Constructed Wetland Summary Design Details***

| Parameter | Unit | Value | *Notes* |
|---|---|---|---|
| Total wetland depth | m | 1.5 | *From base to functional crest* |
| Depth available for attenuation | m | 1.0 | *0.5m depth permanently wet* |
| Limiting discharge rate | l/s | 50.8 | *To be provided by Hydrobrake Optimum unit or similar approved* |
| Wetland crest area | $m^2$ | 7,721 | *Measured in AutoCad* |
| Wetland area at functional base | $m^2$ | 3,849 | *At permanent water level* |
| Wetland side slope gradient | 1 in X | 5 (in southern area)<br>2 (in northern area) | *Varies according to aquatic vegetation establishment requirements and space provision* |

***Table 6 Eastern SuDS Pond Summary Design Details***

| Parameter | Unit | Value | *Notes* |
|---|---|---|---|
| Total pond depth | m | 1.5 | *From base to functional crest* |
| Depth available for attenuation | m | 1.0 | *0.5m depth permanently wet* |
| Limiting discharge rate | l/s | 4.3 | *To be provided by Hydrobrake Optimum unit or similar approved* |
| Pond crest area | $m^2$ | 570 | *Measured in AutoCad* |
| Pond area at functional base | $m^2$ | 149 | *At permanent water level* |
| Pond side slope gradient | 1 in X | 4 | |

Using the above design details the wetland and eastern SuDS pond have been modelled using the MicroDrainage software suite and the results are presented in Table 7 and below and full modelling extracts are included as Appendix C.

*Table 7 Hydraulic Modelling Performance of Constructed Wetland*

| Annual Probability (%) | Max. Water Depth (m) | Freeboard Allowance (mm) | Max Outflow Rate (l/s) | Maximum Storage Volume ($m^3$) |
|---|---|---|---|---|
| 50 | 0.201 | 799 | 30.8 | 832.1 |
| 3.3 | 0.301 | 699 | 49.1 | 1288.7 |
| 1 | 0.374 | 626 | 50.4 | 1640.2 |
| 0.5 | 0.419 | 581 | 50.7 | 1864.1 |
| 0.5 +55% CC | 0.700 | 300 | 50.7 | 3574.9 |

*Table 8 Hydraulic Modelling Performance of Eastern SuDS Pond*

| Annual Probability (%) | Max. Water Depth (m) | Freeboard Allowance (mm) | Max Outflow Rate (l/s) | Maximum Storage Volume ($m^3$) |
|---|---|---|---|---|
| 50 | 0.192 | 808 | 4.2 | 34.7 |
| 3.3 | 0.362 | 638 | 4.3 | 77.0 |
| 1 | 0.440 | 560 | 4.3 | 100.5 |
| 0.5 | 0.490 | 510 | 4.3 | 116.9 |
| 0.5 +55% CC | 0.839 | 161 | 4.3 | 261.7 |

The results above confirm that surface water runoff generated from the Proposed Development can be attenuated and discharged at rates less than the greenfield $Q_{BAR}$ for each catchment, for all design events up to and including the 200yr + 55% CC event. It is noted that this proposal results in post development discharge rates significantly less than the current baseline and minimum required (See Section 2.4.2 previously).

A freeboard allowance of >150mm has also been factored into the hydraulic design of the wetland and SuDS pond – on top of the +55% climate change buffer, making for a robust and future proofed design.

An overview of the preliminary SuDS details / drainage layout are included in Drawings DIA-003 and DIA-004.

# 3. Surface Water Maintenance Plan

## 3.1 Overview

To ensure the proposed surface water management strategy performs at its design operation requirements, drainage components should be inspected and maintained throughout the life of the development. Regular inspection / maintenance will ensure efficient operation and prevent potential failure of drainage components.

The following draft maintenance plan has been developed from best practice guidance, information provided in the CIRIA Report C753 and manufacturer's guidelines.

This draft maintenance schedule will be integrated into the overall site operating and maintenance strategy and tailored / refined over time.

## 3.2 Maintenance Program

### 3.2.1 Wetland and SuDS Pond

Table 9 below provides the inspection and maintenance recommendations set out in Table 23.1 of the CIRIA Report C753.

*Table 9 Wetland and SuDS Pond Maintenance Requirements*

| Maintenance Schedule | Required Action | Typical Frequency |
|---|---|---|
| Regular Maintenance | Remove litter and debris | Monthly |
| | Cut the meadow grass | Half yearly |
| | Remove nuisance plants | Monthly (at start, then as required) |
| | Inspect inlets, outlets, banksides, pipework for evidence of blockage and damage | Monthly |
| | Inspect for signs of poor water quality | Monthly |
| | Inspect silt accumulation | Half yearly |
| | Hand cut submerged and emergent aquatic plants | Annually |
| | Scrub clearance before start of growing season | Annually |
| Remedial Actions | Repair erosion or other damage | As required |
| | Replant, where necessary | As required |
| | Repair inlets or outlets | As required |

### 3.2.2 Filter Drains

Table 10 below provides the inspection and maintenance recommendations set out in Table 16.1 of the CIRIA Report C753.

*Table 10 Filter Drain Maintenance Requirements*

| Maintenance Schedule | Required Action | Typical Frequency |
|---|---|---|
| Regular Maintenance | Remove litter (including leaf litter) and debris form filter drain surface, access chambers and pre-treatment devices | Monthly |

| Maintenance Schedule | Required Action | Typical Frequency |
|---|---|---|
| | Inspect filter drain surface, inlet/outlet pipework for blockages, standing water and damage | Monthly |
| | Inspect inlets and perforated pipework for silt accumulation | Half yearly |
| Occasional Maintenance | Remove surface geotextile and replace, and was or replace overlying filter medium | Five yearly |
| | Clear perforated pipework of blockages | As required |

### 3.2.3 Swales and Ditches

Table 11 below provides the inspection and maintenance recommendations set out in Table 17.1 of the CIRIA Report C753.

*Table 11 Swales and Ditches Maintenance Requirements*

| Maintenance Schedule | Required Action | Typical Frequency |
|---|---|---|
| Regular Maintenance | Remove litter and debris | Monthly |
| | Cut grass | Monthly (during growing season) |
| | Manage other vegetation and remove nuisance plants | Monthly at start, then as required |
| | Inspect inlets and outlets for blockages and clear if required | Monthly |
| | Inspect silt accumulation | Half yearly |
| Occasional Maintenance | Reseed areas of poor vegetation growth | As required |
| Remedial Actions | Repair erosion or other damage by re-turfing or reseeding | As required |
| | Relevel uneven surfaces and reinstate design levels | As required |
| | Remove and dispose of oils or petrol residues using safe standard practices | As required |

### 3.2.4 Filter Strips

Table 12 below provides the inspection and maintenance recommendations set out in Table 15.1 of the CIRIA Report C753.

*Table 12 Filter Strip Maintenance Requirements*

| Maintenance Schedule | Required Action | Typical Frequency |
|---|---|---|
| Regular Maintenance | Remove litter and debris | Monthly |
| | Cut grass | Monthly (during growing season) |
| | Manage other vegetation and remove nuisance plants | Monthly at start, then as required |
| | Inspect surface to identify evidence of erosion, poor vegetation growth and contamination. | Monthly at start, then half yearly |
| | Inspect silt accumulation | Half yearly |
| Occasional Maintenance | Reseed areas of poor vegetation growth | As required |
| Remedial Actions | Repair erosion or other damage by re-turfing or reseeding | As required |
| | Relevel uneven surfaces and reinstate design levels | As required |
| | Remove and dispose of oils or petrol residues using safe standard practices | As required |

### 3.2.5 Bypass Separators

Bypass separators should be regularly inspected in accordance with Pollution Prevention Guidelines and Manufactures specifications to ensure continued functionality and performance over the design life of the units. Generally, suppliers of products will provide a maintenance service which can vary between supplier and product in terms of frequency and services. A typical inspection will be carried out twice yearly and include:

- Internal inspection of the structure for damage;
- Replace required filters;
- Test and clean oil probe; and
- Check fit of covers and inlet and outlet seals.

### 3.2.6 Linear Drains

Specific maintenance for linear drains will be provided by the manufacturer. Generally, the maintenance of linear drains would include:

- Remove debris and leaf litter from surface grating;
- Inspect grating for damage where larger debris could enter the channel;

- Remove grating and inspect channel for silt accumulation (remove if required); and
- Inspect downstream outlets for blockages and damages.

The maintenance of linear drains should be carried out at the same time and frequency of the overall SuDS maintenance to ensure the whole drainage system is maintained.

# 4. Foul Water Management Strategy

## 4.1 Proposed Foul Water Discharge Location

With reference to SEPA's Regulatory Method for Sewage Discharge to Surface Waters[4], site foul flows have been designed for discharging to the existing Scottish Water public foul sewer system to the west of the development in Glen Nevis Business Park. SEPA's order of preference for means of discharge are:

- Connect to a public sewer;
- Discharge to land; and
- Discharge to watercourse.

Sufficient capacity within the public sewer network has been confirmed by Scottish Water via a formal Pre-Development Enquiry (PDE) application. The full PDE response is included as Appendix-D.

## 4.2 Foul Drainage Strategy

The management of foul water from the Proposed Development will comprise a foul gravity sewer collecting internal foul arisings from the main billet plant at its north western corner. A proposed sewer will be laid beneath the new track extents heading west and following the existing track / roads onto Ben Nevis Drive within the business park. A new connection to the existing public network is proposed at the approximate NGR: NN 11823 74731.

The Client's land ownership boundary extends up to Ben Nevis Drive which would readily allow connection to the public sewer.

The proposed foul drainage system will be designed in accordance with Sewers for Scotland 4th Edition and be appropriately sized to convey the expected foul loadings. The expected foul loading from the development has been calculated using the number of daily staff (53) and has been estimated to be a peak discharge rate of **0.258 l/s**. The foul discharge calculations are included as Appendix E.

The proposed foul drainage strategy is included within Drawing DIA-002.

# 5. Process Water

The Billet Plant will source water from the existing hydropower intake which supplies the Smelter and, if necessary additional supply water can be sourced from the Scottish Water strategic mains which is to the immediate west of the development footprint.

The significant majority of process water is used for cooling purposes, and the proposed cooling system is to be a closed loop cooling water circuit with a cooling tower.

4 SEPA (2014) Regulatory Method Sewage Discharges to Surface Waters (WAT-RM-03)

There may be a requirement for an occasional requirement of 'blowdown' water from the cooling process and to be discharged to land drain immediately north, however this water would be clean / passed through the Water Plant (WTP) prior to discharge as indicated on Drawing DIA-002.

Final details of the potential water emissions from the Billet Plant process will be established at the post planning stage and the existing site Pollution Prevention Permit varied to suit if required.

# 6. Conclusions

ITPEnergised has been appointed by Alvance British Aluminium to undertake an Environmental Impact Assessment to for a proposed aluminium billet plant development adjacent to the existing Fort William smelter.

This Drainage Impact Assessment (DIA) has been prepared as Technical Appendix 7.2 to Chapter 7: Hydrology and Hydrogeology, within the Environmental Impact Assessment Report.

The site was visited by experienced ITPEnergised Hydrologist / Civil Engineer personnel in January 2021 to inform the drainage design.

A Surface Water Management Strategy has been proposed which demonstrates that surface water runoff from the impermeable areas of the development can be managed via a combination of conventional roof drainage, linear drains and filter drains. Collected runoff will drain to a constructed SuDS wetland feature or SuDS pond and then discharge either to an existing ditch located to the north of the site or to existing surface water infrastructure in the smelter access road. The wetland and SuDS pond have been suitably sized to attenuate all storm events up to and including the design 0.5% AEP plus a 55% climate change allowance scenario whilst maintaining a maximum discharge rate equivalent to the respective Qbar greenfield runoff rate.

It is noted that this proposal is more conservative than the discharge limit criteria set out in Highland Council's Flood Risk and Drainage Guidance which only requires the 1:30-year event to be limited to the greenfield runoff rate (Section 6.18 of the Guidance) and as much of the site is considered 'brownfield', limiting to Qbar for all return period design events is significant betterment to the current hydrological baseline context at site.

In addition to the above, interception drainage has been proposed to collect and convey upgradient catchment runoff around the site, and thus mitigating any potential upgradient flood risk. This upgradient catchment area will be managed by a perimeter cut-off drain, independent of the development drainage and discharged to the existing ditch to the north of the development unrestricted – maintaining the current hydrological regime.

The surface water management design demonstrates that the scheme is feasible and compliant to appropriate best practice and regulatory requirements. Notwithstanding, the final drainage / SuDS arrangements and layout will be detailed / refined as required at the post planning stages.

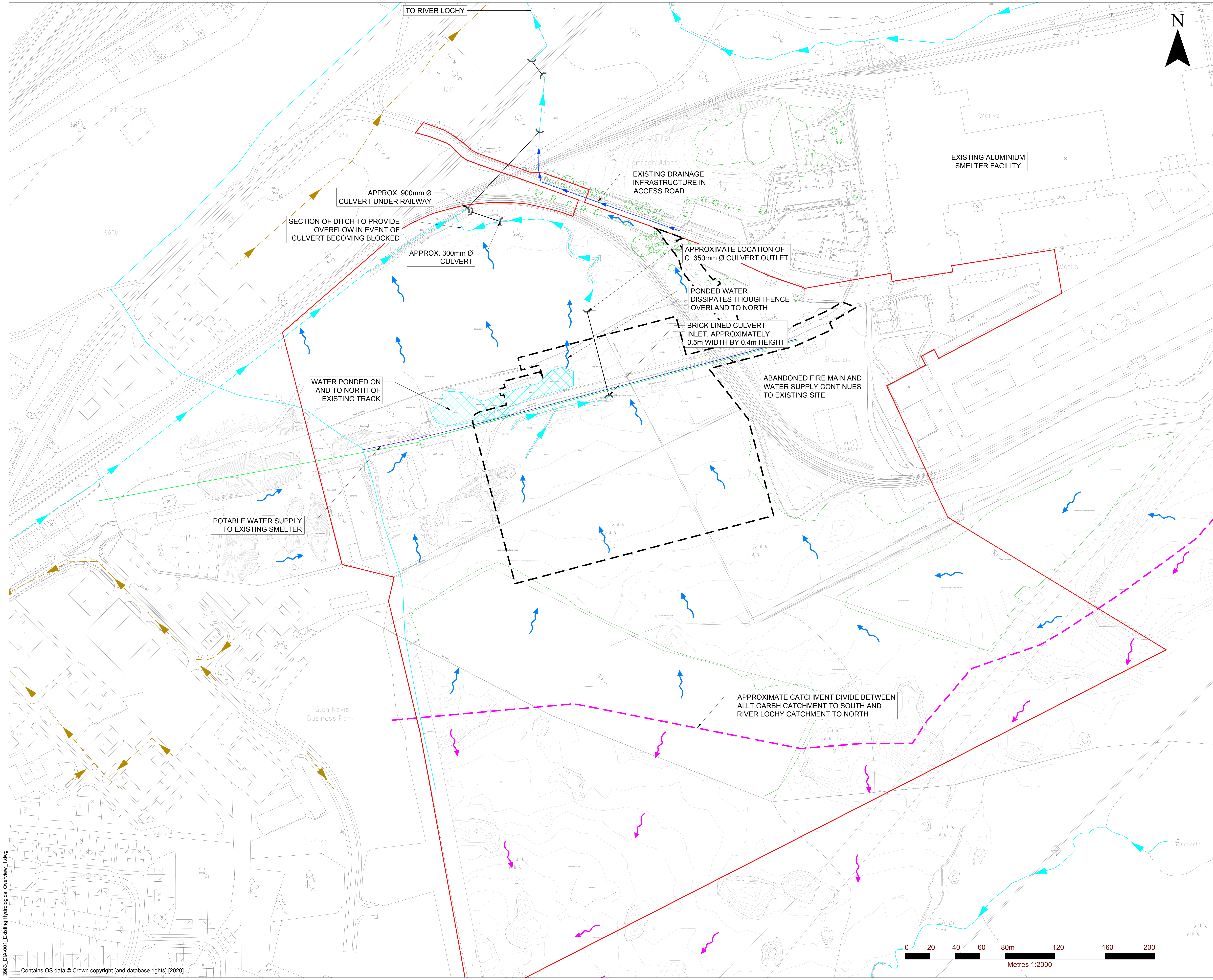
Additionally, foul drainage arising from the new development has also be incorporated into the site designs and details presented in this assessment. The foul water arisings will be routed via gravity sewer to the existing Scottish Water foul sewer network to the west of the development.

There is a process water requirement for cooling purposes, however the proposed cooling system is to be a closed loop cooling water circuit. There may be a requirement for an occasional requirement of 'blowdown' water from the cooling process and to be discharged to land drain immediately north, however this water would be clean / passed through the Water Plant prior to discharge. Final details of the potential water emissions from the Billet Plant process will be established at the post planning stage and the existing site Pollution Prevention Permit varied to suit if required.

The drainage designs (foul, surface water and potential process water emissions) presented at this stage should be considered preliminary subject to optimisation / refinement as the development stages progress, notwithstanding the overriding design concept / principles would remain throughout the development, and the proposals are in compliance with relevant technical and regulatory industry standards.

Taking all of the above into account it is considered there are no overriding impediments to the development being granted planning permission on the grounds of surface, foul water drainage and process water provisions.

# DRAWINGS




## NOTES

1. SITE LAYOUT BASED ON DRAWING 'XX-XX-DR-A-601003_Site Plan' (REV P5) PROVIDED BY KEPPIE DESIGN ON 5TH APRIL 2021.
2. TOPOGRAPHIC SURVEY BASED ON DRAWING '11576.dxf' PROVIDED BY ALVANCE BRITISH ALUMINIUM ON 12TH JANUARY 2021.
3. EXISTING ON-SITE SERVICES BASED ON DRAWING 'services.dwg' PROVIDED BY ALVANCE BRITISH ALUMINIUM OF 12TH JANUARY 2021.
4. EXISTING SCOTTISH WATER SERVICE ALIGNMENTS BASED ON SCOTTISH WATER DRAWINGS '354041 Land Near Lochaber Smelter fresh' AND '354041 Land Near Lochaber Smelter waste' PROVIDED BY PAUL HODGSON ON 16TH JANUARY 2020
5. EXACT EXISTING DITCH AND PIPEWORK ALIGNMENTS APPROXIMATED FROM AVAILABLE INFORMATION

## LEGEND

RED LINE BOUNDARY

APPROXIMATE EXTENT OF PROPOESD HARDSTANDING

UTILITIES

EXISTING ON-SITE POTABLE WATER INFRASTRUCTURE

ABANDONED ON-SITE FIRE MAIN

ABANDONED PIPEWORK

EXISTING SCOTTISH WATER SUPPLY MAIN

EXISTING SCOTTISH WATER FOUL SEWER

EXISTING HYDROLOGY

EXISTING DITCH / MINOR WATERCOURSE

EXISTING CULVERT

EXISTING SURFACE WATER PIPEWORK

OVERLAND FLOW ROUTE - RIVER LOCHY CATCHMENT

OVERLAND FLOW ROUTE - ALLT GARBH CATCHMENT

AREA OF PONDED WATER

APPROXIMATE CATCHMENT DIVIDE BETWEEN ALLT GARBH AND RIVER LOCHY

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| 1 | 04/21 | UPDATED TO SUIT NEW LAYOUT | RL | ZR |
| 0 | 02/21 | INITIAL ISSUE | RL | ZR |

CLIENT:
ALVANCE BRITISH ALUMINIUM

PROJECT:
ALUMINIUM BILLET PLANT

DRAWING TITLE:
**EXISTING HYDROLOGICAL OVERVIEW**

SCALE: 1:2000 @ A2

DATE: APRIL 2021

DRAWING NUMBER: **DIA-001**

REV: **1**

DRAWING STATUS:
DRAINAGE IMPACT ASSESSMENT

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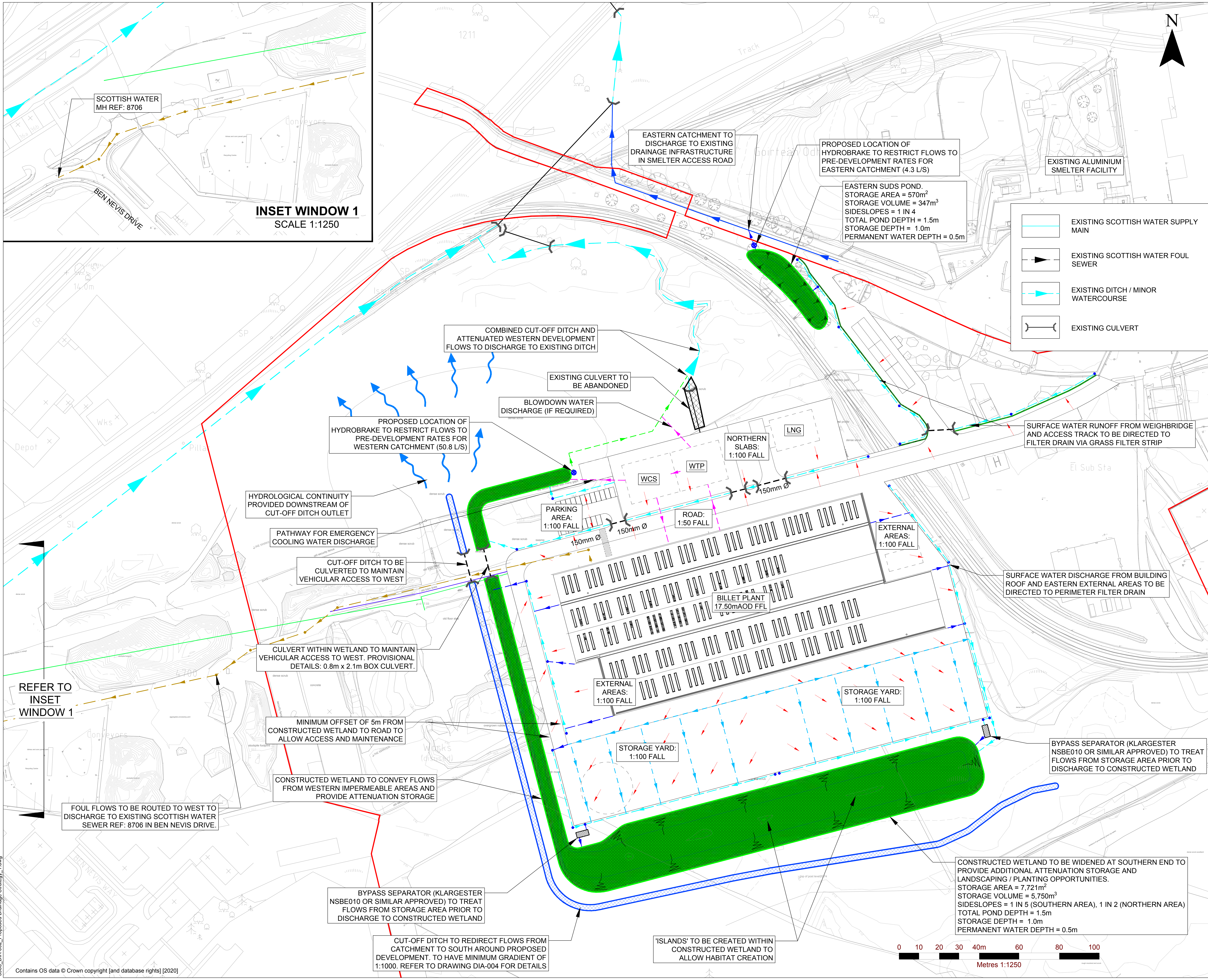


## NOTES

1. SITE LAYOUT BASED ON DRAWING 'KEP-XX-XX-DR-A-601003_Proposed Site Plan' REV P05 PROVIDED BY KEPPIE DESIGN ON 5TH APRIL 2021.
2. TOPOGRAPHIC SURVEY BASED ON DRAWING '11576.dxf' PROVIDED BY ALVANCE BRITISH ALUMINIUM ON 12TH JANUARY 2021.
3. EXISTING ON-SITE SERVICES BASED ON DRAWING 'services.dwg' PROVIDED BY ALVANCE BRITISH ALUMINIUM OF 12TH JANUARY 2021.
4. EXISTING SCOTTISH WATER SERVICE ALIGNMENTS BASED ON SCOTTISH WATER DRAWINGS '354041 Land Near Lochaber Smelter fresh' AND '354041 Land Near Lochaber Smelter waste' PROVIDED BY PAUL HODGSON ON 16TH JANUARY 2020.
5. DESIGN SHOWN SHOULD BE CONSIDERED PROVISIONAL OUTLINE DETAIL. FINAL LEVELS, GRADIENTS, EXACT ALIGNMENTS AND DETAILS TO BE CONFIRMED AT LATER DESIGN STAGES.

## LEGEND

- RED LINE BOUNDARY
- PROPOSED PERIMETER CUT-OFF DITCH
- PROPOSED CONSTRUCTED WETLAND
- PROPOSED CULVERT
- PROPOSED FILTER DRAIN
- PROPOSED LINEAR DRAIN (ACO S200 2300 OR SIMILAR APPROVED)
- PROPOSED SWALE
- PROPOSED SURFACE WATER PIPEWORK
- PROPOSED GRASS FILTER STRIP (0.5m WIDTH)
- PROPOSED PROCESS PIPEWORK (INDICATIVE FOR INFORMATION)
- PROPOSED FINISHED SURFACE FALLS
- PROPOSED FOUL WATER PIPEWORK
- EXISTING ON-SITE POTABLE WATER INFRASTRUCTURE
- ABANDONED ON-SITE FIRE MAIN

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| 1 | 04/21 | UPDATED TO SUIT NEW LAYOUT | RL | ZR |
| 0 | 02/21 | INITIAL ISSUE | RL | ZR |

CLIENT: ALVANCE BRITISH ALUMINIUM

ALVANCE

PROJECT: ALUMINIUM BILLET PLANT

DRAWING TITLE: **PROPOSED DRAINAGE STRATEGY**

SCALE: 1:1250 @ A2

DATE: APRIL 2021

DRAWING NUMBER: **DIA-002**

REV: **1**

DRAWING STATUS: DRAINAGE IMPACT ASSESSMENT

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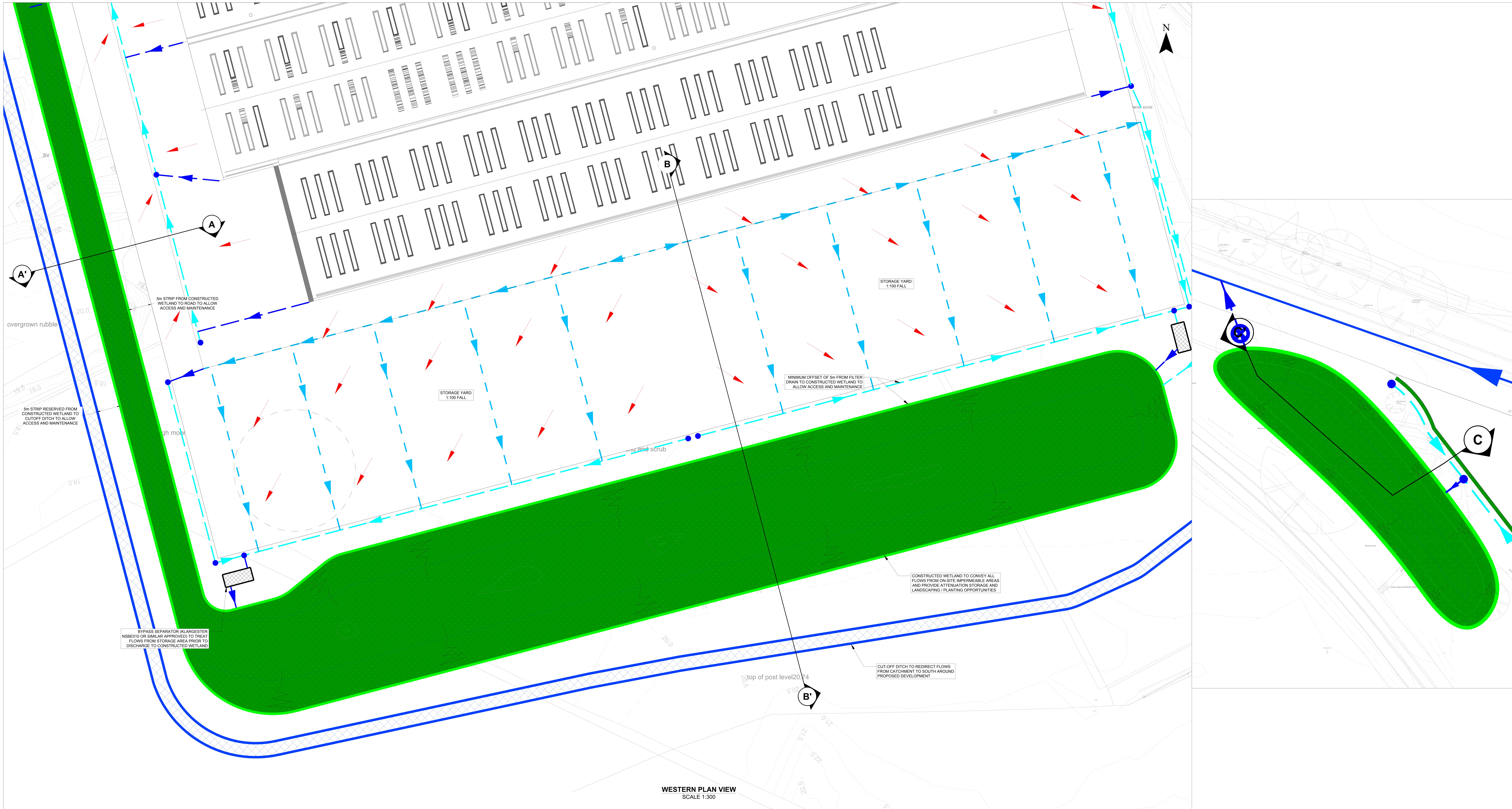
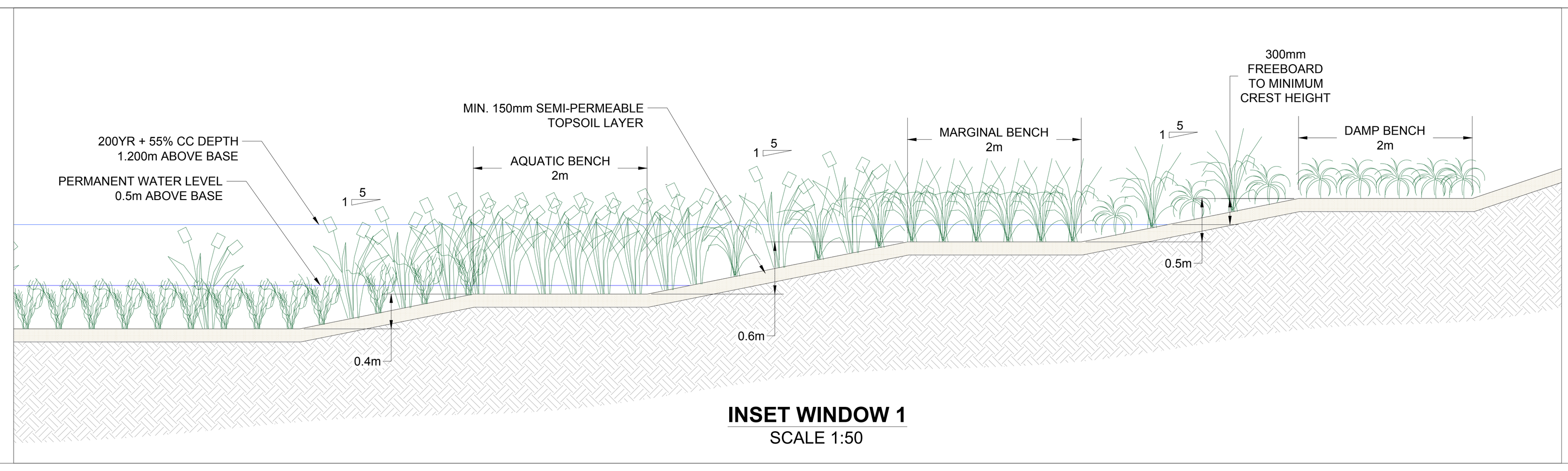
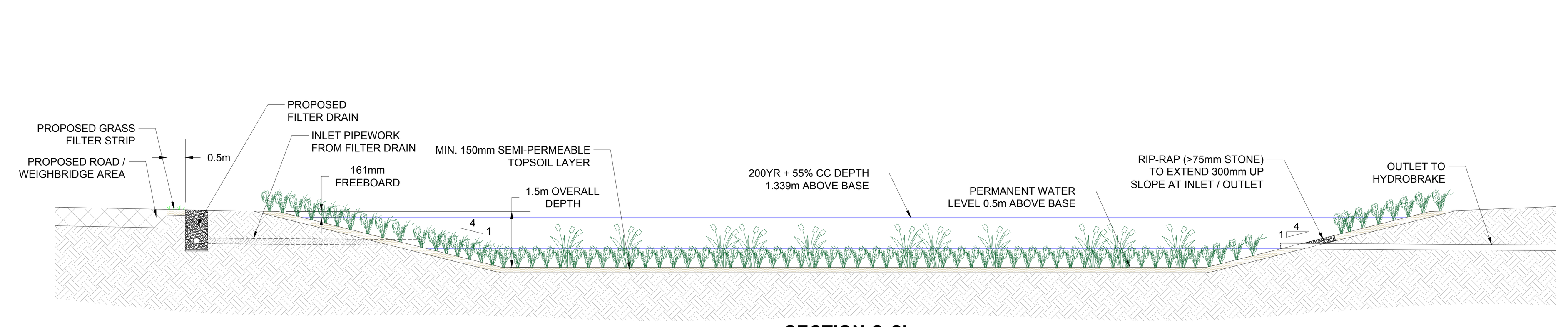


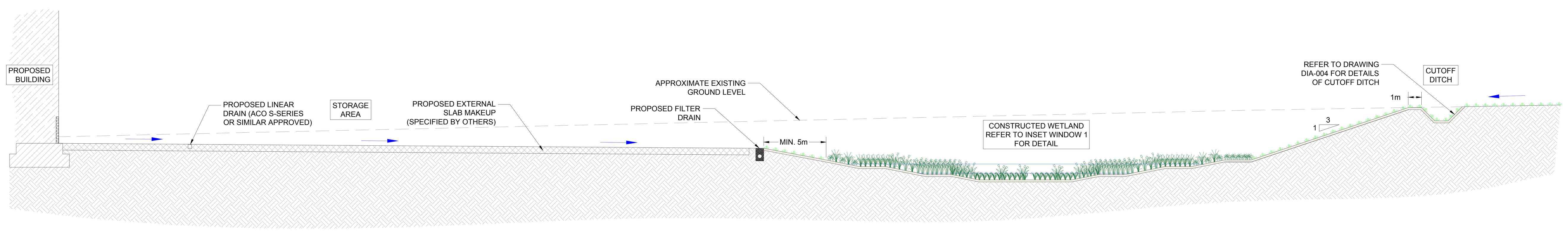

**WESTERN PLAN VIEW**
SCALE 1:300



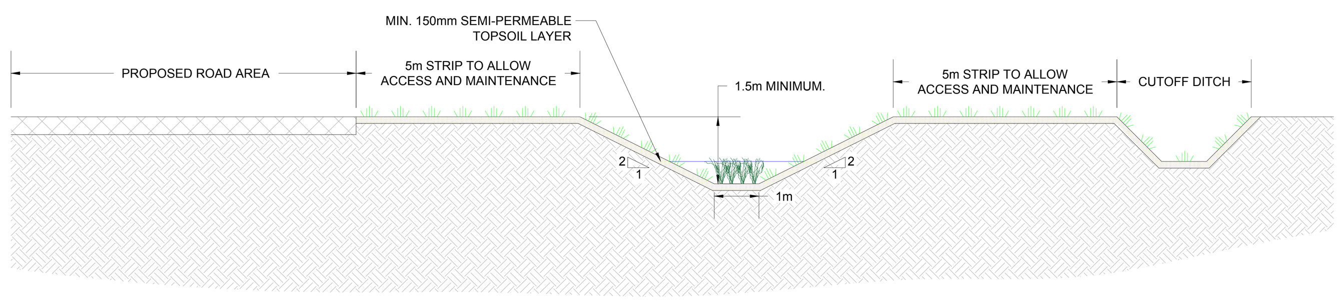

**INSET WINDOW 1**
SCALE 1:50




**SECTION C-C'**
SCALE 1:100




**SECTION B-B'**
SCALE 1:200




**SECTION A-A'**
SCALE 1:100

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NOTES

1. SITE LAYOUT BASED ON DRAWING 'KEP-XX-XX-DR-A-601003_Proposed Site Plan' REV P05 PROVIDED BY KEPPIE DESIGN ON 5TH APRIL 2021.
2. TOPOGRAPHIC SURVEY BASED ON DRAWING '11576.dxf' PROVIDED BY ALVANCE BRITISH ALUMINIUM ON 12TH JANUARY 2021.
3. EXISTING ON-SITE SERVICES BASED ON DRAWING 'services.dwg' PROVIDED BY ALVANCE BRITISH ALUMINIUM OF 12TH JANUARY 2021.
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5. REFER TO DRAWING DIA-002 FOR PROPOSED DRAINAGE STRATEGY
6. REFER TO DRAWING DIA-004 FOR PRELIMINARY CONSTRUCTION DETAILS
7. DESIGN SHOWN SHOULD BE CONSIDERED PROVISIONAL OUTLINE DETAIL. FINAL LEVELS, GRADIENTS, EXACT ALIGNMENTS AND DETAILS TO BE CONFIRMED AT LATER DESIGN STAGES.

LEGEND

- RED LINE BOUNDARY
- PROPOSED PERIMETER CUT-OFF DITCH
- PROPOSED WETLAND / POND
- PROPOSED FILTER DRAIN
- PROPOSED LINEAR DRAIN (ACO S200 2300 OR SIMILAR APPROVED)
- PROPOSED SURFACE WATER PIPEWORK
- PROPOSED FINISHED SURFACE FALLS
- PROPOSED CULVERT
- PROPOSED GRASS FILTER STRIP (0.5m WIDTH)

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| 1 | 04/21 | UPDATED TO SUIT NEW LAYOUT | RL | ZR |
| 0 | 02/21 | INITIAL ISSUE | RL | ZR |

CLIENT: ALVANCE BRITISH ALUMINIUM

PROJECT: ALUMINIUM BILLET PLANT

DRAWING TITLE: **PRELIMINARY SUDS DETAILS**

SCALE: AS SHOWN @ A0
DATE: APRIL 2021

DRAWING NUMBER: **DIA-003**
REV: 1

DRAWING STATUS: DRAINAGE IMPACT ASSESSMENT

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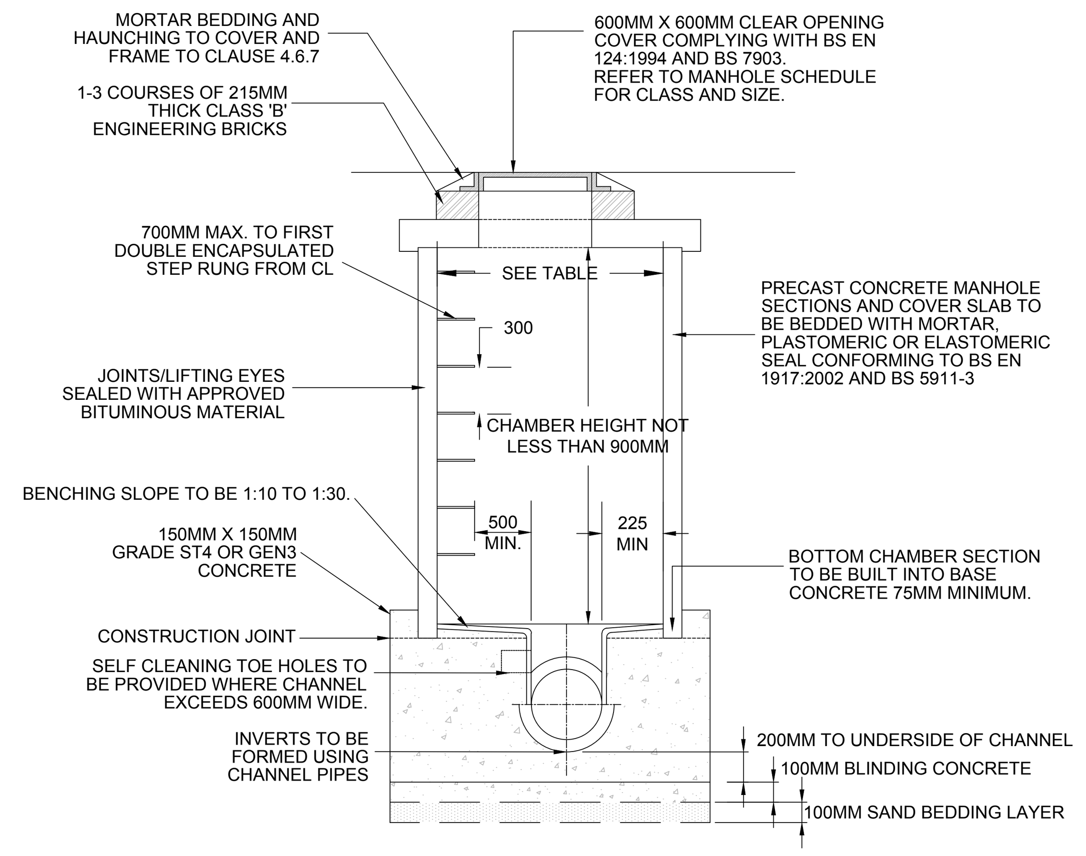
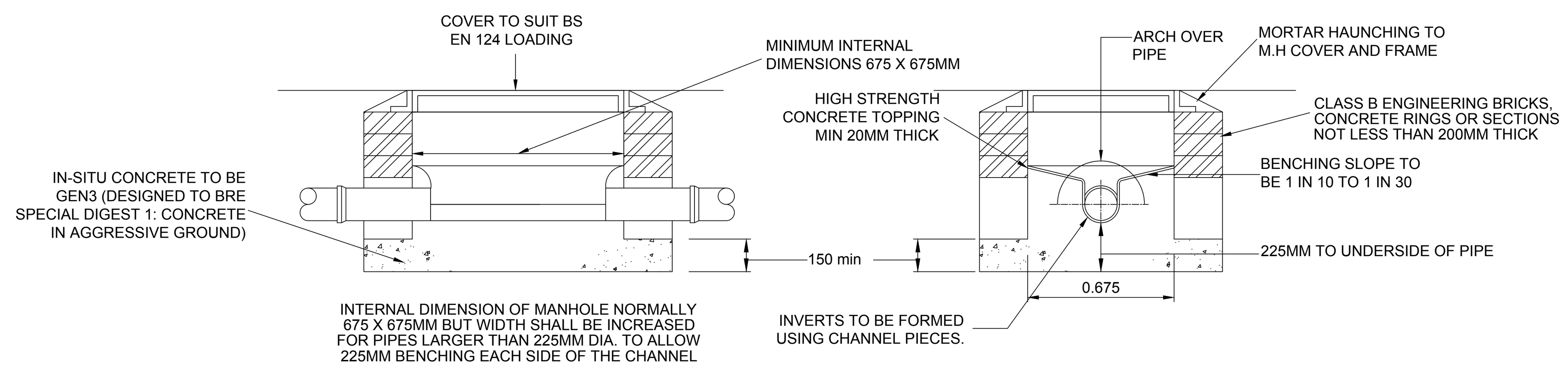
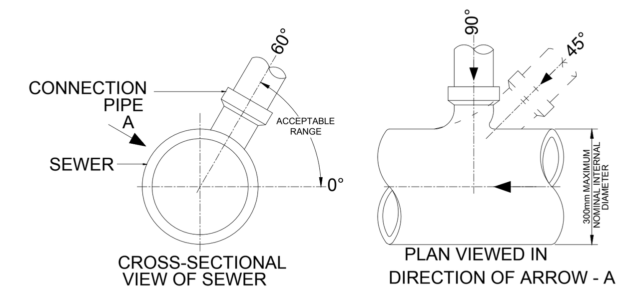


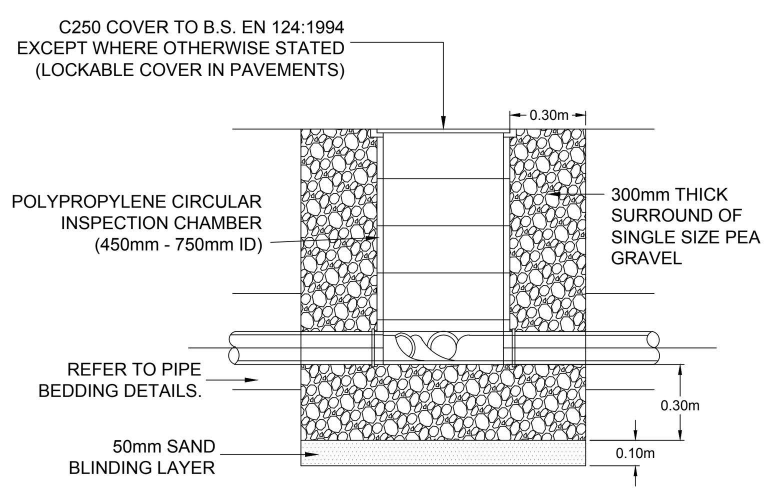

TYPICAL MANHOLE DETAIL - TYPE B
For max. depth from cover to pipe invert of 3.0m
N.T.S.



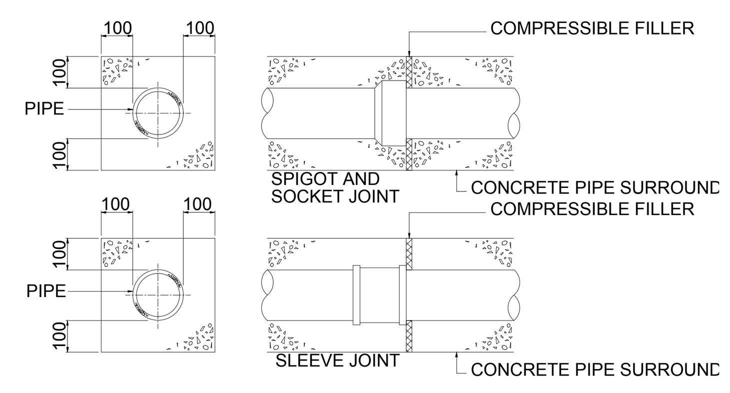

TYPICAL MANHOLE DETAIL - TYPE C
MAXIMUM DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 1.5M
NTS



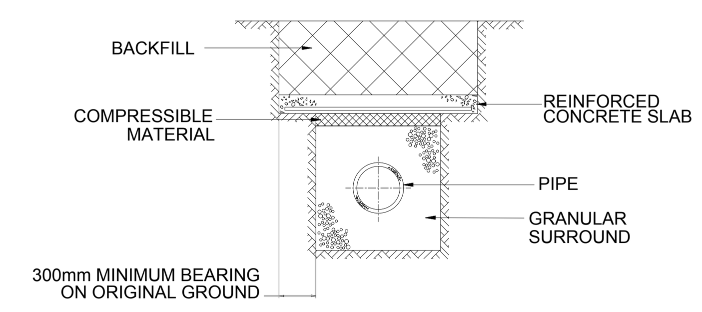

BRANCH SEWER CONNECTION DETAIL
NOT TO SCALE



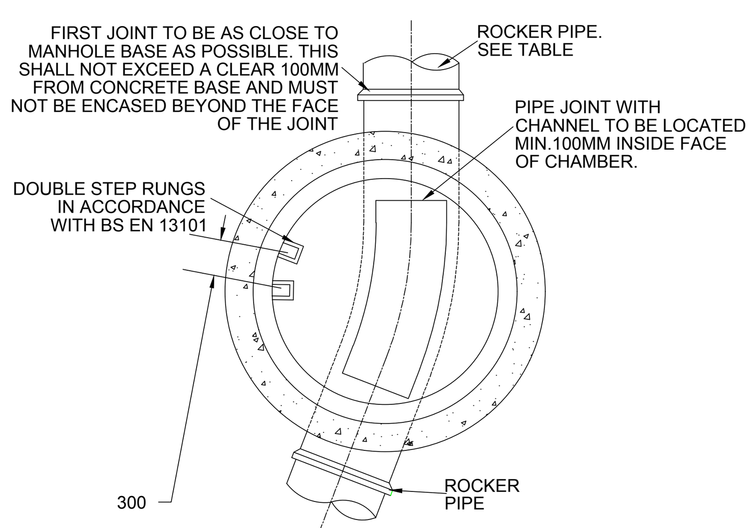

TYPICAL INSPECTION CHAMBER DETAIL (GRAVEL SURROUND - NON-TRAFFICKED AREAS)
1:25




JOINTS FOR CONCRETE ENCASED PIPES
NOT TO SCALE




ALTERNATIVE PIPE PROTECTION DETAIL
NOT TO SCALE




PLAN ON MANHOLE
N.T.S.

NOTE: RIGID PIPES BUILT INTO MANHOLES SHALL HAVE A FLEXIBLE JOINT AS CLOSE AS FEASIBLE TO THE EXTERNAL FACE OF THE STRUCTURE AND THE LENGTH OF THE NEXT ROCKER PIPE SHALL BE AS IN THE TABLE BELOW

MIN ROCKER PIPE LENGTH

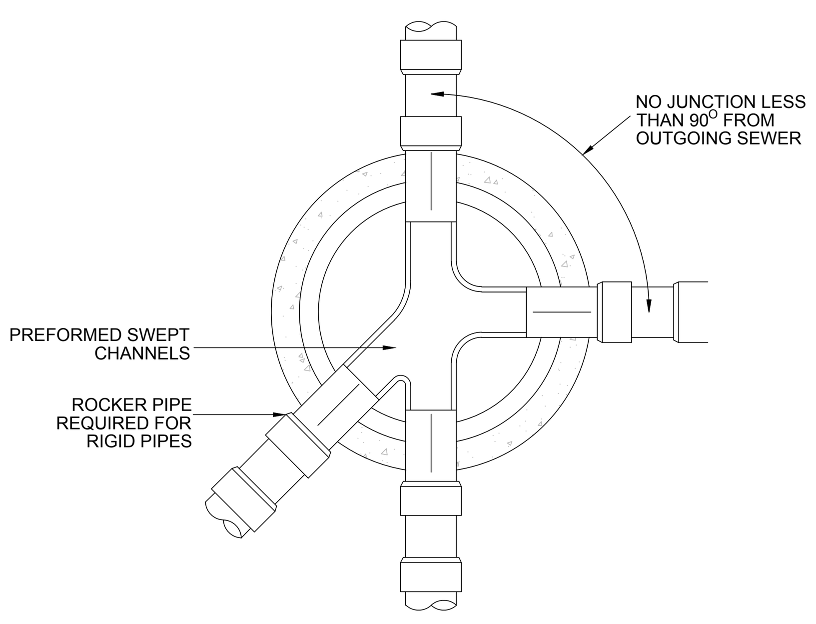
| NOMINAL DIAMETER(mm) | L(mm) |
|---|---|
| 150 to 600 | 600 |
| over 600 to 750 | 1000 |
| over 750 | 1250 |

INTERNAL DIAMETER OF CONCRETE MANHOLES

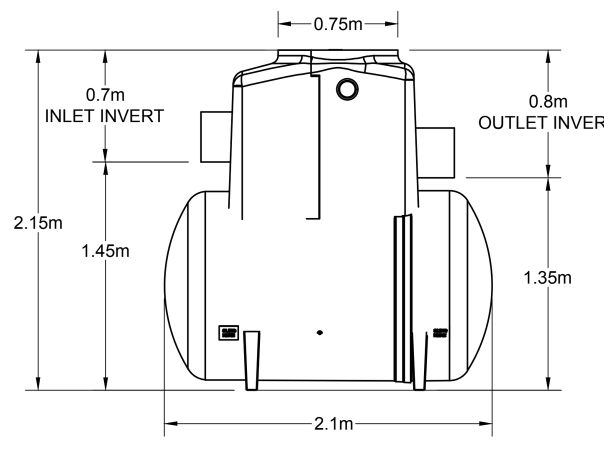
| DIAMETER OF LARGEST PIPE IN MANHOLE (MM) | INTERNAL DIAMETER OF MANHOLE (MM) |
|---|---|
| LESS THAN 375 | 1200 |
| 375 to 450 | 1350 |
| 450 to 700 | 1500 |
| 750 to 1050 | 1800 |
| 1125 to 1500 | 2100 |
| >1500 | CONSULT SCOTTISH WATER |

INTERNAL DIAMETER OF INSPECTION CHAMBERS

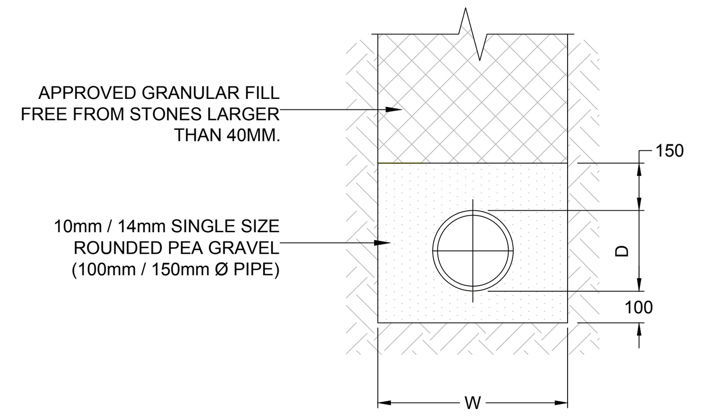
| DIAMETER OF LARGEST PIPE IN MANHOLE (MM) | DIAMETER OF INSPECTION CHAMBER (MM) |
|---|---|
| LESS THAN 160 | 450 |
| 160 to 300 | 600 |
| 300 to 450 | 750 |



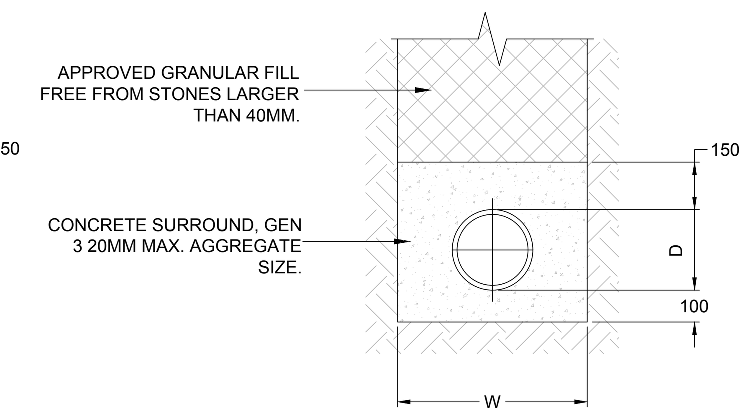

TYPICAL MANHOLE ARRANGEMENT OF PIPE JUNCTIONS
N.T.S.




KLARGESTER NSBE010 BYPASS SEPARATOR
1:20




CLASS 'S' PIPE BEDDING & BACKFILLING DETAIL
SCALE 1:20
PIPES WHERE COVER TO CROWN IS GREATER THAN 1200MM UNDER ROADS AND FOOTPATHS

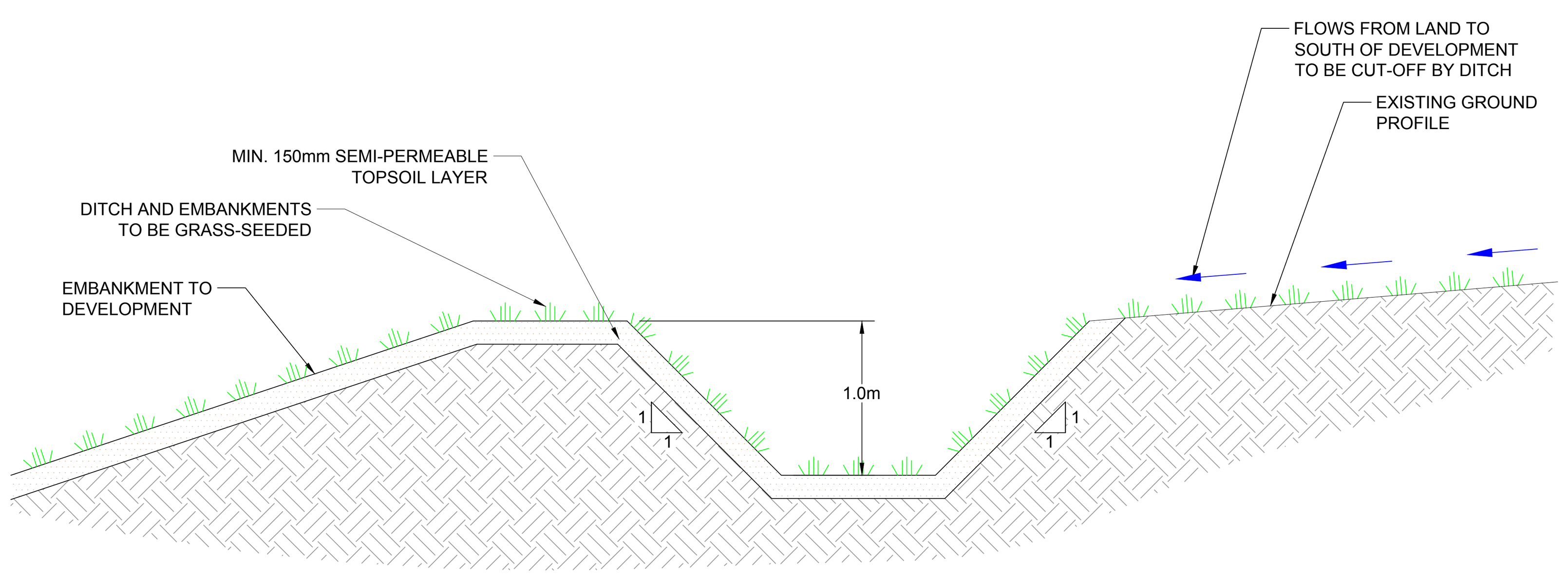



CLASS 'Z' PIPE BEDDING & BACKFILLING DETAIL
SCALE 1:20
PIPES WHERE COVER TO CROWN IS LESS THAN 1200MM UNDER ROADS AND FOOTPATHS

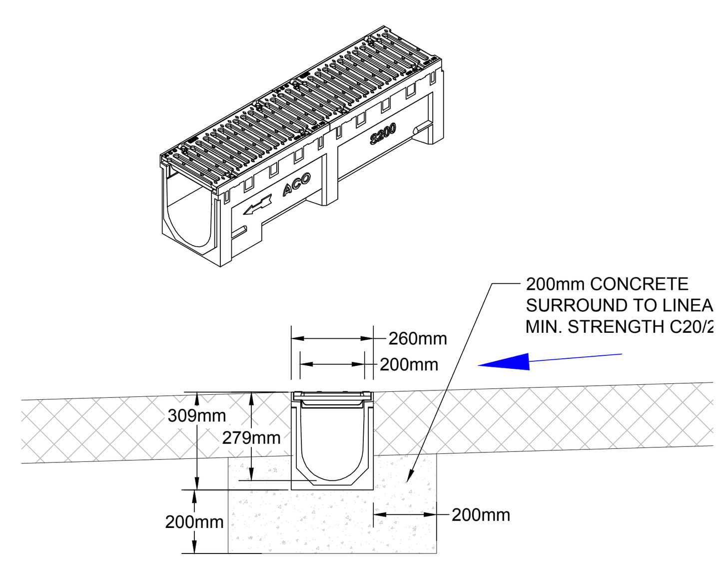
TRENCH DIMENSIONS

| | | | | | |
|---|---|---|---|---|---|
| D | 100 | 150 | 225 | 300 | 375 |
| W | 450 | 600 | 700 | 850 | 1050 |

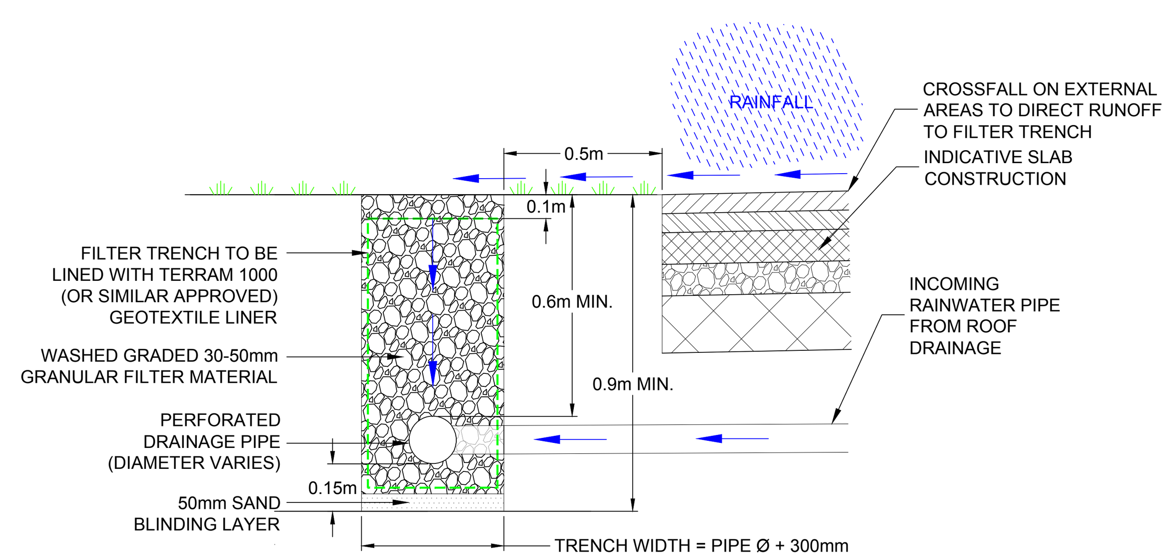
NOTE: PROVIDE FULL DEPTH FLEXIBLE JOINTS @ 5000MM CENTRES MAX. USING 18MM THK. COMPRESSIBLE FIBREBOARD, PRE-CUT TO PIPE DIA.




TYPICAL SECTION THROUGH PERIMETER CUT-OFF DITCH
1:25




LINEAR DRAIN - ACO S200 2300 OR SIMILAR APPROVED
1:20




TYPICAL SECTION THROUGH FILTER TRENCH
1:20

NOTES
1. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER SCHEME DRAWINGS.
2. ALL DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH SEWERS FOR SCOTLAND AND / OR THE SCOTTISH TECHNICAL HANDBOOK WHERE REQUIRED.
3. REFER TO DRAWING DIA-002 FOR PROPOSED DRAINAGE STRATEGY.
4. DRAINAGE INFRASTRUCTURE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS.
5. DESIGN SHOULD BE CONSIDERED PROVISIONAL OUTLINE DETAIL. FINAL LEVELS, GRADIENTS, EXACT ALIGNMENTS AND DETAILS TO BE CONFIRMED AT LATER DESIGN STAGES.

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| 0 | 02/21 | INITIAL ISSUE | RL | ZR |

CLIENT: ALVANCE BRITISH ALUMINIUM
ALVANCE

PROJECT: ALUMINIUM BILLET PLANT

DRAWING TITLE: **PRELIMINARY CONSTRUCTION DETAILS**

SCALE: AS SHOWN @ A1
DATE: FEBRUARY 2021

DRAWING NUMBER: DIA-004
REV: 0

DRAWING STATUS: DRAINAGE IMPACT ASSESSMENT

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3983_DIA-004_Preliminary Construction Details_0.dwg

# APPENDIX A

## Proposed Development Plan




Figured dimensions only are to be taken from this drawing.
All dimensions are to be checked on site before any work is put in hand. IF IN DOUBT ASK.

CDM:
Hazard Elimination & Risk Reduction has been undertaken and recorded where appropriate, in accordance with the requirements of "The Construction (Design and Management) Regulations 2015" and the associated "Industry Guidance for Designers"

0 20 40 60m
Scale 1:1000

N

**Legend**

Proposed Site Boundary
(Recycling & Billet Casting Facility)

**Site Key**

1. Proposed Recycling & Billet Casting Facility
2. Proposed Yard & Laydown Area
3. Proposed SUDS and Swale
4. Proposed Car Park with dedicated pedestrain route to Main Entrance.
*20 car parking spaces proposed, including 2 ambulant disabled and 2 active electric vehicle spaces (+10 passive electric vehicle spaces.)*
5. MV/ LV Electrical Plant
*circa 15x10m footprint, circa 4m high*
6. Water Treatment Plant
*-Water Cooling Plant*
*circa 25x20m footprint, circa 4m high with 3 no. cooling tanks (circa 9m high.)*
*-Waste Water Treatment Plant*
*circa 25x20m footprint, circa 4m high*
7. Gas Facility
*circa 22x16m footprint, circa 4m high with bunded earth sides and green roof*
8. Process Gases Storage
9. Weigh Bridge
10. Existing Smelter Facility

| REV | DESCRIPTION | DR'N | CHK'D | DATE |
|---|---|---|---|---|
| P03 | Planning | EF | AJM | 01.04.21 |
| P02 | For Information | EF | AJM | 17.03.21 |
| P01 | For Information | EF | AJM | 25.02.21 |

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Client
ALVANCE

Project
Recycling & Billet Casting Facility

Drawing
Proposed Site Plan (Extract)

Project No.
P20095

Drawing No.
XXX-KEP-XX-XX-DR-A-601004

Rev
P03

Status
Planning

Status Code
S4

Created: EF
Date: 25.02.21
Checked: AM
Scale: As indicated @ A1

# Proposed Site Plan (Extract)

Scale - 1 : 1000

# APPENDIX B

## Cut-off Ditch Hydraulic Sizing Calculations

# Calculation sheet

| | | | |
|---|---|---|---|
| Subject / Project : | Alvance Billet and Canning Plants | | |
| Job No. / Project No : | 3539 | Ref : Surface Water Calculations | Date : 21/01/2021 |
| Prepared by : | RL | Checked : | ZR |

ITPENERGISED

**Cut-off Ditch Peak Flow**

| | | | |
|---|---|---|---|
| Total Catchment = | 58,484 | $m^2$ | (measured from CAD) |
| Peak flow at 200yr+55% = | 438 | l/s | (From REFH 2.3) |

**Cut-off Ditch Sizing**

| | | | |
|---|---|---|---|
| Manning's n = | 0.04 | | |
| S = 1 in | 1000 | | |

Western Ditch

| | | | |
|---|---|---|---|
| b = | 1.0 | m | |
| d = | 1.0 | m | |
| w = | 1.0 | m | |
| A = | 2.000 | m | |
| P = | 3.828 | m | |
| R = | 0.522 | m | (A/P) |
| Q = | 1.03 | $m^3/s$ | |
| Q = | 1026 | l/s | Capacity |
| Ditch is = | OK | | |

# APPENDIX C

## Constructed Wetland - MicroDrainage Source Control Modelling Extracts

## Rainfall Details

| | |
|---|---|
| Rainfall Model | FEH |
| Return Period (years) | 200 |
| FEH Rainfall Version | 2013 |
| Site Location | GB 212195 774835 NN 12195 74835 |
| Data Type | Point |
| Summer Storms | Yes |
| Winter Storms | Yes |
| Cv (Summer) | 0.750 |
| Cv (Winter) | 0.840 |
| Shortest Storm (mins) | 15 |
| Longest Storm (mins) | 10080 |
| Climate Change % | +55 |

## Time Area Diagram

Total Area (ha) 3.048

| Time From: | (mins) To: | Area (ha) |
|---|---|---|
| 0 | 4 | 3.048 |

## Model Details

Storage is Online Cover Level (m) 1.000

## Tank or Pond Structure

Invert Level (m) 0.000

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|---|---|
| 0.000 | 3849.0 | 0.500 | 5332.0 | 0.501 | 6171.0 | 1.000 | 7721.0 |

## Hydro-Brake® Optimum Outflow Control

| | |
|---|---|
| Unit Reference | MD-SHE-0296-5080-1000-5080 |
| Design Head (m) | 1.000 |
| Design Flow (l/s) | 50.8 |
| Flush-Flo™ | Calculated |
| Objective | Minimise upstream storage |
| Application | Surface |
| Sump Available | Yes |
| Diameter (mm) | 296 |
| Invert Level (m) | 0.000 |
| Minimum Outlet Pipe Diameter (mm) | 375 |
| Suggested Manhole Diameter (mm) | 1800 |

| Control Points | Head (m) | Flow (l/s) |
|---|---|---|
| Design Point (Calculated) | 1.000 | 50.7 |
| Flush-Flo™ | 0.449 | 50.7 |
| Kick-Flo® | 0.787 | 45.2 |
| Mean Flow over Head Range | - | 40.7 |

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|---|---|---|---|---|---|---|---|
| 0.100 | 9.1 | 1.200 | 55.4 | 3.000 | 86.4 | 7.000 | 130.6 |
| 0.200 | 30.5 | 1.400 | 59.7 | 3.500 | 93.1 | 7.500 | 135.0 |
| 0.300 | 49.1 | 1.600 | 63.7 | 4.000 | 99.3 | 8.000 | 139.4 |
| 0.400 | 50.6 | 1.800 | 67.4 | 4.500 | 105.2 | 8.500 | 143.6 |
| 0.500 | 50.6 | 2.000 | 70.9 | 5.000 | 110.8 | 9.000 | 147.6 |
| 0.600 | 49.7 | 2.200 | 74.3 | 5.500 | 116.0 | 9.500 | 151.6 |
| 0.800 | 45.6 | 2.400 | 77.5 | 6.000 | 121.1 | | |
| 1.000 | 50.7 | 2.600 | 80.6 | 6.500 | 125.9 | | |

## Summary of Results for 2 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 0.039 | 0.039 | 1.5 | 152.2 | O K |
| 30 min Summer | 0.057 | 0.057 | 3.2 | 224.3 | O K |
| 60 min Summer | 0.081 | 0.081 | 6.1 | 319.9 | O K |
| 120 min Summer | 0.109 | 0.109 | 10.7 | 437.1 | O K |
| 180 min Summer | 0.126 | 0.126 | 13.9 | 507.8 | O K |
| 240 min Summer | 0.137 | 0.137 | 16.2 | 554.3 | O K |
| 360 min Summer | 0.154 | 0.154 | 19.7 | 624.2 | O K |
| 480 min Summer | 0.166 | 0.166 | 22.4 | 676.7 | O K |
| 600 min Summer | 0.175 | 0.175 | 24.5 | 715.7 | O K |
| 720 min Summer | 0.182 | 0.182 | 26.2 | 745.1 | O K |
| 960 min Summer | 0.190 | 0.190 | 28.2 | 783.0 | O K |
| 1440 min Summer | 0.198 | 0.198 | 30.0 | 815.4 | O K |
| 2160 min Summer | 0.198 | 0.198 | 30.0 | 815.5 | O K |
| 2880 min Summer | 0.194 | 0.194 | 29.1 | 799.3 | O K |
| 4320 min Summer | 0.185 | 0.185 | 26.9 | 759.0 | O K |
| 5760 min Summer | 0.177 | 0.177 | 25.0 | 724.7 | O K |
| 7200 min Summer | 0.171 | 0.171 | 23.7 | 699.3 | O K |
| 8640 min Summer | 0.166 | 0.166 | 22.6 | 678.5 | O K |
| 10080 min Summer | 0.163 | 0.163 | 21.8 | 663.2 | O K |
| 15 min Winter | 0.044 | 0.044 | 1.9 | 170.4 | O K |
| 30 min Winter | 0.064 | 0.064 | 3.9 | 251.0 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 26.764 | 0.0 | 70.9 | 19 |
| 30 min Summer | 19.857 | 0.0 | 126.2 | 34 |
| 60 min Summer | 14.422 | 0.0 | 258.9 | 64 |
| 120 min Summer | 10.308 | 0.0 | 393.8 | 122 |
| 180 min Summer | 8.412 | 0.0 | 495.5 | 180 |
| 240 min Summer | 7.272 | 0.0 | 580.5 | 228 |
| 360 min Summer | 5.913 | 0.0 | 721.7 | 272 |
| 480 min Summer | 5.100 | 0.0 | 838.9 | 334 |
| 600 min Summer | 4.541 | 0.0 | 940.0 | 400 |
| 720 min Summer | 4.125 | 0.0 | 1029.3 | 466 |
| 960 min Summer | 3.534 | 0.0 | 1181.2 | 598 |
| 1440 min Summer | 2.832 | 0.0 | 1419.9 | 864 |
| 2160 min Summer | 2.252 | 0.0 | 1793.2 | 1236 |
| 2880 min Summer | 1.912 | 0.0 | 2028.5 | 1616 |
| 4320 min Summer | 1.523 | 0.0 | 2400.2 | 2336 |
| 5760 min Summer | 1.306 | 0.0 | 2829.4 | 3064 |
| 7200 min Summer | 1.170 | 0.0 | 3163.4 | 3816 |
| 8640 min Summer | 1.076 | 0.0 | 3481.2 | 4504 |
| 10080 min Summer | 1.008 | 0.0 | 3779.4 | 5248 |
| 15 min Winter | 26.764 | 0.0 | 84.1 | 19 |
| 30 min Winter | 19.857 | 0.0 | 148.1 | 33 |

## Summary of Results for 2 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 60 min Winter | 0.090 | 0.090 | 7.5 | 357.7 | O K |
| 120 min Winter | 0.121 | 0.121 | 13.0 | 488.0 | O K |
| 180 min Winter | 0.140 | 0.140 | 16.8 | 567.0 | O K |
| 240 min Winter | 0.153 | 0.153 | 19.5 | 619.5 | O K |
| 360 min Winter | 0.170 | 0.170 | 23.4 | 692.6 | O K |
| 480 min Winter | 0.181 | 0.181 | 26.0 | 744.4 | O K |
| 600 min Winter | 0.189 | 0.189 | 27.9 | 778.9 | O K |
| 720 min Winter | 0.195 | 0.195 | 29.2 | 801.9 | O K |
| 960 min Winter | 0.200 | 0.200 | 30.5 | 825.8 | O K |
| 1440 min Winter | 0.201 | 0.201 | 30.8 | 832.1 | O K |
| 2160 min Winter | 0.195 | 0.195 | 29.2 | 803.1 | O K |
| 2880 min Winter | 0.187 | 0.187 | 27.3 | 766.8 | O K |
| 4320 min Winter | 0.172 | 0.172 | 23.9 | 703.3 | O K |
| 5760 min Winter | 0.161 | 0.161 | 21.4 | 656.3 | O K |
| 7200 min Winter | 0.153 | 0.153 | 19.6 | 623.1 | O K |
| 8640 min Winter | 0.148 | 0.148 | 18.4 | 597.9 | O K |
| 10080 min Winter | 0.143 | 0.143 | 17.5 | 578.8 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 60 min Winter | 14.422 | 0.0 | 296.5 | 62 |
| 120 min Winter | 10.308 | 0.0 | 448.7 | 120 |
| 180 min Winter | 8.412 | 0.0 | 563.1 | 176 |
| 240 min Winter | 7.272 | 0.0 | 658.7 | 228 |
| 360 min Winter | 5.913 | 0.0 | 817.4 | 278 |
| 480 min Winter | 5.100 | 0.0 | 949.2 | 352 |
| 600 min Winter | 4.541 | 0.0 | 1062.8 | 426 |
| 720 min Winter | 4.125 | 0.0 | 1163.2 | 498 |
| 960 min Winter | 3.534 | 0.0 | 1334.2 | 638 |
| 1440 min Winter | 2.832 | 0.0 | 1603.3 | 910 |
| 2160 min Winter | 2.252 | 0.0 | 2014.9 | 1300 |
| 2880 min Winter | 1.912 | 0.0 | 2279.5 | 1672 |
| 4320 min Winter | 1.523 | 0.0 | 2699.7 | 2420 |
| 5760 min Winter | 1.306 | 0.0 | 3173.3 | 3168 |
| 7200 min Winter | 1.170 | 0.0 | 3548.6 | 3888 |
| 8640 min Winter | 1.076 | 0.0 | 3906.7 | 4584 |
| 10080 min Winter | 1.008 | 0.0 | 4245.8 | 5344 |

Summary of Results for 30 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 0.089 | 0.089 | 7.3 | 353.2 | O K |
| 30 min Summer | 0.131 | 0.131 | 14.9 | 528.0 | O K |
| 60 min Summer | 0.182 | 0.182 | 26.3 | 746.9 | O K |
| 120 min Summer | 0.209 | 0.209 | 32.6 | 864.4 | O K |
| 180 min Summer | 0.222 | 0.222 | 35.7 | 925.4 | O K |
| 240 min Summer | 0.233 | 0.233 | 38.2 | 970.7 | O K |
| 360 min Summer | 0.249 | 0.249 | 41.7 | 1043.7 | O K |
| 480 min Summer | 0.261 | 0.261 | 44.1 | 1099.0 | O K |
| 600 min Summer | 0.270 | 0.270 | 45.9 | 1140.9 | O K |
| 720 min Summer | 0.277 | 0.277 | 47.2 | 1173.3 | O K |
| 960 min Summer | 0.286 | 0.286 | 48.7 | 1218.2 | O K |
| 1440 min Summer | 0.297 | 0.297 | 49.0 | 1267.7 | O K |
| 2160 min Summer | 0.299 | 0.299 | 49.1 | 1277.4 | O K |
| 2880 min Summer | 0.292 | 0.292 | 48.9 | 1244.2 | O K |
| 4320 min Summer | 0.272 | 0.272 | 46.4 | 1151.1 | O K |
| 5760 min Summer | 0.254 | 0.254 | 42.8 | 1068.5 | O K |
| 7200 min Summer | 0.239 | 0.239 | 39.6 | 998.7 | O K |
| 8640 min Summer | 0.226 | 0.226 | 36.7 | 942.7 | O K |
| 10080 min Summer | 0.216 | 0.216 | 34.3 | 897.4 | O K |
| 15 min Winter | 0.099 | 0.099 | 9.0 | 395.2 | O K |
| 30 min Winter | 0.146 | 0.146 | 18.0 | 590.8 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 62.416 | 0.0 | 235.1 | 19 |
| 30 min Summer | 47.316 | 0.0 | 399.6 | 33 |
| 60 min Summer | 34.581 | 0.0 | 706.8 | 62 |
| 120 min Summer | 21.323 | 0.0 | 887.5 | 122 |
| 180 min Summer | 16.236 | 0.0 | 1023.2 | 172 |
| 240 min Summer | 13.448 | 0.0 | 1136.9 | 196 |
| 360 min Summer | 10.385 | 0.0 | 1327.2 | 256 |
| 480 min Summer | 8.704 | 0.0 | 1490.2 | 324 |
| 600 min Summer | 7.621 | 0.0 | 1636.1 | 392 |
| 720 min Summer | 6.856 | 0.0 | 1770.2 | 460 |
| 960 min Summer | 5.834 | 0.0 | 2012.9 | 596 |
| 1440 min Summer | 4.708 | 0.0 | 2436.0 | 866 |
| 2160 min Summer | 3.831 | 0.0 | 3090.2 | 1252 |
| 2880 min Summer | 3.295 | 0.0 | 3541.3 | 1616 |
| 4320 min Summer | 2.622 | 0.0 | 4197.8 | 2336 |
| 5760 min Summer | 2.215 | 0.0 | 4823.7 | 3064 |
| 7200 min Summer | 1.933 | 0.0 | 5254.2 | 3816 |
| 8640 min Summer | 1.727 | 0.0 | 5621.2 | 4504 |
| 10080 min Summer | 1.571 | 0.0 | 5930.8 | 5248 |
| 15 min Winter | 62.416 | 0.0 | 272.7 | 19 |
| 30 min Winter | 47.316 | 0.0 | 459.4 | 33 |

## Summary of Results for 30 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 60 min Winter | 0.202 | 0.202 | 31.0 | 835.3 | O K |
| 120 min Winter | 0.232 | 0.232 | 38.0 | 968.2 | O K |
| 180 min Winter | 0.248 | 0.248 | 41.5 | 1039.1 | O K |
| 240 min Winter | 0.257 | 0.257 | 43.4 | 1083.5 | O K |
| 360 min Winter | 0.273 | 0.273 | 46.5 | 1157.7 | O K |
| 480 min Winter | 0.284 | 0.284 | 48.5 | 1205.9 | O K |
| 600 min Winter | 0.291 | 0.291 | 48.8 | 1238.6 | O K |
| 720 min Winter | 0.296 | 0.296 | 49.0 | 1261.4 | O K |
| 960 min Winter | 0.301 | 0.301 | 49.1 | 1285.5 | O K |
| 1440 min Winter | 0.301 | 0.301 | 49.1 | 1288.7 | O K |
| 2160 min Winter | 0.290 | 0.290 | 48.8 | 1236.9 | O K |
| 2880 min Winter | 0.276 | 0.276 | 47.0 | 1168.3 | O K |
| 4320 min Winter | 0.247 | 0.247 | 41.4 | 1038.4 | O K |
| 5760 min Winter | 0.226 | 0.226 | 36.7 | 941.6 | O K |
| 7200 min Winter | 0.210 | 0.210 | 32.8 | 867.7 | O K |
| 8640 min Winter | 0.197 | 0.197 | 29.7 | 811.1 | O K |
| 10080 min Winter | 0.186 | 0.186 | 27.2 | 766.1 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 60 min Winter | 34.581 | 0.0 | 800.2 | 62 |
| 120 min Winter | 21.323 | 0.0 | 1003.0 | 118 |
| 180 min Winter | 16.236 | 0.0 | 1155.3 | 172 |
| 240 min Winter | 13.448 | 0.0 | 1282.9 | 200 |
| 360 min Winter | 10.385 | 0.0 | 1496.4 | 272 |
| 480 min Winter | 8.704 | 0.0 | 1679.4 | 348 |
| 600 min Winter | 7.621 | 0.0 | 1843.1 | 422 |
| 720 min Winter | 6.856 | 0.0 | 1993.6 | 498 |
| 960 min Winter | 5.834 | 0.0 | 2266.2 | 644 |
| 1440 min Winter | 4.708 | 0.0 | 2742.3 | 922 |
| 2160 min Winter | 3.831 | 0.0 | 3468.0 | 1300 |
| 2880 min Winter | 3.295 | 0.0 | 3974.5 | 1672 |
| 4320 min Winter | 2.622 | 0.0 | 4715.2 | 2420 |
| 5760 min Winter | 2.215 | 0.0 | 5407.1 | 3120 |
| 7200 min Winter | 1.933 | 0.0 | 5890.7 | 3888 |
| 8640 min Winter | 1.727 | 0.0 | 6304.5 | 4584 |
| 10080 min Winter | 1.571 | 0.0 | 6658.0 | 5344 |

## Summary of Results for 100 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 0.111 | 0.111 | 11.1 | 445.0 | O K |
| 30 min Summer | 0.165 | 0.165 | 22.3 | 674.5 | O K |
| 60 min Summer | 0.229 | 0.229 | 37.3 | 953.9 | O K |
| 120 min Summer | 0.254 | 0.254 | 42.7 | 1066.6 | O K |
| 180 min Summer | 0.266 | 0.266 | 45.2 | 1124.2 | O K |
| 240 min Summer | 0.276 | 0.276 | 47.1 | 1170.5 | O K |
| 360 min Summer | 0.293 | 0.293 | 48.9 | 1249.5 | O K |
| 480 min Summer | 0.307 | 0.307 | 49.3 | 1316.3 | O K |
| 600 min Summer | 0.319 | 0.319 | 49.5 | 1371.1 | O K |
| 720 min Summer | 0.329 | 0.329 | 49.7 | 1417.5 | O K |
| 960 min Summer | 0.344 | 0.344 | 50.0 | 1491.5 | O K |
| 1440 min Summer | 0.363 | 0.363 | 50.2 | 1582.2 | O K |
| 2160 min Summer | 0.368 | 0.368 | 50.3 | 1609.9 | O K |
| 2880 min Summer | 0.359 | 0.359 | 50.2 | 1564.5 | O K |
| 4320 min Summer | 0.324 | 0.324 | 49.6 | 1397.5 | O K |
| 5760 min Summer | 0.292 | 0.292 | 48.9 | 1246.1 | O K |
| 7200 min Summer | 0.271 | 0.271 | 46.1 | 1145.0 | O K |
| 8640 min Summer | 0.254 | 0.254 | 42.7 | 1066.8 | O K |
| 10080 min Summer | 0.240 | 0.240 | 39.9 | 1006.2 | O K |
| 15 min Winter | 0.124 | 0.124 | 13.4 | 497.9 | O K |
| 30 min Winter | 0.184 | 0.184 | 26.6 | 754.7 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 78.805 | 0.0 | 318.1 | 19 |
| 30 min Summer | 60.709 | 0.0 | 541.5 | 33 |
| 60 min Summer | 44.500 | 0.0 | 930.3 | 62 |
| 120 min Summer | 26.584 | 0.0 | 1125.1 | 120 |
| 180 min Summer | 19.931 | 0.0 | 1273.9 | 168 |
| 240 min Summer | 16.359 | 0.0 | 1400.5 | 194 |
| 360 min Summer | 12.516 | 0.0 | 1616.6 | 258 |
| 480 min Summer | 10.456 | 0.0 | 1807.3 | 328 |
| 600 min Summer | 9.151 | 0.0 | 1982.0 | 400 |
| 720 min Summer | 8.242 | 0.0 | 2146.0 | 470 |
| 960 min Summer | 7.050 | 0.0 | 2452.2 | 608 |
| 1440 min Summer | 5.736 | 0.0 | 2990.9 | 882 |
| 2160 min Summer | 4.667 | 0.0 | 3776.7 | 1296 |
| 2880 min Summer | 3.996 | 0.0 | 4309.1 | 1672 |
| 4320 min Summer | 3.149 | 0.0 | 5059.4 | 2416 |
| 5760 min Summer | 2.636 | 0.0 | 5745.6 | 3112 |
| 7200 min Summer | 2.283 | 0.0 | 6214.9 | 3816 |
| 8640 min Summer | 2.028 | 0.0 | 6607.9 | 4504 |
| 10080 min Summer | 1.833 | 0.0 | 6933.3 | 5248 |
| 15 min Winter | 78.805 | 0.0 | 367.0 | 19 |
| 30 min Winter | 60.709 | 0.0 | 619.7 | 33 |

## Summary of Results for 100 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 60 min Winter | 0.254 | 0.254 | 42.7 | 1067.7 | O K |
| 120 min Winter | 0.282 | 0.282 | 48.2 | 1198.3 | O K |
| 180 min Winter | 0.298 | 0.298 | 49.0 | 1270.4 | O K |
| 240 min Winter | 0.308 | 0.308 | 49.3 | 1319.0 | O K |
| 360 min Winter | 0.325 | 0.325 | 49.6 | 1400.8 | O K |
| 480 min Winter | 0.338 | 0.338 | 49.9 | 1463.5 | O K |
| 600 min Winter | 0.348 | 0.348 | 50.0 | 1510.7 | O K |
| 720 min Winter | 0.355 | 0.355 | 50.1 | 1547.3 | O K |
| 960 min Winter | 0.366 | 0.366 | 50.3 | 1599.1 | O K |
| 1440 min Winter | 0.374 | 0.374 | 50.4 | 1640.2 | O K |
| 2160 min Winter | 0.364 | 0.364 | 50.2 | 1588.7 | O K |
| 2880 min Winter | 0.339 | 0.339 | 49.9 | 1469.1 | O K |
| 4320 min Winter | 0.286 | 0.286 | 48.7 | 1216.9 | O K |
| 5760 min Winter | 0.257 | 0.257 | 43.3 | 1079.6 | O K |
| 7200 min Winter | 0.235 | 0.235 | 38.7 | 980.2 | O K |
| 8640 min Winter | 0.219 | 0.219 | 34.9 | 907.9 | O K |
| 10080 min Winter | 0.206 | 0.206 | 31.8 | 850.4 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 60 min Winter | 44.500 | 0.0 | 1051.0 | 62 |
| 120 min Winter | 26.584 | 0.0 | 1269.5 | 118 |
| 180 min Winter | 19.931 | 0.0 | 1436.3 | 172 |
| 240 min Winter | 16.359 | 0.0 | 1578.1 | 222 |
| 360 min Winter | 12.516 | 0.0 | 1820.2 | 278 |
| 480 min Winter | 10.456 | 0.0 | 2033.9 | 358 |
| 600 min Winter | 9.151 | 0.0 | 2229.8 | 434 |
| 720 min Winter | 8.242 | 0.0 | 2413.7 | 512 |
| 960 min Winter | 7.050 | 0.0 | 2757.2 | 664 |
| 1440 min Winter | 5.736 | 0.0 | 3362.5 | 952 |
| 2160 min Winter | 4.667 | 0.0 | 4236.8 | 1364 |
| 2880 min Winter | 3.996 | 0.0 | 4834.7 | 1756 |
| 4320 min Winter | 3.149 | 0.0 | 5681.1 | 2424 |
| 5760 min Winter | 2.636 | 0.0 | 6439.8 | 3168 |
| 7200 min Winter | 2.283 | 0.0 | 6967.0 | 3888 |
| 8640 min Winter | 2.028 | 0.0 | 7410.0 | 4584 |
| 10080 min Winter | 1.833 | 0.0 | 7781.7 | 5336 |

## Summary of Results for 200 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 0.124 | 0.124 | 13.4 | 497.8 | O K |
| 30 min Summer | 0.185 | 0.185 | 27.0 | 760.2 | O K |
| 60 min Summer | 0.256 | 0.256 | 43.1 | 1075.2 | O K |
| 120 min Summer | 0.280 | 0.280 | 47.7 | 1187.9 | O K |
| 180 min Summer | 0.292 | 0.292 | 48.9 | 1246.3 | O K |
| 240 min Summer | 0.303 | 0.303 | 49.2 | 1296.0 | O K |
| 360 min Summer | 0.321 | 0.321 | 49.6 | 1382.0 | O K |
| 480 min Summer | 0.337 | 0.337 | 49.9 | 1457.5 | O K |
| 600 min Summer | 0.350 | 0.350 | 50.1 | 1521.7 | O K |
| 720 min Summer | 0.362 | 0.362 | 50.2 | 1577.1 | O K |
| 960 min Summer | 0.380 | 0.380 | 50.4 | 1667.5 | O K |
| 1440 min Summer | 0.402 | 0.402 | 50.6 | 1776.0 | O K |
| 2160 min Summer | 0.408 | 0.408 | 50.6 | 1807.4 | O K |
| 2880 min Summer | 0.397 | 0.397 | 50.6 | 1753.3 | O K |
| 4320 min Summer | 0.357 | 0.357 | 50.2 | 1556.8 | O K |
| 5760 min Summer | 0.318 | 0.318 | 49.5 | 1368.0 | O K |
| 7200 min Summer | 0.288 | 0.288 | 48.8 | 1224.4 | O K |
| 8640 min Summer | 0.268 | 0.268 | 45.6 | 1133.4 | O K |
| 10080 min Summer | 0.253 | 0.253 | 42.6 | 1064.9 | O K |
| 15 min Winter | 0.138 | 0.138 | 16.3 | 557.0 | O K |
| 30 min Winter | 0.206 | 0.206 | 31.8 | 850.7 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 88.254 | 0.0 | 366.9 | 19 |
| 30 min Summer | 68.572 | 0.0 | 626.0 | 33 |
| 60 min Summer | 50.300 | 0.0 | 1061.4 | 62 |
| 120 min Summer | 29.686 | 0.0 | 1265.5 | 120 |
| 180 min Summer | 22.110 | 0.0 | 1421.8 | 172 |
| 240 min Summer | 18.072 | 0.0 | 1555.5 | 200 |
| 360 min Summer | 13.767 | 0.0 | 1786.1 | 266 |
| 480 min Summer | 11.495 | 0.0 | 1994.9 | 336 |
| 600 min Summer | 10.066 | 0.0 | 2188.4 | 406 |
| 720 min Summer | 9.076 | 0.0 | 2371.4 | 478 |
| 960 min Summer | 7.776 | 0.0 | 2713.2 | 618 |
| 1440 min Summer | 6.318 | 0.0 | 3303.2 | 896 |
| 2160 min Summer | 5.112 | 0.0 | 4141.9 | 1300 |
| 2880 min Summer | 4.357 | 0.0 | 4704.4 | 1700 |
| 4320 min Summer | 3.413 | 0.0 | 5493.2 | 2424 |
| 5760 min Summer | 2.846 | 0.0 | 6208.0 | 3168 |
| 7200 min Summer | 2.460 | 0.0 | 6699.4 | 3824 |
| 8640 min Summer | 2.180 | 0.0 | 7110.2 | 4504 |
| 10080 min Summer | 1.968 | 0.0 | 7449.7 | 5248 |
| 15 min Winter | 88.254 | 0.0 | 422.4 | 19 |
| 30 min Winter | 68.572 | 0.0 | 714.9 | 33 |

Summary of Results for 200 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 60 min Winter | 0.284 | 0.284 | 48.5 | 1204.7 | O K |
| 120 min Winter | 0.313 | 0.313 | 49.4 | 1341.6 | O K |
| 180 min Winter | 0.329 | 0.329 | 49.7 | 1420.9 | O K |
| 240 min Winter | 0.340 | 0.340 | 49.9 | 1473.6 | O K |
| 360 min Winter | 0.357 | 0.357 | 50.2 | 1554.8 | O K |
| 480 min Winter | 0.372 | 0.372 | 50.3 | 1627.6 | O K |
| 600 min Winter | 0.384 | 0.384 | 50.4 | 1685.7 | O K |
| 720 min Winter | 0.393 | 0.393 | 50.5 | 1732.9 | O K |
| 960 min Winter | 0.407 | 0.407 | 50.6 | 1803.7 | O K |
| 1440 min Winter | 0.419 | 0.419 | 50.7 | 1864.1 | O K |
| 2160 min Winter | 0.409 | 0.409 | 50.6 | 1811.0 | O K |
| 2880 min Winter | 0.381 | 0.381 | 50.4 | 1672.9 | O K |
| 4320 min Winter | 0.315 | 0.315 | 49.4 | 1353.0 | O K |
| 5760 min Winter | 0.273 | 0.273 | 46.4 | 1154.6 | O K |
| 7200 min Winter | 0.248 | 0.248 | 41.5 | 1039.8 | O K |
| 8640 min Winter | 0.230 | 0.230 | 37.5 | 957.3 | O K |
| 10080 min Winter | 0.216 | 0.216 | 34.2 | 894.4 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 60 min Winter | 50.300 | 0.0 | 1197.9 | 62 |
| 120 min Winter | 29.686 | 0.0 | 1426.6 | 118 |
| 180 min Winter | 22.110 | 0.0 | 1601.7 | 174 |
| 240 min Winter | 18.072 | 0.0 | 1751.5 | 226 |
| 360 min Winter | 13.767 | 0.0 | 2010.0 | 284 |
| 480 min Winter | 11.495 | 0.0 | 2243.9 | 364 |
| 600 min Winter | 10.066 | 0.0 | 2460.8 | 442 |
| 720 min Winter | 9.076 | 0.0 | 2665.8 | 520 |
| 960 min Winter | 7.776 | 0.0 | 3048.9 | 674 |
| 1440 min Winter | 6.318 | 0.0 | 3710.6 | 968 |
| 2160 min Winter | 5.112 | 0.0 | 4645.8 | 1388 |
| 2880 min Winter | 4.357 | 0.0 | 5277.4 | 1788 |
| 4320 min Winter | 3.413 | 0.0 | 6167.3 | 2508 |
| 5760 min Winter | 2.846 | 0.0 | 6957.7 | 3168 |
| 7200 min Winter | 2.460 | 0.0 | 7509.7 | 3888 |
| 8640 min Winter | 2.180 | 0.0 | 7972.7 | 4584 |
| 10080 min Winter | 1.968 | 0.0 | 8360.5 | 5336 |

## Summary of Results for 200 year Return Period (+55%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 0.187 | 0.187 | 27.3 | 768.1 | O K |
| 30 min Summer | 0.276 | 0.276 | 47.1 | 1171.4 | O K |
| 60 min Summer | 0.382 | 0.382 | 50.4 | 1678.9 | O K |
| 120 min Summer | 0.425 | 0.425 | 50.7 | 1894.4 | O K |
| 180 min Summer | 0.451 | 0.451 | 50.7 | 2030.2 | O K |
| 240 min Summer | 0.470 | 0.470 | 50.7 | 2128.7 | O K |
| 360 min Summer | 0.497 | 0.497 | 50.7 | 2270.2 | O K |
| 480 min Summer | 0.519 | 0.519 | 50.7 | 2400.6 | O K |
| 600 min Summer | 0.538 | 0.538 | 50.7 | 2518.3 | O K |
| 720 min Summer | 0.555 | 0.555 | 50.7 | 2625.8 | O K |
| 960 min Summer | 0.584 | 0.584 | 50.7 | 2814.4 | O K |
| 1440 min Summer | 0.626 | 0.626 | 50.7 | 3083.9 | O K |
| 2160 min Summer | 0.654 | 0.654 | 50.7 | 3268.4 | O K |
| 2880 min Summer | 0.657 | 0.657 | 50.7 | 3288.7 | O K |
| 4320 min Summer | 0.626 | 0.626 | 50.7 | 3084.5 | O K |
| 5760 min Summer | 0.579 | 0.579 | 50.7 | 2783.7 | O K |
| 7200 min Summer | 0.529 | 0.529 | 50.7 | 2464.5 | O K |
| 8640 min Summer | 0.479 | 0.479 | 50.7 | 2175.3 | O K |
| 10080 min Summer | 0.431 | 0.431 | 50.7 | 1923.8 | O K |
| 15 min Winter | 0.208 | 0.208 | 32.3 | 859.6 | O K |
| 30 min Winter | 0.307 | 0.307 | 49.2 | 1313.5 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 136.794 | 0.0 | 624.9 | 19 |
| 30 min Summer | 106.286 | 0.0 | 1036.8 | 33 |
| 60 min Summer | 77.965 | 0.0 | 1686.8 | 62 |
| 120 min Summer | 46.013 | 0.0 | 2003.3 | 122 |
| 180 min Summer | 34.270 | 0.0 | 2245.5 | 182 |
| 240 min Summer | 28.012 | 0.0 | 2452.5 | 240 |
| 360 min Summer | 21.339 | 0.0 | 2809.6 | 324 |
| 480 min Summer | 17.817 | 0.0 | 3132.5 | 390 |
| 600 min Summer | 15.602 | 0.0 | 3431.4 | 462 |
| 720 min Summer | 14.068 | 0.0 | 3713.3 | 530 |
| 960 min Summer | 12.053 | 0.0 | 4237.9 | 674 |
| 1440 min Summer | 9.793 | 0.0 | 5129.0 | 968 |
| 2160 min Summer | 7.924 | 0.0 | 6444.2 | 1404 |
| 2880 min Summer | 6.754 | 0.0 | 7319.7 | 1816 |
| 4320 min Summer | 5.291 | 0.0 | 8564.2 | 2636 |
| 5760 min Summer | 4.412 | 0.0 | 9642.5 | 3400 |
| 7200 min Summer | 3.813 | 0.0 | 10409.2 | 4112 |
| 8640 min Summer | 3.380 | 0.0 | 11054.1 | 4848 |
| 10080 min Summer | 3.050 | 0.0 | 11595.5 | 5552 |
| 15 min Winter | 136.794 | 0.0 | 713.7 | 18 |
| 30 min Winter | 106.286 | 0.0 | 1176.5 | 33 |

## Summary of Results for 200 year Return Period (+55%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 60 min Winter | 0.424 | 0.424 | 50.7 | 1890.0 | O K |
| 120 min Winter | 0.473 | 0.473 | 50.7 | 2140.6 | O K |
| 180 min Winter | 0.503 | 0.503 | 50.7 | 2303.3 | O K |
| 240 min Winter | 0.523 | 0.523 | 50.7 | 2424.5 | O K |
| 360 min Winter | 0.551 | 0.551 | 50.7 | 2600.5 | O K |
| 480 min Winter | 0.572 | 0.572 | 50.7 | 2737.3 | O K |
| 600 min Winter | 0.590 | 0.590 | 50.7 | 2851.4 | O K |
| 720 min Winter | 0.608 | 0.608 | 50.7 | 2966.9 | O K |
| 960 min Winter | 0.638 | 0.638 | 50.7 | 3166.4 | O K |
| 1440 min Winter | 0.679 | 0.679 | 50.7 | 3437.1 | O K |
| 2160 min Winter | 0.700 | 0.700 | 50.7 | 3574.9 | O K |
| 2880 min Winter | 0.689 | 0.689 | 50.7 | 3503.9 | O K |
| 4320 min Winter | 0.622 | 0.622 | 50.7 | 3060.3 | O K |
| 5760 min Winter | 0.540 | 0.540 | 50.7 | 2531.3 | O K |
| 7200 min Winter | 0.453 | 0.453 | 50.7 | 2038.9 | O K |
| 8640 min Winter | 0.376 | 0.376 | 50.4 | 1646.8 | O K |
| 10080 min Winter | 0.317 | 0.317 | 49.5 | 1363.8 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 60 min Winter | 77.965 | 0.0 | 1898.1 | 62 |
| 120 min Winter | 46.013 | 0.0 | 2252.5 | 120 |
| 180 min Winter | 34.270 | 0.0 | 2523.6 | 178 |
| 240 min Winter | 28.012 | 0.0 | 2755.3 | 234 |
| 360 min Winter | 21.339 | 0.0 | 3154.9 | 344 |
| 480 min Winter | 17.817 | 0.0 | 3516.0 | 450 |
| 600 min Winter | 15.602 | 0.0 | 3850.0 | 500 |
| 720 min Winter | 14.068 | 0.0 | 4164.7 | 572 |
| 960 min Winter | 12.053 | 0.0 | 4748.8 | 734 |
| 1440 min Winter | 9.793 | 0.0 | 5729.2 | 1064 |
| 2160 min Winter | 7.924 | 0.0 | 7221.8 | 1536 |
| 2880 min Winter | 6.754 | 0.0 | 8201.9 | 1988 |
| 4320 min Winter | 5.291 | 0.0 | 9601.8 | 2812 |
| 5760 min Winter | 4.412 | 0.0 | 10804.5 | 3576 |
| 7200 min Winter | 3.813 | 0.0 | 11665.0 | 4320 |
| 8640 min Winter | 3.380 | 0.0 | 12390.8 | 4928 |
| 10080 min Winter | 3.050 | 0.0 | 13006.8 | 5544 |

# APPENDIX D

## Eastern SuDS Pond - MicroDrainage Source Control Modelling Extracts

## Rainfall Details

| | |
|---|---|
| Rainfall Model | FEH |
| Return Period (years) | 200 |
| FEH Rainfall Version | 2013 |
| Site Location | GB 212195 774835 NN 12195 74835 |
| Data Type | Point |
| Summer Storms | Yes |
| Winter Storms | Yes |
| Cv (Summer) | 0.750 |
| Cv (Winter) | 0.840 |
| Shortest Storm (mins) | 15 |
| Longest Storm (mins) | 10080 |
| Climate Change % | +55 |

## Time Area Diagram

Total Area (ha) 0.260

| Time (mins) From: | To: | Area (ha) |
|---|---|---|
| 0 | 4 | 0.260 |

## Model Details

Storage is Online Cover Level (m) 15.000

## Tank or Pond Structure

Invert Level (m) 14.000

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 149.0 | 0.500 | 346.0 | 1.000 | 570.0 |

## Hydro-Brake® Optimum Outflow Control

| | |
|---|---|
| Unit Reference | MD-SHE-0098-4300-1000-4300 |
| Design Head (m) | 1.000 |
| Design Flow (l/s) | 4.3 |
| Flush-Flo™ | Calculated |
| Objective | Minimise upstream storage |
| Application | Surface |
| Sump Available | Yes |
| Diameter (mm) | 98 |
| Invert Level (m) | 14.000 |
| Minimum Outlet Pipe Diameter (mm) | 150 |
| Suggested Manhole Diameter (mm) | 1200 |

| Control Points | Head (m) | Flow (l/s) |
|---|---|---|
| Design Point (Calculated) | 1.000 | 4.3 |
| Flush-Flo™ | 0.298 | 4.3 |
| Kick-Flo® | 0.636 | 3.5 |
| Mean Flow over Head Range | - | 3.7 |

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|---|---|---|---|---|---|---|---|
| 0.100 | 3.2 | 1.200 | 4.7 | 3.000 | 7.2 | 7.000 | 10.7 |
| 0.200 | 4.2 | 1.400 | 5.0 | 3.500 | 7.7 | 7.500 | 11.1 |
| 0.300 | 4.3 | 1.600 | 5.3 | 4.000 | 8.2 | 8.000 | 11.4 |
| 0.400 | 4.2 | 1.800 | 5.6 | 4.500 | 8.7 | 8.500 | 11.8 |
| 0.500 | 4.1 | 2.000 | 5.9 | 5.000 | 9.1 | 9.000 | 12.1 |
| 0.600 | 3.7 | 2.200 | 6.2 | 5.500 | 9.6 | 9.500 | 12.4 |
| 0.800 | 3.9 | 2.400 | 6.5 | 6.000 | 10.0 | | |
| 1.000 | 4.3 | 2.600 | 6.7 | 6.500 | 10.4 | | |

## Summary of Results for 2 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 14.074 | 0.074 | 2.2 | 12.0 | O K |
| 30 min Summer | 14.100 | 0.100 | 3.2 | 16.4 | O K |
| 60 min Summer | 14.125 | 0.125 | 3.8 | 21.3 | O K |
| 120 min Summer | 14.154 | 0.154 | 4.0 | 26.8 | O K |
| 180 min Summer | 14.168 | 0.168 | 4.1 | 29.7 | O K |
| 240 min Summer | 14.177 | 0.177 | 4.1 | 31.5 | O K |
| 360 min Summer | 14.184 | 0.184 | 4.1 | 33.1 | O K |
| 480 min Summer | 14.186 | 0.186 | 4.1 | 33.4 | O K |
| 600 min Summer | 14.184 | 0.184 | 4.1 | 33.1 | O K |
| 720 min Summer | 14.181 | 0.181 | 4.1 | 32.4 | O K |
| 960 min Summer | 14.172 | 0.172 | 4.1 | 30.4 | O K |
| 1440 min Summer | 14.152 | 0.152 | 4.0 | 26.4 | O K |
| 2160 min Summer | 14.127 | 0.127 | 3.8 | 21.5 | O K |
| 2880 min Summer | 14.112 | 0.112 | 3.6 | 18.7 | O K |
| 4320 min Summer | 14.095 | 0.095 | 3.0 | 15.5 | O K |
| 5760 min Summer | 14.085 | 0.085 | 2.7 | 13.8 | O K |
| 7200 min Summer | 14.079 | 0.079 | 2.4 | 12.7 | O K |
| 8640 min Summer | 14.075 | 0.075 | 2.3 | 12.0 | O K |
| 10080 min Summer | 14.072 | 0.072 | 2.1 | 11.5 | O K |
| 15 min Winter | 14.083 | 0.083 | 2.6 | 13.4 | O K |
| 30 min Winter | 14.111 | 0.111 | 3.5 | 18.5 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 26.764 | 0.0 | 12.6 | 17 |
| 30 min Summer | 19.857 | 0.0 | 18.9 | 31 |
| 60 min Summer | 14.422 | 0.0 | 27.9 | 48 |
| 120 min Summer | 10.308 | 0.0 | 40.0 | 84 |
| 180 min Summer | 8.412 | 0.0 | 49.0 | 120 |
| 240 min Summer | 7.272 | 0.0 | 56.5 | 156 |
| 360 min Summer | 5.913 | 0.0 | 68.9 | 226 |
| 480 min Summer | 5.100 | 0.0 | 79.3 | 292 |
| 600 min Summer | 4.541 | 0.0 | 88.3 | 360 |
| 720 min Summer | 4.125 | 0.0 | 96.2 | 426 |
| 960 min Summer | 3.534 | 0.0 | 109.9 | 550 |
| 1440 min Summer | 2.832 | 0.0 | 132.1 | 794 |
| 2160 min Summer | 2.252 | 0.0 | 157.9 | 1148 |
| 2880 min Summer | 1.912 | 0.0 | 178.8 | 1500 |
| 4320 min Summer | 1.523 | 0.0 | 213.4 | 2208 |
| 5760 min Summer | 1.306 | 0.0 | 244.4 | 2936 |
| 7200 min Summer | 1.170 | 0.0 | 273.6 | 3672 |
| 8640 min Summer | 1.076 | 0.0 | 301.9 | 4400 |
| 10080 min Summer | 1.008 | 0.0 | 329.8 | 5136 |
| 15 min Winter | 26.764 | 0.0 | 14.2 | 17 |
| 30 min Winter | 19.857 | 0.0 | 21.2 | 30 |

## Summary of Results for 2 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 60 min Winter | 14.140 | 0.140 | 3.9 | 24.0 | O K |
| 120 min Winter | 14.169 | 0.169 | 4.1 | 29.8 | O K |
| 180 min Winter | 14.182 | 0.182 | 4.1 | 32.6 | O K |
| 240 min Winter | 14.189 | 0.189 | 4.2 | 34.0 | O K |
| 360 min Winter | 14.192 | 0.192 | 4.2 | 34.7 | O K |
| 480 min Winter | 14.188 | 0.188 | 4.1 | 33.9 | O K |
| 600 min Winter | 14.181 | 0.181 | 4.1 | 32.5 | O K |
| 720 min Winter | 14.173 | 0.173 | 4.1 | 30.8 | O K |
| 960 min Winter | 14.155 | 0.155 | 4.0 | 27.1 | O K |
| 1440 min Winter | 14.125 | 0.125 | 3.8 | 21.1 | O K |
| 2160 min Winter | 14.102 | 0.102 | 3.3 | 16.9 | O K |
| 2880 min Winter | 14.089 | 0.089 | 2.8 | 14.6 | O K |
| 4320 min Winter | 14.076 | 0.076 | 2.3 | 12.2 | O K |
| 5760 min Winter | 14.069 | 0.069 | 2.0 | 11.0 | O K |
| 7200 min Winter | 14.064 | 0.064 | 1.8 | 10.2 | O K |
| 8640 min Winter | 14.061 | 0.061 | 1.6 | 9.6 | O K |
| 10080 min Winter | 14.058 | 0.058 | 1.5 | 9.2 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 60 min Winter | 14.422 | 0.0 | 31.3 | 54 |
| 120 min Winter | 10.308 | 0.0 | 44.8 | 92 |
| 180 min Winter | 8.412 | 0.0 | 54.9 | 130 |
| 240 min Winter | 7.272 | 0.0 | 63.3 | 170 |
| 360 min Winter | 5.913 | 0.0 | 77.2 | 244 |
| 480 min Winter | 5.100 | 0.0 | 88.8 | 314 |
| 600 min Winter | 4.541 | 0.0 | 98.9 | 382 |
| 720 min Winter | 4.125 | 0.0 | 107.8 | 448 |
| 960 min Winter | 3.534 | 0.0 | 123.2 | 576 |
| 1440 min Winter | 2.832 | 0.0 | 148.0 | 808 |
| 2160 min Winter | 2.252 | 0.0 | 176.9 | 1148 |
| 2880 min Winter | 1.912 | 0.0 | 200.3 | 1504 |
| 4320 min Winter | 1.523 | 0.0 | 239.1 | 2208 |
| 5760 min Winter | 1.306 | 0.0 | 273.7 | 2936 |
| 7200 min Winter | 1.170 | 0.0 | 306.5 | 3672 |
| 8640 min Winter | 1.076 | 0.0 | 338.2 | 4400 |
| 10080 min Winter | 1.008 | 0.0 | 369.5 | 5144 |

## Summary of Results for 30 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 14.160 | 0.160 | 4.0 | 28.1 | O K |
| 30 min Summer | 14.221 | 0.221 | 4.2 | 41.2 | O K |
| 60 min Summer | 14.288 | 0.288 | 4.3 | 57.1 | O K |
| 120 min Summer | 14.308 | 0.308 | 4.3 | 62.3 | O K |
| 180 min Summer | 14.318 | 0.318 | 4.3 | 65.0 | O K |
| 240 min Summer | 14.325 | 0.325 | 4.3 | 66.7 | O K |
| 360 min Summer | 14.331 | 0.331 | 4.3 | 68.4 | O K |
| 480 min Summer | 14.333 | 0.333 | 4.3 | 68.9 | O K |
| 600 min Summer | 14.333 | 0.333 | 4.3 | 68.8 | O K |
| 720 min Summer | 14.331 | 0.331 | 4.3 | 68.4 | O K |
| 960 min Summer | 14.326 | 0.326 | 4.3 | 67.1 | O K |
| 1440 min Summer | 14.313 | 0.313 | 4.3 | 63.7 | O K |
| 2160 min Summer | 14.289 | 0.289 | 4.3 | 57.5 | O K |
| 2880 min Summer | 14.260 | 0.260 | 4.3 | 50.2 | O K |
| 4320 min Summer | 14.201 | 0.201 | 4.2 | 36.6 | O K |
| 5760 min Summer | 14.156 | 0.156 | 4.0 | 27.2 | O K |
| 7200 min Summer | 14.126 | 0.126 | 3.8 | 21.4 | O K |
| 8640 min Summer | 14.112 | 0.112 | 3.6 | 18.7 | O K |
| 10080 min Summer | 14.102 | 0.102 | 3.3 | 16.9 | O K |
| 15 min Winter | 14.177 | 0.177 | 4.1 | 31.6 | O K |
| 30 min Winter | 14.245 | 0.245 | 4.3 | 46.6 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 62.416 | 0.0 | 29.9 | 18 |
| 30 min Summer | 47.316 | 0.0 | 45.6 | 32 |
| 60 min Summer | 34.581 | 0.0 | 67.2 | 62 |
| 120 min Summer | 21.323 | 0.0 | 82.9 | 110 |
| 180 min Summer | 16.236 | 0.0 | 94.7 | 142 |
| 240 min Summer | 13.448 | 0.0 | 104.6 | 176 |
| 360 min Summer | 10.385 | 0.0 | 121.2 | 246 |
| 480 min Summer | 8.704 | 0.0 | 135.5 | 316 |
| 600 min Summer | 7.621 | 0.0 | 148.3 | 386 |
| 720 min Summer | 6.856 | 0.0 | 160.1 | 456 |
| 960 min Summer | 5.834 | 0.0 | 181.7 | 594 |
| 1440 min Summer | 4.708 | 0.0 | 219.9 | 864 |
| 2160 min Summer | 3.831 | 0.0 | 268.8 | 1252 |
| 2880 min Summer | 3.295 | 0.0 | 308.2 | 1616 |
| 4320 min Summer | 2.622 | 0.0 | 367.8 | 2332 |
| 5760 min Summer | 2.215 | 0.0 | 414.6 | 3000 |
| 7200 min Summer | 1.933 | 0.0 | 452.1 | 3680 |
| 8640 min Summer | 1.727 | 0.0 | 484.9 | 4408 |
| 10080 min Summer | 1.571 | 0.0 | 514.2 | 5136 |
| 15 min Winter | 62.416 | 0.0 | 33.6 | 18 |
| 30 min Winter | 47.316 | 0.0 | 51.2 | 32 |

## Summary of Results for 30 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 60 min Winter | 14.318 | 0.318 | 4.3 | 64.9 | O K |
| 120 min Winter | 14.343 | 0.343 | 4.3 | 71.7 | O K |
| 180 min Winter | 14.352 | 0.352 | 4.3 | 74.3 | O K |
| 240 min Winter | 14.358 | 0.358 | 4.3 | 75.9 | O K |
| 360 min Winter | 14.362 | 0.362 | 4.3 | 77.0 | O K |
| 480 min Winter | 14.360 | 0.360 | 4.3 | 76.5 | O K |
| 600 min Winter | 14.355 | 0.355 | 4.3 | 75.1 | O K |
| 720 min Winter | 14.349 | 0.349 | 4.3 | 73.3 | O K |
| 960 min Winter | 14.334 | 0.334 | 4.3 | 69.1 | O K |
| 1440 min Winter | 14.301 | 0.301 | 4.3 | 60.4 | O K |
| 2160 min Winter | 14.249 | 0.249 | 4.3 | 47.6 | O K |
| 2880 min Winter | 14.199 | 0.199 | 4.2 | 36.3 | O K |
| 4320 min Winter | 14.128 | 0.128 | 3.8 | 21.7 | O K |
| 5760 min Winter | 14.105 | 0.105 | 3.4 | 17.4 | O K |
| 7200 min Winter | 14.092 | 0.092 | 3.0 | 15.1 | O K |
| 8640 min Winter | 14.084 | 0.084 | 2.6 | 13.6 | O K |
| 10080 min Winter | 14.078 | 0.078 | 2.4 | 12.6 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 60 min Winter | 34.581 | 0.0 | 75.3 | 60 |
| 120 min Winter | 21.323 | 0.0 | 92.9 | 116 |
| 180 min Winter | 16.236 | 0.0 | 106.1 | 166 |
| 240 min Winter | 13.448 | 0.0 | 117.2 | 190 |
| 360 min Winter | 10.385 | 0.0 | 135.8 | 268 |
| 480 min Winter | 8.704 | 0.0 | 151.8 | 346 |
| 600 min Winter | 7.621 | 0.0 | 166.1 | 422 |
| 720 min Winter | 6.856 | 0.0 | 179.4 | 496 |
| 960 min Winter | 5.834 | 0.0 | 203.5 | 638 |
| 1440 min Winter | 4.708 | 0.0 | 246.4 | 910 |
| 2160 min Winter | 3.831 | 0.0 | 301.0 | 1296 |
| 2880 min Winter | 3.295 | 0.0 | 345.2 | 1644 |
| 4320 min Winter | 2.622 | 0.0 | 412.0 | 2292 |
| 5760 min Winter | 2.215 | 0.0 | 464.4 | 2944 |
| 7200 min Winter | 1.933 | 0.0 | 506.4 | 3672 |
| 8640 min Winter | 1.727 | 0.0 | 543.1 | 4408 |
| 10080 min Winter | 1.571 | 0.0 | 576.0 | 5144 |

## Summary of Results for 100 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 14.197 | 0.197 | 4.2 | 35.8 | O K |
| 30 min Summer | 14.275 | 0.275 | 4.3 | 53.9 | O K |
| 60 min Summer | 14.358 | 0.358 | 4.3 | 75.7 | O K |
| 120 min Summer | 14.378 | 0.378 | 4.3 | 81.5 | O K |
| 180 min Summer | 14.385 | 0.385 | 4.3 | 83.7 | O K |
| 240 min Summer | 14.391 | 0.391 | 4.3 | 85.3 | O K |
| 360 min Summer | 14.397 | 0.397 | 4.3 | 87.3 | O K |
| 480 min Summer | 14.402 | 0.402 | 4.3 | 88.5 | O K |
| 600 min Summer | 14.404 | 0.404 | 4.3 | 89.3 | O K |
| 720 min Summer | 14.406 | 0.406 | 4.3 | 89.9 | O K |
| 960 min Summer | 14.409 | 0.409 | 4.3 | 90.7 | O K |
| 1440 min Summer | 14.409 | 0.409 | 4.3 | 90.8 | O K |
| 2160 min Summer | 14.394 | 0.394 | 4.3 | 86.3 | O K |
| 2880 min Summer | 14.365 | 0.365 | 4.3 | 77.9 | O K |
| 4320 min Summer | 14.292 | 0.292 | 4.3 | 58.2 | O K |
| 5760 min Summer | 14.226 | 0.226 | 4.2 | 42.4 | O K |
| 7200 min Summer | 14.176 | 0.176 | 4.1 | 31.4 | O K |
| 8640 min Summer | 14.141 | 0.141 | 3.9 | 24.3 | O K |
| 10080 min Summer | 14.121 | 0.121 | 3.8 | 20.3 | O K |
| 15 min Winter | 14.217 | 0.217 | 4.2 | 40.3 | O K |
| 30 min Winter | 14.302 | 0.302 | 4.3 | 60.8 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 78.805 | 0.0 | 37.9 | 18 |
| 30 min Summer | 60.709 | 0.0 | 58.7 | 32 |
| 60 min Summer | 44.500 | 0.0 | 86.5 | 62 |
| 120 min Summer | 26.584 | 0.0 | 103.4 | 120 |
| 180 min Summer | 19.931 | 0.0 | 116.3 | 158 |
| 240 min Summer | 16.359 | 0.0 | 127.3 | 190 |
| 360 min Summer | 12.516 | 0.0 | 146.1 | 258 |
| 480 min Summer | 10.456 | 0.0 | 162.8 | 328 |
| 600 min Summer | 9.151 | 0.0 | 178.1 | 400 |
| 720 min Summer | 8.242 | 0.0 | 192.5 | 470 |
| 960 min Summer | 7.050 | 0.0 | 219.6 | 610 |
| 1440 min Summer | 5.736 | 0.0 | 268.0 | 884 |
| 2160 min Summer | 4.667 | 0.0 | 327.5 | 1296 |
| 2880 min Summer | 3.996 | 0.0 | 373.8 | 1672 |
| 4320 min Summer | 3.149 | 0.0 | 441.6 | 2380 |
| 5760 min Summer | 2.636 | 0.0 | 493.3 | 3112 |
| 7200 min Summer | 2.283 | 0.0 | 534.2 | 3752 |
| 8640 min Summer | 2.028 | 0.0 | 569.2 | 4488 |
| 10080 min Summer | 1.833 | 0.0 | 600.0 | 5144 |
| 15 min Winter | 78.805 | 0.0 | 42.5 | 18 |
| 30 min Winter | 60.709 | 0.0 | 65.8 | 32 |

## Summary of Results for 100 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume ($m^3$) | Status |
|---|---|---|---|---|---|
| 60 min Winter | 14.393 | 0.393 | 4.3 | 85.9 | O K |
| 120 min Winter | 14.418 | 0.418 | 4.3 | 93.7 | O K |
| 180 min Winter | 14.429 | 0.429 | 4.3 | 96.9 | O K |
| 240 min Winter | 14.433 | 0.433 | 4.3 | 98.2 | O K |
| 360 min Winter | 14.438 | 0.438 | 4.3 | 99.8 | O K |
| 480 min Winter | 14.440 | 0.440 | 4.3 | 100.5 | O K |
| 600 min Winter | 14.440 | 0.440 | 4.3 | 100.3 | O K |
| 720 min Winter | 14.438 | 0.438 | 4.3 | 99.8 | O K |
| 960 min Winter | 14.433 | 0.433 | 4.3 | 98.1 | O K |
| 1440 min Winter | 14.416 | 0.416 | 4.3 | 92.9 | O K |
| 2160 min Winter | 14.372 | 0.372 | 4.3 | 79.9 | O K |
| 2880 min Winter | 14.315 | 0.315 | 4.3 | 64.1 | O K |
| 4320 min Winter | 14.203 | 0.203 | 4.2 | 37.1 | O K |
| 5760 min Winter | 14.133 | 0.133 | 3.9 | 22.8 | O K |
| 7200 min Winter | 14.109 | 0.109 | 3.5 | 18.1 | O K |
| 8640 min Winter | 14.097 | 0.097 | 3.1 | 15.9 | O K |
| 10080 min Winter | 14.088 | 0.088 | 2.8 | 14.4 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume ($m^3$) | Discharge Volume ($m^3$) | Time-Peak (mins) |
|---|---|---|---|---|
| 60 min Winter | 44.500 | 0.0 | 96.9 | 60 |
| 120 min Winter | 26.584 | 0.0 | 115.9 | 118 |
| 180 min Winter | 19.931 | 0.0 | 130.3 | 172 |
| 240 min Winter | 16.359 | 0.0 | 142.6 | 222 |
| 360 min Winter | 12.516 | 0.0 | 163.7 | 280 |
| 480 min Winter | 10.456 | 0.0 | 182.4 | 358 |
| 600 min Winter | 9.151 | 0.0 | 199.5 | 436 |
| 720 min Winter | 8.242 | 0.0 | 215.7 | 514 |
| 960 min Winter | 7.050 | 0.0 | 246.0 | 664 |
| 1440 min Winter | 5.736 | 0.0 | 300.2 | 954 |
| 2160 min Winter | 4.667 | 0.0 | 366.8 | 1364 |
| 2880 min Winter | 3.996 | 0.0 | 418.7 | 1756 |
| 4320 min Winter | 3.149 | 0.0 | 494.7 | 2420 |
| 5760 min Winter | 2.636 | 0.0 | 552.5 | 3056 |
| 7200 min Winter | 2.283 | 0.0 | 598.3 | 3680 |
| 8640 min Winter | 2.028 | 0.0 | 637.5 | 4400 |
| 10080 min Winter | 1.833 | 0.0 | 672.1 | 5112 |

## Summary of Results for 200 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 14.217 | 0.217 | 4.2 | 40.3 | O K |
| 30 min Summer | 14.304 | 0.304 | 4.3 | 61.4 | O K |
| 60 min Summer | 14.396 | 0.396 | 4.3 | 86.8 | O K |
| 120 min Summer | 14.417 | 0.417 | 4.3 | 93.1 | O K |
| 180 min Summer | 14.424 | 0.424 | 4.3 | 95.4 | O K |
| 240 min Summer | 14.429 | 0.429 | 4.3 | 96.8 | O K |
| 360 min Summer | 14.435 | 0.435 | 4.3 | 98.9 | O K |
| 480 min Summer | 14.441 | 0.441 | 4.3 | 100.8 | O K |
| 600 min Summer | 14.446 | 0.446 | 4.3 | 102.3 | O K |
| 720 min Summer | 14.450 | 0.450 | 4.3 | 103.5 | O K |
| 960 min Summer | 14.456 | 0.456 | 4.3 | 105.7 | O K |
| 1440 min Summer | 14.462 | 0.462 | 4.3 | 107.5 | O K |
| 2160 min Summer | 14.450 | 0.450 | 4.3 | 103.6 | O K |
| 2880 min Summer | 14.422 | 0.422 | 4.3 | 94.7 | O K |
| 4320 min Summer | 14.344 | 0.344 | 4.3 | 72.1 | O K |
| 5760 min Summer | 14.270 | 0.270 | 4.3 | 52.7 | O K |
| 7200 min Summer | 14.210 | 0.210 | 4.2 | 38.7 | O K |
| 8640 min Summer | 14.167 | 0.167 | 4.1 | 29.4 | O K |
| 10080 min Summer | 14.137 | 0.137 | 3.9 | 23.4 | O K |
| 15 min Winter | 14.239 | 0.239 | 4.3 | 45.4 | O K |
| 30 min Winter | 14.334 | 0.334 | 4.3 | 69.3 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 88.254 | 0.0 | 42.5 | 18 |
| 30 min Summer | 68.572 | 0.0 | 66.3 | 33 |
| 60 min Summer | 50.300 | 0.0 | 97.8 | 62 |
| 120 min Summer | 29.686 | 0.0 | 115.5 | 120 |
| 180 min Summer | 22.110 | 0.0 | 129.1 | 170 |
| 240 min Summer | 18.072 | 0.0 | 140.7 | 200 |
| 360 min Summer | 13.767 | 0.0 | 160.8 | 266 |
| 480 min Summer | 11.495 | 0.0 | 179.0 | 336 |
| 600 min Summer | 10.066 | 0.0 | 196.0 | 408 |
| 720 min Summer | 9.076 | 0.0 | 212.0 | 480 |
| 960 min Summer | 7.776 | 0.0 | 242.2 | 624 |
| 1440 min Summer | 6.318 | 0.0 | 295.2 | 908 |
| 2160 min Summer | 5.112 | 0.0 | 358.7 | 1316 |
| 2880 min Summer | 4.357 | 0.0 | 407.6 | 1700 |
| 4320 min Summer | 3.413 | 0.0 | 478.8 | 2424 |
| 5760 min Summer | 2.846 | 0.0 | 532.8 | 3120 |
| 7200 min Summer | 2.460 | 0.0 | 575.5 | 3816 |
| 8640 min Summer | 2.180 | 0.0 | 612.1 | 4496 |
| 10080 min Summer | 1.968 | 0.0 | 644.2 | 5152 |
| 15 min Winter | 88.254 | 0.0 | 47.7 | 18 |
| 30 min Winter | 68.572 | 0.0 | 74.3 | 32 |

## Summary of Results for 200 year Return Period

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 60 min Winter | 14.433 | 0.433 | 4.3 | 98.3 | O K |
| 120 min Winter | 14.460 | 0.460 | 4.3 | 106.8 | O K |
| 180 min Winter | 14.471 | 0.471 | 4.3 | 110.6 | O K |
| 240 min Winter | 14.476 | 0.476 | 4.3 | 112.3 | O K |
| 360 min Winter | 14.481 | 0.481 | 4.3 | 113.8 | O K |
| 480 min Winter | 14.486 | 0.486 | 4.3 | 115.4 | O K |
| 600 min Winter | 14.488 | 0.488 | 4.3 | 116.3 | O K |
| 720 min Winter | 14.490 | 0.490 | 4.3 | 116.8 | O K |
| 960 min Winter | 14.490 | 0.490 | 4.3 | 116.9 | O K |
| 1440 min Winter | 14.480 | 0.480 | 4.3 | 113.6 | O K |
| 2160 min Winter | 14.441 | 0.441 | 4.3 | 100.7 | O K |
| 2880 min Winter | 14.383 | 0.383 | 4.3 | 82.9 | O K |
| 4320 min Winter | 14.254 | 0.254 | 4.3 | 48.9 | O K |
| 5760 min Winter | 14.164 | 0.164 | 4.1 | 28.8 | O K |
| 7200 min Winter | 14.118 | 0.118 | 3.8 | 19.8 | O K |
| 8640 min Winter | 14.104 | 0.104 | 3.3 | 17.2 | O K |
| 10080 min Winter | 14.094 | 0.094 | 3.0 | 15.4 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 60 min Winter | 50.300 | 0.0 | 109.6 | 62 |
| 120 min Winter | 29.686 | 0.0 | 129.4 | 118 |
| 180 min Winter | 22.110 | 0.0 | 144.6 | 174 |
| 240 min Winter | 18.072 | 0.0 | 157.6 | 228 |
| 360 min Winter | 13.767 | 0.0 | 180.1 | 288 |
| 480 min Winter | 11.495 | 0.0 | 200.5 | 366 |
| 600 min Winter | 10.066 | 0.0 | 219.5 | 446 |
| 720 min Winter | 9.076 | 0.0 | 237.5 | 526 |
| 960 min Winter | 7.776 | 0.0 | 271.3 | 682 |
| 1440 min Winter | 6.318 | 0.0 | 330.6 | 982 |
| 2160 min Winter | 5.112 | 0.0 | 401.8 | 1404 |
| 2880 min Winter | 4.357 | 0.0 | 456.6 | 1788 |
| 4320 min Winter | 3.413 | 0.0 | 536.3 | 2504 |
| 5760 min Winter | 2.846 | 0.0 | 596.7 | 3120 |
| 7200 min Winter | 2.460 | 0.0 | 644.6 | 3680 |
| 8640 min Winter | 2.180 | 0.0 | 685.5 | 4408 |
| 10080 min Winter | 1.968 | 0.0 | 721.6 | 5144 |

## Summary of Results for 200 year Return Period (+55%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 14.313 | 0.313 | 4.3 | 63.6 | O K |
| 30 min Summer | 14.431 | 0.431 | 4.3 | 97.6 | O K |
| 60 min Summer | 14.555 | 0.555 | 4.3 | 139.9 | O K |
| 120 min Summer | 14.597 | 0.597 | 4.3 | 155.7 | O K |
| 180 min Summer | 14.621 | 0.621 | 4.3 | 165.3 | O K |
| 240 min Summer | 14.638 | 0.638 | 4.3 | 172.0 | O K |
| 360 min Summer | 14.659 | 0.659 | 4.3 | 180.4 | O K |
| 480 min Summer | 14.673 | 0.673 | 4.3 | 186.2 | O K |
| 600 min Summer | 14.686 | 0.686 | 4.3 | 191.8 | O K |
| 720 min Summer | 14.699 | 0.699 | 4.3 | 197.2 | O K |
| 960 min Summer | 14.722 | 0.722 | 4.3 | 207.3 | O K |
| 1440 min Summer | 14.757 | 0.757 | 4.3 | 223.1 | O K |
| 2160 min Summer | 14.781 | 0.781 | 4.3 | 234.0 | O K |
| 2880 min Summer | 14.782 | 0.782 | 4.3 | 234.5 | O K |
| 4320 min Summer | 14.746 | 0.746 | 4.3 | 218.0 | O K |
| 5760 min Summer | 14.688 | 0.688 | 4.3 | 192.7 | O K |
| 7200 min Summer | 14.602 | 0.602 | 4.3 | 157.7 | O K |
| 8640 min Summer | 14.512 | 0.512 | 4.3 | 124.4 | O K |
| 10080 min Summer | 14.433 | 0.433 | 4.3 | 98.3 | O K |
| 15 min Winter | 14.343 | 0.343 | 4.3 | 71.5 | O K |
| 30 min Winter | 14.469 | 0.469 | 4.3 | 109.9 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 136.794 | 0.0 | 66.1 | 18 |
| 30 min Summer | 106.286 | 0.0 | 103.0 | 33 |
| 60 min Summer | 77.965 | 0.0 | 151.8 | 62 |
| 120 min Summer | 46.013 | 0.0 | 179.2 | 122 |
| 180 min Summer | 34.270 | 0.0 | 200.2 | 182 |
| 240 min Summer | 28.012 | 0.0 | 218.2 | 242 |
| 360 min Summer | 21.339 | 0.0 | 249.3 | 360 |
| 480 min Summer | 17.817 | 0.0 | 277.6 | 432 |
| 600 min Summer | 15.602 | 0.0 | 303.8 | 498 |
| 720 min Summer | 14.068 | 0.0 | 328.7 | 568 |
| 960 min Summer | 12.053 | 0.0 | 375.5 | 704 |
| 1440 min Summer | 9.793 | 0.0 | 457.4 | 994 |
| 2160 min Summer | 7.924 | 0.0 | 556.0 | 1424 |
| 2880 min Summer | 6.754 | 0.0 | 631.9 | 1844 |
| 4320 min Summer | 5.291 | 0.0 | 742.4 | 2680 |
| 5760 min Summer | 4.412 | 0.0 | 825.8 | 3512 |
| 7200 min Summer | 3.813 | 0.0 | 892.1 | 4248 |
| 8640 min Summer | 3.380 | 0.0 | 948.8 | 4928 |
| 10080 min Summer | 3.050 | 0.0 | 998.8 | 5552 |
| 15 min Winter | 136.794 | 0.0 | 74.1 | 18 |
| 30 min Winter | 106.286 | 0.0 | 115.4 | 33 |

## Summary of Results for 200 year Return Period (+55%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 60 min Winter | 14.603 | 0.603 | 4.3 | 158.3 | O K |
| 120 min Winter | 14.652 | 0.652 | 4.3 | 177.7 | O K |
| 180 min Winter | 14.681 | 0.681 | 4.3 | 189.7 | O K |
| 240 min Winter | 14.701 | 0.701 | 4.3 | 198.2 | O K |
| 360 min Winter | 14.727 | 0.727 | 4.3 | 209.5 | O K |
| 480 min Winter | 14.745 | 0.745 | 4.3 | 217.6 | O K |
| 600 min Winter | 14.759 | 0.759 | 4.3 | 223.8 | O K |
| 720 min Winter | 14.770 | 0.770 | 4.3 | 228.9 | O K |
| 960 min Winter | 14.794 | 0.794 | 4.3 | 240.1 | O K |
| 1440 min Winter | 14.826 | 0.826 | 4.3 | 255.5 | O K |
| 2160 min Winter | 14.839 | 0.839 | 4.3 | 261.7 | O K |
| 2880 min Winter | 14.825 | 0.825 | 4.3 | 254.7 | O K |
| 4320 min Winter | 14.750 | 0.750 | 4.3 | 219.6 | O K |
| 5760 min Winter | 14.630 | 0.630 | 4.3 | 168.8 | O K |
| 7200 min Winter | 14.469 | 0.469 | 4.3 | 109.7 | O K |
| 8640 min Winter | 14.336 | 0.336 | 4.3 | 69.9 | O K |
| 10080 min Winter | 14.237 | 0.237 | 4.3 | 44.7 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 60 min Winter | 77.965 | 0.0 | 170.0 | 62 |
| 120 min Winter | 46.013 | 0.0 | 200.7 | 120 |
| 180 min Winter | 34.270 | 0.0 | 224.2 | 178 |
| 240 min Winter | 28.012 | 0.0 | 244.4 | 236 |
| 360 min Winter | 21.339 | 0.0 | 279.2 | 348 |
| 480 min Winter | 17.817 | 0.0 | 310.9 | 458 |
| 600 min Winter | 15.602 | 0.0 | 340.3 | 560 |
| 720 min Winter | 14.068 | 0.0 | 368.2 | 604 |
| 960 min Winter | 12.053 | 0.0 | 420.5 | 750 |
| 1440 min Winter | 9.793 | 0.0 | 512.1 | 1068 |
| 2160 min Winter | 7.924 | 0.0 | 622.8 | 1540 |
| 2880 min Winter | 6.754 | 0.0 | 707.7 | 1992 |
| 4320 min Winter | 5.291 | 0.0 | 831.5 | 2896 |
| 5760 min Winter | 4.412 | 0.0 | 924.9 | 3752 |
| 7200 min Winter | 3.813 | 0.0 | 999.2 | 4328 |
| 8640 min Winter | 3.380 | 0.0 | 1062.7 | 4936 |
| 10080 min Winter | 3.050 | 0.0 | 1118.7 | 5544 |

# APPENDIX E

## Scottish Water Pre-Development Enquiry Response

Friday, 05 February 2021

Richard Lucey
7 Dundas Street
Edinburgh
EH3 6QG

Scottish Water
Trusted to serve Scotland
Development Operations
The Bridge
Buchanan Gate Business Park
Cumbernauld Road
Stepps
Glasgow
G33 6FB

Development Operations
Free phone Number - 0800 389 0379
E-Mail - developmentoperations@scottishwater.co.uk
www.scottishwater.co.uk

Follow Us

Dear R Lucey

**Alvance British Aluminium, Lochaber Smelter, Fort William, PH33 6TH**
## Pre-Development Enquiry Application – Capacity Review
**Our Reference: DSCAS-0030707-LFB**
**Your Reference: 3539**

Thank you for your recent application regarding the above proposed development. Please note our reference number above, which should be quoted on all future correspondence.

**Units reviewed: Aluminium Canning and Billet Plant**

## Capacity Assessment

Scottish Water has carried out a Capacity review and we can confirm the following:

- There is currently sufficient capacity in the Camisky Wellfield Water Treatment Works to service your development.
- There is currently sufficient capacity in the Fort William Waste Water Treatment works to service your development.

## Network Assessment

- There are no issues currently identified within our **water** and **wastewater** network that would adversely affect the demands of your development.

### Please Note

- This response is valid for **12 months** from the date above and may be subject to further review.
- Water: exact point of connection to be determined at technical audit stage.
- The above waste water assessment is based on a foul only connection.
- All surface water to discharge to watercourse as per application.

- This will require permission from local authority and SEPA. Foul and surface water to be separated within the site.

## Water Access and Standoff Distances

There is a 350mm Ductile Iron trunk main running through your site boundary.

There are two critical issues relating to how close you can build to the above water mains:-

### 1. Access Distance

The Access Distance is the legally supported distance, required to facilitate future SW access to allow repair, maintenance or renewal of the water main in every direction (e.g. at the end of a water main or at changes of direction). The Access Distance will be measured from the extreme edge of the pipe.

No development that will restrict our access or put at risk the integrity of our assets is permitted within the Access Distance.

### 1. Stand-off Distance

a. This is the recommended distance to minimise the risk of damage to adjacent properties and structures in the event of a water main failure.
b. It is suggested that this distance may include garden areas but should not include inhabited structures.

The Access Distance for the 350mm DI main is 6.0 metres either side from the outside edge for the pipe.

No building, private gardens suds ponds or other obstruction should be located within the eight metre Access Distance.

With respect to the Stand-off distance as described above Scottish Water requires developers to seriously consider the consequences of a possible mains failure. The Stand-off distance is calculated using WSSC guidelines and is dependent on the water pressure in the main.

On this site the water pressure in the pipe is estimated at approximately 60m or 6 bar and the Stand-off Distance is calculated as 7.2m, which is more the Access Distance.  Hence the figure to be used is the Stand-off Distance. The summarised position is as follows:-

| Pipe Size | Material | Stand Off distance (Metres) | Access Distance (Metres) |
|---|---|---|---|
| 350mm | Ductile Iron | 7.5 | 6 |

The pipe needs to be out with the site boundary to ensure that the pipe has 24hr unhindered access to facilitate inspection, maintenance and repair. You should therefore implement the required access distance to the site boundary in the event that the site is being fenced off for security purposes.

## General Note

- Scottish Water's current minimum level of service for water pressure is 1.0 bar or 10m head in the public main. Any property which cannot be adequately serviced using this pressure may require private pumping arrangements installed, subject to compliance with the current water byelaws.

- Scottish Water is unable to reserve capacity therefore connections to the water and wastewater networks can only be granted on a first come first served basis. For this reason, we will review our ability to serve the development on receipt of an application to connect.

- Please be advised that Scottish Water will only accept surface water into the combined network under exceptional circumstances. In the consideration of any development, if due diligence has been carried out in fully investigating the available options for surface water drainage and if all of these options are subsequently deemed unreasonable to pursue, the remaining alternative options can then be considered for approval to allow the development to proceed.

- Unless stated on your PDE application, the drainage is assumed to propose to connect to our network via gravity without the use of a pumping station. If this is not the case, then please let us know as soon as possible because Scottish Water would need to reassess this case.

## Next Steps

This response is in relation to the information you have provided in your application. If there are any changes to your proposed development you may be required to submit a new Pre-Development Enquiry application via our portal or contact Development Operations.

You will require applying for technical approval for your waste water/water infrastructure from our technical team. In order to apply for this you will need to apply through a Licensed Provider. For further details on the Licensed Providers available at present please go to www.scotlandontap.gov.uk

I trust the above is acceptable however if you require any further information regarding this matter please contact me on **0800 389 0379** or via the e-mail address below.

Yours sincerely

**Carly Gourlay**
Development Operations
developmentoperations@scottishwater.co.uk

***Scottish Water Disclaimer:***

***"It is important to note that the information on any such plan provided on Scottish Water's infrastructure, is for indicative purposes only and its accuracy cannot be relied upon. When the exact location and the nature of the infrastructure on the plan is a material requirement then you should undertake an appropriate site investigation to confirm its actual position in the ground and to determine if it is suitable for its intended purpose. By using the plan you agree that Scottish Water will not be liable for any loss, damage or costs caused by relying upon it or from carrying out any such site investigation."***

# APPENDIX F

## Foul Loading Calculations

## Alvance British Aluminium - Billet Plant

**FOUL WATER**

| No. of staff members |
|---|
| 53 |

| Amenity | Flow (L) per use | no. of uses per person per day | total volume per day (l) | Total flow (l/s) |
|---|---|---|---|---|
| Toilet Block | 10 | 3 | 1590 | 0.018 |
| Shower | 40 | 1 | 2120 | 0.025 |
| | | | | **0.043** |

| | | |
|---|---|---|
| **Average foul discharge rate** | **0.043** | **l/s** |
| **Peak foul discharge rate** | **0.258** | **l/s** |

ITPEnergised is a leading, international consultancy offering renewable energy, natural resources, environmental, engineering, technical advisory and asset management services for clients with onshore and offshore projects.

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# Appendix 8.1 Phase 1 Habitat Survey

ITPENERGISED

# Alvance Recycling and Billet Casting Facility EIA

## Extended Phase 1 Habitat Survey

| | |
|---|---|
| Client: | Alvance British Aluminium |
| Project/Proposal No: | 3539 |
| Version: | 1.0 |
| Date: | 2021-05-10 |

# Document Information

| | |
|---|---|
| Project Name: | Alvance Recycling and Billet Casting Facility EIA |
| Document Title: | Extended Phase 1 Habitat Survey |
| Client Name: | Alvance British Aluminium |
| Client Contact: | James Tangney |
| Client Address: | Lochaber Smelter, North Road, Fort William, PH33 6TH, United Kingdom |
| Document Status: | Final for Issue |
| Author: | A Gow |
| Reviewed: | J Diack |
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| Version | Date | Authored | Reviewed | Approved | Notes |
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| 1.0 | 2021-05-10 | AG | JD | MF | First issue |
| | | | | | |
| | | | | | |
| | | | | | |

# Contents

# 1. Introduction

## 1.1 Overview

ITPEnergised has been appointed by Alvance British Aluminium (the Applicant) to undertake an extended Phase 1 habitat survey and protected mammal survey (notably bat, badger, otter, water vole, red squirrel and pine marten) of a site located south-west of the existing Lochaber Smelter, Fort William, in the Highland Council area. The site has central Ordnance Survey Grid Reference NN 12287 74807. Drawing 1 shows the development footprint (hereafter referred to as the 'site'), development footprint plus SUDs drainage and associated 100 m survey buffer as well as the wider development area.

The Applicant proposes to construct a Recycling and Billet Casting Facility with associated areas of hardstanding, landscaping and drainage ('the Proposed Development'). The facility will utilise scrap metal from the smelter to manufacture new product. For the proposed site layout refer to Appendix A. The Proposed Development overlaps the footprint of the previously consented Alloy Wheel Plant (AWP) (Application ref: 17/05202/FUL) for which an Environmental Impact Assessment (EIA) was completed. Ecological surveys to inform the AWP EIA included a Desk Study, Phase 1 Habitat, NVC Survey and protected mammal survey in 2017 (Golder, 2017). The resulting Technical Appendices should be read in conjunction with this report.

The purpose of the extended Phase 1 habitat survey and protected mammal survey was to update the existing baseline information on habitats and species present within the Site (extended to include SUDs drainage) and 100 m survey buffer (the 'study area'). The survey results are intended to facilitate the identification of potential constraints to development and identify where mitigation and/or further survey work may be required. This information will be used to inform the Ecology chapter of the EIA for the Proposed Development.

This report describes the methods used to compile habitat and protected species baseline information for the site and wider study area and details the findings of the survey. Where appropriate, further recommendations are outlined.

## 1.2 Site Description

The wider development area is approximately 25.9 ha and the development footprint (including SUDs drainage) is approximately 5.4 ha in size and is located in the north of Fort William just off North Road (A82), see Drawing 1. The site is predominantly comprised of wet modified bog, recently felled broadleaved woodland and marshy grassland mosaic, semi-improved neutral grassland, broadleaved semi-natural woodland and hardstanding. The 100 m survey buffer also includes coniferous plantation woodland, recently felled coniferous woodland, scattered scrub, amenity grassland, continuous bracken, scattered broadleaved trees, buildings and further hardstanding. The wider development area is bounded to the north-west by a railway line, retail buildings and North Road (A82) beyond, to the north and north-east by the existing Smelter and associated access road and to the west by further industrial buildings and residential areas including Claggan.

## 1.3 Survey History

The site has previously been consented for the development of a larger AWP and as such information included in the EIA Report (Golder, 2017) for that development is also relevant for the current Proposed Development. A summary of the previous findings are included below.

### 1.3.1 Nature Conservation Designations

A single designation of international importance and two designations of national importance were identified within 5km of the Site boundary. Details of the designated sites and their features are detailed below in Table 1.

*Table 1 Nature Conservation Designations within 5 km*

| Designated site | Distance to wider development area | Designated features |
|---|---|---|
| Ben Nevis SAC | 0.42 km E | Annex I habitats that are a primary reason for selection of this site:<br>o Siliceous alpine and boreal grasslands<br>o Alpine and subalpine calcareous grasslands<br>o Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)<br>o Calcareous rocky slopes with chasmophytic vegetation<br>o Siliceous rocky slopes with chasmophytic vegetation<br>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:<br>o Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*<br>o Northern Atlantic wet heaths with *Erica tetralix*<br>o European dry heaths<br>o Alpine and Boreal heaths<br>o Sub-Arctic *Salix* spp. scrub<br>o Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) * Priority feature<br>o Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels<br>o Blanket bogs (* if active bog) * Priority feature<br>o Alpine pioneer formations of the *Caricion bicoloris-atrofuscae* * Priority feature<br>o Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*)<br>o Old sessile oak woods with Ilex and Blechnum in the British Isles<br>o Caledonian forest * Priority feature |
| Ben Nevis SSSI | 0.42 km E | Designated for the following features:<br>o Upland assemblage<br>o Native pinewood<br>o Upland oak woodland |

| Designated site | Distance to wider development area | Designated features |
|---|---|---|
| | | o Vascular plant assemblage<br>o Bryophyte assemblage<br>o Breeding bird assemblage<br>o Small mountain ringlet butterfly (*Erebia epiphron*)<br>o Fly assemblage |
| Ach an Todhair SSSI | 3.3 km SW | Designated for the following features:<br>o Upland mixed ash woodland<br>o Upland habitat assemblage |

Additionally, three areas of ancient woodland were identified within 2 km of the wider development area, the closest woodland was located approximately 0.3 km south-west, beyond Claggan.

### 1.3.2 Habitats

EIA Report Technical Appendix 12.2 (Phase 1 Habitat Survey, National Vegetation Classification Survey and Groundwater Dependent Terrestrial Ecosystems Report) described the location of the facility at the time of survey in September 2017 as being dominated by semi-natural broadleaved woodland characterised mainly by downy birch (*Betula pubescens*), with small amounts of grey willow (*Salix cinerea*), alder (*Alnus glutinosa*) and some silver birch (*B. pendula*). Much of the woodland was stunted and on very wet ground. The field layer had constant purple moor-grass (*Molinia caerulea*), which locally became the dominant species. Other species in the field layer included bog-mosses, such as red bog-moss (*Sphagnum capillifolium*) and papillose bog-moss (*S. papillosum*). Habitats at the edge of the AWP footprint also included scrub to the north-east dominated by gorse (*Ulex europaeus*), locally with bramble (*Rubus fruticosus agg*.). Bare and disturbed ground was present to the north and northwest, whereas species-poor coniferous plantation was present to the southwest. It should be noted that the broadleaved woodland and adjacent conifer plantation under the footprint of the AWP was cleared in the winter of 2018-19. The site has been dominated by bare soil (mainly peat) and brash since then.

### 1.3.3 Terrestrial Mammals

EIA Report Technical Appendix 12.3 (Protected Terrestrial Mammal Survey Report) states that historical records of protected mammals within 5 km of the site include otter (*Lutra lutra*), pine marten (*Martes martes*) and red squirrel (*Sciurus vulgaris*). A survey of protected terrestrial mammals was therefore undertaken in September 2017 that included searching for evidence of the above species as well as badger (*Meles meles*), Scottish wildcat (*Felis silvestris silvestris*) and water vole (*Arvicola amphibius*) within the then planning boundary, which included the location of the currently Proposed Development and areas within a minimum 100 m buffer of its footprint. No evidence of any of the above protected species was recorded. The only evidence of any mammals recorded in the survey included signs of fox (*Vulpes vulpes*), rabbit (*Oryctolagus cuniculus*) and roe deer (*Capreolus capreolus*). It was therefore concluded that the study area was not regularly used by any of those protected species. As the woodland habitat was subsequently removed from the footprint of the AWP, the potential for protected species presence in that area is likely to be further reduced.

# 2. Legislation, Policy and Guidelines

An overview of relevant legislation, policy and guidance is provided below.

## 2.1 Legislation

Full consideration has been given to all relevant nature conservation legislation when carrying out this assessment. This includes the following:

- The Conservation of Natural Habitats and Wild Flora and Fauna (the 'Habitats Directive') 1992 (92/43/3EEC) ;
- Directive (2009/147/EC) of the European Parliament and of the Council on the conservation of wild birds (the 'Birds Directive');
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);
- Wildlife and Countryside Act 1981 (as amended) (WCA);
- The Nature Conservation (Scotland) Act 2004 (as amended);
- The Wildlife and Natural Environment (Scotland) (WANE) Act, 2011 (as amended); and
- The Protection of Badgers Act 1992, as amended by the Wildlife and Natural Environment (Scotland) Act 2011.

Legislation specific to bats, otter, red squirrel, pine marten, water vole and badger, including details of all actions which would constitute an offence, is detailed fully within Appendix B.

## 2.2 Policy Framework

The policies set out in Appendix C are those relevant to nature conservation and include those from Scottish Planning Policy (Scottish Government, 2014); Planning Advice Note 60: Planning for Natural Heritage (Scottish Government, 2000); and Highland-wide Local Development Plan (The Highland Council, 2012).

## 2.3 Best Practice Ecological Guidance

As part of the baseline report, cognisance has been taken of the Chartered Institute of Ecology and Environmental Management (CIEEM) good practice guidelines and survey methods, notably the standard methods developed for Preliminary Ecological Appraisals (CIEEM, 2017) and Ecological Impact Assessment (CIEEM, 2018).

As part of each ecological survey, cognisance has been taken of the following best practice guidelines and survey method publications:

### 2.3.1 Phase 1 Habitat Survey

- Handbook for Phase 1 Habitat Survey - a technique for environmental audit (JNCC, 2010).

### 2.3.2 Bats

- Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016).

### 2.3.3 Otter

- Monitoring the Otter *Lutra lutra* (Chanin, 2003).
- Competencies for Species Survey: Eurasian Otter (CIEEM, 2013a).

### 2.3.4 Scottish Wildcat

- The Scottish Wildcat. Analyses for conservation and an action plan (MacDonald *et al.*, 2004).
- UK BAP Mammals Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation (Cresswell *et al.*, 2012).

### 2.3.5 Pine Marten

- National Pine Marten Survey of Ireland 2005 (O'Mahony *et al.*, 2006).
- A guide to Identifying evidence of Pine Martens in Wales (Vincent Wildlife Trust, 2017).
- Competencies for Species Survey: Pine Marten (CIEEM, 2013b).

### 2.3.6 Red Squirrel

- Red squirrel conservation: Field study methods (Gurnell and Pepper, 1994).
- Practical Techniques for Surveying and Monitoring Squirrels (Gurnell *et al.*, 2009).
- Competencies for Species Survey: Red Squirrel (CIEEM, 2013c).

### 2.3.7 Badger

- Surveying for Badgers: Good Practice Guidelines (Scottish Badgers, 2018).
- Competencies for Species Survey: Badger (CIEEM, 2013d)

### 2.3.8 Water Vole

- The Water Vole Mitigation Handbook (Dean *et al.*, 2016).
- Competencies for Species Survey: Water Vole (CIEEM, 2013e)

# 3. Biodiversity Priorities

## 3.1 Scottish Biodiversity List

Scottish Ministers created the Scottish Biodiversity List (SBL) (Scottish Government, 2013) in 2005 to satisfy the requirements under Section 2(4) of the Nature Conservation (Scotland) Act 2004 and assist public bodies in carrying out conservation of biodiversity, as well as to provide the general public with information regarding conservation within Scotland. The SBL comprises species and habitats listed using both scientific and social criteria. Only scientific criteria are considered relevant to this report. They include the following:

- All UK Priority Species present in Scotland;
- Species which Scotland has an international obligation to safeguard;
- All species defined as nationally rare at a UK level that are present in Scotland;
- Species with populations present (resident, wintering or breeding) in 5 or fewer 10km squares or sites in Scotland;
- All species that are endemic to Scotland;
- Any sub-species or race that is widely recognised and accepted by the scientific (or other relevant) community and that is endemic to Scotland, if it also meets one of the other criteria; and
- Natural and semi-natural habitats that are known to be particularly important for supporting assemblages of plant or animal groups that are data deficient, such as fungi, bryophytes, lichens, algae and invertebrates.

## 3.2 Local Biodiversity Reporting

The Highland Biodiversity Action Plan (BAP) was published in 2015 and covers the time period 2015-2020. The plan provides an update on progress made since it started in 2002, identifies the key strategic biodiversity issues that exist in Highland today, and proposes a range of future actions or projects (Highland Biodiversity Working Group, 2015).

The objectives of the Highland BAP are as follows:

- *'To encourage and promote land management for biodiversity.*
- *To take biodiversity into account during building and maintenance works.*
- *To encourage and help communities, local groups and volunteers to carry out practical biodiversity projects.*
- *To raise awareness of biodiversity and related issues and help children and young people to learn about local nature and wildlife.*
- *To tackle invasive non-native species by undertaking practical projects and promoting good practice.*
- *To improve the management and sharing of biological records, and encourage the collection of new records, specifically targeting under-recorded species*.' (Highland Biodiversity Working Group, 2015).

## 3.3 Birds of Conservation Concern 4 (BoCC)

The leading government (JNCC) and non-government conservation organisations in the UK jointly reviewed the population status of the 246 bird species that are regularly found within the United Kingdom, using data from national monitoring schemes. This was most recently done in 2015 (Eaton *et al*., 2015). On the basis of seven quantitative criteria, each species has been placed on one of three lists, these being:

- Red – red-listed species are those that are globally threatened, have had an historical population decline in the UK from 1800 -1995, a rapid (> or = 50%) decline in UK breeding population over the past 25 years, or a rapid (> or = 50%) contraction of UK breeding range over the past 25 years;
- Amber – amber-listed species have had a historical population decline from 1800-1995 but are recovering; population size has more than doubled over the past 25 years, a moderate (25-49%) decline in UK breeding population over the past 25 years, a moderate (25-49%) contraction of UK breeding range over the past 25 years, a moderate (25-49%) decline in UK non-breeding population over the past 25 years, or species with unfavourable conservation status in Europe also known as Species of European Conservation Concern (SPEC); and
- Green – green-listed species have no identified threat to their population status.

# 4. Methods

## 4.1 Desk Study

An ecological desk study was carried out using a range of publicly available information sources, to provide updated baseline desk study information for the site.

In terms of statutory nature conservation designations, the desk study identified any international and national designations, such as Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) or Local Nature Reserves (LNRs) within 5 km of the site boundary. Only ecological (biological) features were considered relevant to the present study. Any non-statutory designations, such as Local Biodiversity Sites (LBSs), Sites of Interest for Nature Conservation (SINCs), RSPB Important Bird Areas, Scottish Wildlife Trust Reserves (SWTR) or woodland areas included on the Ancient Woodland Inventory (AWI), were identified within a 2 km distance of the site boundary.

Existing records for protected or otherwise notable species (e.g. SBL/LBAP priority species) were identified with a 5 km distance of the site boundary. Only records from the last 10 years were considered relevant to the study.

Data sources included the following organisations and online databases:

- NBN Atlas (NBN Atlas, 2020); and
- NatureScot SiteLink (NatureScot, 2020a).

## 4.2 Extended Phase 1 Habitat Survey

An extended Phase 1 habitat survey was carried out of the site and 100 m survey buffer (access permitting) on the 19 January 2021, by a qualified and experienced ecologist, using the standard JNCC survey methodology (JNCC, 2010) to map each of the habitats present within the study area. The vegetation was described in a series of georeferenced target notes (TNs), with plant nomenclature following Stace (2010). Target notes were also produced to describe notable habitats too small to be mapped (i.e. < 0.1 ha).

The survey also recorded incidental evidence of protected or otherwise notable species, including Scottish wildcat, red squirrel and pine marten, as well as habitats or features with the potential to support such species within the study area. Birds and other animals were identified and recorded on an *ad hoc* basis. Note that a Preliminary (bat) Roost Assessment of all structures and trees within the site and a 50 m buffer and full surveys for badger, otter and water vole, were also completed as described below.

Whilst not a full botanical or protected species survey, the field walkover survey enables experienced ecologists to obtain an understanding of the ecology of a site, such that it is possible to:

- Confirm the nature conservation significance of a site and assess whether the potential for impacts on habitats/species is likely to represent a material consideration in planning terms; or
- Establish the scope and extent of any additional specialist ecological surveys that may be required, before such a confirmation can be made.

## 4.3 Preliminary Roost Assessment

The site and a 50 m buffer (access permitting) were surveyed to identify potentially valuable roosting features for bats, following current Bat Conservation Trust (BCT) guidelines (Collins, 2016).

All trees and structures within the site and 50 m buffer were inspected from ground level (using binoculars, where appropriate) searching for features with potential suitability to support roosting bats (e.g. woodpecker holes, rot holes, hazard beams, cankers and knot holes). Additionally, physical evidence of presence was searched for (e.g. bat corpses, droppings, feeding remains, scratch marks, and urine and grease staining).

The potential for the trees or structures to support roosting bats was ranked in accordance with the criteria set out in the BCT guidelines.

Guidelines for assessing the potential suitability of the proposed development site for bats, based on the presence of habitat features, are given in the categories below:

- Negligible – Negligible habitat features on site, not suitable for roosting bats.
- Low – A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by large

numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). Could also be a tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.

- Moderate – A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat bat unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
- High – A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

The need for further survey work was determined following the iterative process outlined in the BCT guidelines (Collins, 2016).

## 4.4 Otter

A search was undertaken of the riparian zone and up to 20 m away from the water's edge (where suitable habitat was found to be present) within the site and within 100 m upstream and downstream of the site boundary. Throughout the survey, overhanging banks, cavities, bankside vegetation and riparian features, such as boulders and mud, were searched for the following signs of otter use:

- Resting-up places – comprising couches (areas of flattened vegetation) or hovers (lay-up areas, including ledges under rocks or hollows under fallen trees or roots).
- Potential holt sites – holes or dens;
- Spraints – otter dung, which is used for marking territories, is often located on prominent features within the channel or on the bank (including weirs, bridges, rocks, tree roots, watercourse confluences, etc.); and
- Footprints – located in soft mud, silt or sand banks.
- Runs and trails – pathways from the water into dense cover or around bankside trees;
- Slides – down banks as an entry to waterbodies; and
- Feeding remains – e.g. remains of fish and amphibians.

It should be noted that that features, such as resting-up places, holts, runs, trails or slides, require presence of either a spraint or footprint to confirm use by otter. These features cannot be used in isolation to definitively indicate otter presence/absence.

## 4.5 Water Vole

A search was undertaken in the riparian zone and up to 20 m away from the water's edge, within the site and within 50m upstream and downstream of the site boundary, for evidence of water voles.

Potential evidence of water vole searched for included the following:

- Latrines – water vole droppings are often concentrated in discreet latrine sites near the nest, at range boundaries and places where they regularly enter and exit the water;
- Feeding stations and feeding remains – feeding remains in the form of neat piles of chewed lengths of vegetation are often found in runways and at haul-out platforms;
- Tunnel/burrow entrances – these are typically found along the water's edge on top of the bank up to 5 m from the water's edge. Holes on top of the banks often have grazed 'lawns' around them;
- Paths and runs at the water's edge;

- Footprints – these may be identified in soft mud or silt;
- Sightings and or sounds of water voles entering the water; and
- Droppings – while most droppings will be deposited in latrines, some may also be found scattered along runways in vegetation.

Specifically, for watercourses, the approximate depth and speed of water flow, the waterway width, bankside vegetation and surrounding land use, was also recorded, as these factors may determine the suitability of habitat for supporting water voles.

It should be noted that any single field sign recorded in isolation, especially when ambiguous (e.g. a burrow or footprints) would not be definitive in confirming presence/absence.

## 4.6 Badger

As part of the survey, field signs including setts, day beds, latrines, evidence of foraging, badger paths, scratching posts, hair and footprints, were actively searched for within the site and a 100 m buffer. The survey was based on the methods described by Scottish Badgers (2018). The survey included all hedgerows, field boundaries, watercourses, paths and other linear features within the study area.

On identification of a badger sett, the observer noted the number of entrances, in addition to a description of the activity level and status of the sett wherever possible. The status of a sett was evaluated and determined, wherever possible, based on descriptions presented in Scottish Badgers Good Practice Guidelines (2018), which assigns setts into one of four categories:

- Main sett (used throughout the year and constitutes the main breeding sett);
- Annexe sett (forms part of the main sett area, but is not directly linked by an underground passage to the main sett, either due to a barrier (e.g. separated by a watercourse or ditch) or by distance);
- Subsidiary sett (offers an alternative large sett complex to the main sett but is usually although not always at least 50m away and are not always obviously linked by a well-used path); and
- Outlier sett (often comprising just one or two holes and is infrequently used by badgers).

Each sett entrance is classified according to its degree of usage:

- Well-used: are clear of vegetation and debris, sides worn smooth but not necessarily excavated recently;
- Partially used: not in regular use and have debris in the entrance; and
- Disused: not in use for some time, are partially blocked and could not be used without considerable effort.

It should be noted that the status of a badger sett can change over a relatively short period of time. For example, some badger social groups will move the location of the main sett to other less used setts within their territory in response to external factors, such as disturbance.

## 4.7 Survey Limitations

As the Phase 1 habitat survey was completed in January, outwith the optimal survey season (April to September, inclusive), a number of plant species may have been in their vegetative state, thus making detection and/or identification difficult. Though this may have resulted in a reduced plant species list, it is not considered to have limited the ability of the surveyor to correctly classify habitats within the study area when viewed in conjunction with the 2017 baseline habitat survey information. If any habitats were considered to have the potential to be more species rich, and therefore be of greater ecological value, these were highlighted for further survey during the optimal survey period. This limitation also did not affect the assessment of the potential for habitats to support protected or otherwise notable species. It is therefore considered a robust assessment of the ecological baseline conditions on site and fit for purpose in terms of informing the EIA and subsequent planning application.

# 5. Results

## 5.1 Desk Study

### 5.1.1 Nature Conservation Designations

See Drawing 2 for statutory and non-statutory sites designated for nature conservation, identified within the 5 km and 2 km search areas, respectively. A single designation of international importance and two designations of national importance were identified within 5 km of the site boundary. Details of the designated sites and their features are detailed below in Table 2.

*Table 2 Nature Conservation Designations within 5 km*

| Designated site | Distance to wider development area | Designated features |
|---|---|---|
| Ben Nevis SAC | 0.42 km E | Annex I habitats that are a primary reason for selection of this site:<br>o Siliceous alpine and boreal grasslands<br>o Alpine and subalpine calcareous grasslands<br>o Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)<br>o Calcareous rocky slopes with chasmophytic vegetation<br>o Siliceous rocky slopes with chasmophytic vegetation<br>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:<br>o Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea<br>o Northern Atlantic wet heaths with Erica tetralix<br>o European dry heaths<br>o Alpine and Boreal heaths<br>o Sub-Arctic Salix spp. scrub<br>o Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) * Priority feature<br>o Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels<br>o Blanket bogs (* if active bog) * Priority feature<br>o Alpine pioneer formations of the Caricion bicoloris-atrofuscae * Priority feature<br>o Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) |

| Designated site | Distance to wider development area | Designated features |
|---|---|---|
| | | o Old sessile oak woods with Ilex and Blechnum in the British Isles<br>o Caledonian forest * Priority feature |
| Ben Nevis SSSI | 0.42 km E | Designated for the following features:<br>o Upland assemblage<br>o Native pinewood<br>o Upland oak woodland<br>o Vascular plant assemblage<br>o Bryophyte assemblage<br>o Breeding bird assemblage<br>o Small mountain ringlet butterfly (*Erebia epiphron*)<br>o Fly assemblage |
| Ach an Todhair SSSI | 3.3 km SW | Designated for the following features:<br>➢ Upland mixed ash woodland<br>➢ Upland habitat assemblage |

Additionally, three areas of ancient woodland were identified within 2km of the wider development area, the closest woodland was located c.0.28 km south-west, beyond Claggan.

### 5.1.2 Terrestrial Animals

#### Desk Study Records

Data obtained from NBN Atlas (NBN Atlas, 2020) included records of 14 protected or otherwise notable species within 5 km of the site boundary; see

Table 3.

*Table 3 Protected or Otherwise Notable Species*

| Common Name | Scientific Name | Legal/Conservation Status |
|---|---|---|
| Mammals | | |
| Badger | *Meles meles* | Fully protected under the Protection of Badgers Act 1992 as amended by the Wildlife and Natural Environment (Scotland) Act 2011. |
| Otter | *Lutra lutra* | Fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).<br>SBL priority species*. HBAP Priority Species. |
| Red squirrel | *Sciurus vulgaris* | Red squirrels and their dreys are fully protected under Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended). SBL priority species*. HBAP Priority Species. |
| Pine marten | *Martes martes* | Fully protected under Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended). Partial protection under the |

| Common Name | Scientific Name | Legal/Conservation Status |
|---|---|---|
| | | Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). SBL priority species*. HBAP Priority Species. |
| Scottish wildcat | *Felis sylvestris* | Fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).<br>SBL priority species*. HBAP Priority Species. |
| Common pipistrelle | *Pipistrellus pipistrellus* | Fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).<br>SBL priority species*. |
| Soprano pipistrelle | *Pipistrellus pygmaeus* | Fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).<br>SBL priority species*.<br>HBAP Priority Species. |
| Brown long-eared bat | *Plecotus auritus* | Fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).<br>SBL priority species*.<br>HBAP Priority Species. |
| Hedgehog | *Erinaceus europaeus* | Partially protected under the Wildlife and Countryside Act 1981 (as amended).<br>SBL priority species*.<br>HBAP Priority Species. |
| Reptiles and Amphibians | | |
| Slow-worm | *Anguis fragilis* | Partially protected under the Wildlife and Countryside Act 1981 (as amended).<br>SBL priority species*.<br>HBAP Priority Species. |
| Common lizard | *Zootoca vivipara* | Partially protected under the Wildlife and Countryside Act 1981 (as amended).<br>SBL priority species*.<br>HBAP Priority Species. |
| Common toad | *Bufo bufo* | Partially protected under the Wildlife and Countryside Act 1981 (as amended).<br>SBL priority species*.<br>HBAP Priority Species. |
| Palmate newt | *Lissotriton helveticus* | Partially protected under the Wildlife and Countryside Act 1981 (as amended). |
| Common frog | *Rana temporaria* | Partially protected under the Wildlife and Countryside Act 1981 (as amended). |

*SBL priority species: an SBL-listed species for which conservation action is needed.

***Of the 150 bird species identified within 5 km of the site boundary, 27 are listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), 16 are listed in Annex 1 of the EU Birds Directive and 53 are listed in the SBL. Additionally, of the bird species records returned by the desk study, 39 are BoCC Red-listed and 53 are Amber-listed; see***

Table 4.

*Table 4 Protected or Otherwise Notable Birds*

| Common name | Scientific name | Annex 1 | Schedule 1 | SBL | BoCC | LBAP |
|---|---|---|---|---|---|---|
| Barn owl | *Tyto alba* | | X | X | Green | |
| Barnacle goose | *Branta leucopsis* | X | | X | Amber | |
| Bar-tailed godwit | *Limosa lapponica* | X | | X | Amber | |
| Bittern | *Botaurus stellaris* | X | X | X | Amber | |
| Black guillemot | *Cepphus grylle* | | | | Amber | |
| Black redstart | *Phoenicurus ochruros* | | X | | Red | |
| Black-headed gull | *Chroicocephalus ridibundus* | | | X | Amber | |
| Black-tailed godwit | *Limosa limosa* | | X | X | Red | X |
| Brambling | *Fringilla montifringilla* | | X | X | Green | |
| Brent goose | *Branta bernicla* | | | | Amber | |
| Bullfinch | *Pyrrhula pyrrhula* | | | X | Amber | X |
| Chough | *Pyrrhocorax pyrrhocorax* | | X | X | Green | |
| Common gull | *Larus canus* | | | | Amber | |
| Common sandpiper | *Actitis hypoleucos* | | | | Amber | |
| Common scoter | *Melanitta nigra* | | X | X | Red | X |
| Crossbill | *Loxia curvirostra* | | X | | Green | |
| Cuckoo | *Cuculus canorus* | | | X | Red | X |
| Curlew | *Numenius arquata* | | | X | Red | X |
| Dipper | *Cinclus cinclus* | | | | Amber | |
| Dunlin (schinzii race) | *Calidris alpina schinzii* | X | | | Amber | |
| Dunnock | *Prunella modularis* | | | X | Amber | |
| Eider | *Somateria mollissima* | | | | Amber | |
| Fieldfare | *Turdus pilaris* | | X | | Red | |
| Firecrest | *Regulus ignicapilla* | | X | | Green | |
| Gadwall | *Anas strepera* | | | | Amber | |

| Common name | Scientific name | Annex 1 | Schedule 1 | SBL | BoCC | LBAP |
|---|---|---|---|---|---|---|
| Glaucous gull | *Larus hyperboreus* | | | | Amber | |
| Golden plover | *Pluvialis apricaria* | X | | X | Green | |
| Goldeneye | *Bucephala clangula* | | | | Amber | |
| Grasshopper warbler | *Locustella naevia* | | | X | Red | X |
| Great black-backed gull | *Larus marinus* | | | | Amber | |
| Great northern diver | *Gavia immer* | X | X | X | Amber | |
| Greenshank | *Tringa nebularia* | | X | | Amber | |
| Grey wagtail | *Motacilla cinerea* | | | | Red | |
| Greylag goose | *Anser anser* | | | | Amber | |
| Guillemot | *Uria aalge* | | | | Amber | |
| Hen harrier | *Circus cyaneus* | X | X | X | Red | |
| Herring gull | *Larus argentatus* | | | X | Red | X |
| Hooded crow | *Corvus cornix* | | | X | Green | |
| House martin | *Delichon urbicum* | | | | Amber | |
| House sparrow | *Passer domesticus* | | | X | Red | X |
| Iceland gull | *Larus glaucoides* | | | | Amber | |
| Kestrel | *Falco tinnunculus* | | | X | Amber | |
| Kingfisher | *Alcedo atthis* | X | X | X | Amber | |
| Kittiwake | *Rissa tridactyla* | | | | Red | |
| Knot | *Calidris canutus* | | | | Amber | |
| Lapwing | *Vanellus vanellus* | | | X | Red | X |
| Lesser black-backed gull | *Larus fuscus* | | | | Amber | |
| Lesser redpoll | *Acanthis cabaret* | | | X | Red | X |
| Linnet | *Linaria cannabina* | | | X | Red | X |
| Little gull | *Hydrocoloeus minutus* | | X | | Green | |
| Long-tailed duck | *Clangula hyemalis* | | X | | Red | |
| Mallard | *Anas platyrhynchos* | | | | Amber | |
| Meadow pipit | *Anthus pratensis* | | | | Amber | |
| Mistle thrush | *Turdus viscivorus* | | | | Red | |
| Mute swan | *Cygnus olor* | | | | Amber | |
| Oystercatcher | *Haematopus ostralegus* | | | | Amber | |
| Peregrine | *Falco peregrinus* | X | X | X | Green | |

| Common name | Scientific name | Annex 1 | Schedule 1 | SBL | BoCC | LBAP |
|---|---|---|---|---|---|---|
| Pied flycatcher | *Ficedula hypoleuca* | | | | Red | |
| Pink-footed goose | *Anser brachyrhynchus* | | | | Amber | |
| Pintail | *Anas acuta* | | | | Amber | |
| Ptarmigan | *Lagopus muta* | X | | | Green | |
| Razorbill | *Alca torda* | | | | Amber | |
| Red grouse | *Lagopus lagopus* | | | | Amber | X |
| Red kite | *Milvus milvus* | X | X | X | Green | |
| Red-necked grebe | *Podiceps grisegena* | | | X | Red | |
| Redshank | *Tringa totanus* | | | | Amber | |
| Redstart | *Phoenicurus phoenicurus* | | | | Amber | |
| Red-throated diver | *Gavia stellata* | X | X | X | Green | |
| Redwing | *Turdus iliacus* | | X | X | Red | |
| Reed bunting | *Emberiza schoeniclus* | | | X | Amber | X |
| Reed warbler | *Acrocephalus scirpaceus* | | | X | Green | |
| Ring ouzel | *Turdus torquatus* | | | X | Red | X |
| Ringed plover | *Charadrius hiaticula* | | | | Red | |
| Sanderling | *Calidris alba* | | | | Amber | |
| Scaup | *Aythya marila* | | X | X | Red | |
| Scottish crossbill | *Loxia scotica* | X | X | X | Amber | X |
| Shag | *Phalacrocorax aristotelis* | | | | Red | |
| Shelduck | *Tadorna tadorna* | | | | Amber | |
| Siskin | *Spinus spinus* | | | X | Green | |
| Skylark | *Alauda arvensis* | | | X | Red | X |
| Slavonian grebe | *Podiceps auritus* | X | X | X | Red | |
| Snipe | *Gallinago gallinago* | | | | Amber | |
| Snow bunting | *Plectrophenax nivalis* | | X | X | Amber | |
| Song thrush | *Turdus philomelos* | | | X | Red | X |
| Spotted flycatcher | *Muscicapa striata* | | | X | Red | X |
| Starling | *Sturnus vulgaris* | | | X | Red | X |
| Swift | *Apus apus* | | | X | Amber | |

| Common name | Scientific name | Annex 1 | Schedule 1 | SBL | BoCC | LBAP |
|---|---|---|---|---|---|---|
| Tawny owl | *Strix aluco* | | | | Amber | |
| Teal | *Anas crecca* | | | | Amber | |
| Tree pipit | *Anthus trivialis* | | | X | Red | X |
| Tree sparrow | *Passer montanus* | | | X | Red | X |
| Turnstone | *Arenaria interpres* | | | | Amber | |
| Twite | *Linaria flavirostris* | | | X | Red | X |
| Whimbrel | *Numenius phaeopus* | | X | | Red | |
| Whinchat | *Saxicola rubetra* | | | | Red | |
| White-tailed eagle | *Haliaeetus albicilla* | X | X | X | Red | |
| Whooper swan | *Cygnus cygnus* | X | X | X | Amber | |
| Wigeon | *Anas penelope* | | | | Amber | |
| Willow warbler | *Phylloscopus trochilus* | | | | Amber | |
| Wood warbler | *Phylloscopus sibilatrix* | | | X | Red | X |
| Woodcock | *Scolopax rusticola* | | | X | Red | |
| Yellow wagtail | *Motacilla flava* | | | X | Red | |
| Yellowhammer | *Emberiza citrinella* | | | X | Red | X |
| Yellow-legged Gull | *Larus michahellis* | | | | Amber | |

## 5.2 Habitats

The habitats recorded within the study area are detailed below and shown in Figure 2 and Target Notes (TNs) are detailed in Appendix D. Scientific names of species can be found in Appendix E. The following 17 habitat types were recorded during the survey:

- Semi-natural broadleaved woodland (A1.1.1);
- Coniferous plantation woodland (A1.2.2);
- Dense/continuous scrub (A2.1);
- Scattered scrub (A2.2);
- Broadleaved parkland/scattered trees (A3.1);
- Recently felled broadleaved woodland/ marshy grassland mosaic (A4.1/B5);
- Recently felled coniferous woodland (A4.2);
- Semi-improved neutral grassland (B2.2);
- Marshy grassland (B5);
- Continuous bracken (C1.1);
- Wet modified bog (E1.7);
- Running water (G2);

- Amenity grassland (J1.2);
- Species-poor intact hedge (J2.1.2);
- Fence (J2.4);
- Buildings (J3.6); and
- Other (J5) (hardstanding, car parking, bare and disturbed ground, road, footpaths and railway lines).

### 5.2.1 Semi-natural broadleaved woodland

The semi-natural broadleaved woodland in the north of the site comprised downy birch, silver birch, alder sycamore, beech and ash as well as Sitka spruce (TN3). The understorey included young trees as well as gorse, Butterfly-bush and rhododendron. The ground vegetation included tufted hair-grass, common bent, purple moor-grass, bracken, bramble, cock's-foot, broad-leaved dock, lady fern, bog-mosses (*Sphagnum* species) and haircap (*Polytrichum* species) moss. Many of the trees within the woodland had collapsed especially along the southern woodland boundary. Broom was also recorded along the edge of the railway.

The woodland surrounding the Lochaber Smelter in the northern study area also contained silver birch, alder and Sitka spruce as well as sycamore. The understorey comprised holly, gorse and bracken whilst the ground vegetation consisted of tufted hair-grass, common bent, broad-leaved dock, bog-mosses and haircap moss. Mammal paths were also present within this section of woodland.

### 5.2.2 Coniferous plantation woodland

There are two main areas of coniferous plantation woodland within the study area comprising Scots pine and Sitka spruce. Following recent felling operations, there are three small sections of mature Scots pine plantation in the centre of the site (TN2), the understorey is relatively bare although young beech, silver birch and downy birch grow around the northern edges. There is also a second section of coniferous plantation woodland in the east of the site (TN1).

### 5.2.3 Dense/continuous scrub

Dense gorse was recorded along the railway (TN4). Further dense scrub in the east of the site was recorded within the Smelter site and comprised young Sitka spruce, silver birch and gorse (TN5).

A section of dense scrub was identified to the west of the site boundary within the neighbouring recycling centre. Scrub species including young alder, gorse, butterfly-bush, silver birch and broom had started to grow on a large pile of rubble (TN6).

### 5.2.4 Scattered scrub

Scattered scrub is present directly south of an area of hardstanding within the site (TN7). Species recorded include young silver birch, Sitka spruce, grey willow, rhododendron and gorse. The ground vegetation included soft-rush, heather, purple moor-grass, creeping thistle, common bent, deergrass, mat-grass, bog-mosses and haircap moss.

Scattered young silver birch, beech, Scots pine, grey willow, alder and gorse are all present to the north of the coniferous plantation woodland (TN8).

### 5.2.5 Broadleaved parkland/scattered trees

Silver birch and ash trees are present within areas of amenity grassland around Lochaber Smelter (TN9).

### 5.2.6 Recently felled broadleaved woodland / marshy grassland mosaic

A section of recently felled broadleaved woodland within the centre of the site was comprised of marshy grassland overlain with bundles of brash throughout (TN10). The grassland species were dominated by soft-rush and purple moor-grass. Bog-mosses and haircap moss were also recorded.

### 5.2.7 Recently felled coniferous woodland

As with much of the woodland under the footprint of the consented AWP footprint, large areas of coniferous woodland recorded in 2017 have been clear felled (TN11). Only small sections of the woodland remain. The ground vegetation includes rhododendron, soft-rush, mat-grass, purple moor-grass, deergrass, bog-mosses, including red bog-moss, and haircap moss.

### 5.2.8 Semi-improved neutral grassland

A section of rough grassland was identified around the broadleaved woodland in the north of the site (TN12). Much of the ground comprised rubble aggregate which has become colonised by grassland species. Species recorded included common bent, mat-grass, purple moor-grass, deergrass, bracken, rosebay willowherb, foxglove, bramble, *Calluna vulgaris* and soft-rush. Small sections on particularly wet ground were dominated by soft-rush and the ground vegetation also included bog-mosses and haircap moss, bracken and foxglove.

### 5.2.9 Marshy grassland

The marshy grassland along the boundary fence of Lochabar Smelter in the east of the study area comprises predominantly soft-rush as well as purple moor-grass and deergrass. There are also small sections of bare ground along the stretch of marshy grassland.

### 5.2.10 Continuous bracken

Sections of continuous bracken are present along the south of the railway line and in the very north of the study area.

### 5.2.11 Wet modified bog

Owing to previous works carried out within the site, the woodland recorded in the 2017 survey (Golder, 2017) has been clear felled. Vehicle movements through the site have resulted in areas of wet modified bog being disturbed exposing bare peat and becoming waterlogged (TN13). Species recorded in these areas included heather, cross-leaved heath, purple moor-grass, soft-rush and deergrass. Young silver birch and Sitka spruce as well as rhododendron are scattered throughout.

The area in the south-west of the site is similar in that it has been recently disturbed, and species include purple moor-grass, heather, soft-rush, bog-mosses and haircap moss as well as scattered young silver birch (TN14).

### 5.2.12 Standing water

An area of flooded ground was present along the south of the woodland (TN15).

### 5.2.13 Running water

A small watercourse and drainage channels are present within the woodland at the north of the site (TN16, TN17 and TN18).

### 5.2.14 Amenity grassland

Amenity grassland is present around the entrance to the existing Smelter and scattered trees are present throughout (TN9).

### 5.2.15 Intact species-poor hedge

A cotoneaster hedge was present along the edge of the amenity grassland and railway line in the north of the study area.

### 5.2.16 Fence

Boundary fencing was present throughout the study area.

#### 5.2.17 Buildings

Buildings associated with the existing Smelter are present in the north-east of the study area. Additionally, North Road Retail Park is present in the north of the study area and several industrial buildings/office are present along the western survey buffer including Lochaber Mountain Rescue, Marine Harvest Scotland and New Co.

#### 5.2.18 Other (hardstanding, car parking, road, footpaths and railway lines)

A large section in the centre of the site comprises concrete hardstanding and an access road as well as bare and disturbed ground and mounds of rubble throughout (TN19, 20 and 21). Much of this habitat is associated with a now demolished Carbon Plant.

Other hardstanding including roads, footpaths and car parking associated with Lochaber Smelter are present in the north-east of the site.

A railway line is present in the north of the site, the line splits into three sections: the main northern line continues north-east parallel to North Road; the second continues east along the northern edge of the existing Smelter; and the final section bisects the site from north to east (TN4).

Further roads, car parking and footpaths are present in the north of the study area as well as the western survey buffer.

## 5.3 Species

#### 5.3.1 Bats

Roosting

The trees and structures within the site and wider study area were unsuitable for use by bats. The trees within the site and surrounding woodland were young and lacked features such as knot holes, broken limbs and lifting bark that could be used by roosting bats. Similarly, the buildings associated with the Lochaber Smelter included modern office buildings which lack suitable roost features such as holes and gaps in slate roofing, brick work or flashings. Additionally, there is regular noise disturbance from the operational activities within the smelter.

Habitats

Woodland edge habitat, stream corridors and the railway corridor within the northern reaches of the study are linear features which could be used by foraging and commuting bats.

#### 5.3.2 Otter

No evidence of otter was recorded during the survey. The watercourse within the north of the study area flows under the railway and towards the River Lochy (TN16). Additionally, the River Nevis is beyond the southern survey limit. Given the connectivity of the site to the wider area, otter could use the watercourse and drainage channels to forage and commute. However, the channels were small with no suitable features for resting places or holts.

#### 5.3.3 Badger

No evidence of badger was recorded during the survey. The water table within the study area was generally at, or above, ground level making it unsuitable for sett building. Some areas of woodland in the north of the site could be used where the ground is sloped. Suitable foraging and commuting habitat is limited to areas of grassland and woodland habitats within the north of the site. It is therefore not anticipated that development of the site will impact badgers and as such this species is not considered any further.

### 5.3.4 Water Vole

No evidence of water vole was recorded during the survey. The watercourse and drainage channels in the north of the site are slow-flowing and have suitable banks to support water vole. However, the surrounding vegetation comprises semi-improved neutral grassland amongst areas of rubble aggregate and the woodland floor is largely comprised of purple moor-grass and mosses therefore foraging opportunities are limited. The study area is considered suboptimal for water vole and no further consideration of this species is required.

### 5.3.5 Amphibians and Reptiles

Although a dedicated amphibian and reptile survey was not undertaken the surveyor noted any evidence of these species and potential hibernacula within the study area. No incidental evidence of amphibians, such as common frog or common toad, was recorded during the field survey. The wet nature of the site makes much of the ground suitable habitat for such species with shallow pools/flooded ground that could be used for breeding. No ponds were identified within the study area.

No incidental evidence of reptiles, such as adder or common lizard, was recorded during the field survey. Although these species are known to inhabit heathland and moss habitats (McInerny & Minting, 2016) the highly disturbed nature and degraded condition of the habitats within the site provides limited opportunities for foraging and basking. There are areas suitable for refugia habitat, notably the piles of rubble/aggregate and brash throughout the centre of the site; however, the immediate habitats are largely suboptimal for reptiles. Suitable habitat is limited to areas of grassland and woodland edge habitat at the north of the site and the railway corridor with its associated areas of scrub, rough grassland and undisturbed dry dwarf shrub heath and wet dwarf shrub heath within the southern end of the study area. These areas are largely outwith the footprint of the development. It is considered unlikely that reptiles will be impacted by the proposed development and no further consideration of these species is considered necessary.

### 5.3.6 Birds

During the survey robin and buzzard were recorded within the study area. The woodland, scrub and grassland habitats within the study area all provide potential foraging and nesting habitat for a wide variety of bird species.

### 5.3.7 Other species

No evidence of wildcat was recorded during the survey. Generally, habitats within the site boundary are considered suboptimal for wildcat as there are no suitable denning habitat identified within the site. Previous felling works have removed large swathes of woodland habitat and the remaining stands are highly fragmented with limited connectivity to the wider landscape. If wildcat is present in the local area, it is possible that individuals may occasionally enter the site, but a permanent presence is unlikely. It is therefore not anticipated that proposed development of the site will impact wildcat and as such this species is not considered further.

No evidence of pine marten or red squirrel was recorded during the survey. Generally, habitats within the site boundary are considered suboptimal for pine marten with no suitable drey or denning habitat identified within the site. Felling works have removed large swathes of woodland habitat and the remaining stands are highly fragmented with limited connectivity to the wider landscape. The site in its present condition is highly unlikely to support a red squirrel or pine marten population. It is therefore not anticipated that proposed development of the site will impact either species and as such this species is not considered further.

# 6. Discussion

## 6.1 Habitats

The site and 100 m survey buffer are comprised predominantly of semi-natural broadleaved woodland, coniferous plantation woodland, dense/continuous scrub, scattered scrub, broadleaved parkland/scattered trees, recently felled woodland, semi-improved neutral grassland, marshy grassland, wet dwarf shrub heath, bracken, running water and amenity grassland as well as buildings and hardstanding. The species recorded within the site and 100 m buffer are moderately diverse and considered to consist of common and widespread species commonly found within sites of this nature and in this part of Scotland.

## 6.2 Invasive non-native species

Rhododendron was recorded throughout the survey and is identified for control in order to stop their spread in Scotland by NatureScot (NatureScot, 2020b) as well as listed under Schedule 9 of the WCA 1981 (as amended by the Wildlife and Natural Environment (Scotland) Act 2012 [the WANE Act]). This places a responsibility on landowners to prevent the spread of invasive non-native species to adjacent land.

## 6.3 Other non-native species

Butterfly-bush and cotoneaster was recorded within the site. Under the WANE Act 2011, it is an offence to plant, or otherwise cause to grow, a plant in the wild at a location outside its native range. If any soil or arisings containing non-native species is to be moved off-site, they should be treated accordingly to prevent the spread of these species.

## 6.4 Species

### 6.4.1 Bats

Whilst there are no suitable roosting features within the study area, bats could use linear features such as woodland edges, hedgerows, watercourses and the railway corridor to forage and commute. Therefore, the following good practice guidelines should be followed during construction:

- Artificial lighting can often impact the foraging and commuting behaviour of nocturnal mammals such as bats. Consequently, it is recommended that lighting should be directed to where it is needed and light spillage (whether direct and/or in-direct) should be avoided as far as practicable. Also, the times during which lighting is on should be limited to provide dark periods. See IPL Guidance Notes for the Reduction of Obtrusive Light (Institution of Lighting Professionals, 2020) and the Bat Conservation Trust/IPL Guidance Note 08/18 'Bats and Artificial Lighting in the UK (IPL/BCT, 2018).

### 6.4.2 Otter

Whilst no evidence of otter was recorded during the survey, suitable habitat for foraging and commuting was identified given the connectivity to the wider area. Therefore, the following best practice guidelines, endorsed by NatureScot are recommended (NatureScot, 2020c):

- Cap exposed pipe systems when contractors are off-site, and cover or provide exit ramps from exposed trenches or holes, to prevent otters (or any other wildlife) becoming trapped.

### 6.4.3 Birds

Birds could nest within the woodland, hedgerows, scrub and grassland within the Survey Area. As all breeding birds and their nests are protected by the WCA (with Annex1/Schedule 1 offered additional protection), if the construction works are scheduled to take place within the breeding bird season (April to August, inclusive), then vegetation located within the proposed works area should be cleared prior to the start of the breeding season (i.e. prior to late March at the latest). A pre-construction survey of all suitable habitat should be conducted by a Suitably Qualified Ecologist (SQE) no more than 48 hours before construction works begin, with exclusion zones established, if appropriate, to prevent disturbance of any nesting birds identified.

## 6.5 Repeat Surveys

The survey data in the present report are considered valid for up to 18 months. Should construction of the Proposed Development not commence before July 2022, it is recommended that an update survey is undertaken, as per the methods section of this report, to ensure there has been no significant change to the baseline outlined within this report.

# 7. References


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# Drawings

## Drawing 1: Site Location


**KEY**

- Wider Development Boundary
- Footprint of Works
- Development footprint plus SUDs drainage area
- Buffer (50m)
- Buffer (100m)


0 0.05 0.1 0.15 km

Scale 1:2,800 @ A3

ALVANCE

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Alvance British Aluminium – Billet Facility
Extended Phase 1 Habitat Survey

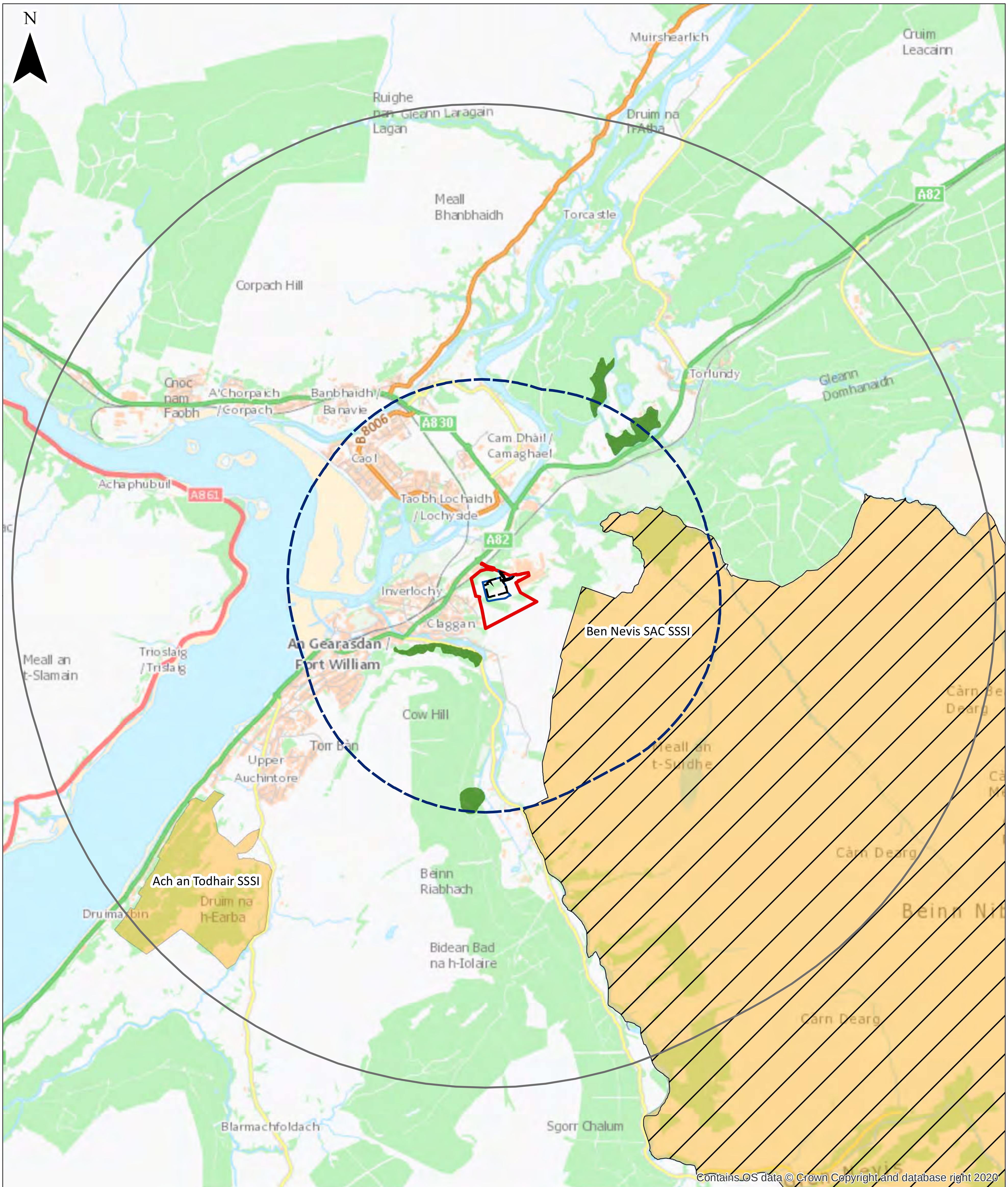
**Drawing 1**

**Site Location**

| Date: 06/05/2021 | Drawn by: AG | Checked by: MF | Version: V1 |
|---|---|---|---|

Project Number: 3539

## Drawing 2: Nature Conservation Designations




**KEY**

- Wider Development Boundary
- Footprint of Works
- Development footprint plus SUDs drainage area
- Buffer (2km)
- Buffer (5km)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland

0 1 2 km

Scale 1:42,000 @ A3

ALVANCE

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Alvance British Aluminium – Billet Facility
Extended Phase 1 Habitat Survey

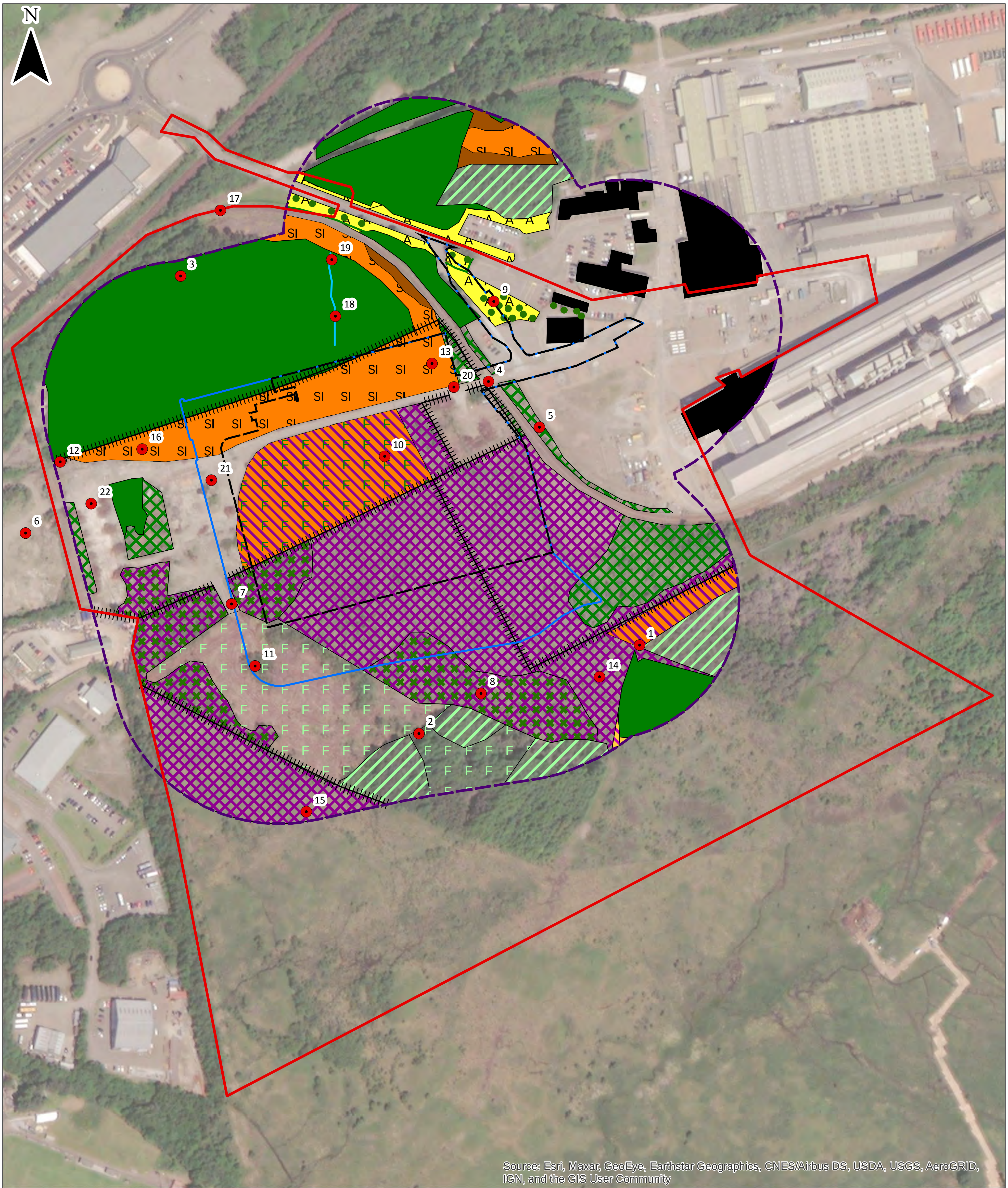
**Drawing 2**

**Nature Conservation Designations**

| Date: 06/05/2021 | Drawn by: AG | Checked by: MF | Version: V1 |
|---|---|---|---|

Project Number: 3539

## Drawing 3: Phase 1 Habitats




**KEY:**

- Wider Development Boundary
- Footprint of Works
- Development footprint plus SUDs drainage area
- Buffer (100m)
- Target Note

**Phase 1 Habitats**

- Semi-natural broadleaved woodland (A1.1.1)
- Coniferous plantation woodland (A1.2.2)
- Dense/continuous scrub (A2.1)
- Scattered scrub (A2.2)
- Broadleaved parkland/scattered trees (A3.1)
- Recently felled broadleaved woodland/ marshy grassland mosaic (A4.1/B5)
- Recently felled coniferous woodland (A4.2)
- SI Semi-improved neutral grassland (B2.2)
- Marshy grassland (B5)
- Continuous bracken (C1.1)
- Wet modified bog (E1.7)
- Running water (G2)
- A A Amenity grassland (J1.2)
- Species-poor intact hedge (J2.1.2)
- Fence (J2.4)
- Buildings (J3.6)
- Other (J5)

0 0.05 0.1 0.15 km

**Scale 1:2,800 @ A3**

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Alvance British Aluminium – Billet Facility
Extended Phase 1 Habitat Survey

**Drawing 3**

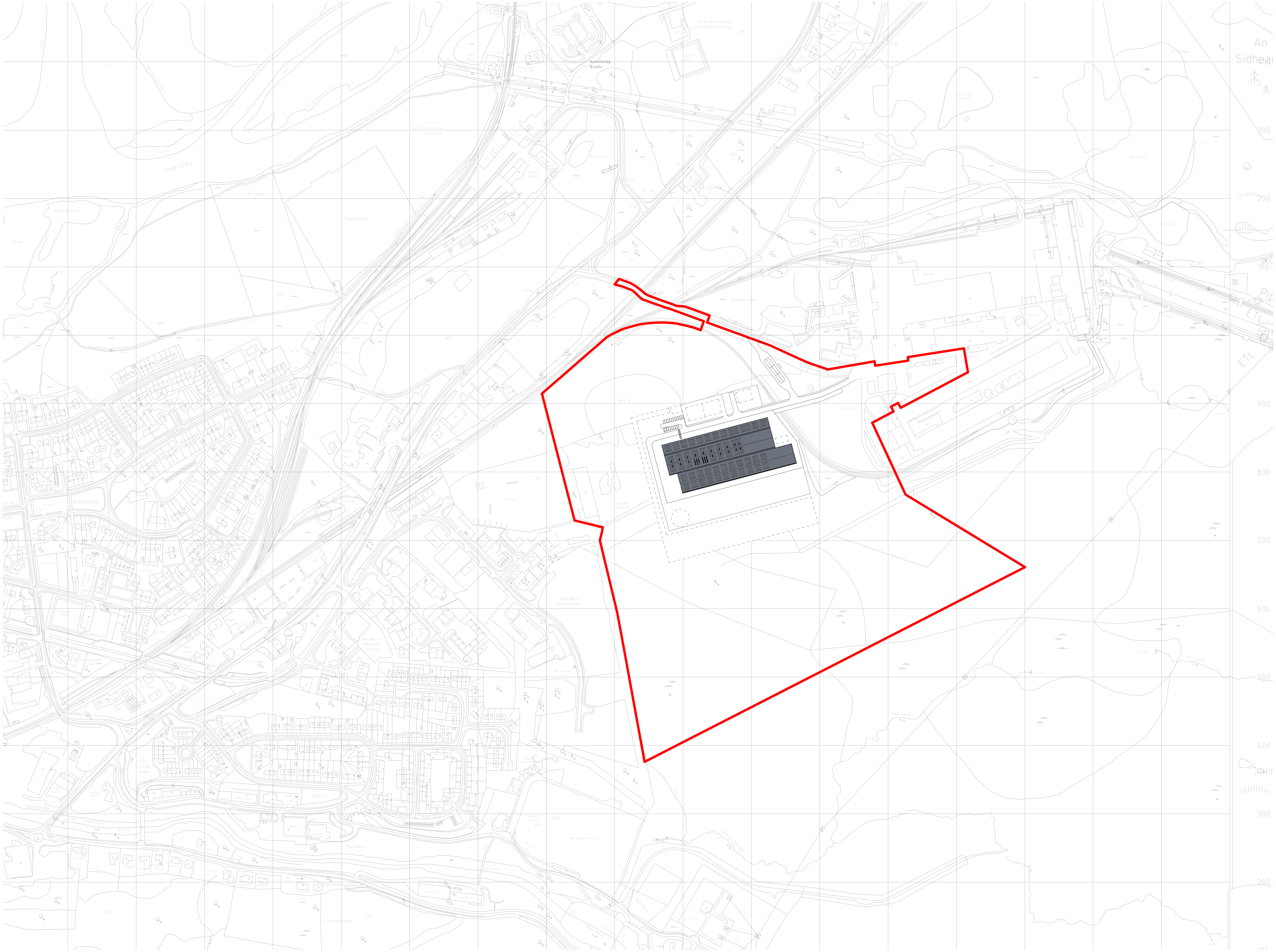
**Extended Phase 1 Habitat Survey**

| Date: 06/05/2021 | Drawn by: AG | Checked by: MF | Version: V1 |
|---|---|---|---|

Project Number: 3539

# Appendices

## Appendix A: Proposed Development





Figured dimensions only are to be taken from this drawing.
All dimensions are to be checked on site before any work is put in hand. IF IN DOUBT ASK.

CDM:
Hazard Elimination & Risk Reduction has been undertaken and recorded where appropriate, in accordance with the requirements of "The Construction (Design and Management) Regulations 2015" and the associated "Industry Guidance for Designers"

0 50 100 150m

Scale 1:2500

N

**Legend**

Proposed Site Boundary (Recycling & Billet Casting Facility)

| REV | DESCRIPTION | DR'N | CHK'D | DATE |
|---|---|---|---|---|
| P05 | Planning | EF | AJM | 01.04.21 |
| P04 | For Information | EF | AJM | 17.03.21 |
| P03 | For Information (Car parking layout updated.) | EF | AJM | 03.02.21 |
| P02 | For Information (Updated following client feedback - Indication of proposed Water Canning Facility removed.) | EF | AJM | 28.01.21 |
| P01 | For Information. | EF | AJM | 25.01.21 |

GLASGOW
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Client
ALVANCE

Project
Recycling & Billet Casting Facility

Drawing
Proposed Site Plan

Project No.
P20095

Drawing No. XXX-KEP-XX-XX-DR-A-601003 Rev P05

Status Planning Status Code S4

Created: EF Checked: NB
Date: 25.01.21 Scale: 1 : 2500@ A1

# Proposed Site Plan

Scale - 1 : 2500

# Appendix B: Species Specific Legislation

## Bats

Bats are listed on Appendix II of the Bern Convention and on Annexes II and IV of the European Union Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (i.e. the 'Habitats Directive') and are protected as European Protected Species under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). For any wild bat species, it is an offence to deliberately or recklessly:

- Capture, injure or kill a bat;
- Harass a bat or group of bats;
- Disturb a bat in a roost (any structure or place it uses for shelter or protection);
- Disturb a bat while it is rearing or otherwise caring for its young;
- Obstruct access to a bat roost or otherwise deny an animal use of a roost;
- Disturb a bat in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species;
- Disturb a bat in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young; and
- Disturb a bat while it is migrating or hibernating.

It is also an offence to:

- Damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly); and
- Keep, transport, sell or exchange, or offer for sale or exchange any wild bat (or any part or derivative of one) obtained after 10 June 1994.

It is a strict liability offence to damage or destroy a bat roost. A bat roost is protected at all times irrespective as to whether any bats are using the roost at a given time. If the work proposed is to affect bats or their roosts, an EPS licence, issued by the licensing authority NatureScot under Regulation 44 of the Habitats Regulations will be required in order to permit an otherwise illegal activity.

## Otter

Otter is listed on Appendix II of the Bern Convention and on Annexes II and IV of the European Union Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (i.e. the 'Habitats Directive'), and it is protected as a European Protected Species under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). As such, it is an offence to deliberately or recklessly:

- Capture, injure or kill an otter;
- Harass an otter or group of otters;
- Disturb an otter in a holt or any other structure or place it uses for shelter or protection;
- Disturb an otter while it is rearing or otherwise caring for its young;
- Obstruct access to a holt or other structure or place otters use for shelter or protection, or otherwise deny the animal use of that place;
- Disturb an otter in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species; and
- Disturb an otter in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

It is also an offence to:

- Damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly); and
- Keep, transport, sell or exchange, or offer for sale or exchange any wild otter (or any part or derivative of one) obtained after 10 June 1994.

It should be noted that otter resting sites are legally protected whether an otter is present or not. Actions that are prohibited can be made lawful by a licence issued by the appropriate Statutory Nature Conservation Organisation, which in this case is NatureScot.

### Pine Marten

Pine marten are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Additionally, certain methods of killing or taking pine marten are illegal under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

It is an offence to intentionally or recklessly:

- Kill, injure or take a pine marten;
- Damage, destroy or obstruct access to a nest or den – i.e. any structure or place which such an animal uses for shelter or protection; and
- Disturb such an animal when it is occupying a nest or den for shelter or protection (except when this is inside a dwelling house).

It is also an offence to:

- Possess or control, sell, offer for sale or possess or transport for the purpose of sale any living or dead pine marten or any derivative of such an animal; and
- Knowingly cause or permit any of the above acts to be carried out.

### Red Squirrel

Red squirrels and their dreys (resting places) receive full protection under Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended).

It is an offence to intentionally or recklessly:

- Kill, injure or take a red squirrel;
- Damage, destroy or obstruct access to a drey or any other structure or place which a red squirrel uses for shelter or protection; and
- Disturb a red squirrel when it is occupying a structure or place for shelter or protection.

It should be noted that this protection does not apply to areas where red squirrels only feed.

It is also an offence to:

- Possess or control, sell or offer for sale, or possess or transport for the purpose of sale any living or dead red squirrel or any derivative of such an animal;
- Release a grey squirrel into the wild; and
- Knowingly causing or permitting any of the above acts to be carried out is also an offence.

### Badger

Badgers and their setts are protected under the Protection of Badgers Act 1992, as amended by the Wildlife and Natural Environment (Scotland) Act 2011. Under this legislation it is an offence to intentionally or recklessly:

- Kill, injure, take, possess or cruelly ill-treat a badger or attempt to do so;
- Interfere with a sett by damaging or destroying it;

- Obstruct access to a badger sett;
- Disturb a badger whilst it is occupying a sett;
- Cause or allow a dog to enter a sett;
- Sell a live badger, or offer one for sale, or possess a live badger; and
- Be in the possession, or control of, a dead badger or anything derived from a dead badger.

Under the Protection of Badgers Act 1992, a badger sett is defined as 'any structure or place which displays signs indicating current use by a badger'. Following NatureScot guidance, in the absence of any case law to define current use, the presence of field signs such as bedding, fresh spoil heaps, signs of recent digging, hair, latrines, or footprints in or around the potential sett or evidence of badgers entering or exiting the structure or place in question would indicate current use of the structure / place by a badger (SNH, 2018). Where a possible sett has no immediate evidence of current use, the structure should be actively monitored for a minimum of two weeks.

This legislation means that badgers are fully protected in Scotland, and that any planned activity, which may affect them, requires prior consultation with the appropriate statutory nature conservation organisation (i.e. NatureScot). Under Section 10 (1) of The Protection of Badgers Act 1992, licences may be granted by NatureScot for certain purposes that would otherwise be illegal.

### Water Vole

The water vole receives partial protection through its listing on Schedule 5 of The Wildlife and Countryside Act 1981 (as amended). In Scotland, this legal protection is currently restricted only to the water voles' places of shelter or protection; it does not extend to the animal itself. It is an offence to intentionally or recklessly:

- Damage, destroy or obstruct access to any structure or place that water voles use for shelter or protection; or
- Disturb a water vole while it is using any such place of shelter or protection.

Actions that are prohibited can be made lawful by a licence issued by NatureScot.

# Appendix C: Policy Framework

## Scottish Planning Policy

The Scottish Planning Policy (SPP) (Scottish Government, 2014) superseded National Planning Policy Guideline (NPPG) 14 (Natural Environment) and forms the basis for planning system decisions with respect to conserving and enhancing the natural environment.

Under 'Landscape and Natural Heritage', the SPP sets out, in addition to other points, how planning authorities should take a strategic, broader approach to landscape and natural heritage than just conserving designated or protected sites and species, by taking into account ecosystems and natural processes in the area.

In addition to the above, the SPP also outlines how planning authorities should place emphasis on the prevention of '*…further habitat fragmentation or isolation of habitats and identify opportunities to restore links which have been broke*' and '*seek benefits for species and habitats from new development including the restoration of degraded habitats'*.

With regards to protected species, the SPP outlines that '*…although the presence of legally protected species is an important consideration in planning decision, they are not necessarily an absolute block on development with mitigation often needed. If protected species are on site or are likely to be affected by a proposed development their presence must be established and the requirements of the species factored in to the planning and design of the development along with any likely impact fully considered prior to the determination of the planning application*'.

The SPP concludes by stating that, '*…planning permission must not be granted for a development that would be likely to have an adverse effect on a European Protected species unless the planning authority is satisfied that there is no satisfactory alternative and the development is required for preserving public or public safety or for other imperative reasons overriding public interest (including social, economic and beneficial for the environment)*'.

## Planning Advice Notes (PANs) 60

- National planning policy on landscape and natural heritage is supported by Planning Advice Note (PAN) 60 Planning for Natural Heritage, the key elements include:
- Taking a broader approach to landscape and natural heritage than just conserving designated or protected sites and species, taking into account ecosystems and natural processes.
- Facilitating positive landscape change whilst maintaining and enhancing distinctive character.
- Seeking benefits for species and habitats from new development including the restoration of degraded habitats.
- Siting and design of development should be informed by local landscape character.
- Encouraging connectivity between habitats, through green networks.
- Protecting internationally and nationally designated habitats and species.
- Protecting and enhancing woodland and trees of high nature conservation value.

## Local Development Plan

The Highland-wide Local Development Plan (HwLDP) was published in 2012 and sets out how the Council will '*guide development and investment in the area over the next twenty years. It is important to emphasise that this is very much a Plan for the Highland Council Area as a whole*' (The Highland Council, 2012).
The policies relevant to ecology include:

- Policy 51 - Trees and Development
- Policy 52 - Principle of Development in Woodland
- Policy 57 - Natural, Built and Cultural Heritage

- Policy 58 - Protected Species
- Policy 59 - Other Important Species
- Policy 60- Other Important Habitats
- Policy 74 - Green Networks
- Policy 75 - Open Space

## Appendix D: Target Notes

| TN | Grid Reference | Description |
|---|---|---|
| 1 | 212450 774701 |  Coniferous plantation woodland in the east of the site. The woodland is highly fragmented and isolated and as such is considered suboptimal for pine marten and red squirrel. No incidental evidence of these species was found in these areas. |
| 2 | 212289 774637 |   Following recent felling operations, there are three small sections of mature Scots pine plantation as well as Sitka spruce remaining in the centre of the site. The understorey is relatively bare although young beech, silver birch and downy birch grow around the northern edges. The woodland is highly fragmented and isolated and as such is considered suboptimal for pine marten and red squirrel. No incidental evidence of these species was found in these areas. |
| 3 | 212116 774969 |   The semi-natural broadleaved woodland in the north of the site comprised downy birch, silver birch, alder sycamore, beech and ash as well as Sitka spruce (TN3). The understorey included young trees as well as gorse, Butterfly-bush and rhododendron. The ground vegetation included tufted hair-grass, common bent, purple moor-grass, bracken, bramble, cock's-foot, broad-leaved dock, lady fern, bog-mosses (*Sphagnum* species) and haircap (*Polytrichum* species) moss. Many of the trees within the woodland had collapsed especially along the southern woodland boundary. Broom was also recorded along the edge of the railway. |

| TN | Grid Reference | Description |
|---|---|---|
| 4 | 212340 774892 |   Dense gorse was recorded along the railway edges. |
| 5 | 212377 774859 |  Dense scrub in the east of the site was recorded within the Smelter site and comprised young Sitka spruce, silver birch and gorse. |
| 6 | 212004 774782 |   A section of dense scrub was identified to the west of the site boundary within the neighbouring recycling centre. Scrub species including young alder, gorse, Butterfly-bush, silver birch and broom had started to grow on a large pile of rubble. |
| 7 | 212153 774731 |   Scattered scrub is present directly south of the hardstanding within the site, species include young silver birch, grey willow, Sitka spruce, rhododendron and gorse. The ground vegetation included soft-rush, heather, purple moor-grass, creeping thistle, common bent, deergrass, mat-grass, bog-mosses and haircap moss. |

| TN | Grid Reference | Description |
|---|---|---|
| 8 | 212334 774666 |   Scattered young silver birch, beech, Scots pine, alder and gorse are all present to the north of the coniferous plantation woodland. |
| 9 | 212344 774950 |  Silver birch and ash trees are present in the amenity grassland around Lochaber Smelter. |
| 10 | 212264 774838 |  A section of recently felled broadleaved woodland within the centre of the site was comprised of marshy grassland overlain with bundles of brash throughout. The grassland species were dominated by soft-rush and purple moor-grass, bog-mosses and haircap moss. were also recorded. |
| 11 | 212170 774686 |  An area of coniferous woodland which has been clear felled. Only small sections of the woodland remain. The remaining ground vegetation includes rhododendron, soft-rush, mat-grass, purple moor-grass, deergrass, red bog-moss, bog-mosses and haircap moss. |
| 12 | 212299 774905 |   Rough grassland was identified around the broadleaved woodland in the north of the site. Much of the ground comprised rubble aggregate colonised by grassland species. Species recorded included common bent, mat-grass, purple moor-grass, deergrass, bracken, rosebay willowherb, foxglove, bramble, heather and soft- |

| TN | Grid Reference | Description |
|---|---|---|
| | | rush. Small sections on particularly wet ground were dominated by soft-rush and the ground vegetation also included bog-mosses, haircap moss, bracken and foxglove. |
| 13 | 212420 774678 |  The ground within the centre of the site is disturbed and waterlogged. Species recorded included heather, cross-leaved heath, purple moor-grass, soft-rush and deergrass. Young silver birch and Sitka spruce as well as rhododendron are scattered throughout. |
| 14 | 212207 774580 |   The area in the south-west of the site has been recently disturbed due to the felling works and species recorded included purple moor-grass, heather, soft-rush, bog-mosses and haircap moss well as scattered young silver birch. |
| 15 | 212088 774843 |  An area of flooded ground was present along the south of the woodland. |
| 16 | 212145 775016 |   A small watercourse is present within the woodland at the north of the site. |

| TN | Grid Reference | Description |
|---|---|---|
| 17 | 212229 774940 |  A small drainage channel is present within the woodland at the north of the site. |
| 18 | 212226 774981 |  A small drainage channel is present within the woodland at the north of the site. |
| 19 | 212315 774888 |  Concrete hardstanding and access track leading from the existing Smelter into the site. A concrete yard containing brash was present to the south of the track. |
| 20 | 212139 774821 |  Concrete hardstanding within the site with large bundles of rubble around the edges. |

| TN | Grid Reference | Description |
|---|---|---|
| 21 | 212051<br>774803 | <br>Concrete hardstanding within the site. |

## Appendix E: Species List

| Common Name | Scientific Name |
|---|---|
| **Trees and Shrubs** | |
| Alder | *Alnus glutinosa* |
| Ash | *Fraxinus excelsior* |
| Beech | *Fagus sylvatica* |
| Bramble | *Rubus fruticosus* |
| Broom | *Cytisus scoparius* |
| Butterfly-bush | *Buddleia davidii* |
| Cotoneaster | *Cotoneaster sp.* |
| Cross-leaved heath | *Erica tetralix* |
| Downy birch | *Betula pubescens* |
| Gorse | *Ulex europaeus* |
| Grey willow | *Salix cinerea* |
| Heather | *Calluna vulgaris* |
| Holly | *Ilex aquifolium* |
| Rhododendron | *Rhododendron ponticum* |
| Rowan | *Sorbus aucuparia* |
| Scots pine | *Pinus sylvestris* |
| Silver birch | *Betula pendula* |
| Sitka spruce | *Picea sitchensis* |
| Sycamore | *Acer pseudoplatanus* |
| **Herbs** | |
| Bracken | *Pteridium aquilinum* |
| Broad-leaved dock | *Rumex obtusifolius* |
| Cock's-foot | *Dactylis glomerata* |
| Common bent | *Agrostis capillaris* |
| Creeping thistle | *Cirsium arvense* |
| Deergrass | *Trichophorum cespitosum* |
| Foxglove | *Digitalis purpurea* |
| Lady fern | *Athyrium filix-femina* |
| Mat-grass | *Nardus stricta* |
| Purple moor-grass | *Molinia caerulea* |
| Rosebay willowherb | *Chamaenerion angustifolium* |
| Soft-rush | *Juncus effusus* |
| Tufted hair-grass | *Deschampsia cespitosa* |

| Common Name | Scientific Name |
| --- | --- |
| **Bryophytes** | |
| Bog-mosses | *Sphagnum sp.* |
| Haircap moss | *Polytrichum sp.* |
| Red bog-moss | *Sphagnum capillifolium* |
| **Terrestrial Mammals** | |
| Badger | *Meles meles* |
| Otter | *Lutra lutra* |
| Pine marten | *Martes martes* |
| Red squirrel | *Sciurus vulgaris* |
| Scottish Wildcat | *Felis silvestris silvestris* |
| Water vole | *Arvicola amphibius* |
| **Amphibians and Reptiles** | |
| Adder | *Vipera berus* |
| Common frog | *Rana temporaria* |
| Common lizard | *Zootoca vivipara* |
| Common toad | *Bufo bufo* |
| **Birds** | |
| Buzzard | *Buteo buteo* |
| Robin | *Erithacus rubecula* |

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# Appendix 8.2 Draft Peat Management Plan

ITPENERGISED

# Alvance Recycling and Billet Casting Facility EIA

## Draft Peat Management Plan

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|---|---|
| Client: | Alvance British Aluminium |
| Project/Proposal No: | 3539 |
| Version: | 1.0 |
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# Contents

# 1. Introduction

## 1.1 Background

ITPEnergised was commissioned by Alvance British Aluminium (the Applicant) to produce a Draft Peat Management Plan (PMP) for the proposed Recycling and Billet Casting Facility ('the Proposed Development') southwest of the existing Aluminium Smelter in Fort William, Highland. The Proposed Development will be constructed in an area comprising both greenfield and brownfield land (the 'site'). Deep peat is present, some of which will need to be removed to facilitate the development. This Draft PMP has been developed to set out the approach to the management of the peat resource during construction of the Proposed Development.

This document is based on a draft PMP prepared for the previously consented Alloy Wheel Plant (AWP), which was proposed in the same location as the Proposed Development. Planning consent 17/05202/FUL for the AWP was granted on 06 February 2018 subject to a number of planning conditions, of which Condition 11 states the following:

'*No development shall commence until a Peat Management Plan, developed in consultation with SEPA and SNH, has been submitted to, and approved in writing by, the Planning Authority. The Peat Management Plan shall draw upon the findings of the approved Environmental Impact Assessment Report and the Technical Memorandum from Golder Associates dated 24 November 2017 and shall consider the findings of any additional ground investigations carried out prior to development commencing. The Peat Management Plan shall include a management/reinstatement scheme for all peat areas within the application site, including:*

i. *Details and plans for all peat and soil stripping and excavation and the storage and proposed use and replacement of peat, topsoil and subsoil;*

ii. *A method statement setting out the measures to protect peat during excavation, storage, handling and reuse;*

iii. *Total peat disturbance limited to removal to the depth of 0.5m below existing ground levels, unless otherwise first agreed in writing by the Planning Authority;*

iv. *Peat only to be removed from the site if it is for beneficial use elsewhere, and where this is proposed will be supported by a Habitat Management Plan, and*

v. *Peat only temporarily stored within the footprint of the excavations or on existing laydown areas within the site boundary.*

*The Peat Management Plan shall be implemented as approved, and all reinstatement fully undertaken prior to the initial occupation of the manufacturing facility hereby approved.*

*Reason: To ensure that a plan is in place to deal with the storage and reuse of peat within the application site, including peat stability and slide risks, in accordance with Policy 55 of the Highland wide Local Development Plan.*'

Following a site walkover and meeting on 02 August 2019, Scottish Environment Protection Agency (SEPA) and Scottish Natural Heritage (SNH, now NatureScot) outlined their preferences on the re-use of peat, the locations of peat receptor areas and the general requirements of the PMP. The stated preference was for excavated peat to be reinstated in an area of felled and extant conifer plantation immediately southeast of the site.

The Proposed Development will occupy a similar footprint to the previously consented AWP. As it will occupy the same site, it will also involve excavation of peat. This document is therefore based on the principles developed for the AWP PMP.

## 1.2 Site Description

The Proposed Development will be located to the southwest of the existing Smelter, approximately centred on national grid reference NN 12279 74812 (Drawing 1). The site can be described in terms of three current or recent land uses:

- A brownfield area in the north and west of the site was the site of a carbon plant, which has since been demolished, but concrete slabs, roads and piles of rubble remain. Peat is absent from this area.
- An area of felled conifer plantation characterises the southern part of the site. The woodland was partly felled in the winter of 2018-19. The soil substrate includes peat and boulders.
- Peatland (including peatland with low birch woodland) dominates the majority of the site including all of the central and eastern section. The peat body here varies in thickness from 0.2 m to 4.65 m.

## 1.3 Scope of the Document

The purpose of the Draft PMP is to set out the approach to the management of peat resource associated with the construction of the Proposed Development as noted above.

This document includes:

- A detailed description of the peat depths within the site and immediately adjacent areas, including maps showing the location of the development.
- Quantification of where surplus peat will be generated and in what quantities and broken down into the amounts of catotelmic and acrotelmic peat, respectively.
- A description of the principles of peat re-use, identified receptor locations and details of the amount of peat that can be accommodated within them.
- A method statement detailing how the peat from the site will be excavated and reinstated into the receptor areas.

It is envisaged that the Draft PMP will be updated and finalised post consent and following further site investigation and stakeholder consultation. It will then remain a live document, which may be subject to revision throughout the project as needed.

# 2. Developments on Peatland

## 2.1 Definitions of Peat

In Scotland, peat is defined as an organic soil which contains more than 60% of organic matter and exceeds 50 centimetres in thickness (Macaulay Institute for Soil Research, 1984; Bruneau and Johnson, 2014). However, the NatureScot document '*Scotland's National Peatland Plan*' (SNH, 2015) also considers organic soils less than 50 cm deep given their importance as carbon stores (SNH, 2015). Such shallow organic soils are often referred to as 'organo-mineral soils' or 'peaty soils' and are considered part of the peat soil resource by the Joint Nature Conservation Committee (JNCC) (2011) and Scottish Government, NatureScot and SEPA in their joint guidance on peat surveys (Scottish Government, SNH and SEPA, 2017).

The structure of a true active peatland typically comprises a thin surface layer of living vegetation (the acrotelm) overlying a usually thicker layer of well decayed and humified peat, comprising the consolidated remains of former surface vegetation (the catotelm) (Bruneau and Johnson, 2014). Below the peat forming layers is the basal substrate; either a mineral soil, mineral superficial deposit or bedrock.

The acrotelm is the living layer of the peat including the peat turf or turve being a thin, floating vegetation mat layer. The acrotelm is generally found within the top layer of peat (often less than 0.5 m) depending on the degree of decomposition and fibrous nature of the peat (approximately H1 to H6 on the von post classification scale[1]). The acrotelm is generally of high permeability, decreasing with depth. The water table fluctuates in this layer and conditions vary from aerobic to anaerobic. Material may be fibrous or pseudo-fibrous (plant remains recognisable), spongy, and when excavated strength is lost but retains integral structure and can stand unsupported when stockpiled > 1 m.

The catotelm is the dead layer of peat found deeper than acrotelmic peat which has some remnant plant structures. Material has high water content and is permanently below the water table (saturated) therefore organic matter decomposes anaerobically. Some plant structures may be recognisable but are highly humified losing most of their characteristics (approximately H6 to H9 on the von post classification scale) and strength. Water flow through the catotelm is slow unless peat structures such as sink holes or peat pipes are present.

Amorphous peat is highly decomposed organic material where all recognisable plant remains are absent (approximately H9 to H10 in the von post classification scale). These deposits are dark brown to black in colour, plastic, are low tensile strength and are unable to stand unsupported > 1 m when stockpiled.

## 2.2 Peatlands in Scotland

Over 20% of Scotland's land area is covered by peatlands, and Scotland hosts a significant proportion of the European and world resource (SNH, 2015). Peatlands have particular significance as long-term carbon stores, important to tackling climate change, and as habitats for a range of specialised fauna and flora, as well as the raw ingredient of rural farming, tourism and crofting. Other benefits from peatlands in good condition include provision of clean water and reduced flood risk. They contribute peat to the whisky industry and continue to provide domestic fuels in rural parts (SNH, 2015).

Large areas of peatlands have been lost or damaged: Recent estimates assess that 70% of the Scottish blanket bog and 90% of the raised bog resources have been damaged to some degree (SNH, 2015). Drying and physical damage to peat can result in the release greenhouse gases, reduce water quality and diminish a range of other services. In addition, peat is geotechnically complex, and special consideration must be given to the practicalities of engineering in peat and peat soils, with careful management of construction activities required to avoid such damage.

## 2.3 Legislation and Policy

The significance of peatland habitats is most evident in their protection by various legislation, policy and local, national or international conservation initiatives, notably the following:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the 'Habitats Directive')[2];

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[1] The scale was devised by Lennart von Post for measurement of degree of decomposition of dead plant matter such as *Sphagnum* moss. Using parameters such as fibre integrity, colour and viscosity of exudate, and presence of colloidal particles, it creates a descriptive framework across a wide range of organic soils, and assigns a numerical value from 1 (undecomposed) to 10 (colloidal).

[2] Although the UK has now left the European Union, there has been no significant change in the wording of UK nature conservation legislation based on European directives, and these are therefore considered to remain relevant to the present report

- Directive 2000/60/EC of the European Parliament and of the Council Establishing a Framework for the Community Action in the Field of Water Policy (the 'Water Framework Directive');
- Scotland's National Peatland Plan (SNH, 2015);
- Climate Change Plan (2018-2032) (Scottish Government, 2018); and
- The Scottish Biodiversity List (Scottish Government, 2013) (a tool to help public bodies carry out their Biodiversity Duty).

There are no specific directives, acts or policies for the protection of peat soils. However, through its Scottish Soil's Framework (Scottish Government, 2009) the Scottish Government aims to promote sustainable management and protection of soils, consistent with the economic, social and environmental needs of Scotland. It is recognised that inappropriate developments can lead to environmental impacts such as soil organic matter loss, soil degradation, leading to erosion, compaction, loss of biodiversity and nutrient leaching.

Excluding sections on commercial peat extraction that are not relevant here, Policy 55 (Peat and Soils) of The Highland Council Local Development Plan (The Highland Council, 2012) states the following:

> *'Development proposals should demonstrate how they have avoided unnecessary disturbance, degradation or erosion of peat and soils.*
>
> *Unacceptable disturbance of peat will not be permitted unless it is shown that the adverse effects of such disturbance are clearly outweighed by social, environmental or economic benefits arising from the development proposal.*
>
> *Where development on peat is clearly demonstrated to be unavoidable then the Council may ask for a peatland management plan to be submitted which clearly demonstrates how impacts have been minimised and mitigated.'*

Planning condition 11 of 17/05202/FUL refers to Policy 55.

SEPA has a statutory and legislative duty to ensure that peat spoil generated during construction is stored, re-used, treated or disposed of correctly (which may require authorisation or permits). SEPA's policy on the management of peat spoil is set out within the document '*Regulatory Position Statement – Developments on Peat*' (SEPA, 2010). This outlines a hierarchy in which the best management option is to minimise peat excavation and disturbance. Where this is unavoidable, developers should attempt to re-use as much of the peat produced on site as is possible, in justifiable and environmentally beneficial ways.

A number of on-site activities may involve the use of peat e.g. restoration of hardstanding areas, road banking, etc. Any developer wishing to re-use any waste peat material is encouraged to contact their local SEPA office to discuss proposed re-use activities. However, the fact that materials have a potential reuse within the site boundary is not sufficient in itself to say that they are not waste. For example, where there is no justified requirement or demonstrable need for the peat to be used or it is clearly not suitable for the identified use, it will likely be classed as a disposal operation, and the proposed activity will require authorisation from SEPA accordingly.

It is therefore strongly recommended that PMPs are formulated to ensure that peatlands are managed in accordance with best practice and specifically, that damage to peatland habitats and vegetation are, wherever possible, avoided during construction and, where this is not possible, that peat is re-instated effectively with a minimal loss of carbon.

Minimising the volumes of peat generated by construction is preferable in order to preserve the various ecosystem services associated with peatlands, and to reduce potential carbon losses associated with construction. The key guiding principle is only to re-use peat where it is suitable for the identified and required use, as previously noted. Careful handling is essential to retain the structure and integrity of the excavated materials and thereby maximise the potential for excavated material to be re-used.

The publication '*Developments on Peatland: Guidance on the Assessment of Peat Volumes, Re-use of Excavated Peat and the Minimisation of Waste*' (Scottish Renewables and SEPA, 2012) identifies examples of valid re-uses of excavated peat during construction. Although the examples used in the document are taken from wind farms, the document is aimed at all forms of activities that involve developments on peat. Re-use of peat can potentially include dressing off and re-instating peat on the slopes and edges of constructed infrastructure, re-instatement of service trenches, screening bunds, and peatland restoration via water table restoration, habitat enhancement or wetland creation.

# 3. Current Conditions

In the following the site is described as two parts:

- The development area in the north-western part of the site, which is defined as the footprint of the Proposed Development and associated infrastructure, proposed wetland, boundary drain and a 10 m buffer; and
- Areas south and east of the Proposed Development. The latter include a plantation woodland straddles the planning boundary; this woodland has been described in its entirety.

## 3.1 Habitats

### 3.1.1 Proposed Development Area

In the EIA Report for the previously consented AWP (Golder, 2017), Technical Appendix 12.2 (Phase 1 Habitat Survey, National Vegetation Classification Survey and Groundwater Dependent Terrestrial Ecosystems Report) described the location of the development area at the time of survey as being dominated by semi-natural broadleaved woodland characterised mainly by downy birch (*Betula pubescens*), with small amounts of grey willow (*Salix cinerea*), alder (*Alnus glutinosa*) and some silver birch (*B. pendula*). Much of the woodland was low grown and on very wet ground. The field layer had constant purple moor-grass (*Molinia caerulea*), which locally became the dominant species. Other species in the field layer included bog-mosses, such as red bog-moss (*Sphagnum capillifolium*) and papillose bog-moss (*S. papillosum*). As shown on the National Vegetation Classification (NVC) map included as Annex A, the vegetation corresponded to NVC community type W4 *Betula pubescens–Molinia caerulea* woodland, with both the W4b soft-rush (*Juncus effusus*) sub-community and the W4c *Sphagnum* sub-community being recorded. The latter was found to dominate the footprint of the Proposed Development but much of this habitat was cleared in the winter of 2018-19 (see Plate 1). The areas were resurveyed in November 2019 and again in January 2021. Except where otherwise noted below, the 2021 survey confirmed the 2019 findings.

*Plate 1 – Largely cleared W4 woodland within the footprint of the Proposed Development (March 2019)*

In January 2021, brash and bare, disturbed peat continue to be present in the area, but some vegetation development has also occurred, dominated by soft-rush and purple moor-grass (see Plate 2).

*Plate 2 – Vegetation development in cleared W4 woodland (January 2021)*

In addition to W4 woodland, W6d *Alnus glutinosa–Urtica dioica* woodland, the *Sambucus nigra* sub-community, was present in the northwest of the Proposed Development area in 2017, and coniferous plantation forestry comprising mature Scots pine (*Pinus sylvestris*), Sitka spruce (*Picea sitchensis*) and European larch (*Larix decidua*) were present to the south. The larger conifer stems were felled in the winter of 2018-19 (see Plate 3) and in January 2021 brash was still found to dominate this area.

*Plate 3 – Felled conifer woodland within the footprint of the Proposed Development with plantation remaining to the southeast (March 2019)*

An area to the northeast of the location of the Proposed Development was found to be dominated by hard standing and scrub.

There are no watercourses within 50 m of the Proposed Development area.

### 3.1.2 Locations South and East of the Proposed Development Area

The semi-natural and plantation woodland habitats described above also characterise parts of the area south and east of the Proposed Development and some of this woodland remains *in situ*. Three main areas of woodland are present:

- The conifer plantation described in the previous section extends southeast into this area, with an overhead power line corridor defining the south-eastern extent. It is referred to as the 'Southern Woodland' in the sections below.
- Another area of woodland is present approximately 100 m northeast of the Southern Woodland and is referred to as the 'Northern Woodland' in the sections below. The overhead power line corridor also defines the south-eastern boundary of this woodland.
- Birch-dominated scrubby W4 woodland with blanket bog ground vegetation.

There has been some felling within the Southern Woodland, mainly in the low-lying centre of the plantation, and some stems have fallen over; however, many stems remain in place (see Plates 4 and 5 and Drawing 2). The remaining woodland is dominated by larch and Scots pine, with an impoverished understorey and ground flora, which in the AWP EIA Report was described as comprising patches of woolly fringemoss (*Racomitrium lanuginosum*) and sparse areas of purple moor-grass. The substrate includes both organic and mineral soils. The topography rises to the east. However, distinct hillocks, which apparently comprise mineral soil, rise approximately 2 m from the adjacent areas.

*Plate 4 – Felled, wind-blown and standing trees within the Southern Woodland (January 2021)*

*Plate 5 – Scots pine and scattered birch within the Southern Woodland (November 2019)*

The Northern Woodland includes a section of coniferous plantation dominated by Scots pine, again with a sparse understorey and ground flora (see Plate 6). However, the woodland also includes a range of broadleaved species, mainly alder and birch but also rowan (*Sorbus aucuparia*), cherry (*Prunus* sp.), sessile oak (*Quercus petraea*) and beech (*Fagus sylvatica*), and some of this broadleaved woodland is likely to be semi-natural (see Plate 7) although broadleaved plantation woodland also occurs (see Plate 8). The substrate of the broadleaved woodland appears to be mineral, and such areas may also be present southeast of the overhead lines. The substrate of the conifer section comprises peat but areas with mineral soil could also be present. The topography rises gently to the east.

*Plate 6 – Scots pine within Northern Woodland (November 2019)*

*Plate 7 – Section of regenerating alder at the north end of the Northern Woodland. A fallen over tree shows the substrate to be mineral (November 2019)*

*Plate 8 – View to the south-eastern edge of broadleaved plantation within the Northern Woodland (November 2019)*

As shown on the map in Annex A, low (scrubby) birch-dominated semi-natural W4 woodland abuts the Northern and Southern Woodlands. It is a relatively open habitat and the ground flora contains a number of blanket bog species, such as deergrass (*Trichophorum germanicum*), purple moor-grass, heather (*Calluna vulgaris*), hare's-tail cottongrass (*Eriophorum vaginatum*) and *Sphagnum* mosses (see Plate 9).

*Plate 9 – Low-growing W4 woodland between the Northern and Southern Woodlands (November 2019)*

As documented in Technical Appendix 12.2 of the AWP EIA Report and shown in Annex A, open peatland is present south of the Southern Woodland. A large proportion of this was found to comprise M17a *Trichophorum cespitosum–Eriophorum vaginatum* blanket mire, *Drosera rotundifolia–Sphagnum* spp. sub-community, and was concluded to be unmodified blanket bog of high value. Some of the blanket bog graded into W4 woodland. Other habitats recorded included the dry heath communities H10 *Calluna vulgaris–Erica cinerea* heath and H12 *Calluna vulgaris–Vaccinium myrtillus* heath, as well as M15 *Trichophorum cespitosum–Erica tetralix* wet heath. These heath communities were also described as being of high quality, albeit present only as small stands.

Additional habitats in the area include marshy grassland comprising M23b *Juncus effusus/acutiflorus–Galium palustre* rush-pasture, the *Juncus effusus* sub-community, and M25 *Molinia caerulea–Potentilla erecta* mire, as well as W23 *Ulex europaeus–Rubus fruticosus* agg. scrub.

There is no watercourse on or adjacent to the site. However, a small watercourse flows at the far southern and south-eastern end of the study area, 150 m from the Southern and Northern Woodlands, where it abuts the open peatland.

## 3.2 Geology and Soils

Chapter 7: Hydrology and Hydrogeology summarises the geology baseline conditions at the site and wider planning boundary as comprising post-glacial peat that has developed between the hummocks of glacial deposits. The underlying bedrock geology at the Proposed Development comprises micaceous psammite and pelite and classed as a low productivity aquifer. Given the nature of the bedrock geology, any groundwater within the superficial deposits is unlikely to be in hydrological connectivity with deeper groundwater.

### 3.2.1 Proposed Development Area

A geophysical investigation of the Proposed Development area was undertaken by Golder Associates Limited (Golder) in 2018 (Golder, 2019a) and a geotechnical site investigation was undertaken in 2019 by Soil Engineering Limited (SEGL) (SEGL, 2019), with an interpretive report subsequently produced by Golder Associates Limited (Golder) (Golder, 2019b). The following summarises the key results:

- Made ground: As shown in Annex B, made ground is present in the developed areas west and north of the site and falls into two categories:
  - Areas with buildings and hard standing are underlain by a layer of crushed aggregate of large angular cobbles and gravels, likely placed in a controlled manner to replace excavated peat.
  - Other made ground encountered on the site consists of ash, clinker, carbon, alumina, concrete, brick, topsoil, and rebar. These were encountered at depths between 0.20 m and 6.00 m below ground level (bgl). Stockpiles containing these materials are also present in the location of the former carbon plant.
- Peat: As shown in Annex D, deep (> two metres) peat dominates the north-eastern half of the footprint of the Proposed Development and extends to six metres in depth, corresponding to a hollow in that area. Shallow (< two metres) peat dominates the south-western half of the footprint as well as the wider study area surrounding the footprint.
- Glacial moraine: Below the peat and made ground is a granular glacial moraine deposit consisting of a slightly silty to silty, fine to coarse sand with sub-angular to sub-rounded gravel, cobbles and boulders of granite, psammite, quartz and schist. Locally the ratios of sand and gravel vary, occasionally becoming a slightly gravelly sand. The material forms hummocks in the western part of the site and is dense to very dense.
- Bedrock: The rotary cored boreholes recovered core identified as schist, psammite, semipelite and pelite. The formation varies from slightly fractured to highly fractured with some healing on the discontinuities, fracture orientation varied from bedding, foliation and random orientation. Mineral veins were regularly encountered primarily of quartz and calcite up to 80 mm thick. A biotite mica vein was also encountered. Iron pyrite was occasionally noted as being present within or adjacent to some of the veins.

Annex C shows the base of peat elevations, and Annex D shows the thickness of the peat. Both maps are from Golder (2019b) and are based on the information collected by Soil Engineering Limited (SEGL) in 2019. Using information from SEGL, Table 1 summarises the peat data for the boreholes below the footprint of the Proposed Development Area and adjacent areas within 50 m (note that locations on the map in Annex E are shown relative to the AWP footprint).

***Table 1 Peat data in the development area (extracted from SEGL report, 2019)***

| Borehole ID | Approximate Location | Depth to Peat | Depth of Pseudo-fibrous Peat | Depth of Amorphous Peat | Total Depth of Peat |
|---|---|---|---|---|---|
| BH01 | Under Proposed Development footprint | 0 cm | 90 cm | - | 90 cm |
| BH02A | West of Proposed Development footprint: West of wetland, east of cut-off drain | 0 cm | 100 cm | 0 cm | 100 cm |
| BH02B | West of Proposed Development footprint: West of wetland, east of cut-off drain | 0 cm | 0 cm | 200 cm | 200 cm |
| BH03 | East of wetland, west of Proposed Development | - | 0 cm | 0 cm | 0 cm |
| BH04 | Under Proposed Development footprint | 0 cm | 130 cm | 0 cm | 130 cm |
| BH05 | West of Proposed Development footprint: West of wetland, east of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH06 | Under Proposed Development footprint | 0 cm | 230 cm | 0 cm | 230 cm |
| BH07 | Under Proposed Development footprint | 0 cm | 110 cm (with medium cobbles) | 0 cm | 110 cm |
| BH08 | Under cut-off drain | 0 cm | 120 cm | 60 cm | 180 cm |
| BH09A | East of wetland, west of Proposed Development | 0 cm | 120 cm | 60 cm | 180 cm |
| BH09B | East of wetland, west of Proposed Development | 0 cm | 0 cm | 180 cm | 180 cm |
| BH10 | Under storage yard footprint | 0 cm | 172 cm | 198 cm | 370 cm |
| BH11 | Under Proposed Development footprint | 0 cm | 80 cm | 0 cm | 80 cm |
| BH12 | West of wetland, east of cut-off drain | 0 cm | 50 cm | 50 cm | 100 cm |
| BH13 | Under storage yard footprint | 0 cm | 120 cm | 0 cm | 120 cm |

| Borehole ID | Approximate Location | Depth to Peat | Depth of Pseudo-fibrous Peat | Depth of Amorphous Peat | Total Depth of Peat |
|---|---|---|---|---|---|
| BH14 | Under storage yard footprint | 0 cm | 120 cm | 200 cm | 320 cm |
| BH15 | West of cut-off drain | 0 cm | 100 cm | 0 cm | 100 cm |
| BH15A | West of cut-off drain | 0 cm | 0 cm | 110 cm | 110 cm |
| BH16 | Under wetland footprint | 0 cm | 80 cm | 0 cm | 80 cm |
| BH17 | Under storage yard footprint | 0 cm | 180 cm | 420 cm | 600 cm |
| BH18 | Under storage yard footprint | 140 cm | 0 cm | 25 cm | 25 cm |
| BH19 | Under cut-off drain | 0 cm | 120 cm | 0 cm | 120 cm |
| BH20 | Under wetland area footprint | 0 cm | 100 cm | 0 cm | 100 cm |
| BH21 | Under wetland area footprint | 0 cm | 120 cm | 180 cm | 300 cm |
| BH22 | Southwest of cut-off drain | 0 cm | 0 cm | 200 cm | 200 cm |
| BH23A | Under cut-off drain | 0 cm | 120 cm | 20 cm | 140 cm |
| BH23B | Under cut-off drain | 0 cm | 0 cm | 140 cm | 140 cm |
| BH24 | Under wetland area footprint | 0 cm | 220 cm | 350 cm | 570 cm |
| BH25A | South of wetland area, north of cut-off drain | 0 cm | 130 cm (with frequent roots) | 0 cm | 130 cm |
| BH25B | South of wetland area, north of cut-off drain | 0 cm | 0 cm | 135 cm | 135 cm |
| BH43A | West of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH43B | West of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH44 | West of wetland, east of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH45 | North of Proposed Development | 180 cm | 0 cm | 30 cm | 30 cm |
| BH46A | North of Proposed Development | - | 0 cm | 0 cm | 0 cm |
| BH46B | North of Proposed Development | - | 0 cm | 0 cm | 0 cm |
| BH48A | East of Proposed Development, east of railway | - | 0 cm | 0 cm | 0 cm |
| BH48B | East of Proposed Development, east of railway | - | 0 cm | 0 cm | 0 cm |

| Borehole ID | Approximate Location | Depth to Peat | Depth of Pseudo-fibrous Peat | Depth of Amorphous Peat | Total Depth of Peat |
|---|---|---|---|---|---|
| BH49 | South of cut-off drain | 0 cm | 150 cm | 0 cm | 150 cm |
| BH50 | South of cut-off drain | 0 cm | 130 cm | 0 cm | 130 cm |
| BH51 | Under cut-off drain | 0 cm | 120 cm | 70 cm | 190 cm |
| BH52 | South of cut-off drain | 0 cm | 110 cm | 60 cm | 170 cm |
| BH53 | South of wetland, north of cut-off drain | 0 cm | 120 cm | 100 cm | 220 cm |
| BH56A | West of wetland, east of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH56B | West of wetland, east of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH57 | West of wetland, east of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH58A | West of wetland, east of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH58B | West of wetland, east of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH59A | West of wetland, east of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH59B | West of wetland, east of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH60A | West of wetland, east of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH60B | West of wetland, east of cut-off drain | - | 0 cm | 0 cm | 0 cm |
| BH62A | East of wetland, north of cut-off drain | 0 cm | 0 cm | 30 cm | 30 cm |
| BH63A | North of Proposed Development | 0 cm | 130 cm | 0 cm | 130 cm |
| BH63B | North of Proposed Development | 0 cm | 120 cm (with 'vegetation') | 0 cm | 120 cm |

As shown in Table 1 most locations within the footprint of the Proposed Development have pseudo-fibrous peat present at the surface. Nevertheless, a large minority of the locations have amorphous peat at the surface. Pseudo-fibrous peat occurs to a maximum depth of 2.30 m bgl, and although there is typically a gradual change from fibrous to amorphous peat, the SEGL (2019) data suggests that in some cases the entire peat layer is either pseudo-fibrous or amorphous.

### 3.2.2 Locations South and East of the Proposed Development Area

The 2018 and 2019 studies also included areas further to the south and east of the location of the Proposed Development, although those areas were not sampled at the same intensity. The following summarises the key results:

- Made ground: Made ground is not described for the area south and east of the Proposed Development. However, only few locations were sampled within the plantation woodland and any made ground within those areas may therefore not have been recorded. In a walkover survey on 18 November 2019, the root ball of a fallen over alder tree comprised mineral soil (see Plate 7) and a broken slab was observed nearby (at grid reference NN12691 74810). As stated earlier, the broadleaved section of the Northern Woodland, and possibly also the conifer woodland in both the Northern and Southern Woodlands, may overlap with areas of spoil moved to the site in the 1980s when an extension to the smelter was constructed (James Tangney, Alvance, *pers. comm*.).
- Peat: As shown in Annex D, deep peat is less common within this area but dominates pockets in the north-central (off the south-western extent of the Northern Woodland) and far south of the site.
- Glacial moraine: Below the peat is a granular glacial moraine deposit consisting of a slightly silty to silty, fine to coarse sand with sub-angular to sub-rounded gravel, cobbles and boulders of granite, psammite, quartz and schist. Locally the ratios of sand and gravel vary, occasionally becoming a slightly gravelly sand. The material forms hummocks and is dense to very dense.
- Bedrock: The rotary cored boreholes recovered core identified as schist, psammite, semipelite and pelite. The formation varies from slightly fractured to highly fractured with some healing on the discontinuities, fracture orientation varied from bedding, foliation and random orientation. Mineral veins were regularly encountered primarily of quartz and calcite up to 80 mm thick. A biotite mica vein was also encountered. Iron pyrite was occasionally noted as being present within or adjacent to some of the veins.

As before, Annex C shows the base of peat elevations, and Annex D shows the thickness of the peat. Both maps are from Golder (2019b) and are based on the information in SEGL (2019). Using information in (SEGL, 2019), Table 2 summarises the peat data for the boreholes >50 m south and east of the Proposed Development (locations are shown on the map in Annex E).

***Table 2 Peat data south and east of development area (from SEGL, 2019)***

| Borehole ID | Approximate Location | Depth to Peat | Depth of Pseudo-fibrous Peat | Depth of Amorphous Peat | Total Depth of Peat |
|---|---|---|---|---|---|
| BH34 | West of Proposed Development | 0 cm | 110 cm (slightly gravelly with low cobble content) | (60 cm of slightly peaty gravel underlies the fibrous peat) | 110 cm 170 cm (peat and peat-rich soil) |
| BH35A | West of Proposed Development | 0 cm | 50 cm (with gravel and rootlets) | 0 cm | 50 cm |
| BH35B | West of Proposed Development | 0 cm | 0 cm | 50 cm | 50 cm |
| BH36A | Peatland south of Southern Woodland | 0 cm | 220 cm (with abundant rootlets) | 0 cm | 220 cm |
| BH36B | Peatland south of Southern Woodland | 0 cm | 0 cm | 135 cm | 135 cm |
| BH37 | Peatland south of Southern Woodland | 0 cm | 120 cm (slightly gravelly with low cobble content) | 0 cm | 120 cm |
| BH38A | Southern Woodland | 0 cm | 110 cm | 0 cm | 110 cm |
| BH38B | Southern Woodland | 0 cm | 0 cm | 110 cm | 110 cm |

| Borehole ID | Approximate Location | Depth to Peat | Depth of Pseudo-fibrous Peat | Depth of Amorphous Peat | Total Depth of Peat |
|---|---|---|---|---|---|
| BH39 | W4 scrub and bog between Southern and Northern Woodlands | 0 cm | 100 cm | 0 cm | 100 cm |
| BH40A | Conifer plantation of Northern Woodland | 0 cm | 170 cm | 0 cm | 170 cm |
| BH40B | Conifer plantation of Northern Woodland | 0 cm | 0 cm | 170 cm | 170 cm |
| BH42 | Northwest of Proposed Development | - | 0 cm | 0 cm | 0 cm |
| BH54 | W4 scrub and bog between Southern and Northern Woodlands | 0 cm | 80 cm | 0 cm | 80 cm |
| BH55 | Peatland south of Southern Woodland | 0 cm | 200 cm | 0 cm | 200 cm |
| BH61A | North of railway line | - | 0 cm | 0 cm | 0 cm |
| BH61B | North of railway line | - | 0 cm | 0 cm | 0 cm |

As shown in Table 2, most locations within the area have pseudo-fibrous peat present at the surface, although again in some locations amorphous peat is present at the surface. Pseudo-fibrous peat occurs to a maximum depth of 2.20 m bgl, and although there is typically a gradual change from fibrous to amorphous peat, the SEGL (2019) data suggests that in some cases the entire peat layer is either pseudo-fibrous or amorphous.

# 4. Peat Balance

### 4.1.1 Excavation Volumes

The SEGL (2019) data does not detail the degree of peat decomposition, except as pseudo-fibrous or amorphous. Based on the data in Tables 1 and 2, these peat layers are shown in the following peat maps:

- Drawing 3: Pseudo-fibrous peat; and
- Drawing 4: Amorphous peat.

Where pseudo-fibrous peat is present within a depth of c. 50 cm of the surface, this can be interpreted as corresponding to acrotelmic peat. Lower layers of pseudo-fibrous peat, as well as amorphous peat, are considered to represent catotelmic peat.

The development of a peat balance for the Proposed Scheme involves calculation of volumes excavated during construction, volumes re-instated during or following construction, and volumes of re-use that may be achieved through habitat restoration/enhancement within remaining areas of plantation.

Peat excavation volumes have been calculated using the following assumptions:

- All peat will be removed from under the billet footprint, associated infrastructure and the sustainable drainage system (SuDS) wetland;

- The zone between the SuDS wetland and the cut-off drain is indicative, as the wetland crest level is not known. It is assumed that the slope of the peat will be at 1:3 to tie-in to existing topography. Taking a precautionary approach, it is assumed that the zone will on average be 6.3 m wide.
- A site strip of 1.5 m is conducted across the Proposed Development footprint to remove most of the shallow peat from beneath the foundation footprint and to allow for the removal of roots and organics that may remain on site following the felling of the forestry plantation.

The estimated volumes of excavated peaty soil and acrotelmic and catotelmic peat are provided in Table 3:

***Table 3 Estimated peat excavations***

| Scheme Element | Area ($m^2$) | Peat Excavation ($m^3$) | |
|---|---|---|---|
| | | Pseudo-fibrous Peat | Amorphous Peat |
| Proposed Development and infrastructure footprint and SuDS wetland (all peat to be removed) | 48,347 | 45,410 | 38,461 |
| Area between SuDS wetland and cut-off drain | 4,261 | 3,065 | 1,277 |
| Cut off drain (681 m length) | 1,361 | 1,021 | 75 |
| **Totals** | **53,969** | **49,496** | **39,813** |

### 4.1.2 Re-instatement Volumes

The management option for the scheme is for excavated peat to be re-used in suitable ways that maintain their provisioning, regulating, cultural and ecosystem supporting services. In this respect, as described in Section 1, SEPA and NatureScot have proposed that excavated peat is used to restore peatland in the remaining areas of plantation woodland.

Including the already felled areas within the Southern Woodland, the extent of this woodland area as shown on Drawing 2 is approximately 12,442 $m^2$. The woodland is impoverished and considered to be of low value. As described in Section 3, the woodland has a varied topography with areas of peat in between hillocks of mineral soil rising c. 2 m from the adjacent topography. The main potential amorphous peat receptor area corresponds with the low-lying clear-felled areas within the woodland (shown in white on Drawing 2 and covering 3,837 $m^2$). Fibrous peat can be placed on top of the entire Southern Woodland area, including to cap amorphous peat. The area can be extended north-westwards towards the Proposed Development; this potential additional reinstatement area is indicated with yellow hatching on Drawing 2 and covers approximately 4,155 $m^2$.

The sections of conifer and broadleaved woodland in the Northern Woodland shown on Drawing 2 cover approximately 18,442 $m^2$. These sections have a sparse understorey and ground layer and are considered to be of low value. As described in Section 3, the Northern Woodland has both peat and mineral soil/spoil at the surface, with the latter present below the alder plantation, the broadleaved plantation and at least part of the conifer plantation in between those two areas; this 8,984 $m^2$ area is referred to as the 'Northern Excavation Zone' on Drawing 2, because it represents an opportunity for providing fill to be used in the development, with the excavation subsequently available for placing amorphous peat into. Fibrous peat can be placed on top of the entire Northern Woodland area, including to cap amorphous peat. The area can be extended northwards; this potential additional reinstatement area is indicated with yellow hatching on Drawing 2 and covers approximately 11,028 $m^2$.

Potential peat reinstatement volumes have been calculated using the following assumptions:

- Mineral soil/spoil will be excavated from the 'Northern Excavation Zone' and the excavation used as an amorphous peat receptor area;

- Bunding/support structures will be required to produce cells for amorphous peat;
- Amorphous peat can be reinstated at average depths of 1.5 m and never exceeding 2 m; and
- Pseudo-fibrous peat can be reinstated at up to 1.5 m depth.

The estimated volumes of acrotelmic and catotelmic peat which can potentially be accommodated into the plantation are provided in Table 4:

*Table 4 – Estimated peat reinstatement capacities*

| Receptor Area | Area ($m^2$) | Peat Re-instatement Capacity ($m^3$) | |
|---|---|---|---|
| | | Pseudo-fibrous Peat | Amorphous Peat |
| Southern Woodland: | | | |
| Low-lying clear-felled area | 3,837 | 5,756 | 5,756 |
| Remaining conifer plantation | 8,605 | 12,906 | - |
| Additional reinstatement area | 4,155 | 6,233 | 6,233 |
| Northern Woodland: | | | |
| Northern Excavation Zone (mineral soil) | 8,984 | 13,476 | 13,476 |
| Remaining conifer plantation (peat) | 9,458 | 14,187 | - |
| Additional reinstatement area | 11,028 | 16,543 | 16,543 |
| **Totals** | **46,067** | **69,101** | **42,008** |

#### 4.1.3 Conclusion

Based on the volumes detailed in Tables 4 and 5, the capacity for peat to be reinstated to restore bog habitat in current or former plantation forestry exceeds the volumes of pseudo-fibrous and amorphous peat being generated.

# 5. Peat Management

## 5.1 General

It is essential that good practice measures are employed by the Contractor prior to, during and following the construction period. The following sections describe the minimum good practice measures that the Contractor must adopt in this respect, to ensure that peat deposits are appropriately handled, managed and re-used.

Before any works are carried out, a works plan will be produced that will divide donor and receptor areas into a range of cells to be worked sequentially. This plan will also include details on water table monitoring.

## 5.2 Excavation

The material to be excavated will comprise acrotelmic pseudo-fibrous peat, catotelmic pseudo-fibrous peat and amorphous peat. Peat layers will be kept separate. Low centre of gravity, low ground pressure, wide tracked machinery will be used in order to minimise the risk of compaction of the peat.

Where possible, the acrotelmic pseudo-fibrous peat will be excavated as peat turves. These will be intact blocks of upper peat, comprising the surface vegetation layer (acrotelm), where present, and adjoining pseudo-fibrous catotelm.

The following methodologies for excavation of peat will be employed:

- Excavation will be done sequentially, working from northeast to southwest. Excavation will be done in separate 'cells' which will match the capacity of cells in the receptor areas.
- Areas of peat within the footprint of any excavation will have the top layer of vegetation stripped off as turf prior to construction by an experienced specialist contractor. When excavating areas of peat, excavated turves should be as intact as possible. Often it is easiest to achieve this by removing large turves up to 500 mm in order to keep the peat intact.
- These turves will be stored adjacent to the construction area in a way that ensures they remain moist and viable (see temporary storage below). Excavated turves will be kept as intact as possible so as to minimise carbon losses.
- Excavated soils and turves will be handled so as to avoid cross contamination between distinct horizons and ensure reuse potential is maximised.
- Care will be taken when stripping and removing topsoil and peat turves and appropriate storage methods used on site, i.e. excavated material will be stored in separate horizons and vegetation rich top layers will be stored vegetation side up.
- Classification of excavated materials will depend on their identified re-use in reinstatement works. At this site the material to be excavated will comprise acrotelmic, catotelmic and amorphous peat.

## 5.3 Temporary Storage

Temporary storage of peat will be minimised as far as possible by transporting it to the receptor sites as soon as is practicable to help retain as much structural integrity within the peat as possible and to reduce the risk of drying.

However, because the excavated peat must be re-instated in the same layers as in the donor site, the acrotelmic peat will be excavated first and reinstated last, whereas the amorphous catotelm will be excavated last and reinstated first. This means that there will be a delay in moving the acrotelm into place.

Amorphous peat will not be stockpiled but will be installed straight after being excavated.

It is desirable to keep haul distances of excavated peat as short as possible and as close to intended re-use destinations to minimise plant movements in relation to any earthworks activity including peat management in order to minimise the potential impact on the peat structure. Excavated turves will therefore be temporarily stored within the part of the Southern Woodland that will be worked last. This will mean that they remain moist and viable.

Areas for temporary storage will also be located within the part of the Southern Woodland that will be worked last. Areas with largely extant vegetation will be avoided. The following general guidelines will apply:

- The design and location of stockpiles, including incorporated drainage elements, will be agreed with the Ecological Clerk of Works (ECoW) and Geotechnical Consultant / Geotechnical Clerk of Works prior to excavation works commencing.
- Temporary peat storage areas will be located such that erosion and run off is limited, leachate from the material is controlled, and stability of the existing peatland in the vicinity is not affected.
- Excavated material will be stockpiled at least 150 m away from the nearest watercourse. This will ensure that any wetting required on stored peat does not runoff and discharge into watercourses.
- Temporary peat storage will be in the wettest locations within the Southern Woodland and will therefore avoid hillocks.
- Transport of peat to temporary storage areas, restoration areas or designated spoil areas will be by low ground pressure vehicles to avoid excessive compaction of the peat.

## 5.4 Reinstatement

The two target woodland areas will have been felled by the time the peat management works commence. In the Northern Woodland, the area of mineral substrate indicated as the 'Northern Excavation Zone' on Drawing 2 will be excavated to an average depth of at least 1.5 m. The excavated soil will either be used as fill between the piles suspending the floor slab and peat left in situ beneath the building, or it will be taken off site.

Each area will be divided into a number of cells, which will be worked sequentially, starting from the northern-most section, which is furthest away from the excavation works.

Unless excavated with mineral soil, tree stumps will be left *in situ*. The peat will then be reinstated in the correct sequence, i.e. amorphous or lower catotelmic peat first, then pseudo-fibrous catotelmic peat and finally acrotelmic peat.

The amorphous peat will be moved straight from the excavation at the donor site cell to the receptor cell. However, because the acrotelmic peat will be excavated first and reinstated last, unlike the catotelmic or amorphous peats which will be excavated last and reinstated first, short-term temporary storage may be required.

Temporary storage areas will incorporate the following outline good practice:

- Peat will be stored in the Southern Woodland to prevent overburden induced failure. Slope analysis based on geotechnical characteristics derived from additional detailed ground investigation will be employed to assess failure potential and stand-off distances set appropriately; and
- Stored acrotelmic turves incorporating vegetation will be stored vegetation side up.

It is anticipated that acrotelmic peat will normally be stored for a few days, although around holidays it could be up to three weeks. As it will not need to be stored for three or more years, it will not require a permit under The Landfill (Scotland) Regulations 2003.

## 5.5 Timing

The available best practice guidance makes various recommendations regarding the preferred seasons in which peat management work should be undertaken, whether for ease of construction or the efficacy of restoration. In practice, these seasonal preferences often conflict. For example, restoration guidance generally indicates that peat turve cutting is best conducted in autumn or winter to minimise drying. However, most construction guidance suggests that major excavation activities should be conducted in drier months, typically during spring and summer.

This scheduling conflict can be difficult to resolve, but where it is genuinely impossible to undertake certain activities in the most appropriate season, the adoption of the good practice measures outlined in this PMP will be employed, notably concerning irrigation or acrotelmic turves in storage during dry weather.

# 6. Monitoring

Monitoring will be undertaken to identify any additional treatment works that might be required to restore the receptor areas to active peatland. Such treatments may include:

- Flattening of the re-instated surfaces to try and reduce the degree to which local surface drawdown in the summer will lead to local oxidative wastage of placed peat;
- Compacting the peat in places where there is a high degree of void spaces, if evident;
- Tapering of the peat masses at its edges;

- Re-seeding; and
- Temporarily fencing off of areas where peat has been re-used, to prevent grazing of young vegetation and enable heath/ bog vegetation to establish as necessary.

The implementation of these additional treatments and their timing will be subject to ongoing discussions between the Contractor, SEPA and THC, as necessary.

Monitoring will be carried out in years 1, 2, 3 and 5 post peat reinstatement after which the requirement for further monitoring will be reviewed. It will comprise a walkover survey to note vegetation recovery, as well as noting the cover of *Sphagnum* mosses and other peatland species, within 25 permanent plots spread across the receptor areas.

# 7. References


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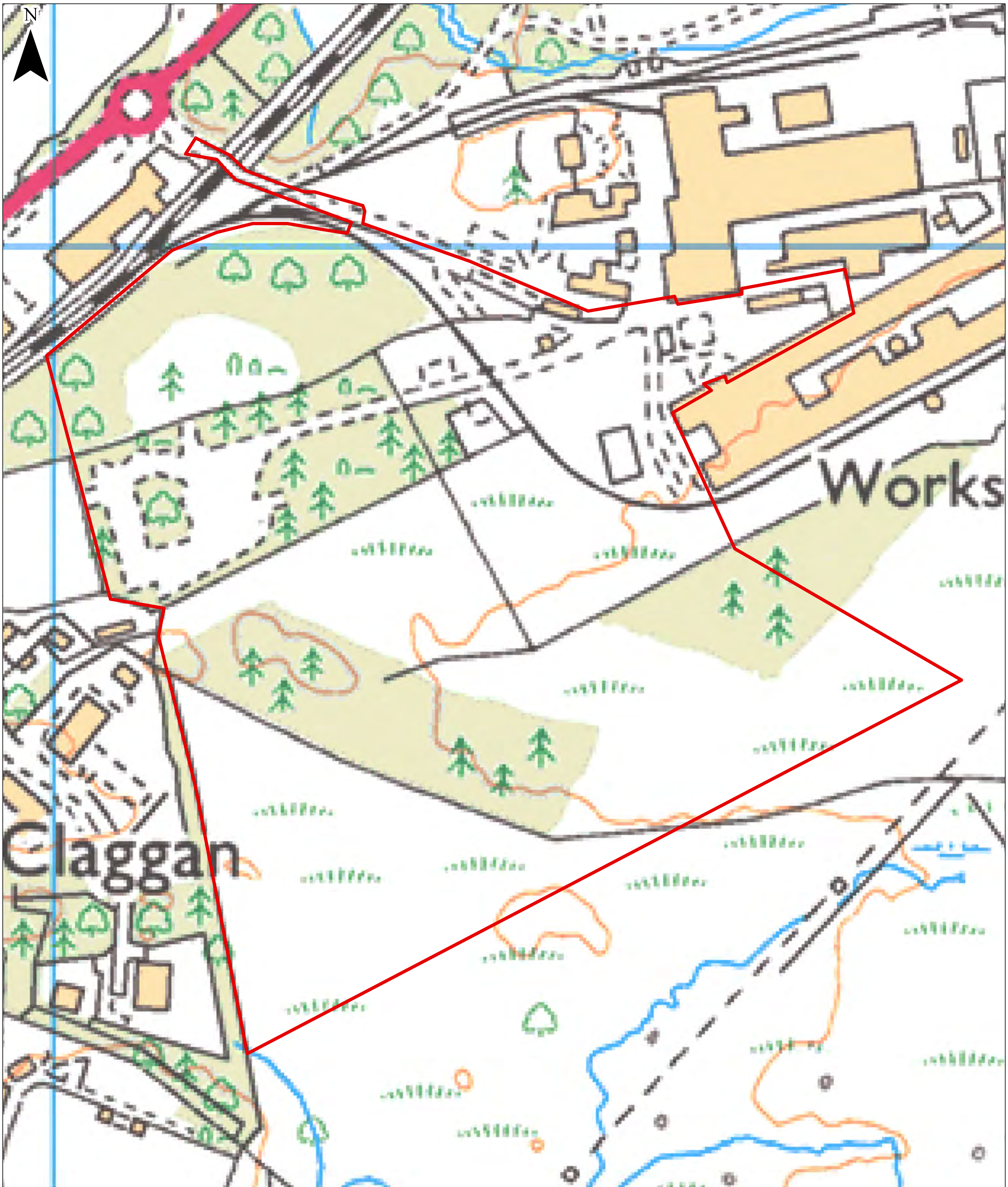
# 8. Drawings

## Drawing 1: Site location

## Drawing 2: Baseline features

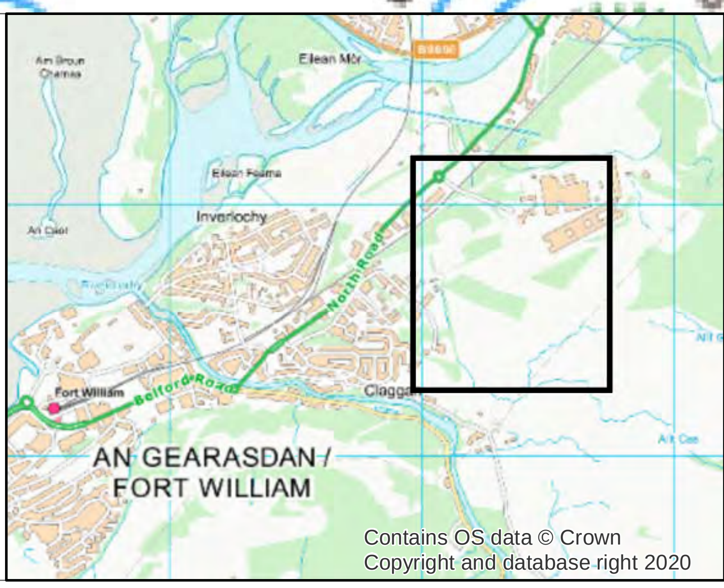
## Drawing 3: Pseudo-fibrous peat

## Drawing 4: Amorphous peat




**KEY:**

Site Boundary




0 0.05 0.1 0.15 km

Scale 1:3,000 @ A3

ALVANCE

ITPENERGISED

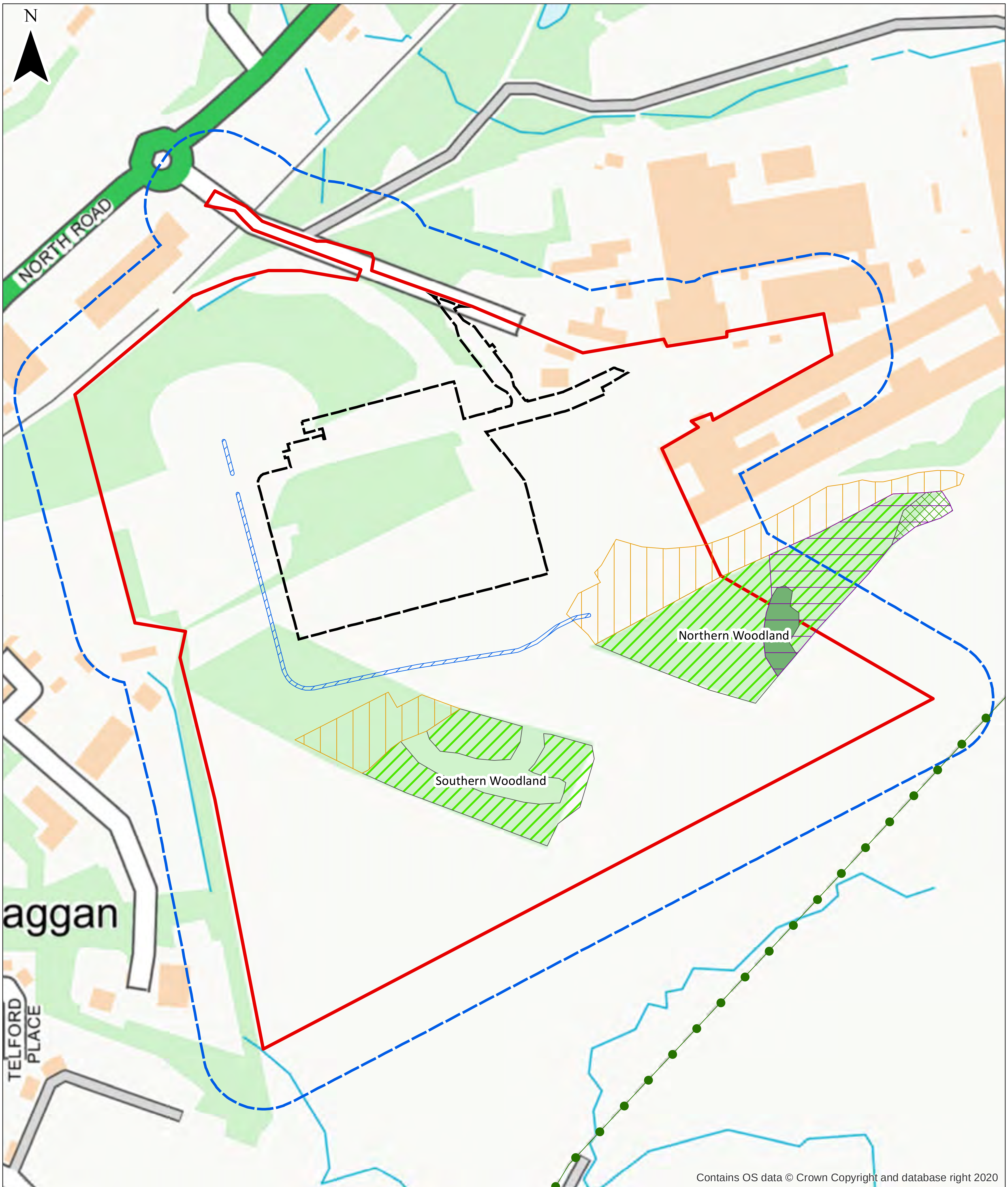
Alvance British Aluminium – Billet Facility
Peat Management Plan

**Drawing 1**

**Site Location**

| Date: 06/05/2021 | Drawn by: AG | Checked by: MF | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY:**

- Site Boundary
- Buffer (50m)
- Footprint of works
- Cut-off ditch
- Overhead line

**Woodland**

- Conifers
- Broad-leaved plantation
- Alder
- Northern Excavation Zone
- Additional Reinstatement Areas

0 0.05 0.1 0.15 km

Scale 1:3,200 @ A3

ALVANCE

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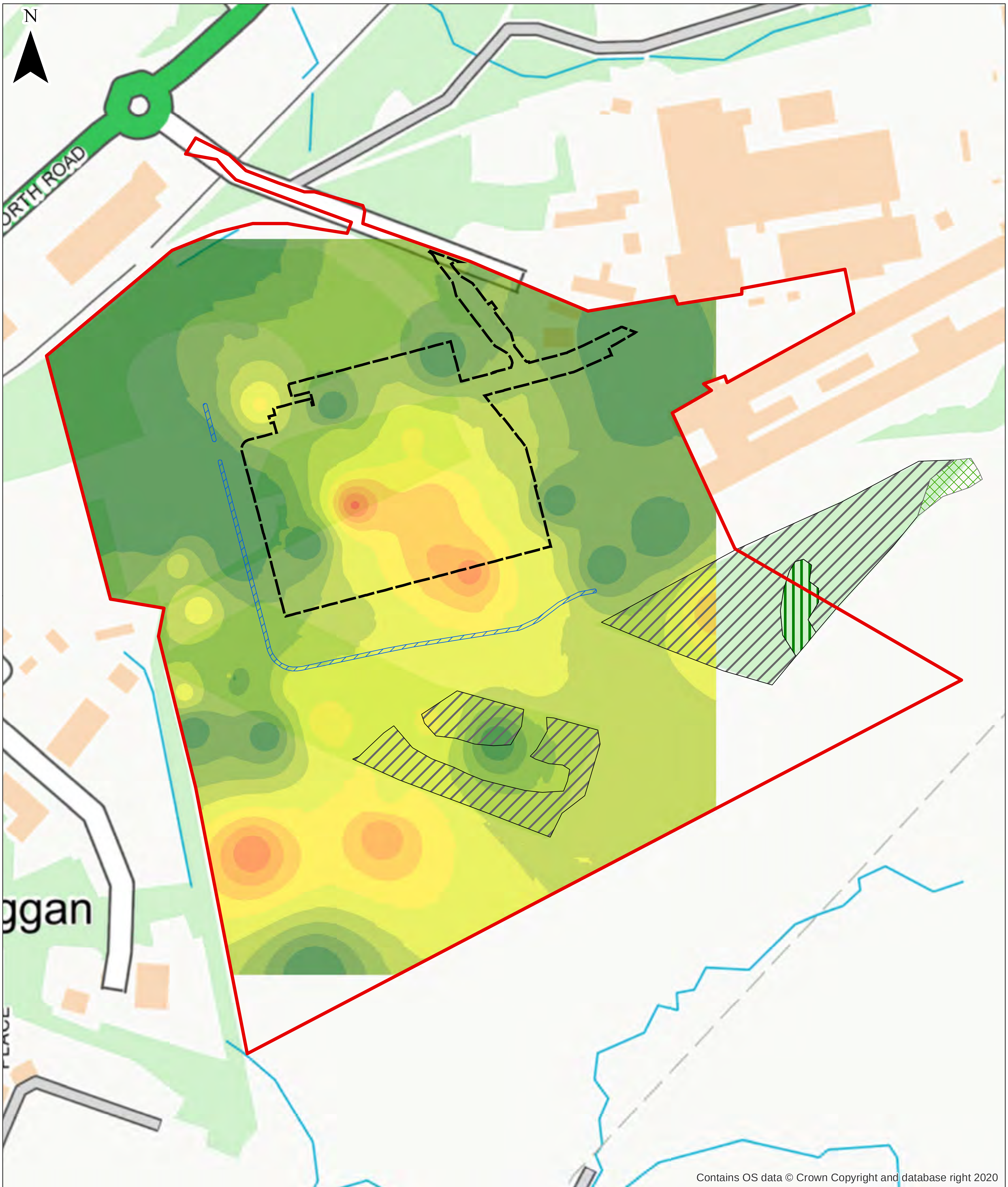
Alvance British Aluminium – Billet Facility
Peat Management Plan

**Drawing 2**

**Baseline Features**

| Date: | Drawn by: | Checked by: | Version: |
|---|---|---|---|
| 06/05/2021 | AG | MF | V1 |

Project Number: 3539




**KEY:**

- Footprint of works
- Cut-off ditch
- Wider development boundary

**Woodland**

- Conifers
- Broad-leaved plantation
- Alder

**Pseudo-fibrous peat Depth (m)**

- 0 - 0.25
- 0.26 - 0.5
- 0.51 - 0.75
- 0.76 - 1
- 1.01 - 1.25
- 1.26 - 1.5
- 1.51 - 1.75
- 1.76 - 2
- 2.1 - 2.25
- 2.26 - 2.5

0 0.05 0.1 0.15 km

Scale 1:3,000 @ A3

ALVANCE

ITPENERGISED

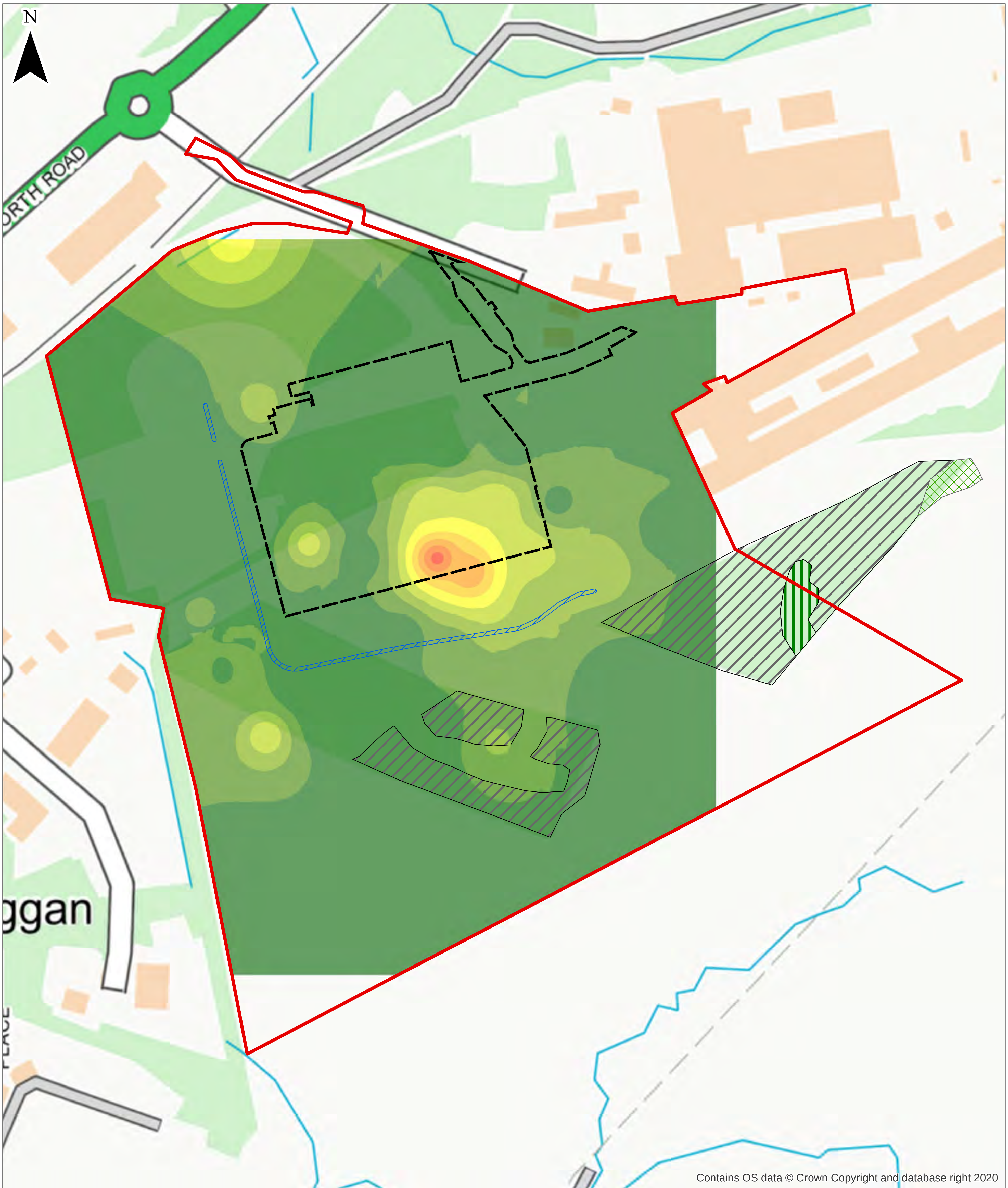
Alvance British Aluminium – Billet Facility
Peat Management Plan

**Drawing 3**

**Pseudo-fibrous Peat Map**

| Date: 06/05/2021 | Drawn by: AG | Checked by: MF | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY:**

Footprint of works

Cut-off ditch

Wider development boundary

**Woodland**

Conifers

Broad-leaved plantation

Alder

**Amorphous Peat**

**Peat depth (m)**

0 - 0.5

0.51 - 1

1.01 - 1.5

1.51 - 2

2.01 - 2.5

2.51 - 3

3.01 - 3.5

3.51 - 4

4.01 - 4.5

0 0.05 0.1 0.15 km

**Scale 1:3,000 @ A3**

ALVANCE ITPENERGISED

Alvance British Aluminium – Billet Facility
Peat Management Plan

**Drawing 4**

**Amorphous Peat Map**

Date: 06/05/2021 | Drawn by: AG | Checked by: MF | Version: V1

Project Number: 3539

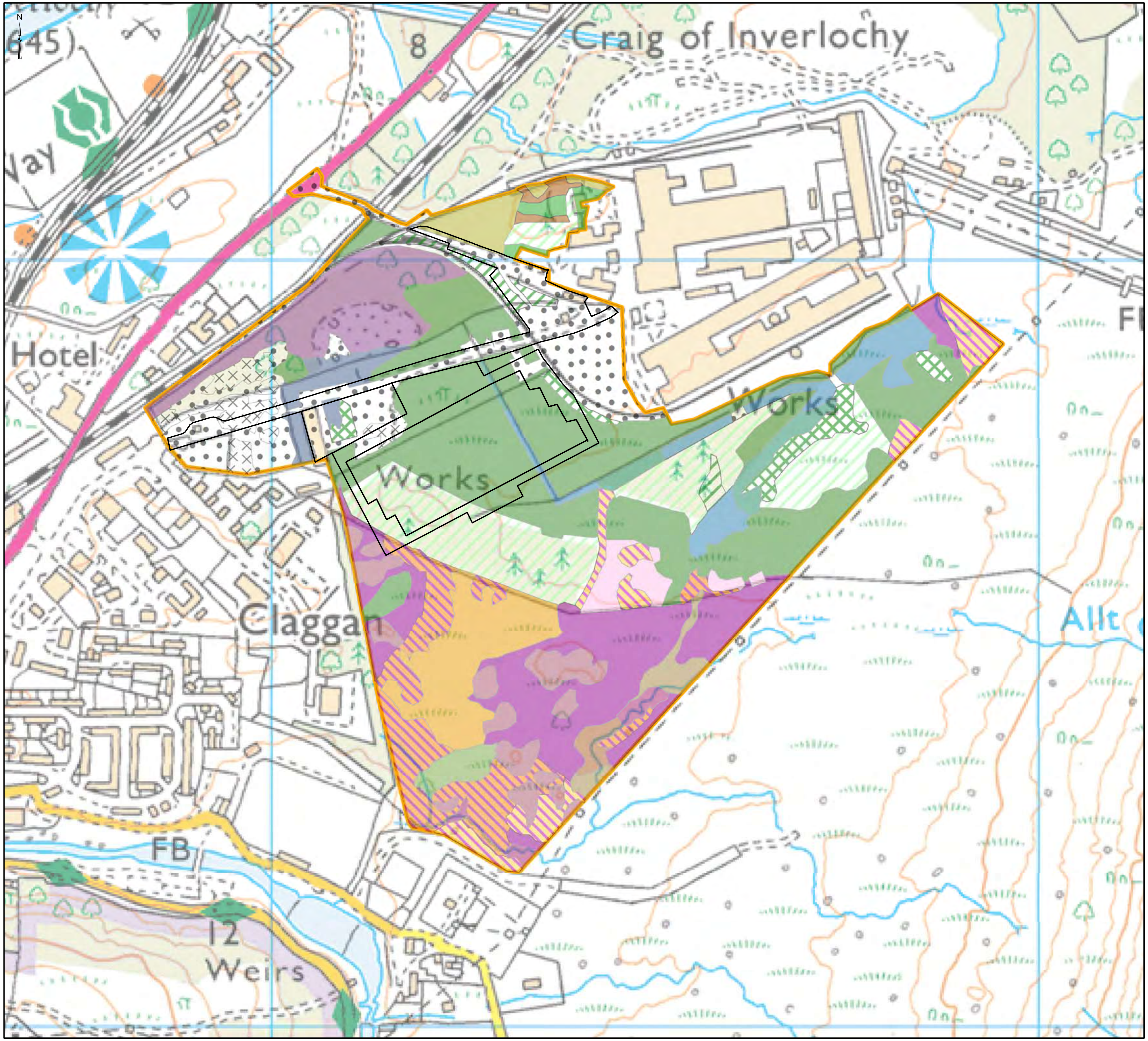
# 9. Annexes

## Annex A: NVC survey

## Annex C: Base of peat elevations

## Annex D: Thickness of peat

## Annex E: Borehole locations




LEGEND

- Development footprint
- Bare ground
- Broadleaf plantation forest
- Coniferous plantation forest
- Disturbed ground
- H10a
- H12a
- M15b
- M17a
- M17a:M25
- M17a:MG10a
- M23b
- M25
- M25:M23b
- MG10a
- MG10a:M25
- MG9b
- U20c
- W23
- W4b
- W4c
- W4c with M17a
- W6d
- W7c
- Study area

REFERENCE

COORDINATE SYSTEM: BRITISH NATIONAL GRID

0.2 0.1 0 0.2

Kilometres

1:5,000

CLIENT

LIBERTY LOCHABER ALUMINIUM LTD.

PROJECT

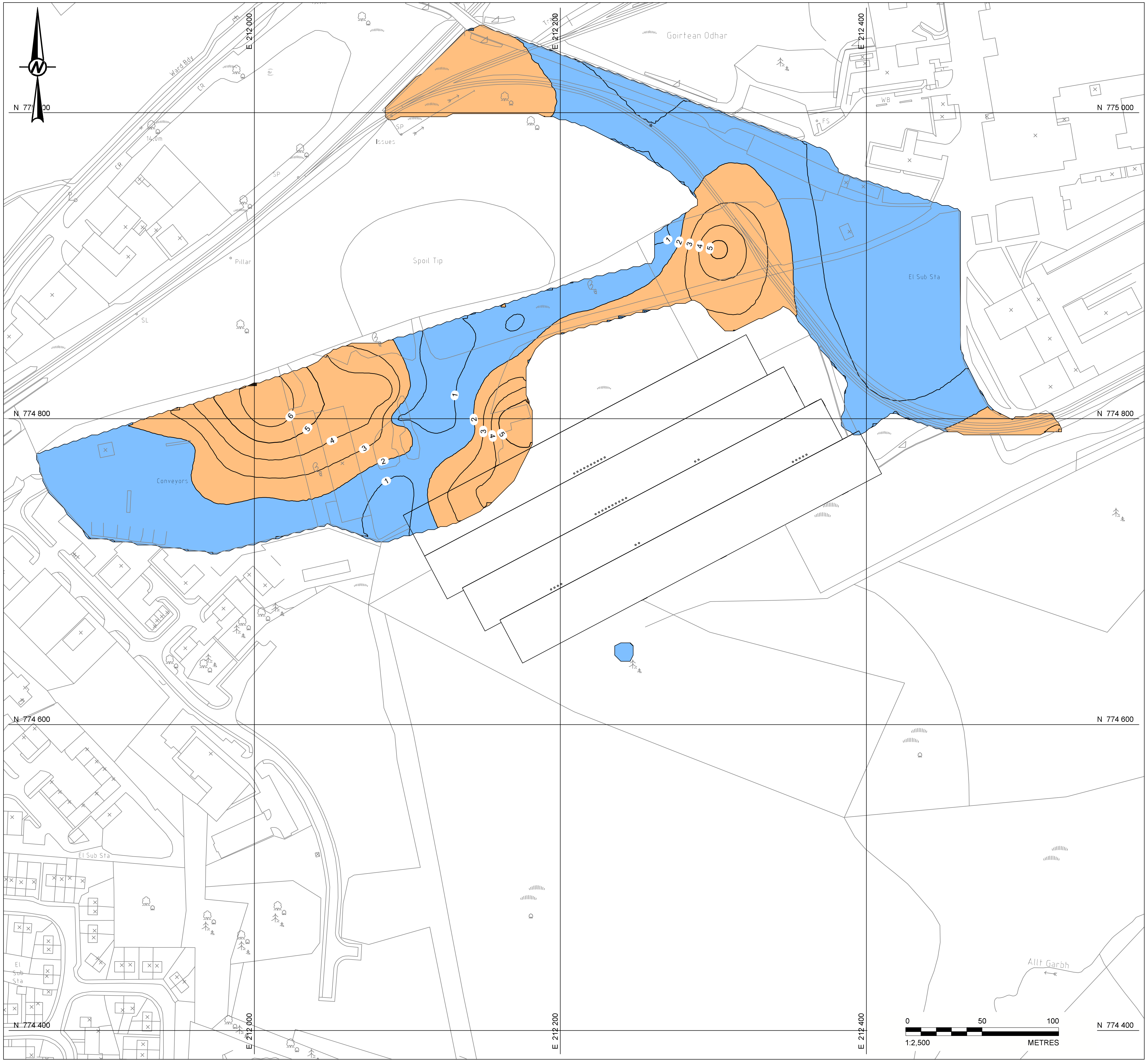
ALLOY WHEEL FACILITY

TITLE

**NATIONAL VEGETATION CLASSIFICATION (NVC)**

| CONSULTANT | | |
|---|---|---|
| Alba Ecology Ltd | YYYY-MM-DD | 2017 OCT 26 |
| | PREPARED | KM |
| | DESIGN | #### |
| | REVIEW | #### |
| | APPROVED | #### |

| PROJECT No. | CONTROL | REV | DRAWING |
|---|---|---|---|
| 1781889 | 505-EIA-017 | B.O | 12.3 |




**LEGEND**

| | |
|---|---|
| Blue | MADE GROUND THICKNESS < 2 m |
| Orange | MADE GROUND THICKNESS > 2 m |

CLIENT
LIBERTY ALUMINIUM LOCHABER LIMITED

PROJECT
GEOTECHNICAL INVESTIGATION

TITLE
**MADE GROUND THICKNESS**

CONSULTANT
GOLDER

| | |
|---|---|
| YYYY-MM-DD | 2019-09-24 |
| DESIGNED | JL |
| PREPARED | TS |
| REVIEWED | AC |
| APPROVED | JL |

| PROJECT NO. | CONTROL | REV. | DRAWING |
|---|---|---|---|
| 1898306 | 1003-GI-0008 | A | 7 |


CLIENT
LIBERTY ALUMINIUM LOCHABER LIMITED

PROJECT
GEOTECHNICAL INVESTIGATION

TITLE
**BASE OF PEAT ELEVATIONS**

CONSULTANT

GOLDER

| | |
|---|---|
| YYYY-MM-DD | 2019-07-22 |
| DESIGNED | JL |
| PREPARED | TS |
| REVIEWED | AC |
| APPROVED | JL |

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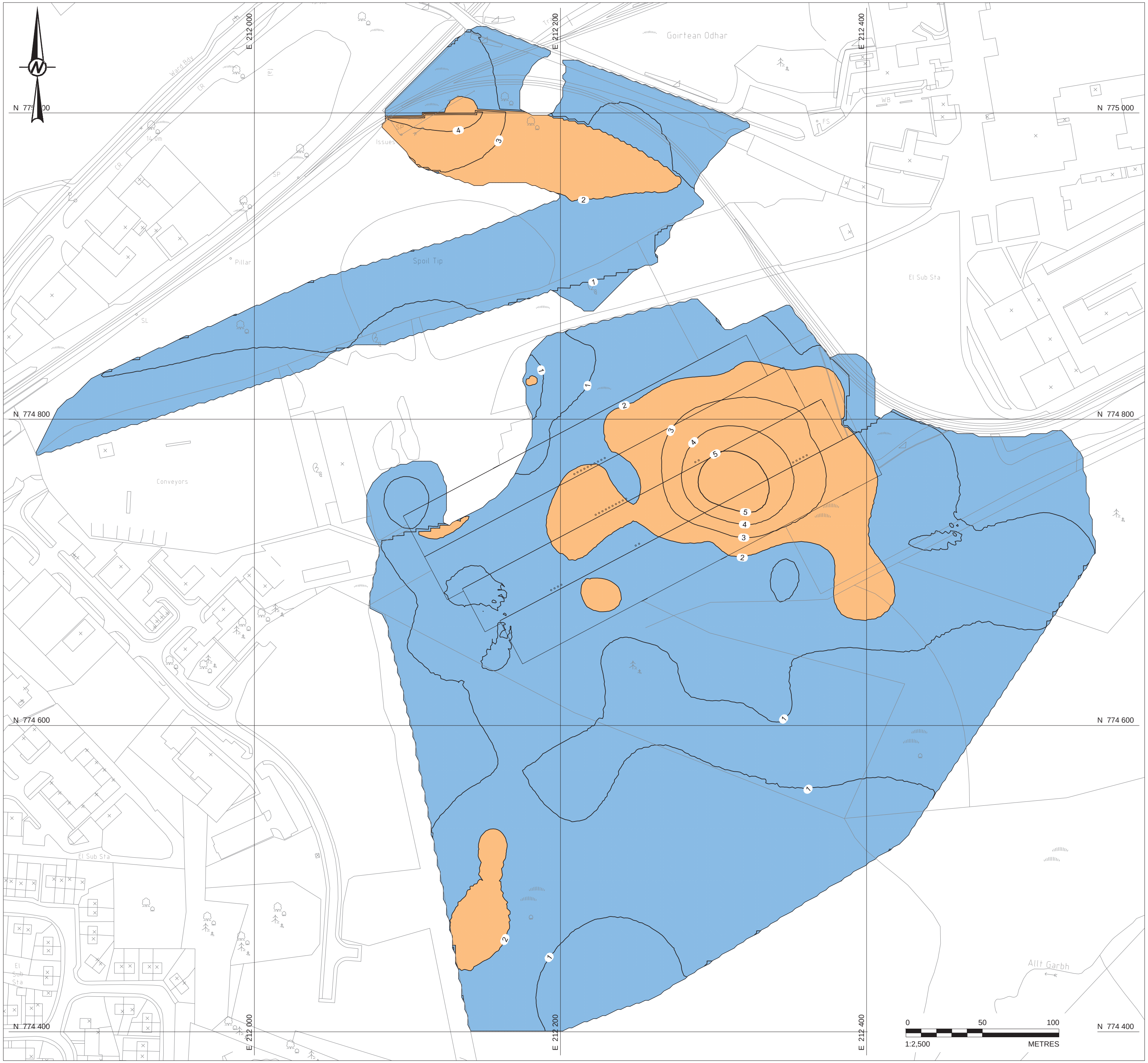
| 1898306 | 1003-GI-0003 | A | 3 |




**LEGEND**

| | |
|---|---|
| (blue) | PEAT THICKNESS < 2 m |
| (orange) | PEAT THICKNESS > 2 m |

CLIENT
LIBERTY ALUMINIUM LOCHABER LIMITED

PROJECT
GEOTECHNICAL INVESTIGATION

TITLE
**PEAT THICKNESS**

CONSULTANT

GOLDER

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| YYYY-MM-DD | 2019-07-22 |
| DESIGNED | JL |
| PREPARED | TS |
| REVIEWED | AC |
| APPROVED | JL |

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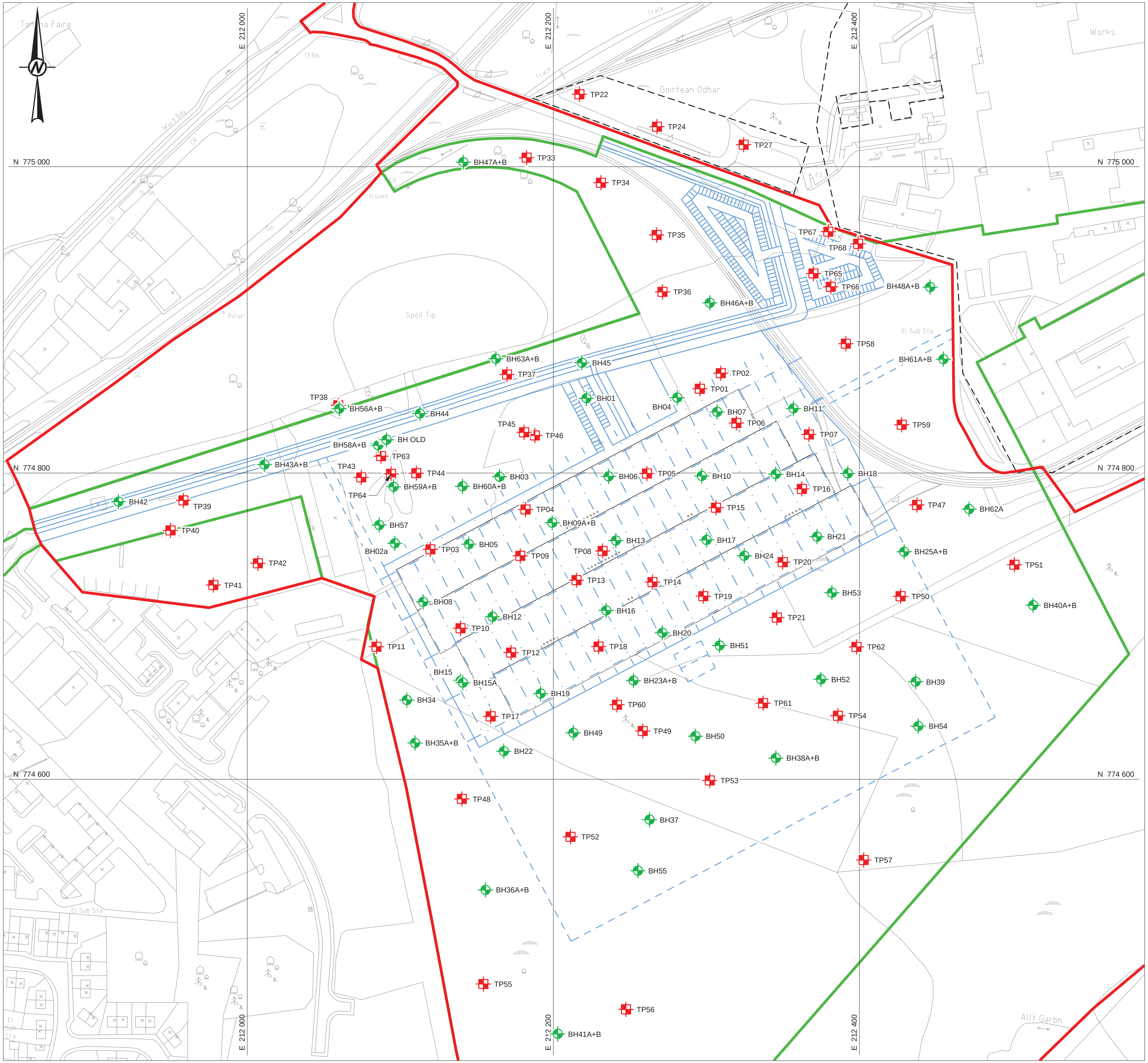


LEGEND

- PROPOSAL OF APPLICATION NOTICE BOUNDARY
- PLANNING APPLICATION BOUNDARY
- POTENTIAL ALLOY WHEEL PLANT LOCATION
- LOCATION OF POTENTIAL FUTURE DEVELOPMENT
- AS BUILT TRIAL PITS
- AS BUILT BOREHOLES

CLIENT
LIBERTY ALUMINIUM LOCHABER LIMITED

PROJECT
GEOTECHNICAL INVESTIGATION

TITLE
**BOREHOLE AND TRIAL PIT LOCATIONS**

CONSULTANT
GOLDER

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| YYYY-MM-DD | 2019-09-23 |
| DESIGNED | JL |
| PREPARED | TS |
| REVIEWED | AC |
| APPROVED | JL |

| PROJECT NO. | CONTROL | REV. | DRAWING |
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# Appendix 9.1 Transport Assessment

**Proposed Recycling & Billet Casting Plant, Lochaber Smelter, Fort William**
Reference number GB01T21A09/110405

**12/05/2021**

# TRANSPORT ASSESSMENT

# PROPOSED RECYCLING & BILLET CASTING PLANT, LOCHABER SMELTER, FORT WILLIAM

TRANSPORT ASSESSMENT

| IDENTIFICATION TABLE | |
|---|---|
| **Client/Project owner** | ITPEnergised / Alvance Aluminium Group |
| **Project** | Proposed Recycling & Billet Casting Plant, Lochaber Smelter, Fort William |
| **Study** | Transport Assessment |
| **Type of document** | Final Report |
| **Date** | 12/05/2021 |
| **Reference number** | GB01T21A09/110405 |
| **Number of pages** | 63 |

**APPROVAL**

| Version | Name | | Position | Date | Modifications |
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| 1 | Author | C Hunt | Senior Engineer | 26/02/2021 | Draft Report |
| | Checked | A DeVenny | Projects Director | 26/02/2021 | |
| | Approved | A DeVenny | Projects Director | 26/02/2021 | |
| 2 | Author | C Hunt | Senior Engineer | 08/04/2021 | Final Report |
| | Checked | A DeVenny | Projects Director | 08/04/2021 | |
| | Approved | A DeVenny | Projects Director | 08/04/2021 | |
| 3 | Author | C Hunt | Senior Engineer | 13/04/2021 | Minor Updates |
| | Checked | A DeVenny | Projects Director | 13/04/2021 | |
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| | Checked | A DeVenny | Projects Director | 12/05/2021 | |
| | Approved | A DeVenny | Projects Director | 12/05/2021 | |

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# 1. INTRODUCTION

## 1.1 General

1.1.1 SYSTRA (UK) Ltd. (Systra) has been commissioned by ITPEnergised on behalf of Alvance Aluminium Group (Alvance) to undertake a Transport Assessment (TA) in support of a planning application to develop a Recycling & Billet Casting Plant at the site of the existing Lochaber Aluminium Smelter situated adjacent to the A82(T) trunk road north of Fort William.

1.1.2 The proposed development will comprise construction of a new building to house the manufacturing of aluminium billet, associated car parking, access and landscaping. The new Recycling & Billet Casting Plant will have a gross floor area (GFA) of approximately 10,000m$^2$ and will use a combination of aluminium from the existing Lochaber Smelter and imported scrap aluminium in order to produce a billet product for export.

1.1.3 The general location of the site in Fort William is illustrated by **Figure 1.1** below.

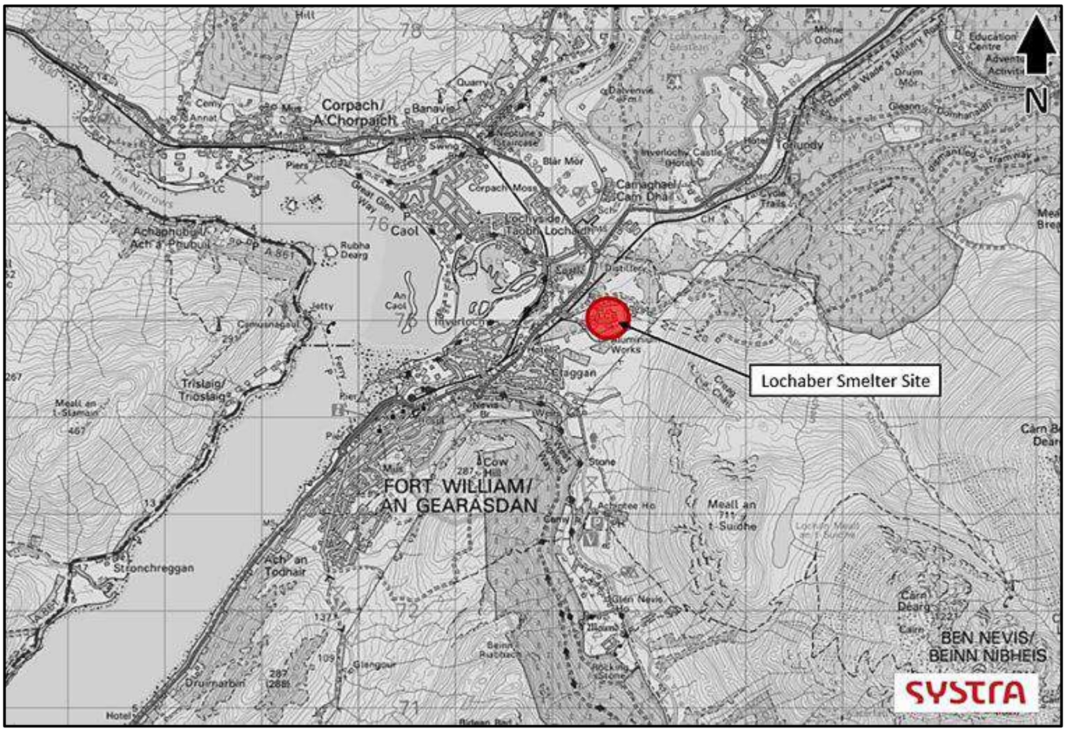


**Figure 1.1: General Site Location**
*Source: ArcGIS; SYSTRA*

1.1.4 The site is well connected to the A82 to the north of the site. The Glasgow to Fort William Railway line also runs parallel with the A82. The principal railway line and maintenance line for the facility branch off from this main line, bringing goods in and out of the heart of the site.

## 1.2 Background

1.2.1 Lochaber Smelter is a hydro-powered aluminium smelter which produces around 40,000 tonnes of aluminium annually and employs around 175 staff, specifically trained for the various operations within the plant. Lochaber Smelter is one of the key employers in Fort William. The Smelter lies on the outskirts of the town centre and is accessed directly from the A82 trunk road. The Smelter has been part of the Fort William Landscape for generations and now under new ownership, plans are being brought forward to expand and enhance the facility.

## 1.3 Planning History

1.3.1 Planning consent was granted in 2018 (subject to Matters Specified in Conditions) to develop an alloy wheel plant facility as an expansion to the smelter facility. However, due to recent changes in demand for aluminium products, as well as a reduced demand across the UK car industry, it is now proposed to bring forward a Recycling & Billet Casting Plant at the site instead. The principle of the proposed development and the AWP are very similar in that they seek to utilise the metal handled at the smelter to manufacture a new product.

1.3.2 The site is located within an area covered by the Highland Wide Local Development Plan (HwLDP), April 2012 and West Highland & Islands Local Development Plan (WestPlan), September 2019. The site is located within the Settlement Development Area of Fort William within the HwLDP (Policy 34), with a small proportion of the site extending into the wider countryside (Policy 36). Within WestPlan, the site is allocated as B6: Glen Nevis Business Park which is identified for business and industrial use, including waste management facilities.

1.3.3 WestPlan allocates the development site within the western edge of business allocations FW26 Aluminium Smelter and Adjoining Land and FW21 Glen Nevis Business Park. Residual areas of the development lie out-with any other WestPlan adopted site allocations but generally lie within the Settlement Area Boundary of Fort William.

## 1.4 Purpose of the Report

1.4.1 The principal purpose of this TA is to examine the current and future transport matters associated with the proposed development site. The report considers all travel modes including pedestrians, cyclists and public transport users as well as vehicular access requirements and parking.

1.4.2 It is fundamental to set out how the proposed development is likely to be accessed, and to determine if the existing transport infrastructure is suitable to accommodate the needs of the new development (taking into account any current transport issues that are observed at the site). The measures being introduced to support the new development are outlined and where challenges are identified, mitigation measures are detailed.

1.4.3 The TA has been undertaken in line with national and local planning policy, as well as scoping discussions with THC. Transport Scotland has also been afforded an opportunity to comment on the scope of the TA given that the development is located in proximity to the trunk road network and access is taken directly from the A82(T). No comments were provided by Transport Scotland in relation to the submitted scoping study.

## 1.5 Vehicular Traffic Impact

1.5.1 In order to provide an analysis of vehicular traffic impact associated with the proposed development, the baseline traffic conditions have been examined using a micro-simulation model in S-Paramics. The model has been created using an existing microsimulation model of the A82(T) corridor through Fort William, which has been updated using survey data collected in September 2017 (and factored to a design year of 2023). Development related traffic has been added to the model, and analysis of traffic conditions for the development's anticipated opening year of 2023 undertaken.

## 1.6 Report Structure

1.6.1 Following this introductory chapter, the structure of the TA is as follows:

- Chapter 2 - Transport Policy Context;
- Chapter 3 - Existing Site Accessibility;
- Chapter 4 - Proposed Development
- Chapter 5 - Development Trip Generation
- Chapter 6 - Traffic Impact Assessment;
- Chapter 7 - Measures to Support the Development;
- Chapter 8 - Framework Construction Traffic Management Plan; and
- Chapter 9 - Summary & Conclusion.

# 2. TRANSPORT POLICY CONTEXT

## 2.1 General

2.1.1 This section of the report provides an overview of national, regional and local transport policies which are relevant to the site and will influence the development.

## 2.2 Policy & Guidance

2.2.1 The TA has been undertaken in accordance with the following policy and guidance:

- Transport Scotland's, 'Transport Assessment Guidance' (TAG);
- Scottish Planning Policy (SPP);
- Planning Advice Note (PAN) 75, 'Planning for Transport';
- Climate Change (Scotland) Act, 2009;
- Scottish National Transport Strategy (NTS), 2016;
- West Highland & Islands Local Development Plan (WestPlan) – September 2019;
- The Highland Council Road and Transport Guidelines for New Developments 2013;
- The Highland Council Guidance on the Preparation of Transport Assessments 2014; and
- The Highland Council Active Travel Masterplan 2019.

## 2.3 National Policy Context

2.3.1 National Planning Policy Context for the proposed development is largely defined by:

- Scottish Planning Policy (SPP); and
- Scottish Planning Advice Note 75 (PAN75) 'Planning for Transport'.

**Planning Advice Note 75 (PAN75)**

2.3.2 PAN75 identifies the need for the integration of land use planning with transport, taking into account policies on economic growth, health and the objective of a fairer, more inclusive society. It identifies the following guidance in relation to the redevelopment of existing sites:

- All new and re-development proposals should be designed for safety and the convenience of all users. Good design and layout of a development can significantly improve the ease of access by non-car modes;
- Entrances to be as close as possible to pedestrian routes and bus stops; and
- Links to cycle networks, with secure parking near the main entrance.

2.3.3 PAN 75 also provides guidance on accessibility thresholds and walking distances from future development sites as follows:

- Walking distances to bus stops from new developments should be no greater than 400 metres; and,
- The maximum acceptable walking distance to local facilities is 1,600m.

### Scottish Planning Policy (SPP)

2.3.4 The purpose of the SPP is to provide policy on land use planning and the associated planning process. This document highlights a range of considerations from a transport perspective and is heavily focused towards providing sustainable developments. Indeed, one of the guiding principles of SPP is that it 'introduces a presumption in favour of development contributes to sustainable development'.

2.3.5 There are number of key criteria and elements of SPP that a development should seek to satisfy. These are summarised as follows:

- ***Paragraph 15*** *– Locating the development in the right place can provide opportunities for people to make sustainable choices, improve quality of life and delivering high quality infrastructure and a choice of how to access amenities and services;*
- ***Paragraph 23*** *– Align development more closely with transport to improve sustainability and connectivity. This is in relation to 'Planning Outcome 4' of SPP to provide a more connected place supporting better transport (and digital) connectivity;*
- ***Paragraph 29*** *– Planning policies and decisions should be guided by a number of principles including supporting delivery of accessible housing, business, retailing and leisure development and, support delivery of infrastructure for example transport;*
- ***Paragraph 46*** *– Developments should be easy to move around and beyond by considering the needs of people before the movement of motor vehicles. This could include higher densities and mix of uses that enhances accessibility by reducing reliance on private cars, prioritising sustainable and active travel choices such as walking, cycling and public transport. This would include paths and routes with direct connections and well connected to the wider area beyond the site boundary. This could include infrastructure and facilities that link different modes of travel;*
- ***Paragraph 270*** *– The planning system should support patterns of development that optimises the use of existing infrastructure, reduces the need to travel, provides safe and convenient opportunities for walking and cycling and facilitates travel by public transport and enables the integration of transport modes;*
- ***Paragraph 273*** *– Promote development which maximises the extent to which travel demands are met first from walking, cycling, public transport and finally car. Plans should facilitate integration between transport modes;*
- ***Paragraph 279*** *– Significant travel generation developments should be sited at locations which are well served by public transport and supported by measures to promote the availability of high quality public transport services, that provide access to a range of destination;*
- ***Paragraph 281*** *– When an area is well served by sustainable transport modes, planning authorities may set more restrictive parking standards; and*
- ***Paragraph 287*** *– Planning permission should not be granted for significant travel generating developments where direct links to local facilities on foot and bicycle is not available, public transport networks would involve walking more than 400m and the Transport Assessment does not identify satisfactory measures to meet sustainable transport requirements.*

2.3.6 On review of the above criteria, SYSTRA concludes that the development is advantageously placed to benefit from a range of existing sustainable transport infrastructure local to the development site. Furthermore, the location of the site within the SDO allows the development to be brought forward in compliance with a significant number of the above criteria, whilst not contravening any objectives.

2.3.7 The key site benefits with regards to SPP includes the wide availability of existing sustainable transport infrastructure in the direct vicinity of the site; the good availability of public transport services which will lead to a higher propensity to travel by means other than the private car; and the ease of which the development can be accessed and navigated by pedestrians and cyclists.

**Transport Assessment Guidance (TAG), 2012**

2.3.1 TAG sets out the approach that should be taken for the preparation of Transport Statements and TA's. The guidelines detail the importance of establishing the existing transport infrastructure and travel characteristics as well as the development proposal itself and the measures which will be included to improve infrastructure and services to encourage sustainable travel to the site.

2.3.2 The accessibility of the site will be measured through calculating the travel time by each mode of access in a hierarchy of sustainability, with walking and cycling at the top. TAG considers the following journey times as acceptable for each mode:

- Walking: 20 – 30 minutes;
- Cycling: 30 – 40 minutes; and
- Public transport: generally a 30 minute door to door travel time (including walk, wait, journey and walk to destination).

**Climate Change (Scotland) Act 2009**

2.3.3 The Climate Change (Scotland) Act 2009 places duties on public bodies relating to climate change and states:

> *"The duties require that a public body must, in exercising its functions, act in the way best calculated to contribute to the delivery of emission reduction targets, in the way best calculated to help deliver any statutory climate change adaptation programme, and in a way that it considers is most sustainable."*

2.3.4 A key objective of the Climate Change (Scotland) Act 2009 is to reduce Scotland's greenhouse gas emissions by at least 80% by 2050. The Act is the centrepiece of Scotland's Climate Change Framework which sets the strategic direction for Scottish Government actions in support of the transition of Scotland into a sustainable low carbon economy.

2.3.5 While the act does not directly influence the site itself, it does influence local policy decisions that are made and future policies. As an example, future spatial planning policies may impact on greenhouse gas emissions associated with waste, transport and energy to a particular local area, and ultimately these decisions may impact on how services could be delivered to the site.

**Scottish National Transport Strategy (NTS) 2006**

2.3.6 In its introductory paragraph, the NTS states:

> *"We want Scotland to be a strong, healthy and just society and to have an environment which provides conditions for the improving health and well-being of people in Scotland. We want Scotland to reduce its global environmental and climate impact through sustainable development."*

2.3.7 Produced against a background of promoting economic development, social inclusion and safety as well as transport integration, the NTS also recognises the cost to and challenges that face our environment. In an attempt to break the link between economic growth, increased traffic and increased emissions, the NTS has set out a series of measures and objectives that the government intends to implement across Scotland. Among these measures are 'Smart Measures'.

2.3.8 The Scottish Government has described Smart Measures as a combination of infrastructure measures that favour active travel and public transport use along with behaviour change campaigns that promote the benefits of more active and sustainable travel.

2.3.9 Every year, high levels of traffic congestion costs the local economy in terms of delays, reduced reliability and increased fuel costs. In his Review published in 2007, Sir Nicholas Stern concluded that to achieve vital atmospheric stabilisation, 'deep emissions cuts will be required in the transport sector'.

2.3.10 The five 'high level' objectives of the plan are:

- Promote economic growth by building, enhancing managing and maintaining transport services, infrastructure and networks to maximise their efficiency;
- Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network;
- Protect our environment and improve health by building and investing in public transport and other types of efficient and sustainable transport which minimise emissions and consumption of resources and energy;
- Improve safety of journeys by reducing accidents and enhancing the personal safety of pedestrians, drivers, passengers and staff; and
- Improve integration by making journey planning and ticketing easier and working to ensure smooth connection between different forms of transport.

2.3.11 The three 'key strategic' outcomes are:

- Improved journey times and connections, to tackle congestion and lack of integration and connections in transport;
- Reduced emissions, to tackle climate change, air quality, health improvement; and
- Improved quality, accessibility and affordability, to give choice of public transport, better quality services and value for money, or alternative to car.

## 2.4 Regional Policy Context

2.4.1 The Regional Planning Policy Context for the proposed development is defined by the following policy documents and discussed in turn below:

- The Highlands and Islands Transport Partnership (HITRANS), adopted 2008; and
- HITRANS Regional Transport Strategy Refresh Main Issues Report, published April 2016.

2.4.2 The HITRANS Regional Transport Strategy (RTS) was adopted in 2008 by Scottish Ministers. The primary objective of this Strategy is to improve the interconnectivity of the whole region to strategic services and destinations in order to enable the region to compete and support growth.

2.4.3 One of the priorities for investment in and around Fort William is to improve the Western Strategic Corridor that is the A82(T) connecting Loch Lomond and Fort William.

## 2.5 Local Policy Context

2.5.1 The Local Planning Policy Context for the proposed development is defined by the following policy documents and is discussed in turn below:

- The Highland-wide Local Development Plan, adopted 2012 (HwLDP)
- West Highland and Islands Local Plan, adopted September 2019 (WestPlan)

2.5.2 The Highland-wide Local Development Plan (HwLDP), adopted April 2012 covers the area, alongside The West Highlands and Islands Local Plan (WestPlan), adopted September 2010, as continued in force as of April 2012.

2.5.3 The following HwLDP policies that are most relevant to the transportation matters in this proposal are detailed below:

***Policy 28 Sustainable Design***

*2.5.4* *The Council will support developments which promote and enhance the social, economic and environmental wellbeing of the people of Highlands. Proposed developments will be assessed on the extent to which they:*

- *Are compatible with public service provision (water and sewerage, drainage, roads, schools, electricity);*
- *Are accessible by public transport, cycling and walking as well as car; and*
- *Maximise energy efficiency in terms of location, layout and design, including the utilisation of renewable sources of energy and heat.*

***Policy 56 Travel***

2.5.5 *"Development proposals that involve travel generation must include sufficient information with the application to enable the Council to consider any likely on- and off- site transport implications of the development and should:*

- *Be well served by the most sustainable modes of travel available in the locality from the outset, providing opportunity for modal shift from private car to more sustainable transport modes wherever possible, having regard to key travel desire lines;*
- *In particular the Council will seek to ensure that opportunities for encouraging walking and cycling are maximised;*
- *Be designed for the safety and convenience of all potential users;*
- *Incorporate appropriate mitigation on site and/or off site, provided through developer contributions where necessary, which might include improvements and enhancements to the walking/cycling network and public transport services, road improvements and new roads; and*
- *Incorporate an appropriate level of parking provision, having regard to the travel modes and services which will be available and key travel desire lines and to the maximum parking standards laid out in Scottish Planning Policy or those set by the Council.*

***Policy 77 Public Access***

2.5.6 *Where a proposal affects a route included in a Core Paths Plan or an access point to water, or significantly affects wider access rights, then The Council will require it to either:*

- *Retain the existing path or water access point while maintaining or enhancing its amenity value; or*
- *Ensure alternative access provision that is no less attractive, is safe and convenient for public use, and does not damage or disturb species or habitats.*

2.5.7 *For a proposal classified as a Major Development, the Council will require the developer to submit an Access Plan. This should show the existing public, non-motorised public access footpaths, bridleways and cycleways on the site, together with proposed public access provision, both during construction and after completion of the development (including links to existing path networks and to the surrounding area, and access point to water)."*

**West Highland & Islands Local Development Plan (WestPlan)**

2.5.8 Within this Plan part of the site is allocated as Proposal B6: Glen Nevis Business Park which is identified for business and industrial use, including waste management facilities. The site continues to be located within the Settlement Development Area (covered by HwLDP Policy 34: Settlement Development Areas).

**West Highlands and Islands Local Development Plan (WestPlan)**

2.5.9 WestPlan was formally adopted on 30th September 2019 following approval by Scottish Ministers. The purpose of the plan is to set out how the highlands and islands area should develop over the 10-year period following its inception. This Plan seeks to deliver key outcomes for safeguarding and enhancing communities, employment, connectivity and transport, plus environment and heritage.

2.5.10 The plan strongly supports the principle of development with emphasis on placemaking priorities in Fort William. The priorities focus on expanding existing businesses, attracting and retaining a skilled workforce, improving services and providing ample housing options. The plan allocates the vast majority of the development site and the wider aluminium smelter area for a combination of industrial and business uses.

2.5.11 As indicated by **Figure 2.1** the development site is allocated for industry; FW26 Aluminium Smelter and Adjoining Land and part of the site is also zoned for business; FW21 Glen Nevis Business Park.

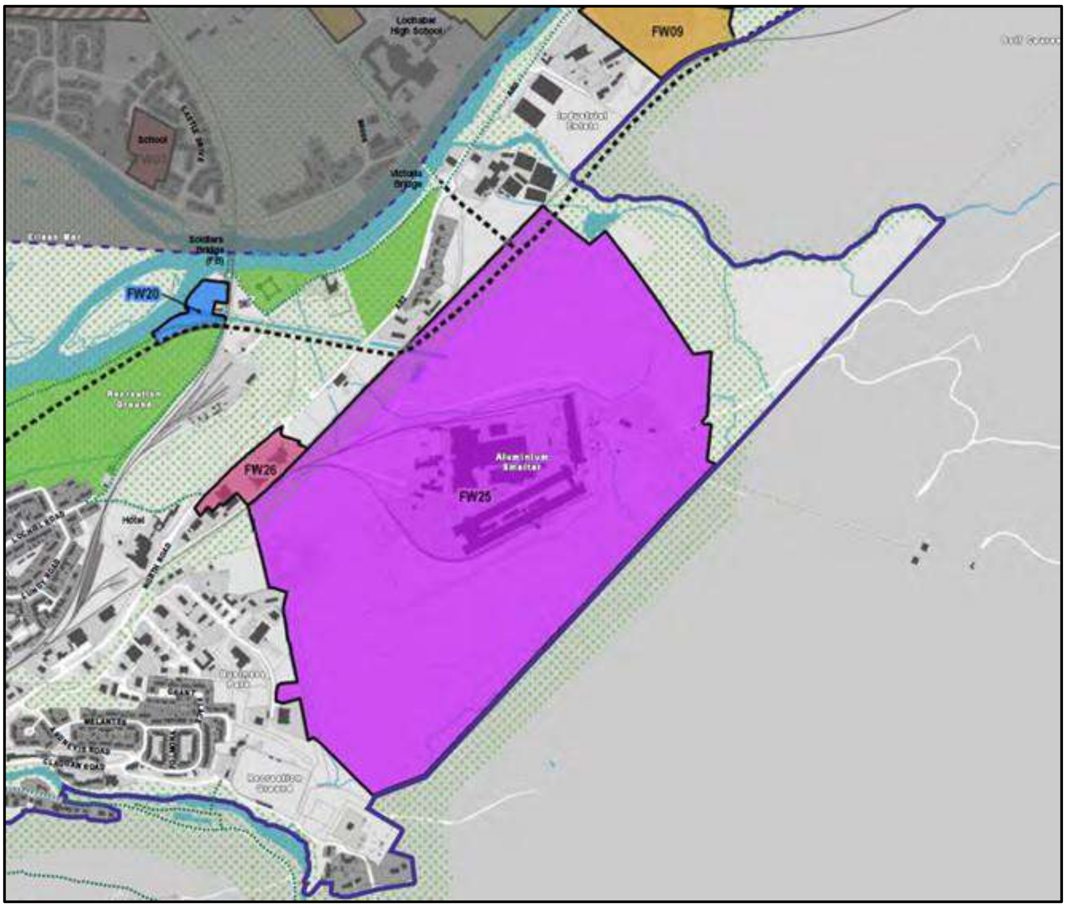


**Figure 2.1: Development Site Allocation**
*Source: WestPlan*

# 3. EXISTING SITE ACCESSIBILITY

## 3.1 General

3.1.1 This chapter considers the existing accessibility of the site and existing local conditions, as well as providing further context on how the neighbouring smelter site currently operates. This is based on the hierarchy set out in Transport Scotland's (TS) TAG document, which details the road user hierarchy where more sustainable modes of travel are prioritised ahead of the private car.

## 3.2 Site Location

3.2.1 The proposed development site encompasses a total land area of circa 68 ha, located approximately 3km to the north-east of Fort William town centre. Land uses adjacent to the site are primarily of an industrial nature; to the north of the site lies the Lochaber Aluminium Smelter while land to the west comprises of smaller scale warehouses, a recycling centre, offices and industrial units which form Glen Nevis Business Park. Land to the south and east is open space and woodland which is part of The Ben Nevis and Glen Coe National Scenic Area.

3.2.2 The site location in relation to the existing Lochaber Smelter site and surrounding area is indicated by **Figure 3.1**.

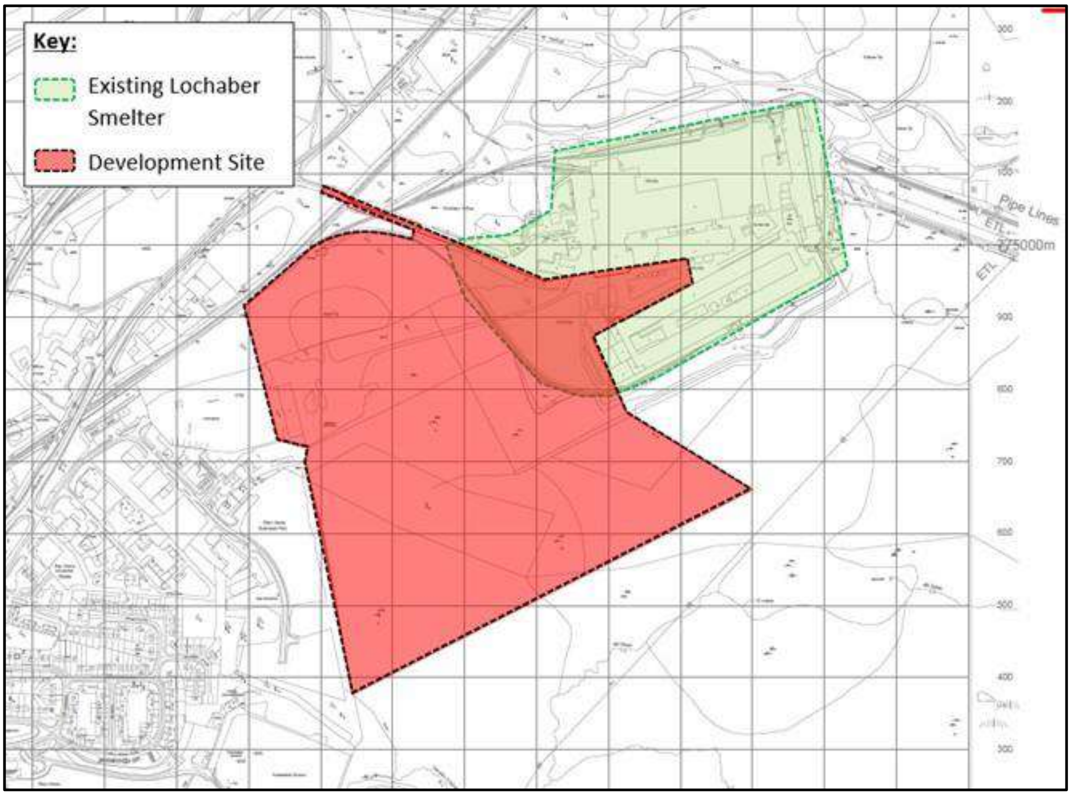


**Figure 3.1: Site Location Plan**
*Source: ITPEnergised*

## 3.3 Access for Sustainable Modes

3.3.1 Pedestrian infrastructure in the direct vicinity of the site is of a high quality, and it is noted that this has been improved in recent years with the introduction of high-quality pedestrian routes through the North Road Retail Park, which opened in 2017.

**Pedestrian Infrastructure**

3.3.2 The access road from the A82 into the site has a continuous footway along the northern side of the carriageway with a general width of approximately 1.8m and street lighting is also provided along the route and into the Lochaber Smelter Site itself. The general characteristics of the main walking route into the site are indicated by **Figure 3.2**. The access road connects to the A82 North Road via a recently constructed roundabout.


Figure 3.2: General Characteristics of Access Road Footway

3.3.3 There is a good level of pedestrian provision at the roundabout between the A82 / North Road Retail Park / Lochaber Smelter Access Road. On all arms except the A82 North Road northbound approach arm (as a signalised crossing is provided to the south) there are dropped kerbs and tactical paving, as indicated by **Figure 3.3** which shows the Lochaber Smelter Access Road arm. At the retail park and A82 North Road southbound approach arms, pedestrian refuge islands are also provided.

3.3.4 With the development of the retail park, walking routes between the site and the A82 heading south have been improved in terms of standard and in terms of journey times. Pedestrians to/from Lochaber Smelter can now take a more direct route via the footpaths within the retail park to reach the new signalised crossing which leads onto walking routes into town and to the north, i.e. effectively 'cutting the corner' of the roundabout junction. The route through the retail park is indicated by **Figure 3.4**.

**Figure 3.3: Pedestrian Provision at New A82 Roundabout**

**Figure 3.4: Pedestrian Route Through Retail Park**

3.3.5 Along the A82 there is good quality footway provision on at least one side of the carriageway and a signalised toucan crossing has recently been provided approximately 160m south of the roundabout, as indicated by **Figure 3.5**.

Figure 3.5: A82 Toucan Crossing

3.3.6 The residential areas of Claggan, Inverlochy and Lochyside are within a 15–20 minute walk from the site which presents good opportunities to encourage walking and cycling trips from these areas for staff members working at the Smelter.

3.3.7 Column mounted street lighting is in place at regular intervals on North Road and Ben Nevis Drive to the south of the site which encourages a safe environment for pedestrians walking these routes out-with daylight hours.

**Cycling Infrastructure**

3.3.8 It is possible to access the existing development site by bike and the existing aluminium smelter offers facilities for cyclists commuting to and from work. Access for cyclists is provided via the main access road from the A82(T).

3.3.9 There are a number dedicated cycle routes in the local area which can be used to link the Lochaber Smelter site with the wider Fort William area as well as to settlements such as Lochyside, Caol, Banavie, Corpach, Claggan and Torlundy which are within an approximate 15-minute cycle.

3.3.10 Improvements to the local cycle infrastructure have been made with the development of the North Road Retail Park in the form of delineated, off-road cycleways along the A82 in the vicinity of the site, as indicated by **Figure 3.6**.


**Figure 3.6: Cycleway (and Bus Stop) Along A82 Adjacent to Retail Park**

3.3.11 In relation to the existing Smelter site, **Figure 3.7** indicates National Cycle Network Route (NCR) 78 "The Caledonia Way" which extends between Fort William and Gairlochy. It is both traffic free and on-road in parts within the vicinity of the site.

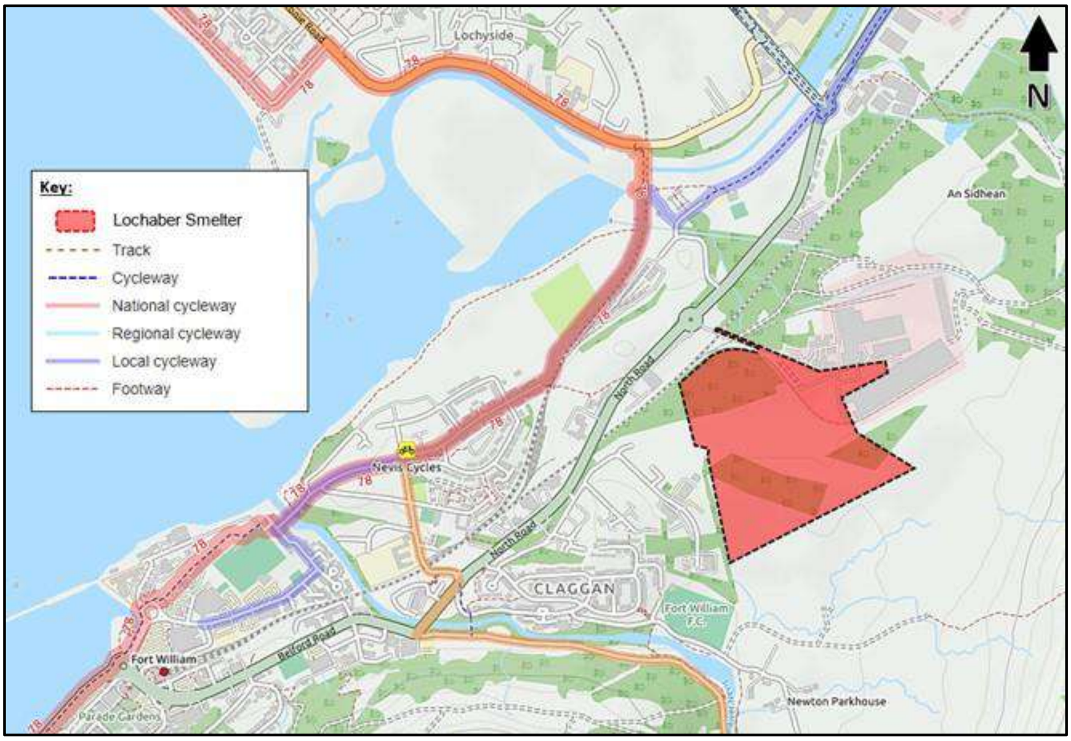


**Figure 3.7: National Cycle Routes**
*Source: OpenStreetMao*

3.3.12 As set out within Chapter 5 of the TA, it is likely that around 10% of employees will cycle to the proposed development. Therefore, an appropriate provision of secure cycle parking will be necessary to serve the Recycling & Billet Casting Plant so that cycling is encouraged as far as practicable. It is noted that there is currently a central bike shed for cycle parking at Lochaber Smelter with capacity for 8 bicycles

**Public Transport Provision**

3.3.13 The general area of Fort William and Lochaber is a popular tourist destination as well as a regional employment centre, offering local services and amenities to a large local residential catchment and hinterland.

3.3.14 SPP (2014) outlines that new developments should, where possible, be located in areas that are highly accessible by public transport in order to promote a real alternative to accessing a development by car.

3.3.15 Planning Advice Note (PAN) 75 recommends that new developments should be located within a 400m '*reasonable walking distance*' of the nearest bus stop. The nearest bus stops to the site are located on the A82(T) North Road and are positioned immediately adjacent to the existing site access junction.

3.3.16 The existing aluminium smelter is served directly by two bus stops on the A82(T) which are within the vicinity of the existing access junction. The location of bus stops in the vicinity of the site and within Fort William are indicated by **Figure 3.8**.

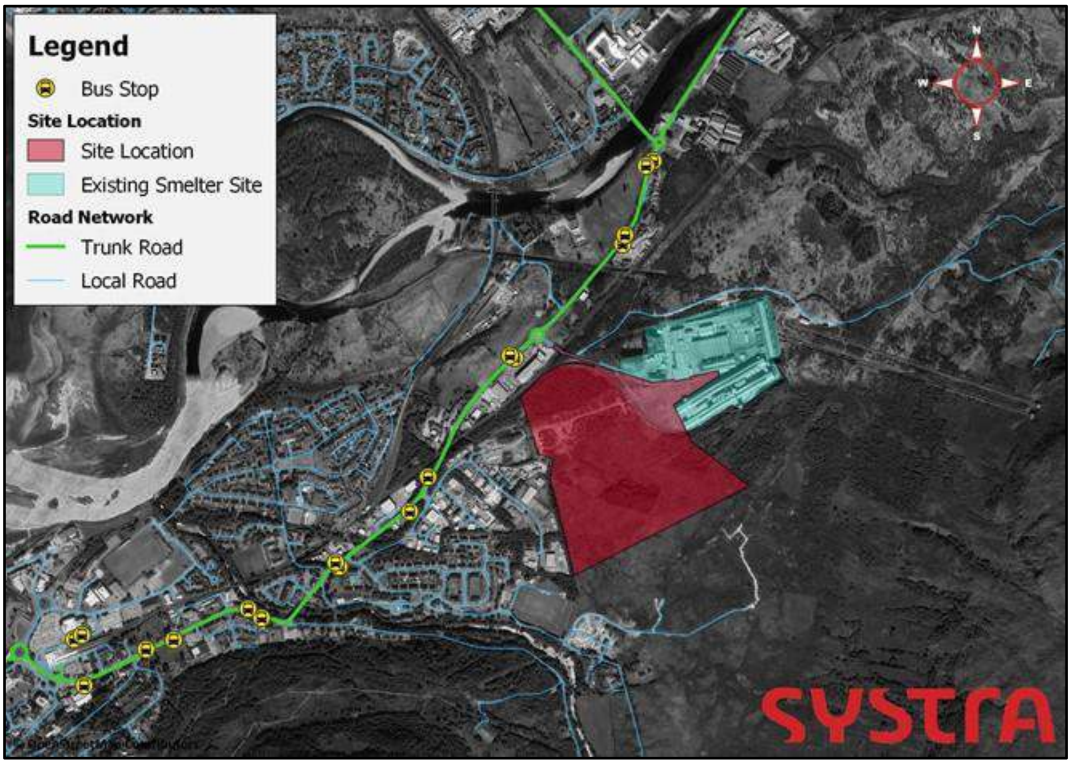


**Figure 3.8: Local Bus Stops**

3.3.17 There are no formal pedestrian crossing facilities in the vicinity of these stops on North Road, however pedestrians have been observed as being able to cross safely at this location unaided.

3.3.18 The services available from these stops, their destinations and frequencies are set out within **Table 3.1**.

**Table 3.1: Bus Service Frequencies**

| SERVICE | OPERATOR | ROUTE | FREQUENCY | | |
|---|---|---|---|---|---|
| | | | Mon-Fri | Saturday | Sunday |
| Shiel Buses | N46 / N47 | Upper Achintore + Plantation circular - Corpach | 2 services per hour | 2 services per hour | 1 service per hour |
| Shiel Buses | 500 | Fort William - Mallaig | 2 services per day | 1 service per day | No service |
| Shiel Buses | 502 | Fort William or Ardnamurchan - Mallaig | 2 services per day | 1 service per day | No service |
| Shiel Buses | 510 | Fort William - Roy Bridge and Invergarry circular | 2 services per day | No service | No service |
| Shiel Buses | 513 | Fort William - Inverness | 3 services per day | 1 service per day | No service |
| Shiel Buses | 517A | Upper Achintore and Plantation - Lochaber HS | 1 service per day | No service | No service |
| Shiel Buses | 522 | Fort William - Trislaig | 4 services per day | No service | No service |
| Scottish Citylink | 914 / 915 / 916 | Glasgow - Uig | 3 services per day | 3 services per day | 3 services per day |
| Scottish Citylink | 919 | Fort William – Inverness (via Spean Bridge) | 9 services per day | 8 services per day | 7 services per day |

*Source: Traveline Scotland (timetable correct as of 26th February 2021).*

3.3.19 Bus services within Fort William are provided mainly by Stagecoach Highlands, Sheils Buses and Scottish Citylink. The major bus corridors which Stagecoach Highlands buses serve are indicated by **Figure 3.9** which demonstrates that the majority of residential areas are served by existing routes.

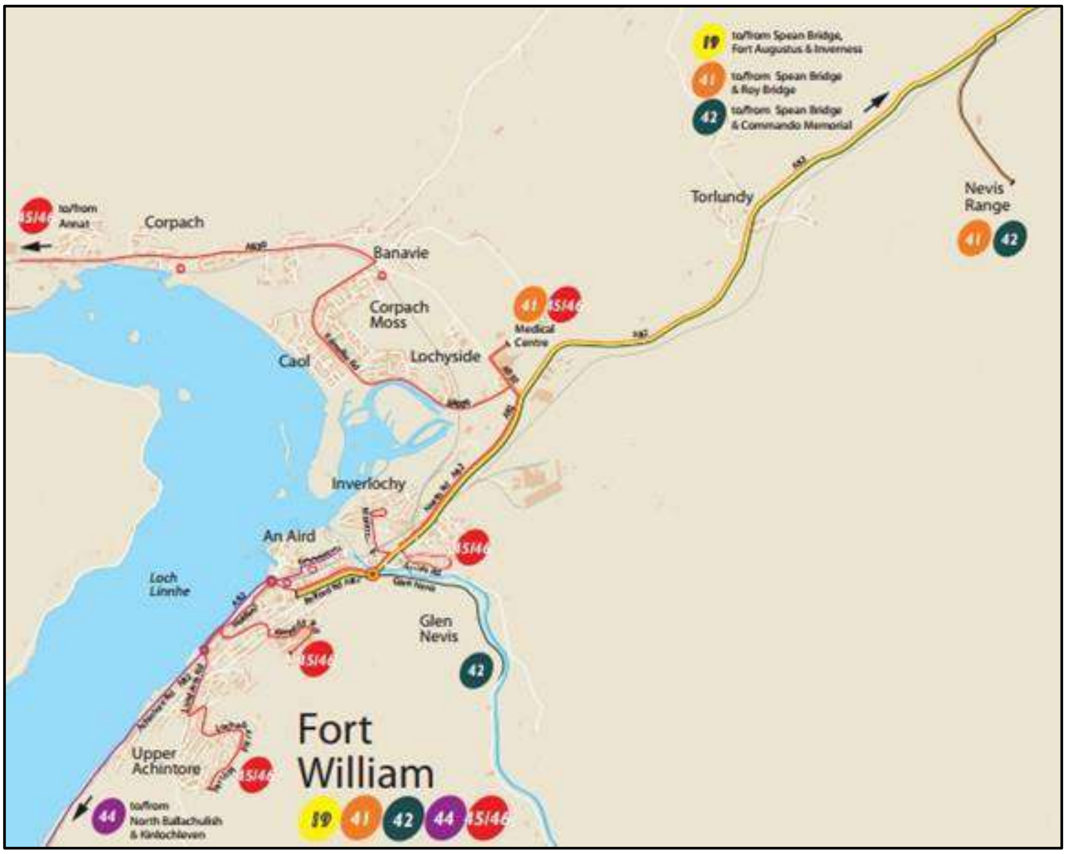


**Figure 3.9: Local Bus Routes**
*Source: Stagecoach Highlands*

**Rail Services**

3.3.20 There are three train stations which are within a relative proximity of the development site:

- Fort William;
- Benavie; and
- Corpach.

3.3.21 Fort William Rail Station is the closest station and is located approximately 1.5 miles from the site. The proposed development site and existing aluminium smelter are just over 20 minutes' walk and within easy cycle distance from the Rail Station. There are also a number of local connecting buses which provide a link to the bus stops on the A82(T) at the site access.

3.3.22 **Figure 3.10** illustrates the location and proximity of each train station in relation to the site. As shown, all three stations lie along existing bus service routes which operate past the smelter site.


**Figure 3.10: Local Rail Halts**
*Source: Google Maps; SYSTRA*

3.3.23 Fort William Station incorporates 24 bicycle storage spaces as well as facilities for the Nevis Cycles cycle hire scheme. Nevis Cycles offers discounted cycle hire for holders of valid rail tickets. The station also has a 50 space car park.

3.3.24 The West Highland Railway Line connects Glasgow to Mallaig via Fort WIlliam. Within the local area these services stop at Corrour, Tulloch, Roy Bridge, Spean Bridge, Banavie and Corpach as well as a number of other smaller settlements.

3.3.25 A rail line extends into the site which is used to bring raw materials into the smelter site. No timetabled public services operate on this line.

**Active & Sustainable Travel Summary**

3.3.26 **Figure 3.11** demonstrates a summary of the local sustainable transport infrastructure which exists surrounding the site. It is evident that the site benefits from being within a well-established sustainable travel network with high quality routes to key destinations. The nature of the infrastructure affords employees genuine travel choice and the potential for intramodality between walking, cycling and public transport.

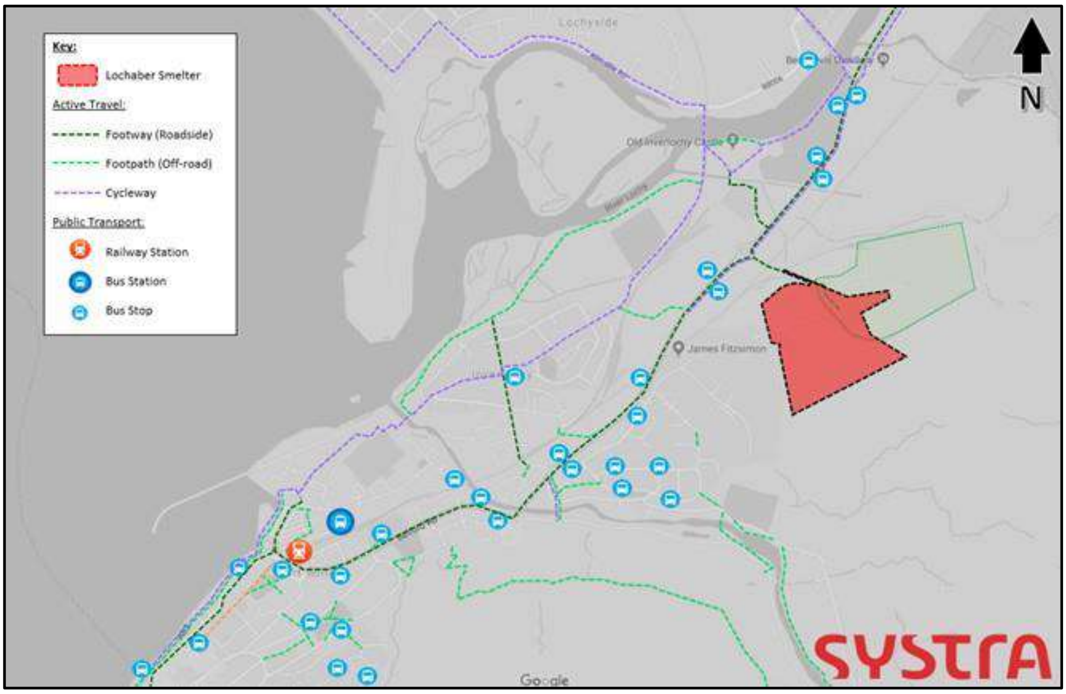


**Figure 3.11: Active Travel Routes (Walking, Cycling & Public Transport)**
*Source: SYSTRA*

## 3.4 Local & Strategic Road Network

3.4.1 The A82 North Road is a trunk road that extends north – south to the west of the site. This is a key link road connecting Glasgow in the south, to Inverness via Fort William. It also provides links to surrounding settlements such as Kinlochleven and Spean Bridge.

3.4.2 Within Fort William, the A82(T) North Road is generally single carriageway, with a carriageway width of approximately 6.6 metres. The stretch of the A82(T) at the site access junction location is currently subject to a 40 mph speed limit. At the south end of Fort William, there is a short section of dual carriageway before the road drops back down to single carriageway heading south out of Fort William.

3.4.3 South of Fort William, the A82 provides the main strategic route south to Tyndrum and Crianlarich. At Crianlarich, there is the option of joining the A85 heading east to Perth where the motorway network can be accessed by joining the M90 heading south. Alternatively, vehicles can stay on the A82 along Loch Lomondside and onwards towards Glasgow. The M8 motorway can be accessed by routing over the Erskine Bridge and the M8 in turn joins the M74 on the south side of Glasgow which provides the main onward route to England.

3.4.4 It is noted that the A82 between Crianlarich and Tarbert (along Loch Lomondside) has been recently upgraded at Pulpit Rock to widen the road but there are still a number of tight and twisty sections of road. The road is marked for further improvements in the years ahead.

3.4.5 The A830(T) connects to the A82(T) to the north of the site via a roundabout and leads on to settlements at Caol, Corpach, Arisaig and Mallaig. It is covered by a 30 mph speed limit through Caol and Corpach and is single carriageway. The road then becomes rural in nature out towards Mallaig and is derestricted in terms of a speed limit.

3.4.6 **Figure 3.12** highlights the strategic and local roads in proximity to the development site and within Fort William and Benavie. It is clear from the figure that the site is situated within a well-established road network. It is of particular note that the site is located approximately 700m south of the roundabout connecting the A82 and A830 at the River Lochy.

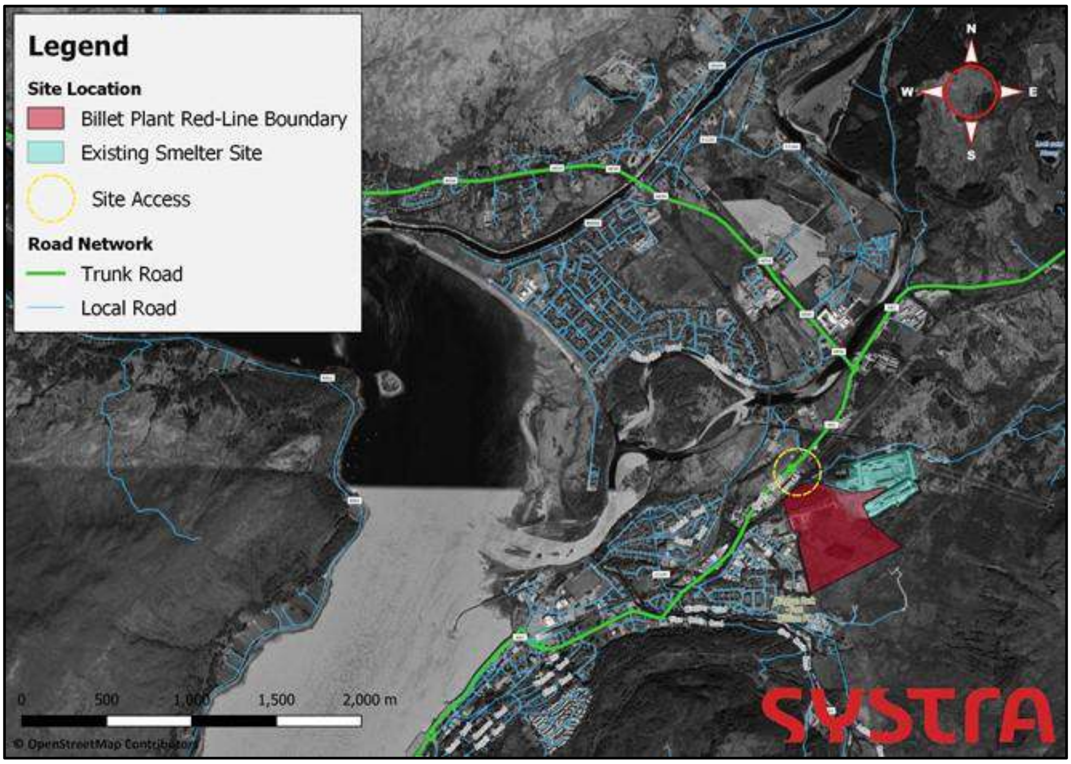


**Figure 3.12: Strategic Road Network**
*Source: ArcGIS; SYSTRA*

**Highway Safety**

3.4.7 The Scottish Government's *Transport Assessment Guidance* (TAG) document states that Transport Assessments and Transport Statements should consider the accident data for the previous three years in the vicinity of proposed developments.

3.4.8 To be robust, the Crash Map[1] website has been utilised to determine the number of accidents that have occurred in the five-year period between 2015 and 2019 inclusive. It is noted that data for 2020 has not yet been made available. Details of the review of accidents within the study area (generally a 2km distance from the site) are indicated by **Figure 3.13** and **Table 3.2** (overleaf). It is noted however that the data does not include near misses.

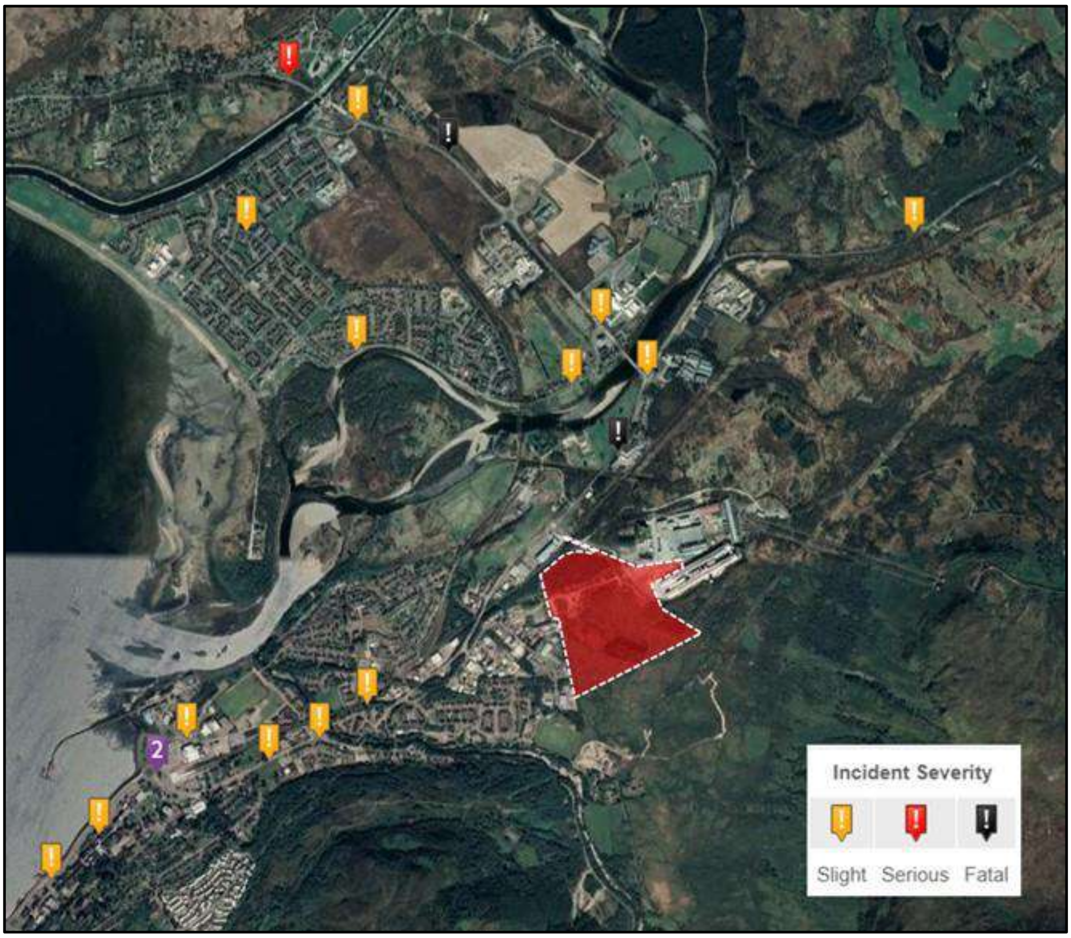


**Figure 3.13: Three-Year Accident Statistics**
*Source: Crash Map Database*

[1] Crash Map website: www.Crashmap.co.uk

3.4.9 **Table 3.2** provides additional commentary for serious and fatal accidents within the area reviewed.

**Table 3.2: Road Traffic Accident Data**

| LOCATION | SLIGHT | SERIOUS | FATAL | COMMENT |
|---|---|---|---|---|
| Smelter Access Road | - | - | - | - |
| A82 | 9 | - | 1 | The fatal accident occurred in August 2016 on the A82 between the Smelter Access Road and the A830<br><br>It is noted that 2 of the accidents occurred in subsequent months during 2018 (October and November) at the exit arm onto Belford Road at the A82 / Belford Road roundabout |
| A830 | 1 | - | 1 | The fatal accident occurred in August 2019 on the A830 between southbound carriageway between Kilmallie Road and the Blar Mhor Roundabout. |

*Source: Crash Map Database*

3.4.10 On review, Systra would conclude that the road traffic collisions which have been identified as occurring within the study area in the previous five years are isolated in nature. There are no apparent clusters or 'accident hotspots' within the local area.

3.4.11 It is noted that two accidents did occur in subsequent months during 2018 (October and November) at the exit arm onto Belford Road at the A82 / Belford Road roundabout. Notwithstanding this, two accidents within a 5-year assessment period would not suggest that there is an issue at the junction which should be of concern in respect to the proposed development.

## 3.5 Accessibility Summary

3.5.1 In summary, the site sits within a well-developed transport network. The site is accessible by bicycle and by public transport while direct access to the strategic (trunk) road network is available. Pedestrian and cycle links have been improved with the development of the North Road Retail Park in recent years which in turn has improved accessibility between the site and the centre of Fort William.

## 4. PROPOSED DEVELOPMENT

### 4.1 Existing Aluminium Smelter Operation

4.1.1 The existing Lochaber Smelter was constructed during the 1920s on a greenfield site. Ancillary facilities including railway lines and store have been added since the site was initially constructed. A former landfill site is located in the northern section of the site as well as refuse and spoil tips positioned in several locations around the site.

4.1.2 The existing site operates 24 hours per day, 7 days per week. There are two separate elements of trip generation that are associated with the site; with all vehicle trips currently travelling on the site via the dedicated access road, joining the A82(T) North Road via a priority junction.

### 4.2 Proposed Development

4.2.1 The proposals being brought forward comprise a new purpose-built aluminium billet manufacturing facility on land directly west of the existing smelter site. **Figure 4.1** illustrates the concept masterplan for the site.

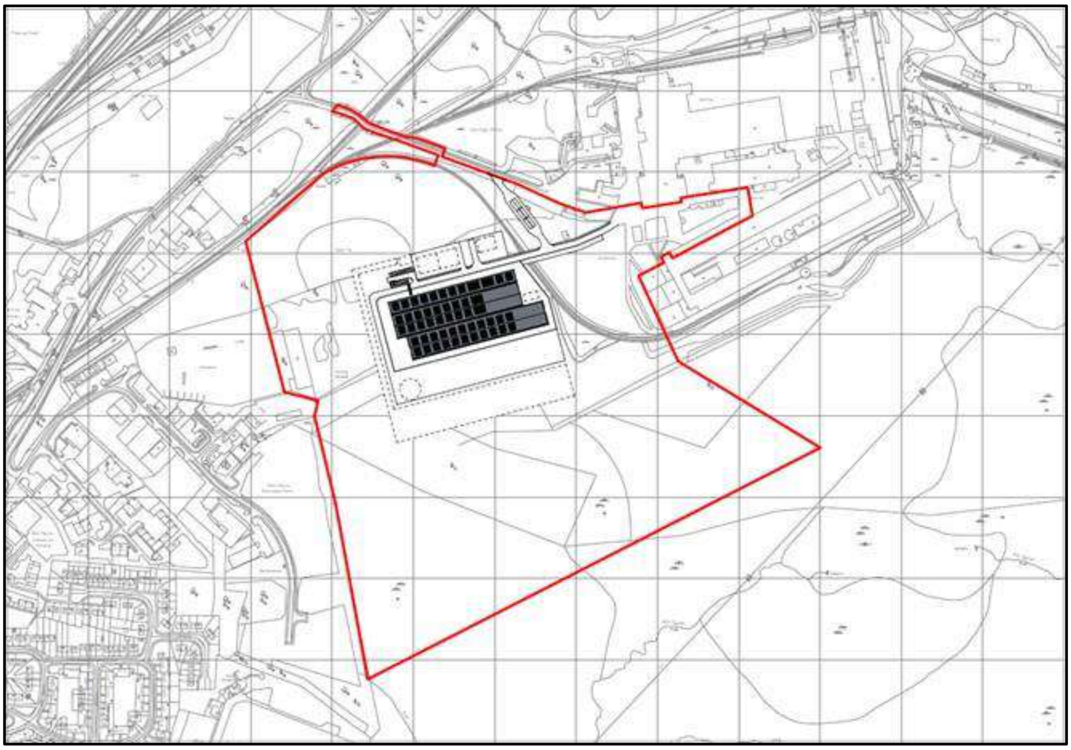

**Figure 4.1: Concept Masterplan**
*Source: ITPEnergised*

### 4.3 Development Access

4.3.1 Vehicular access to the Proposed Development will be provided from a link to the existing Lochaber smelter. The access road to the existing smelter meets the A82 at a 4-arm roundabout which also provides access to the North Road Retail Park.

4.3.2 The existing smelter access road is single carriageway with a speed limit of 20 mph and there are traffic calming measures in place in the form of speed tables. The road crosses railway lines at two points, one which forms an over-bridge while the other cuts across the road to form a level crossing. Street lighting and a footway is provided on the northern side of the carriageway.

4.3.3 All HGV and staff vehicle movements associated with the Proposed Development will enter and exit the site from the A82 using this access road from the roundabout on the A82.

4.3.4 Pedestrians / cyclists will be able to enter and exit the Proposed Development via this access road which provides a direct link to the quality walking and cycling infrastructure through the North Road Retail Park and hence to the wider active travel network.


**Figure 4.2: Proposed Primary Development Access**
*Source: ITPEnergised*

## 4.4 Development Parking Provision

4.4.1 THC *Roads and Transport Guidelines for New Developments* (2013) sets out parking standards for new developments within the THC local authority area. *Table 6.7* of the guidance document details the maximum parking provision per GFA.

4.4.2 Whilst Systra would acknowledge that there are reasonable grounds to consider the site to be within a '*Rural Area*', it is noted that the guidance defines rural areas as follows:

> *"Rural locations - the Council area includes many rural locations where levels of public transport provision are low and there may be instances where a developer and/or the Council consider that the prescribed maximum levels of parking may need to be exceeded, in order to accommodate higher numbers of vehicles generated by larger catchment areas."*
>
> - THC Roads and Transport Guidelines for New Developments, 2013

4.4.3 In cognisance of the above, we have considered the site to be within an '*Edge of Town*' location with respect to the application of parking standards. It is noted that this is more robust in regards to the maximum provision, with edge of town sites permitted a lower level of parking as stipulated by the guidance.

4.4.4 **Table 4.1** sets out the maximum allowance of general parking spaces for the proposed Recycling & Billet Casting Plant. For general industry in edge of town locations, a maximum of one space is permitted per $33m^2$ GFA. This equates to a maximum provision of 303 total spaces but is must be recognised that such a level of provision would be well beyond the requirements of the site when compared against anticipated staff numbers.

**Table 4.1: THC Car Parking Guidelines – Commercial/Industrial Developments**

| DEVELOPMENT TYPE | MAXIMUM PROVISION PER GFA | DEVELOPMENT GFA |
|---|---|---|
| General Industry, factories and workshops | 1 space per $33m^2$ GFA (Edge of Town) | $10,000m^2$ (approximate) |
| **Maximum Permitted:** | | **303 Standard Spaces** |

*Source: THC Roads and Transport Guidelines for New Developments, 2013*

4.4.5 A total of 20 new parking spaces (including 2 ambulant accessible spaces) will be dedicated to the Recycling & Billet Casting Plant. Systra consider this provision to be sufficient to serve the parking requirements which will arise from the development.

4.4.6 The provision will also include 2 active electric vehicle (EV) charging spaces. Additionally, 10 of the spaces will be constructed as passive EV spaces which will allow for the 'retro-fit' of the charging equipment in the future.

4.4.7 **Table 4.2** sets out the corresponding minimum provision for disabled persons, in line with THC guidance.

**Table 4.2: THC Car Parking Guidelines – Provision for Disabled Persons**

| DEVELOPMENT TYPE | MINIMUM PROVISION | STANDARD SPACES |
|---|---|---|
| Employment Uses | To be based on an assessment of need<br>Minimum 1 space per disabled employee plus 1 space;<br>OR<br>5% of maximum standard size, whichever is the greater | 20 Spaces |
| **Minimum Permitted:** | (5%) | **1 Disabled Space** |

*Source: THC Roads and Transport Guidelines for New Developments, 2013*

4.4.8 As detailed in **Section 5.4**, the proposed facility will operate two shift patterns, with a maximum of 14 staff working each shift. This would result in a maximum of 28 staff being on-site at any one time which takes account of the overlap which will be experienced during shift changeovers. Assuming that the existing mode share of the smelter site will apply to new members of staff, there will be a demand for approximately 11 spaces during each shift attributed to Recycling & Billet Casting Plant staff parking.

4.4.9 As shift changeover times are likely to overlap somewhat, Systra would consider that provision of 20 additional parking spaces at the site will be more than sufficient to accommodate the maximum demand which will occur during these two brief periods of each day (at around 07:00 and 19:00).

### Cycle Parking

4.4.10 THC guidance stipulates a minimum level of cycle parking provision for new industrial developments as '*2 spaces plus 1 space per 250m² GFA*'.

4.4.11 This would equate to a minimum provision of 42 cycle spaces to serve the Recycling & Billet Casting Plant. Systra would consider this level of cycle parking to be extremely excessive, given that it is estimated (based on the existing mode share of the Lochaber Smelter) that the development will generate in the region of 2 two-way cycle trips per shift, Systra would suggest that a modest a more modest level of cycle parking is provided.

4.4.12 It is recommended that around 8 new cycle parking spaces are provided at the Recycling & Billet Casting Plant. This could be provided in the form of 4 'Sheffield cycle stands', which each have a capacity for 2 bicycles to be parked per stand.

# 5. DEVELOPMENT TRIP GENERATION

## 5.1 Introduction

5.1.1 In accordance with Transport Scotland's TAG document, consideration has been given to the people-trip generation associated with the proposed Recycling & Billet Casting Plant at the existing Lochaber Smelter site. This considers trips by pedestrians, cyclists, public transport users, and those who use the car (either as a driver or passenger). Scottish Government policies and guidelines focus on achieving a sustainable and integrated transport provision, dealing with reducing the reliance on private cars and promoting greater use of public transport, walking and cycling as alternatives.

## 5.2 Existing Smelter Trip Generation

5.2.1 As part of the existing Lochaber Smelter Travel Plan (TP), in mid-2019, staff of the existing smelter site were invited to complete a travel survey. The purpose of the travel survey was to understand how staff travel to the site and to identify any opportunities for encouraging a change in travel behaviour.

5.2.2 The typical daily traffic movements associated with the existing site (as informed by the travel survey) are set out below for staff and operational trips.

**Staff Trips**

5.2.3 There are currently approximately 59 staff who work shifts at the existing smelter and a further 119 day workers.

5.2.4 The plant operates two 12 hour shifts daily as follows:

- Day shift - 07:00 – 19:00; and
- Night shift - 19:00 – 07:00.

5.2.5 Employees are split into 5 shift groups that operate in a pattern each week, with staff working an average of 3 shifts within this time. The main mode of transport used by staff to travel to work is the private car. Approximately 67% of staff currently travel to the site as single vehicle occupants. Under existing arrangements, the site provides 104 parking spaces.

**Operational / Commercial Trips**

5.2.6 Operational traffic associated with the proposed development will comprise staff travelling to and from the site, predominantly in private cars, and goods vehicles transporting scrap material to the site and Billet away from the site.

5.2.7 There are currently:

- 40 trips in / out per typical day which are mostly LGVs; and
- On average there are 12 HGV trips in / out per weekday.

5.2.8 The LGVs to the site include contractors doing work at the site and deliveries associated with the on-going running of the facility. The HGV movements are generally associated with the export of the finished aluminium product which leaves the site as aluminium ingots. HGVs generally come into the site unloaded and leave the site loaded. Raw materials are brought into site by rail three times a week.

## 5.3 Mode Share

5.3.1 The travel survey asked staff what their main mode of travel to work on a typical day is, where main mode relates to the mode used for the longest part of the journey. The results are indicated by **Figure 5.1**.

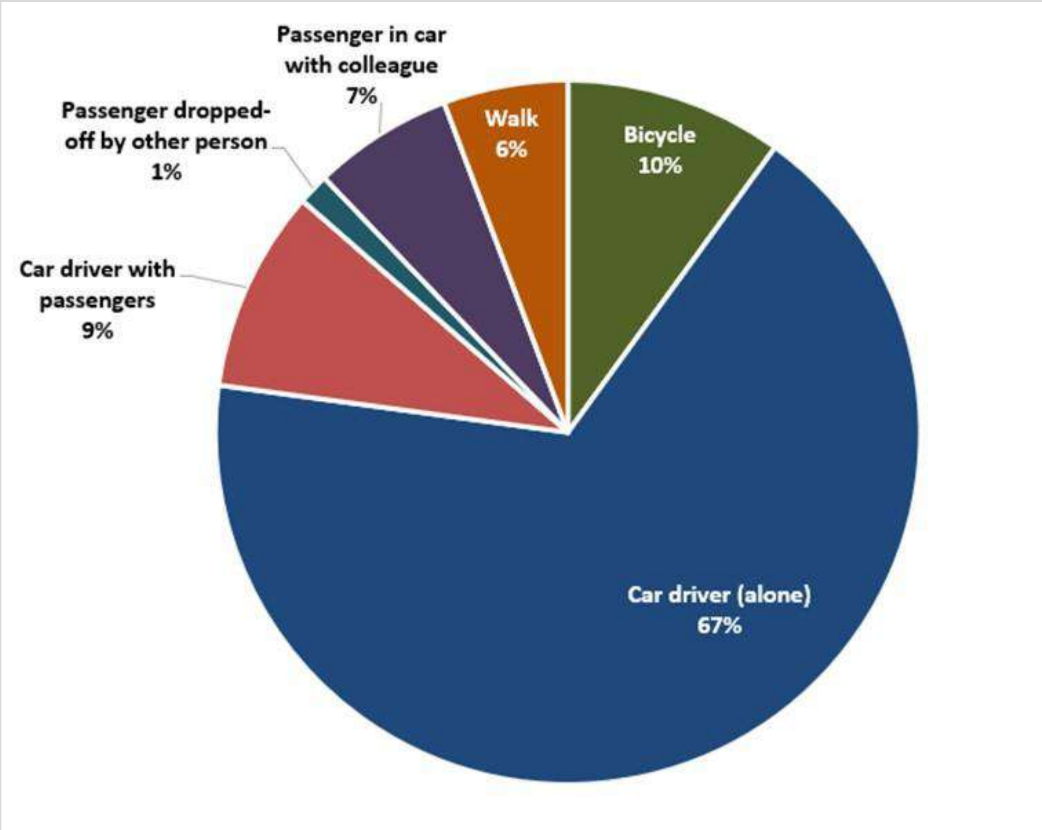


**Figure 5.1: Existing Staff Mode Share**
*Source: Lochaber Smelter Travel Plan (SYSTRA, 2019)*

5.3.2 The pie chart demonstrates that the most popular mode for staff travelling to work is by single occupancy car travel with 67% of the mode share. It is noted that 16% of staff travel by active travel modes (10% cycling and 6% walking) and cycling is the second largest mode share. Approximately 16% of staff car share, either as a car driver (9%) or passenger (7%). Only 1% of staff are dropped off at work by someone other than a colleague.

5.3.3 The existing TP for Lochaber Smelter sets out a target mode share for staff up to 2024. It is proposed that by implementing the measures set out within the TP, the number of single-occupancy private car journeys to and from the development can be reduced by around 6%. The existing mode share and proposed mode share targets are set out within **Table 5.1**.

**Table 5.1: Existing & Targeted Mode Share**

| MODE | EXISTING MODE SHARE (2019) | TARGET MODE SHARE (2024) | PERCENTAGE CHANGE |
|---|---|---|---|
| Walking | 6% | 7% | 1% |
| Cycling | 10% | 12% | 2% |
| Vehicle Passenger | 8% | 9% | 1% |
| Car Driver (with passenger) | 9% | 11% | 2% |
| Car Driver (alone) | 67% | 61% | -6% |
| **Total** | **100%** | **100%** | **-** |

*Source: Lochaber Smelter Travel Plan (SYSTRA, 2019)*

5.3.4 Notwithstanding that the proposed Recycling & Billet Casting Plant is likely to become operational during 2023, to be robust, Systra has adopted the 2019 mode share identified for the site through the travel survey.

## 5.4 Development Trip Generation

**Staff Trips**

5.4.1 As an extension of the existing Lochaber Smelter offering, the Proposed Development will adopt the same shift patterns and operating hours currently in place across the wider Smelter site. The Proposed Development will therefore be operational 24 hours a day and staff shift times will be split into two 12-hour shifts: 07:00 to 19:00 (day shift) and 19:00 to 07:00 (night shift). It is noted that staff would therefore typically arrive and depart outside the peak hours associated with the surrounding road network (typically 08:00 to 09:00 and 17:00 to 18:00), based on these shift times.

5.4.2 The Proposed Development is expected to employ approximately 70 members of staff in total which will include both new and existing members of staff (from the adjacent smelter). It is noted that the number of new employees will be approximately 30. Notwithstanding this, to allow for the additional staffing capacity which will be provided by the Recycling & Billet Casting Plant, it is robust to assume that (as a worst-case scenario) all 70 members of staff will be new and hence will represent an additional trip to and from the site.

5.4.3 As per the existing smelter operation, staff of the Proposed Development will be split across five shift patterns. This generally equates to shifts of 14 staff. As a worst-case scenario, this assessment therefore assumes that 28 staff would make a trip to and from the development (56 two-way people trips) during a 24-hour period.

5.4.4 Should these additional trips align with the existing mode share, then in the region of 20 additional vehicle trips will be generated to and from the development (40 two-way vehicle trips).

5.4.5 The following people-trips by mode can be calculated for additional staff journeys and is presented within **Table 5.2**.

**Table 5.2: Peak Hour People-Trips by Mode**

| MODE | AM PEAK | | | PM PEAK | | | STAFF MODE SHARE |
|---|---|---|---|---|---|---|---|
| | Arrive | Depart | 2-way | Arrive | Depart | 2-way | |
| Walking | 1 | 1 | 2 | 1 | 1 | 2 | 6% |
| Cycling | 1 | 1 | 2 | 1 | 1 | 2 | 10% |
| Vehicle Passenger | 1 | 1 | 2 | 1 | 1 | 2 | 8% |
| Car Driver (with passenger) | 1 | 1 | 2 | 1 | 1 | 2 | 9% |
| Car Driver (alone) | 10 | 10 | 20 | 10 | 10 | 20 | 67% |
| **Total** | **14** | **14** | **28** | **14** | **14** | **28** | **100%** |

*Note: (variances due to rounding).*

5.4.6 Whilst it is reiterated that these will not occur within the network peak hours, it has been assumed that they will, such that the potential traffic impacts forming the basis of any forthcoming planning consent are protected should staff shift patterns change at the proposed development in the future

**Operational / Commercial Trips**

5.4.7 It has been estimated that the Proposed Development will generate an absolute maximum of 31 inbound and 31 outbound (62 two-way) HGV movements per day associated with the import and export of scrap aluminium and billet respectively (if transporting 100% of material by road).

5.4.8 Whilst it is noted that the eventual HGV generation could be substantially less than 62 two-way movements depending upon how the material is transported to and from the site, for the purposes of a robust assessment, it has been assumed that all import and export material will be transported by road.

5.4.9 The assessment of operational traffic impacts therefore considers the worst-case scenario (62 two-way HGV trips), i.e. there is no account taken for any reductions in HGV trips as a result of re-use of materials / alternate transportation methods / shared-trips between the proposed development and the existing smelter.

## 5.5 Daily Vehicle Trips

5.5.1 In summary of the combined staff and HGV generation which will result from development of the Recycling & Billet Casting Plant at the site, **Table 5.3** sets out the hourly profile and total daily traffic generation during the 12-hour period between 07:00 and 19:00.

**Table 5.3: Daily (12-Hour) Vehicle Trip Profile**

| HOUR | OPERATIONAL (HGV) GENERATION | | | STAFF GENERATION (ASSUMED IN PEAK HOURS) | | |
|---|---|---|---|---|---|---|
| | IN | OUT | 2-WAY | IN | OUT | 2-WAY |
| 07:00 – 08:00 | - | - | - | - | - | - |
| 08:00 – 09:00 | 3 | 3 | 6 | 10 | 10 | 20 |
| 09:00 – 10:00 | 3 | 3 | 6 | - | - | - |
| 10:00 – 11:00 | 3 | 3 | 6 | - | - | - |
| 11:00 – 12:00 | 3 | 3 | 6 | - | - | - |
| 12:00 – 13:00 | 3 | 3 | 6 | - | - | - |
| 13:00 – 14:00 | 3 | 3 | 6 | - | - | - |
| 14:00 – 15:00 | 3 | 3 | 6 | - | - | - |
| 15:00 – 16:00 | 3 | 3 | 6 | - | - | - |
| 16:00 – 17:00 | 3 | 3 | 6 | - | - | - |
| 17:00 – 18:00 | 3 | 3 | 6 | 10 | 10 | 20 |
| 18:00 – 19:00 | - | - | - | - | - | - |
| **Daily Total** | **31** | **31** | **62** | **20** | **20** | **40** |

*Note: (variances due to rounding).*

5.5.2 The table demonstrates that (as a worst-case scenario), in the region of 100 daily two way trips will be generated by the Recycling & Billet Casting Plant. The most onerous periods within the above table are during the peak hours (in which 26 two-way trips have been defined per period). However, it is reiterated that the actual shift changeover times will occur out with the network peak periods as per the proposed operation. Therefore, it is highly unlikely that the above profile will occur.

5.5.3 Notwithstanding this, the robust peak period trip generation has been taken forward for analysis within the Paramics model.

## 5.6 Distribution & Assignment

5.6.1 Post code information of staff at Lochaber Smelter has been analysed as part of the TP. The data identified the general areas in which staff reside and these are demonstrated by the heatmap presented in **Figure 5.2**.

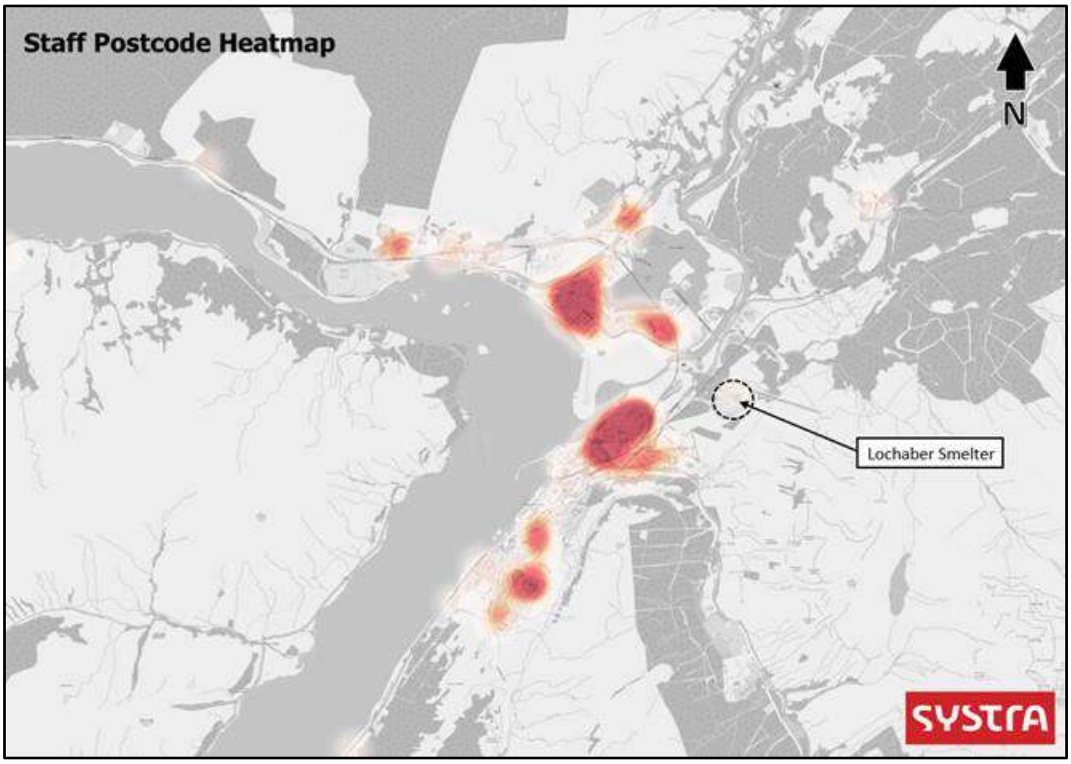


**Figure 5.2: Staff Areas of Residence**
*Source: Lochaber Smelter Travel Plan (SYSTRA, 2019)*

5.6.2 The largest proportion of staff live within proximity to the Lochaber Smelter, in Fort William and the villages of Inverlochy, Lochyside, Caol, Corpach and Banavie which surround the bay where the River Lochy meets Loch Linnhe. Smaller clusters of staff reside in Kinlochleven, Spean Bridge and Ballachulish

5.6.3 The postcode data shows that 51% of staff live south of the site and 43% live north of the site. Of the 43% of staff living to the north of the site, 9% travel from the A82(T), from the residential areas of Spean Bridge, Roybridge and Roughburn. The remaining 34% travel on the A830 from the residential areas of Lochyside, Caol, and Corpach, as well as other smaller rural settlements.

5.6.4 Of the 51% that live south of the site, 13% live outwith Fort William in the settlements of Ballachulish, Glencoe and Kinlochleven. A further 12% live in southern Fort William and the remainder of staff live near Fort William town centre, Inverlochy, or close to the site within the Ben Nevis Drive/ Ardnevis Road residential catchment area.

5.6.5 The above distribution has been adopted for the new staff trips for modelling purposes. With regards to HGV traffic, this has been distributed as per the existing distribution of HGVs which frequent the Lochaber Smelter.

# 6. TRAFFIC IMPACT ASSESSMENT

## 6.1 General

6.1.1 The purpose of this chapter of the TA is to demonstrate the extent of the impact that the traffic generated by the proposed development will have on the local road network. Systra holds an S-Paramics microsimulation model which covers the trunk road corridor (A82 and A830) through Fort William.

6.1.2 Whilst the level of traffic generation anticipated for the proposed development is relatively small, given the sensitivities around the road network in Fort William, Systra has undertaken analysis of the microsimulation model with the addition of development traffic.

6.1.3 Full details of the scope and methodology of the modelling exercise is provided within a Traffic Modelling Assessment Report (**Appendix A**). This chapter summarises the results and conclusions presented within the report.

## 6.2 Existing Microsimulation Model

6.2.1 The existing S-Paramics microsimulation model formed a corridor analysis along the A82(T) from West End Roundabout at the south of Fort William Town Centre to the A82(T)/A830 Roundabout Junction in the north. In its inception, the model originally covered only the weekday PM peak period (16:00 – 19:00).

6.2.2 The model was updated in 2017 with fresh survey data (covering both AM and PM peak periods) to support the previous application on the site for an Alloy Wheel Plant (see **Section 1.3**).

## 6.3 Baseline Traffic Data

6.3.1 Due to the impacts of the Covid-19 pandemic, it has not been possible to undertake recent traffic surveys to inform the junction threshold and modelling assessments. Notwithstanding this, in consultation with THC (through scoping discussions with the Roads Officer), it has been agreed that the 2017 data can be robustly factored using National Roads Traffic Forecast (NRTF) data for traffic growth.

6.3.2 In respect to this application, Systra holds traffic data for 12 junctions within Fort William. The location of these junctions (all of which form part of the A82 and A830) are illustrated in **Figure 6.1** overleaf, with a description of the junctions undernoted.

6.3.3 The peak hours identified from the data are:

- Weekday AM peak hour – 0800 to 0900; and
- Weekday PM peak hour – 1700 to 1800.

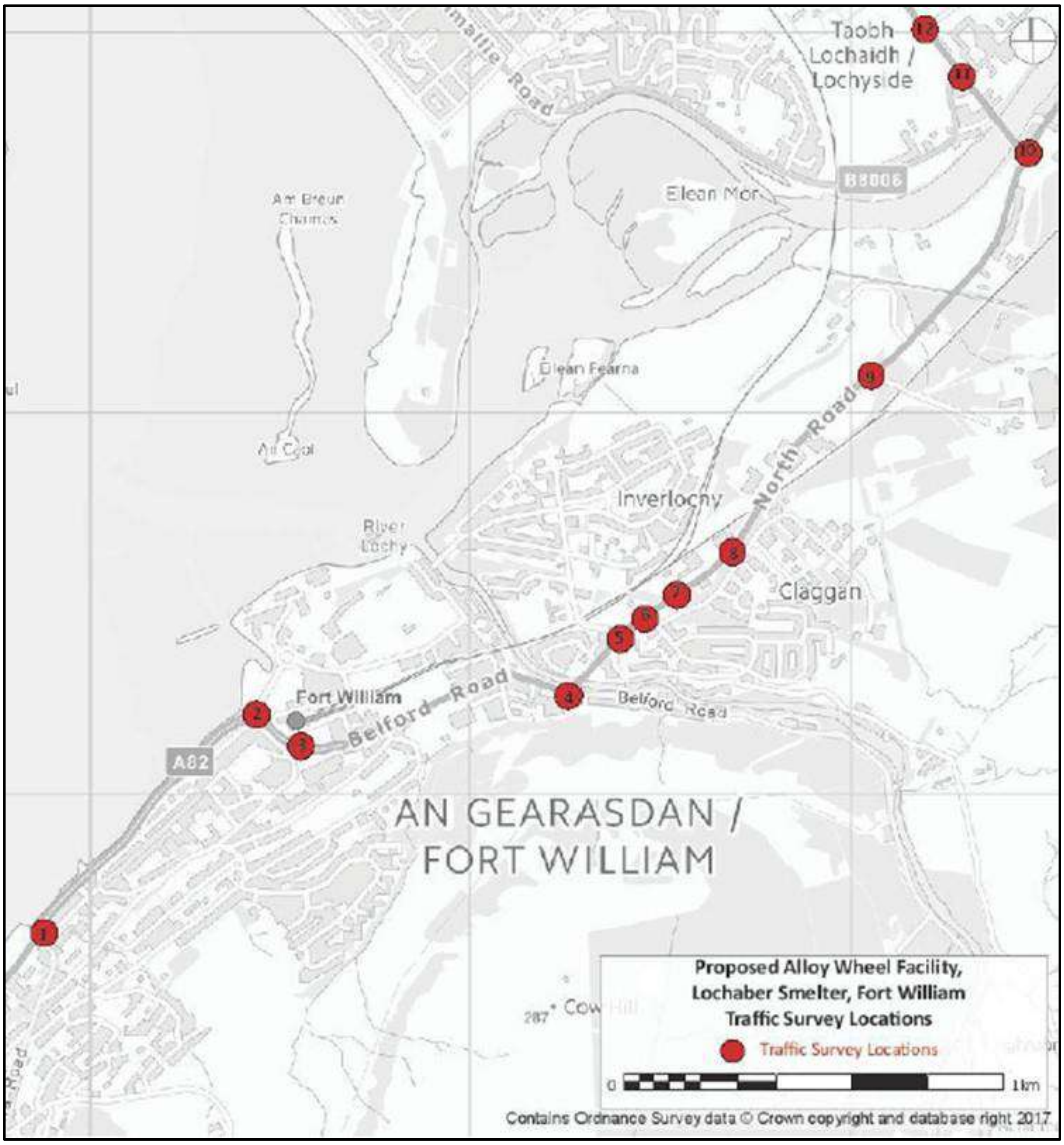


**Figure 6.1: Junction Threshold Assessments (2017)**
*Source: SYSTRA*

1. West End Roundabout;
2. A82 / Morrison's Roundabout;
3. A82 / Middle Street;
4. A82 / Glen Nevis;
5. A82 / Earl of Inverness Road;
6. A82 / Ardnevis Road;
7. A82 / Fort William Retail Park;
8. A82 / Glen Nevis Business Park;
9. A82 / Lochaber Aluminium Smelter Access Junction;
10. A82 / A830 (Lochybridge);
11. A830 / B8006; and
12. A830 / Lochaber High School.

## 6.4 Study Area

6.4.1 The study area as modelled within the S-Paramics microsimulation software is presented within **Figure 6.2**. The modelled area encapsulates the trunk road network through Fort William passed the development site and extends as far north as Fort William Golf Course. The model also includes the section of A830 adjacent to the Blar Mhor Industrial Estate.

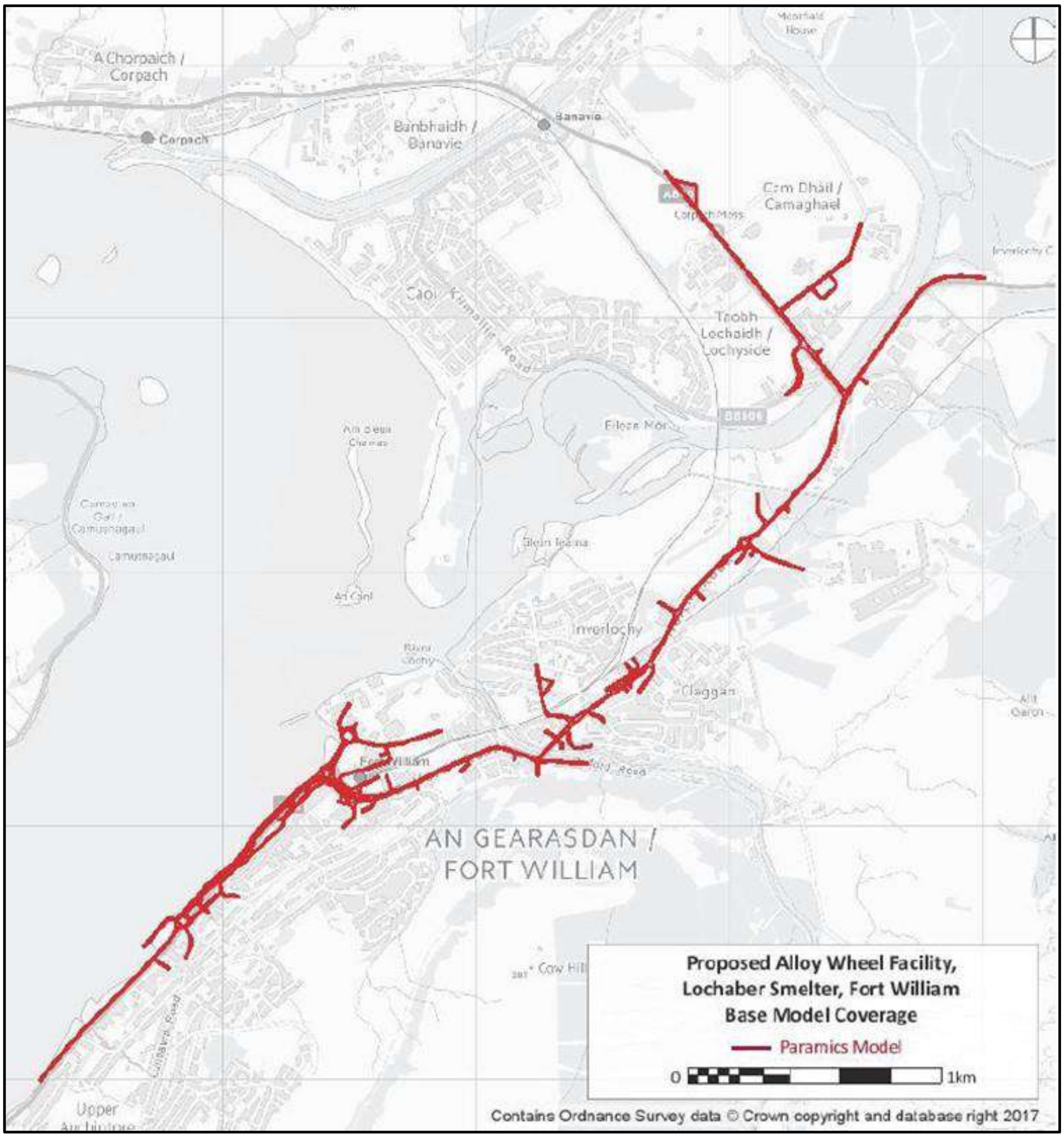


**Figure 6.2: Paramics Microsimulation Study Area**
*Source: SYSTRA*

## 6.5 Committed Development

6.5.1 In cognisance that the data is for 2017, Systra has included the traffic flows generated by the North Road Retail Park and Kilmallie Road residential developments. These developments were included as committed development within the previous model analysis. Flows form these sites now form part of the baseline reference case for the proposed development design year.

## 6.6 Opening Year Assessment

6.6.1 The NRTF traffic growth factors have been used to apply background traffic growth to the network to obtain a design year reference case. In consultation with THC, it was agreed that 'high' growth is suitable to apply to the traffic flows on the A82, while 'central' growth is suitable for the A830 and the Smelter access road.

6.6.2 The development is due to become operational during the year 2023. We have therefore applied the relevant NRTF factors to the 2017 baseline traffic flows to factor them to the assessment year. The NRTF predicts a central growth of 6.8% for the 6-year period between 2017 and 2023 and a high growth of 8.7% for the same period, i.e.:

- NRTF Central-Growth Factor (2017 to 2023) = **1.068**; and
- NRTF Central-Growth Factor (2017 to 2023) = **1.087**.

6.6.3 Systra would note that Department for Transport (DfT) traffic counters located on the A82 in Fort William and on the A830 both show increases in annual average daily traffic (AADT) of approximately 1% between 2017 and 2019. Therefore, it is highlighted that the above NRTF factors which have been adopted are extremely robust.

## 6.7 Model Production & Calibration

6.7.1 Development of the S-Paramics model utilised extensive data sources to define the positions of roadside kerbs, lane markings, traffic signal timings, bus route information and detailed travel demand data.

6.7.2 The following methodology was used in the production and calibration of the model:

- Junction turning count data was evaluated to obtain the travel demand profile over the peak periods and the number plate matching data was used to calculate profiles for the through movements. Where demand was low or there was no turn count data available, a general profile for light vehicles and HGVs has been adopted;
- The model has been calibrated by checking the network description, demand matrices and model inputs and parameters to ensure the model achieves a satisfactory representation of traffic flows and conditions;
- To determine whether the calibration is acceptable it is important to ensure that the model is fit for the purpose of the study, that decision makers understand the quality of the information with which they are working, and that inherent uncertainties are considered when reaching decisions;
- The calibration and validation of the model was undertaken by comparing modelled turn counts, and queue lengths to the observed data set; and
- The guidelines set out in *Transport Analysis Guidance WebTag, Unit M3.1, Highway Assignment Modelling* (DfT, 2014). have been used to undertake the validation of the model. These guidelines are based on the comparison of modelled data to an independent set of data not used to develop the model. All available turn count data was used during the model calibration process. Comparisons of the modelled turn counts cannot be considered a completely independent check, but comparisons are presented to indicate the degree of calibration of the model. Journey time data has been used for the independent validation check against the modelled data.

## 6.8 Results & Discussion

6.8.1 Analysis of the Paramics model results is based on the following parameters over circa 10 runs per modelled scenario:

- Journey times; and
- Queue lengths (defined by the number of vehicles queued across the network).

6.8.2 Full details of the production methodology, calibration and results are provided within a separate modelling report which is contained within **Appendix A** of this TA.

### Journey Times

6.8.3 Average journey time comparisons were extracted from the traffic models through two sections of the A82. The two routes assessed are:

- Achintore Rd to Glen Nevis Roundabout (both directions)
- Glen Nevis Roundabout to A830 at Police Scotland roundabout (both directions)

6.8.4 **Table 6.1** sets out the average journey times (over circa 10 runs) as reported by Paramics across the various scenarios. The journey times are reported in seconds.

Table 6.1: Average Journey Times (in seconds)

| PEAK | ROUTE | | 2023 REF CASE | + DEVELOPMENT | DIFFERENCE |
|---|---|---|---|---|---|
| AM | Auchintore Road to Glen Nevis Roundabout | EB | 145 | 147 | 1 |
| | | WB | 120 | 120 | 0 |
| | Glen Nevis Roundabout to Police Scotland Roundabout | NB | 252 | 252 | 0 |
| | | SB | 261 | 261 | 0 |
| PM | Auchintore Road to Glen Nevis Roundabout | EB | 160 | 160 | 0 |
| | | WB | 123 | 123 | 0 |
| | Glen Nevis Roundabout to Police Scotland Roundabout | NB | 270 | 272 | 1 |
| | | SB | 695 | 747 | 52 |

6.8.5 As per **Table 6.1** and the modelling report, there is very little impact due to development traffic. It is noted that there could be a potential increase in overall average journey time between the Police Scotland Roundabout at Blar Mhor and the Glen Nevis Roundabout, during the PM peak hour. This increase is reported by Paramics as approximately 52 seconds. The distance between these two junctions is approximately 3.0km. Therefore, an increase in average journey time of approximately 52 seconds is not considered adverse or disproportionate to the length of the route.

6.8.6 It is noted that this is for a scenario in which staff journeys coincide with the network peak hours. However, as discussed, this will not be the case and has been assessed to protect any forthcoming consent from being restricted against future changes to shift patterns.

6.8.7 All other routes are reported to have the same journey times with and without development traffic confirming that the development has a very small traffic impact on the Fort William network.

## Network Wide Traffic Queueing

6.8.8 Traffic model outputs can be extracted for individual junction arms or whole areas of the model network. The total network queuing statistic provides a comparison of the total number of vehicles queueing in the model network at any one time. This is therefore a good statistical comparator for identifying overall network queuing.

**Figure 6.3** demonstrates a comparison of the profiles of total network queueing between the reference case and the development scenario.

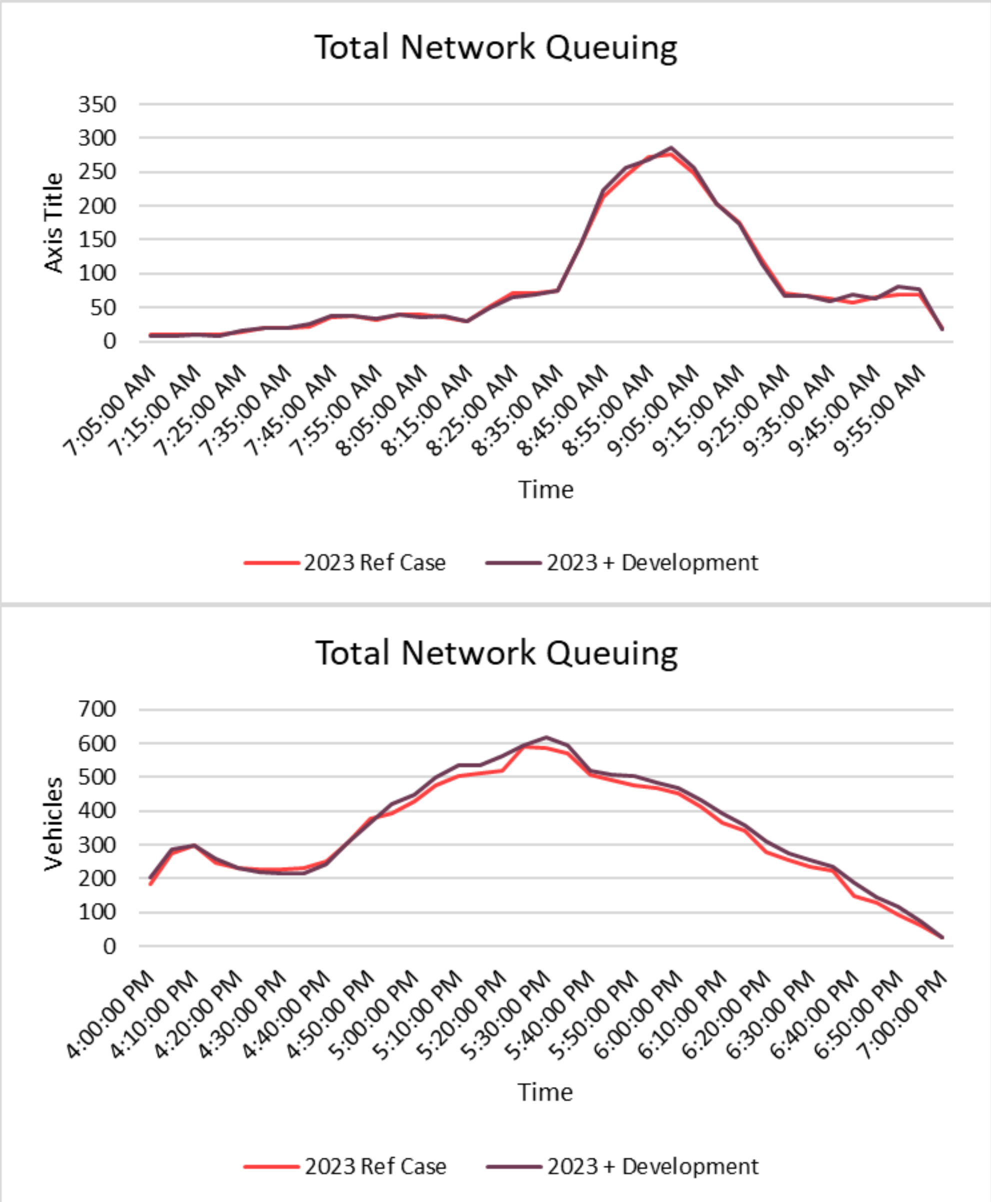


**Figure 6.3: Total Network Queueing – AM & PM Peak Periods**

6.8.9 As illustrated by the graphs, there is a negligible difference in the total number of vehicles which are reported to be queueing across the model when development traffic is added. This is the case for both peak periods.

6.8.10 Again, it is highlighted that this is for a scenario in which staff journeys coincide with the network peak hours.

## 6.9 Traffic Impact Summary

6.9.1 The existing S-Paramics microsimulation model held by Systra for the A82(T) corridor through Fort William (including the A830 up to the Police Scotland Roundabout at Blar Mhor) has been updated to support the proposed development.

6.9.2 The NRTF traffic growth factors have been used to apply background traffic growth to the network to obtain a 2023 design year reference case. A robust estimation of the potential development traffic resulting from the Recycling & Billet Casting Plant has been added to the network to assess the impacts of the development on the local road network in Fort William.

6.9.3 Despite the current proposed shift patterns which are out with the network peak periods, Systra has applied the development trip generation to the network peak hours so that any future changes to shift start and end times are appropriately considered at the planning stage.

6.9.4 The results of the modelling exercise evidence that the modest level of trip generation which will arise from the Recycling & Billet Casting Plant will have a negligible impact on the local and strategic road network and therefore it is concluded that the development traffic impacts are acceptable.

# 7. MEASURES TO SUPPORT THE DEVELOPMENT

## 7.1 Walking & Cycling

7.1.1 Scottish Government guidelines indicate a hierarchy of travel modes with walking being the highest and most sustainable form of travel, followed closely by cycling. It is therefore important to ensure that the surrounding network of walking and cycling infrastructure is suitable to accommodate the additional trips on foot and by bicycle that will be generated by the proposed development and that good connectivity is provided to / from this network.

7.1.2 This has been demonstrated by the discussions presented within **Chapter 2** of the TA and it is reiterated that there is an established network of footways and cycling infrastructure surrounding the site.

7.1.3 Scottish Government Transport Assessment Guidance (TAG) recommends that journey times of up to 20 – 30 minutes (1,600m – 2,400m) are appropriate for walking. As such, **Figure 7.1** highlights the walking isochrones from the development site in 5-minute increments up to a 30-minute walking distance from the development[2].

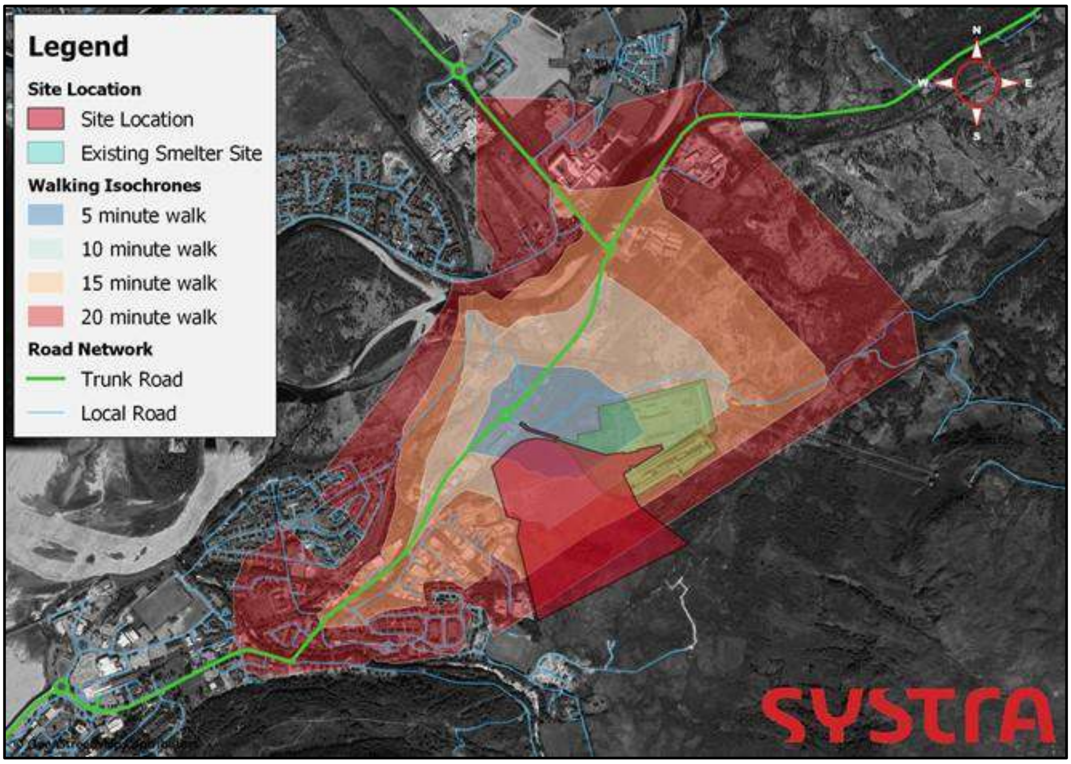


**Figure 7.1: Walking Isochrones**
*Source: QGIS; SYSTRA*

[2]The isochrone assessment assumes an average walking speed across all users of 1.2m/s which is based upon the guidelines within Transport Scotland's policy document: Planning Advice Note (PAN) 75, 'Planning for Transport'.

7.1.4 The isochrone assessment illustrates that the north of Fort William, Inverlochy, Lochyside and Caol are accessible within a 30-minute walk from the development. It is reiterated that a high proportion of existing staff reside within these areas (see **Figure 5.2**).

7.1.5 Cycling is the second most sustainable mode of travel after walking. TAG suggests that journey times of up to 30 – 40 minutes are appropriate for cycle access to developments, which equates to around 10km at a typical cycle speed of around 16km/h[3].

7.1.6 **Figure 7.2** therefore details the cycling isochrones in 10-minute increments up to a 40-minute journey time from the proposed development site.

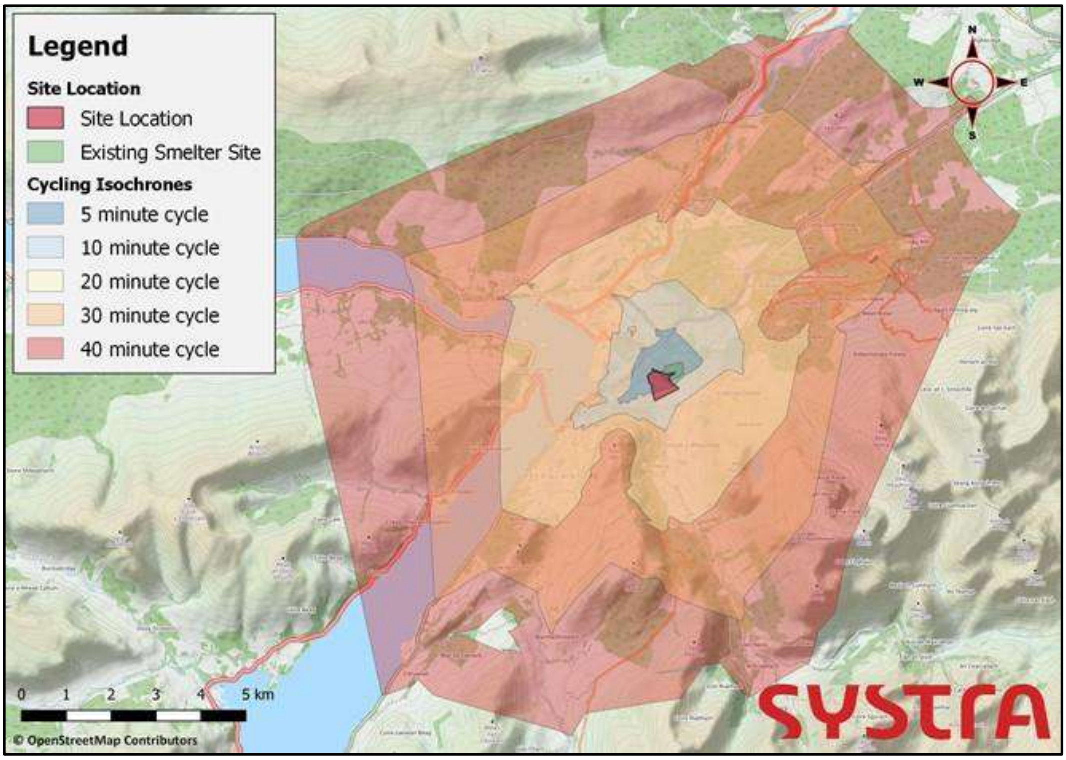


**Figure 7.2: Cycling Isochrones**
*Source: QGIS; SYSTRA*

7.1.7 The cycling isochrone assessment demonstrates that all of the surrounding residential areas within the wider Fort William settlement are accessible within a 20 to 30-minute cycle from the development.

7.1.8 A4-scale walking and cycling isochrones are provided within **Appendix C** of this TA.

7.1.9 Recent infrastructure improvements have been made to the pedestrian and cycle network as a result of development of the North Road Retail Park adjacent to the development site. Direct access to the high-quality pedestrian routes through the North Road Retail Park can be gained from the existing smelter access road, which will accommodate both pedestrians and cyclist movements.

[3]The isochrone assessment assumes an average cycle speed across all users of 16km/h which is based upon the guidelines within Transport Scotland's policy document: Cycling by Design (2010).

7.1.10 It is recommended that around 8 new cycle parking spaces are provided at the Recycling & Billet Casting Plant. This could be provided in the form of 4 'Sheffield cycle stands', which each have a capacity for 2 bicycles to be parked per stand.

## 7.2 Public Transport

7.2.1 The site is served directly by two bus stops on the A82(T) which are within a 400m *reasonable walking distance*. A travel survey of existing Lochaber Smelter employees has indicated that no staff currently travel by public transport. It is considered that the reason for this is due to the existing shift patterns which changeover at 07:00 and 19:00, which is out with the period in which peak bus services operate.

## 7.3 Development Access

7.3.1 Vehicular access to the Proposed Development will be provided from a link to the existing Lochaber smelter. The access road to the existing smelter meets the A82 at a 4-arm roundabout which also provides access to the North Road Retail Park.

7.3.2 The existing smelter access road is single carriageway with a speed limit of 20 mph and there are traffic calming measures in place in the form of speed tables. All HGV and staff vehicle movements associated with the Proposed Development will enter and exit the site from the A82 using this access road from the roundabout on the A82.

7.3.3 Pedestrians / cyclists will be able to enter and exit the Proposed Development via this access road which provides a direct link to the quality walking and cycling infrastructure through the North Road Retail Park and hence to the wider active travel network.

## 7.4 Car Parking Provision

7.4.1 A total of 20 new parking spaces will be dedicated to the Recycling & Billet Casting Plant including 2 accessible and 2 active EV charging spaces. Additionally, 10 of the spaces will be constructed as passive EV spaces which will allow for the 'retro-fit' of the charging equipment in the future.

7.4.2 Systra consider this provision to be more than sufficient to serve the parking requirements which will arise from the development. It is anticipated that there will be a demand for around 11 spaces during each shift (based on the existing mode-share for the Smelter). Therefore, 20 spaces allows for an appropriate level of overlap during shift changeover periods.

7.4.3 We would note that the two accessible spaces will be located within 45m of the main entrance as per the Scottish Non Domestic Technical Standard requirements.

## 7.5 Travel Planning

7.5.1 A Travel Plan (TP) is a general term for a package of measures tailored to the needs of individual sites and aimed at promoting more sustainable travel choices among users of those sites. TPs are frequently a planning condition for new development sites such as employment units, leisure facilities; schools; and residential developments.

7.5.2 Lochaber Smelter has an existing TP which was prepared by Systra in 2019 to support more sustainable travel choices by staff of the existing Lochaber Smelter. The TP is provided as an appended document to this TA (**Appendix B**).

7.5.3 The purpose of the TP is to provide a set of potential measures and a scheme of monitoring to support a reduction in single-occupancy car travel. Some of the measures outlined within the TP are as follows:

- Promote walking and cycling;
- Provide information on local accessibility;
- Identify potential physical improvements to the network;
- Cycle to work scheme;
- Manage car use (particularly single-occupancy trips);
- Staff Induction;
- Consistent working hours; and
- Guaranteed lift home.

7.5.4 TPs are live documents which require ongoing review and updates to keep them relevant and therefore useful in promoting sustainable travel choices. It is therefore envisaged that the existing TP will be adopted by the Recycling & Billet Casting Plant facility.

# 8. FRAMEWORK CONSTRUCTION TRAFFIC MANAGEMENT PLAN

## 8.1 Purpose of the Framework CTMP

8.1.1 The purpose of a CTMP is to minimise traffic impacts during the construction works associated with the proposed development and to minimise traffic impacts (and associated environmental impacts) on local residents and users of the area.

8.1.2 This Framework CTMP seeks to define the mechanisms for managing the movement of construction related vehicular traffic associated with the development and also the processes for monitoring of the CTMP and consultation with parties who may be affected by construction traffic and construction activities.

8.1.3 The CTMP only applies to the construction stage of the development and does not apply to the future ongoing operation of the development. It is the responsibility of the main contractor for the construction of the facility to implement the CTMP as well as monitoring its application and making any modifications to the CTMP that may be required. Any sub-contractors employed on the site would fall under the umbrella of the CTMP.

## 8.2 Scope of the Framework CTMP

8.2.1 This Framework CTMP focuses on outlining potential measures which could be introduced to address any issues of safety and the control of risks that may arise from the use of HGVs for the delivery of plant and materials. The Health and Safety Executive (HSE) expect to see CTMPs that include the following elements:

- Planning and managing both vehicles and pedestrian routes;
- The elimination of reversing where possible;
- Safe driving and working practices;
- Protection of the public;
- Adequate vision and lines of sight;
- The provision of signs and barriers; and
- Adequate parking and off-loading/storage areas.

8.2.2 This Framework CTMP has been prepared taking into account the above elements and also ensuring that other environmental impacts such as noise and dust are also considered due to the location of the proposed development and the available access routes.

8.2.3 The CTMP is intended to be a working document that evolves during the detailed construction planning stage for project and during the construction period itself. Monitoring of the CTMP will be undertaken and any necessary modifications will be made in consultation with THC as the local roads authority.

## 8.3 Potential Construction Impacts

8.3.1 Estimates of traffic generation associated with the construction phase of the development have been identified from a first principles approach and have taken account of the following activities:

- Delivery and removal of plant / materials in relation to site mobilisation and set up of site compound;
- Site clearance;
- Delivery of quarry materials and removal of peat for earthworks;
- Delivery of construction materials (such as concrete, steel, etc.);
- Delivery of fit-out kits (such as windows, doors, fixtures and fittings);
- Delivery of paving and carriageway surfacing;
- Delivery of hard landscaping materials;
- Delivery and removal of cranes for building erection;
- Delivery and removal of plant;
- Miscellaneous deliveries; and
- Construction worker travel movements.

## 8.4 Construction Traffic Generation

8.4.1 Construction traffic generation associated with the proposed development includes both construction HGV traffic and staff travel. Due to the varying characteristics of each in terms of a daily profile for arrivals and departures, both have been considered for traffic impacts on their own merits.

**Heavy Goods Vehicles**

8.4.2 The main traffic movements during the construction stage will occur during the earthworks activities. It is estimated that approximately 40,000m$^3$ of quarry material is to be brought to the site.

8.4.3 This activity is programmed for an 11-week period in which approximately 450m$^3$ of material will be brought to site per day (using eight-wheel tippers with an approximate load capacity of 15m$^3$ per tipper). This will result in an approximate 30 HGV loads per day (60 two-way movements) for the 11-week programme. This level of HGV traffic has been assessed as the worst-case scenario as part of the corresponding Environmental Impact Assessment Report (EIAR) Transportation chapter.

**Staff Trips**

8.4.4 Staff travel includes the two-way travel to and from site by staff and site operatives. Based upon general construction site working hours of 07:00 – 18:00 (Mon – Fri), it can be assumed that all staff journeys to the site will occur between 06:30 and 07:30, and all staff journeys from site will occur between 18:00 and 18:30. The Operative and Staff trips are therefore likely to occur out with the peak times.

8.4.5 It is understood that the maximum number of staff on-site at any one time during the construction phase will be approximately 50 – 60. If all staff were to travel by private car (single occupancy) this would equate to a maximum of 120 two-way trips during the construction phase.

8.4.6 The maximum trip generation during the construction phase of the project will therefore be approximately 210 two-way vehicle movements.

## 8.5 Construction Vehicle Impact

8.5.1 It is generally considered that an increase in traffic of 30% or less in all areas, or an increase of 10% or less in sensitive locations (such as, areas with high pedestrian activity and limited pedestrian infrastructure can be considered to be a negligible impact.

8.5.2 The maximum trip generation during the construction phase of 210 two-way vehicle movements per day results in a maximum impact of 2.5% on the public road network (A82 north of Fort William). Within Fort William, the maximum impact will be approximately 1.4% and occurs at the A830. This is below the adopted thresholds and therefore unlikely to cause any potential environmental impacts.

8.5.3 The maximum HGV trip generation of 90 two-way daily movements is around a 5.2% increase within Fort William. Out with Fort William, the maximum increase will be in the region of 15.5% in an area that is not considered to be a sensitive receptor. Again, this level of trip generation is below the adopted thresholds and unlikely to cause any environmental impacts.

8.5.4 Notwithstanding this, the developer will still be required to ensure the safety of all road users and to mitigate where possible the risks associated with construction traffic. These measures are discussed below.

## 8.6 Measures Proposed to Mitigate Impacts

8.6.1 As there is currently a roundabout junction for access into the proposed development site (which is fit for construction HGV traffic), it is considered that there are no physical measures required to accommodate construction traffic accessing the site. There are, however, a number of traffic management measures which are available to the contractor to help reduce the impact of general construction traffic during the construction works.

8.6.2 Some of the traffic management measures which could be adopted by the contractor are set out below:

- Delivery Control;
- Banksmen;
- Contractor Speed Limit;
- Designated Construction Routes;
- Promotion of Car Share and Works Transport;
- Measures to Reduce Dust and Debris (such as wheel wash facilities);
- Appropriate Signage;
- Construction Site Operating Hours;
- Workforce Travel and Parking Arrangements;
- Measures to Maintain Pedestrian Safety;
- Travel Notice Board;
- Staff Induction Process;
- Road Condition Survey; and
- Vehicle Movement Monitoring.

8.6.3 This is not an exhaustive list and, where appropriate, other measures than those set out above could be implemented, if identified as necessary by the site contractor.

## 8.7 Implementation & Monitoring of the CTMP

8.7.1 The implementation of the CTMP will be the responsibility of the main contractor who will also be responsible for the monitoring of the plan. Further evolution of the CTMP will be required during the detailed project planning stages and during the construction period itself.

8.7.2 The main contractor may employ a number of sub-contractors on the site who will fall under the guidance of the CTMP and will have an obligation to adhere to the plan written in to their contracts.

8.7.3 Responsibilities of Contractor:

- Primary Point of Contact
- Transport Co-ordination
- Monitoring of the CTMP
- Liaison with Local Community
- Letters / Telephone Calls / Meetings Etc.

## 8.8 Summary of Measures

8.8.1 The purpose of the CTMP is to provide detail on the proposed traffic management measures and procedures that will be put in place to support the development during the construction phase, and to minimise disruption to local residents while maintaining road safety on the surrounding road network.

8.8.2 Management measures have been identified for both the movement of general construction traffic and also for the movement of HGVs. It is considered that when these measures are implemented, a safe environment will be created for local residents affected by the development, existing road users and also employees at the construction site.

8.8.3 The CTMP coordinator will be responsible for all elements of transport during the construction process. The coordinator will review and update the number of site personnel, traffic numbers, and the construction programme as the project progresses. Any significant changes will be discussed and agreed with the Local Authority. The coordinator will also act as the liaison officer responsible for communication with external parties.

8.8.4 Discussions with sub-contractors at the tender stages will allow for traffic management policies to be written into the contractual agreements by the main contractor. It is anticipated that through the introduction of the CTMP (including measures such as the promotion of car share and works transport), a reduction in the number of car trips to the site can also be achieved.

8.8.5 It is considered that the impact of construction traffic associated with the construction of the Recycling & Billet Casting Plant can be appropriately mitigated with measures put in place to minimise the impact on local residents and maintain the safe environment currently enjoyed by users of the area surrounding the existing Lochaber Smelter site.

# 9. SUMMARY & CONCLUSION

## 9.1 Overview

9.1.1 Systra has been commissioned by ITPEnergised on behalf of Alvance Aluminium Group to undertake a Transport Assessment in support of a planning application to develop a Recycling & Billet Casting Plant at the site of the existing Lochaber Aluminium Smelter situated adjacent to the A82(T) trunk road north of Fort William.

9.1.2 The proposed development will comprise construction of a new building to house the manufacturing of aluminium billet, associated car parking, access and landscaping. The new Recycling & Billet Casting Plant will have a gross floor area (GFA) of approximately 10,000m$^2$ and will use a combination of aluminium from the existing Lochaber Smelter and imported scrap aluminium.

## 9.2 Development Proposals

9.2.1 The proposals being brought forward comprise a new purpose-built aluminium billet manufacturing facility on land directly west of the existing smelter site.

9.2.2 Vehicular access to the Proposed Development will be provided from a link to the existing Lochaber smelter. The access road to the existing smelter meets the A82 at a 4-arm roundabout which also provides access to the North Road Retail Park. Pedestrians / cyclists will be able to enter and exit the Proposed Development via this access road which provides a direct link to the quality walking and cycling infrastructure through the North Road Retail Park and hence to the wider active travel network.

## 9.3 Measures to Encourage Sustainable Development

9.3.1 The development is located within a well-established sustainable travel network with high quality routes to key destinations. The nature of the infrastructure affords employees genuine travel choice and the potential for intramodality between walking, cycling and public transport.

9.3.2 Recent infrastructure improvements have been made to the pedestrian and cycle network as a result of development of the North Road Retail Park adjacent to the development site. Direct access to the high-quality pedestrian routes through the North Road Retail Park can be gained from the existing smelter access road, which will accommodate both pedestrians and cyclist movements.

9.3.3 The site is served directly by two bus stops on the A82(T) which are within a 400m *reasonable walking distance*. A travel survey of existing Lochaber Smelter employees has indicated that no staff currently travel by public transport. It is considered that the reason for this is due to the existing shift patterns which changeover at 07:00 and 19:00, which is out with the period in which peak bus services operate.

9.3.4 It is recommended that around 8 new cycle parking spaces are provided at the Recycling & Billet Casting Plant. This could be provided in the form of 4 'Sheffield cycle stands', which each have a capacity for 2 bicycles to be parked per stand.

9.3.5 An existing Travel Plan is in operation for the Lochaber Smelter and will be adopted by the Recycling & Billet Casting Plant. The Travel Plan is provided within **Appendix B** of this TA.

## 9.4 Traffic Impact Assessment

9.4.1 The existing S-Paramics microsimulation model held by Systra for the A82(T) corridor through Fort William has been updated using robust growth factors to support the proposed development. The results of the modelling exercise evidence that the modest level of trip generation which will arise from the Recycling & Billet Casting Plant will have a negligible impact on the local road network.

9.4.2 Despite the current proposed shift patterns which are out with the network peak periods, Systra has applied the development trip generation to the network peak hours so that any future changes to shift start and end times are appropriately considered at the planning stage.

## 9.5 Mitigation

9.5.1 Whilst the TA has not identified any requirement for off-site mitigation, Systra would note that, as is good practice, a Framework Construction Traffic Management Plan has been produced for the proposed development (see **Chapter 8**).

## 9.6 Overall Conclusion

9.6.1 This Transport Assessment demonstrates that the proposed development will be accessible by a range of sustainable modes and is supported by a wealth of active travel infrastructure in the immediate vicinity of the site. The brownfield nature of the development (which will form part of the existing Alvance provision at Lochaber Smelter) allows ease of integration within the existing established transport network and is in accordance with local and national transport policy.

9.6.2 There will be no adverse impact on the surrounding road network resulting from the proposed development and this is evidenced by the traffic modelling analysis. As such, it is considered that the proposed development should not be resisted on the grounds of traffic or transportation.

# APPENDICES

| | | |
|---|---|---|
| **APPENDIX A** | **–** | **PARAMICS Modelling Report** |
| **APPENDIX B** | **–** | **Lochaber Smelter Travel Plan** |
| **APPENDIX C** | **–** | **Accessibility Isochrones** |
| **APPENDIX D** | **–** | **Scoping & Pre-Application Discussions** |

# APPENDIX A

## PARAMICS MODELLING REPORT

**Proposed Recycling & Billet Casting Plant, Lochaber Smelter, Fort William**
Reference number GB01T21A09/110405

**06/04/2021**

# TRAFFIC MODELLING ASSESSMENT

SYSTRA

# PROPOSED RECYCLING & BILLET CASTING PLANT, FORT WILLIAM

TRAFFIC MODELLING ASSESSMENT

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# 1. INTRODUCTION

## 1.1 Background

1.1.1 SYSTRA has been commissioned by ITPEnergised on behalf of Alvance Aluminium Group to undertake a Transport Assessment (TA) in support of a planning application for development of a proposed Recycling & Billet Casting Plant on land associated with the existing Lochaber Aluminium Smelter situated adjacent to the A82 (T) North Road in Fort William.

1.1.2 The development comprises a new industrial building adjacent to the existing smelter facility, with associated ancillary infrastructure and access. The site location is provided in Figure 1.1.

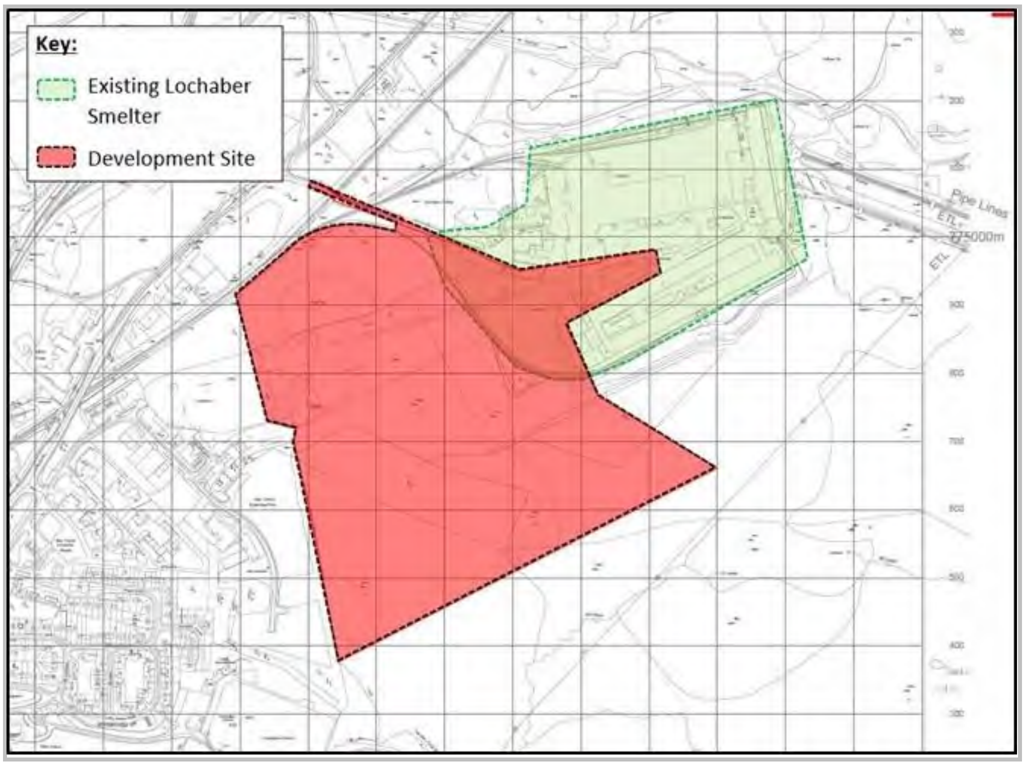


Figure 1.1 :Site Location Plan

## 1.2 Purpose of Report

1.2.1 As part of the TA, the Paramics Microsimulation model of the study area that was developed for a previous assessment has been updated and utilised assess the traffic impacts of the proposed development.

1.2.2 This report details the development of the:

- Fort William 2017 Base Model,
- 2023 Reference Case future year model,
- Model testing and impact of the proposed development on the 2023 Reference Case Model.

# 2. TRAFFIC SURVEYS

## 2.1 Introduction

2.1.1 Traffic surveys were undertaken by Nationwide Data Collection (NDC) at key junctions within the Fort William network on Thursday 21st September 2017. The data from the surveys was utilised in the development of the 2017 Fort William base Model. This chapter provides detail on the survey programme undertaken.

## 2.2 Turn Count and Queue Data

2.2.1 Turn Count and Queue Length Data was collected at 12 junctions within the study area. Details of the turn count and queue length locations are given in Table 2.1 and Figure 2.1.

Table 2.1 : Junction Turn Count / Queue Length Surveys

| Site | Location | Type of Survey |
|---|---|---|
| 1 | A82 / Car Park Entrance / Achintore Road / Lundavra Road / High Street | MCC & Queues |
| 2 | Carmichael Way / A82 / Belford Road | MCC & Queues |
| 3 | A82 Belford Rd Off Ramp / A82 Belford Rd(W) / Middle St / A82 Belford Rd(E) | MCC & Queues |
| 4 | North Road / A82 Belford Road / West Highland Access Road / Glen Nevis | MCC & Queues |
| 5 | Earl of Inverness Road / A82 North Road(S) / A82 North Road(N) | MCC & Queues |
| 6 | A82 North Road(N) / A82 North Road(S) / Ardnevis Road | MCC & Queues |
| 7 | A82 North Road(N) / Glen Nevis Retail Park / A82 North Road(S) | MCC & Queues |
| 8 | A82 North Road(N) / A82 North Road(S) / Glen Nevis Business Park | MCC & Queues |
| 9 | A82(N) / A82(S) / Liberty British Aluminium Works Access | MCC & Queues |
| 10 | A82(N) / A830(Lockybridge) / A82(S) | MCC & Queues |
| 11 | A830(N) / B8006 / A830(S) | MCC & Queues |
| 12 | A830(N) / A830(S) / Lochaber High School | MCC & Queues |

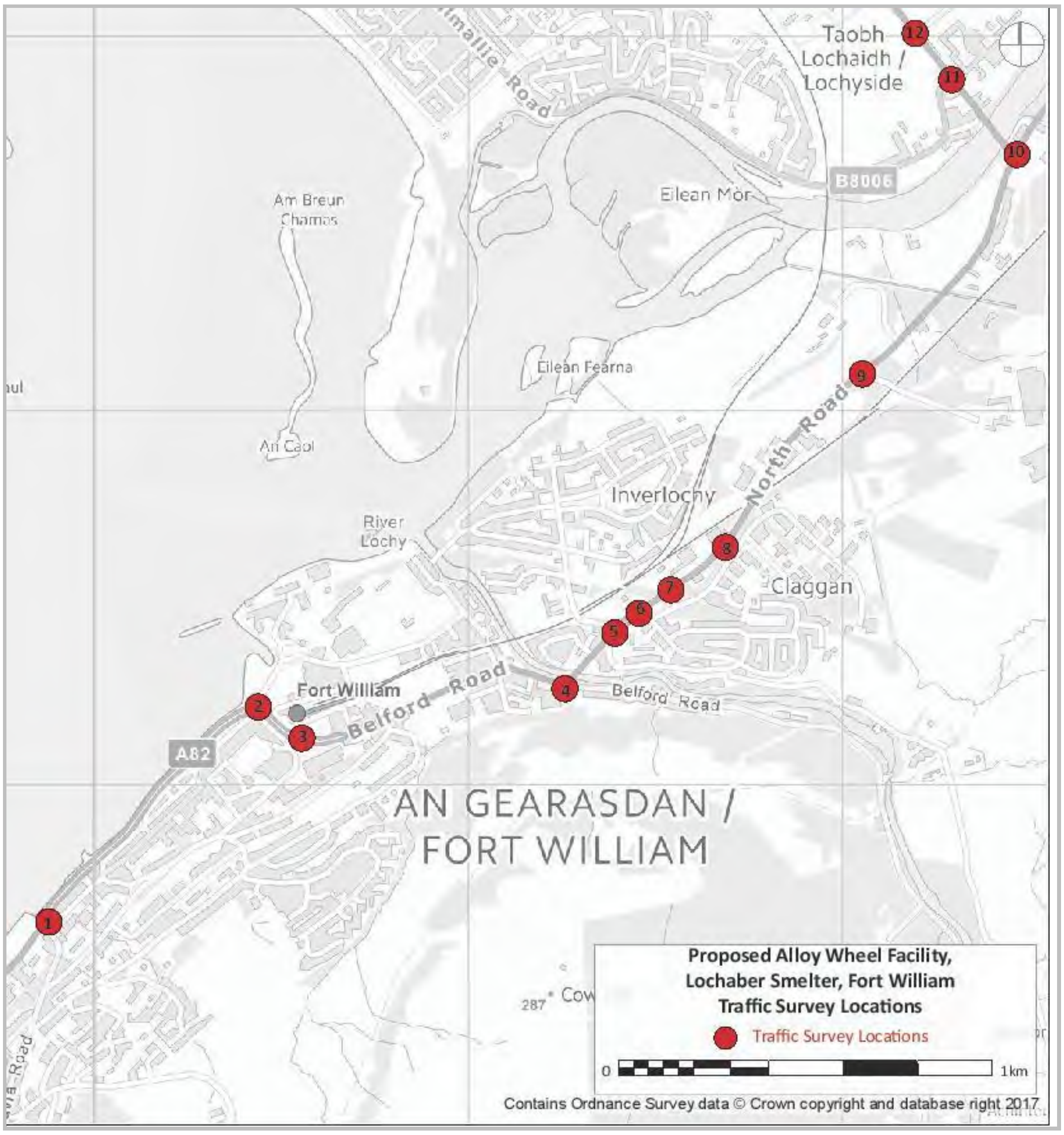

Figure 2.1 :Junction Turn Count / Queue Length Surveys

## 2.3 Journey Time Surveys

2.3.1 Vehicle journey time runs were undertaken through the model network area in both directions between the following two junctions:

- A82 West End Roundabout (Junction1)
- A82 / A830 Lochy Bridge (Junction12)

2.3.2 Between 9 and 12 runs were recorded in both directions in the AM and PM Peak periods (07:00-10:00, 16:00-19:00). Interim journey times at 10 timing points along the routes were also recorded.

# 3. BASE MODEL DEVELOPMENT

## 3.1 Introduction

3.1.1 Various data sources were utilised in developing the base model. Site visits and Google mapping provided detailed road infrastructure information, and Nationwide Data Collection (NDC) carried out the survey programme.

3.1.2 The following provides detail on the base model development process and data sources.

## 3.2 Network Development

3.2.1 The S-Paramics network was created using version 2012.1 The development of the model utilised the extensive data sources to define the positions of roadside kerbs, lane markings, traffic signal timings, bus route information and detailed travel demand data.

3.2.2 Figure 3.1 provides detail on the model network extent.

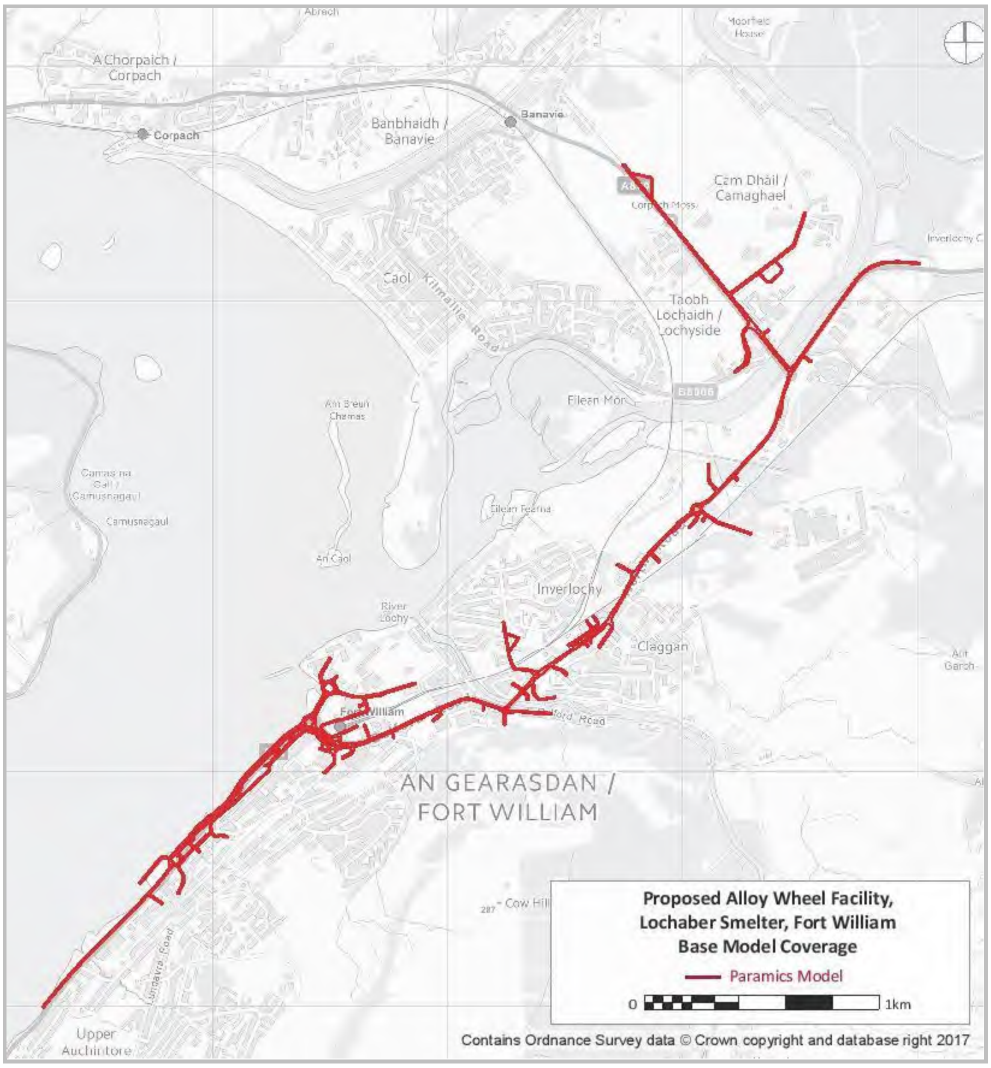


Figure 3.1 :Fort William Model 2017 – Network Extent

3.2.3 The following time periods have been modelled:

- AM Peak 07:00-10:00
- PM Peak 16:00-19:00

3.2.4 The timings for the traffic signals at A830 / B8006 junction were obtained from video surveys.

3.2.5 The pedestrian crossings in the model are located at:

- On A82 East of West end roundabout
- On A82 at the Ferry Landing
- On A82 at Bedford Hospital
- On A82 at Glen Nevis Place
- On A82 at Earl of Inverness Rd
- On A82 south of Lochy Bridge roundabout

3.2.6 The pedestrian crossing at Earl of Inverness Rd also includes a signal plan to replicate additional delay between 08:30 and 09:00 AM due to a school crossing patrol (as observed in survey videos)

3.2.7 On the day of survey, the roundabout at the site access was under construction with traffic management conditions affecting traffic queueing and delay within the local area. This impact was required to be included within the 2017 Base Model network for calibration and validation purposes (but would be removed for future year modelling).

3.2.8 Following a review of the traffic survey videos, the following elements were applied in the model to replicate the on-site conditions through the roadworks:

- 1 lane routing around roundabout (approach flares closed)
- Reduced traffic speed through roundabout (10mph)
- Additional delay on northern A82 arm due to road scarification and ramp delay (1 second full stop time applied to all vehicles in both directions)
- Traffic management conditions to be removed for future year modelling

3.2.9 Paramics allows an accurate method for coding public transport information and it is possible to code precise individual release times, which provides a more robust public transport model.

3.2.10 Public transport data was obtained by SYSTRA for the study area using online sources. This information provided details for bus services/routes and bus stops which were subsequently coded in the model.

## 3.3 Trip Matrix Development

3.3.1 The 2017 trip matrices were developed using the 2017 turn count survey data. Two matrix levels were created for the Paramics model and the proportion of each vehicle type within the matrices is as follows:

- Light Vehicles:
  - Cars 88.1%
  - LGVs 11.9%
- Light Vehicles:
  - Cars 64.7%
  - LGVs 22.3%
  - Coaches 13%

3.3.2 The rate that traffic that leaves each area will vary throughout the model period. Paramics offers the ability to simulate this by applying a variety of travel demand profiles throughout the network.

3.3.3 The junction turn count data was evaluated to obtain the travel demand profile over the peak periods and the number plate matching data was used to calculate profiles for the through movements. Where demand is low or there was no turn count data available a general profile for lights and heavies was applied.

3.3.4 There is a total of 38 profiles used in the model.

## 3.4 Model Calibration

3.4.1 The calibration process involves checking the network description, demand matrices and model inputs and parameters to ensure the model achieves a satisfactory representation of traffic flows and conditions.

3.4.2 To determine whether the calibration is acceptable it is important to ensure that the model is fit for the purpose of the study, that decision makers understand the quality of the information with which they are working, and that inherent uncertainties are considered when reaching decisions.

3.4.3 The calibration and validation of the model was undertaken by comparing modelled turn counts, and queue lengths to the observed data set.

3.4.4 The guidelines set out in *Transport Analysis Guidance WebTag, Unit M3.1, Highway Assignment Modelling (Department for Transport, January, 2014).* have been used to undertake the validation of the model. These guidelines are based on the comparison of modelled data to an independent set of data were not used to develop the model. All available turn count data was used during the model calibration process. Comparisons of the modelled turn counts cannot be considered a completely independent check, but comparisons are presented to indicate the degree of calibration of the model. Journey time data has been used for the independent validation check against the modelled data.

3.4.5 Calibration Factors: visibility and GA look next were applied to appropriate links in the model.

3.4.6 Detailed comparisons of observed and modelled turn counts occurred throughout the model development process. Comparisons were made on both a periodic and hourly basis to ensure both the total demand and variation within the modelled time periods were robust.

3.4.7 The GEH statistic has been used to compare modelled and observed flows and is defined as:

$$GEH = \sqrt{\left(M - O\right)^2 / \left(0.5 \times \left(M + O\right)\right)}$$

Where:

M = modelled flow

O = observed flow

3.4.8 The guidelines set out in *WebTag* state that 85% of individual hourly flows should have a GEH of less than 5 for a model to be considered acceptable.

3.4.9 Table 3.1 shows the percentage of link counts which achieve a GEH value of less than 4, 5 (the guidance figure) and 7 in the AM and PM periods.

3.4.10 The percentages of link count comparisons yielding a GEH value of less than 5 are excellent across all hours in both periods with every hour exceeding the *WebTag* criteria of 85% of turns with a GEH of less than 5.

3.4.11 Table 3.2 shows the percentage of turn counts which achieve a GEH value of less than 4, 5, and 7 in the AM and PM periods.

3.4.12 The percentages of turn count comparisons yielding a GEH value of less than 5 are also excellent across all hours in both periods. Whilst turn count calibration is not required within *WebTag*, the statistics provide further confirmation of the calibration level achieved within the model.

Table 3.1 : Link Count Comparison

| Peak | Time Period | GEH <4 | GEH <5 | GEH <7 |
|---|---|---|---|---|
| AM Peak | 07:00-08:00 | 85% | 93% | 100% |
| | 08:00-09:00 | 91% | 95% | 100% |
| | 09:00-10:00 | 99% | 100% | 100% |
| | 07:00-10:00 | 96% | 98% | 100% |
| PM Peak | 16:00-17:00 | 100% | 100% | 100% |
| | 17:00-18:00 | 100% | 100% | 100% |
| | 18:00-19:00 | 95% | 100% | 100% |
| | 16:00-19:00 | 100% | 100% | 100% |

Table 3.2 : Turn Count Comparison

| Peak | Time Period | GEH <4 | GEH <5 | GEH <7 |
|---|---|---|---|---|
| AM Peak | 07:00-08:00 | 90% | 96% | 99% |
| | 08:00-09:00 | 89% | 96% | 100% |
| | 09:00-10:00 | 99% | 100% | 100% |
| | 07:00-10:00 | 95% | 100% | 100% |
| PM Peak | 16:00-17:00 | 99% | 99% | 100% |
| | 17:00-18:00 | 100% | 100% | 100% |
| | 18:00-19:00 | 96% | 99% | 100% |
| | 16:00-19:00 | 98% | 100% | 100% |

## 3.5 Model Validation

3.5.1 *WebTag* recommends that for the journey time validation the percentage difference between modelled and observed journey times, subject to an absolute maximum difference should be used as a measure.

3.5.2 *WebTag* acceptability guidelines suggest that over a journey time route the modelled mean comparison should be within 1 minute or 15% of the observed, in 85% of cases. Table 3.3 shows that the journey time routes fall within the acceptability guidelines in both peak periods.

Table 3.3 : Modelled Vs Observed Journey Time Comparison

| Peak | From | To | Observed | | | Modelled | | | %age | <1min |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Mean | Max | Min | Mean | Max | Diff of | or 15% |
| AM | West End Roundabout | A82 / A830 (Lochy Bridge) | 306 | 348 | 392 | 325 | 346 | 406 | -1% | ✓ |
| AM | A82 / A830 (Lochy Bridge) | West End Roundabout | 288 | 374 | 510 | 321 | 384 | 559 | 3% | ✓ |
| PM | West End Roundabout | A82 / A830 (Lochy Bridge) | 306 | 384 | 554 | 325 | 384 | 504 | 0% | ✓ |
| PM | A82 / A830 (Lochy Bridge) | West End Roundabout | 295 | 490 | 804 | 326 | 529 | 905 | 8% | ✓ |

3.5.3 No specific *WebTag* guidelines exist for the comparison of observed and modelled queues due to the subjectivity in the data collection methods and the degree of interpretation required when comparing modelled and observed queue data.

3.5.4 The queue length survey data provided by the survey company was compared against observations form the video surveys and some discrepancies were noted at locations where rolling queues occurred.

3.5.5 In the traffic model, a vehicle is deemed to be in a queued state if the speed drops below 10mph. This therefore registers vehicles as queuing when a slow-moving queue occurs. There was therefore some differences between the observed queue data and the modelled queue data (as detailed in Appendix A).

3.5.6 For the purposes of this model, a visual overview of the significant queuing in the model was undertaken and the model queue lengths were validated to the observed conditions. The key queue locations were noted as follows:

- A82 North Road southbound on approach to Belford Road – southbound rolling queue throughout A82 North Rd corridor, particularly in PM Peak.
- Some northbound queuing at the Smelter site access due to temporary road works (both peaks)
- Significant southbound queueing, from the Smelter site back through the A830 / A82 junction in both peaks

3.5.7 **Appendix A** provides some of the key queue length comparisons between the model and observed queues in the AM and PM peaks.

3.5.8 Given the high level of model calibration and validation achieved, it was considered that the Fort William Base Model 2017 was fit for model testing of the proposed Smelter Development.

3.5.9 The following Chapters detail the model testing undertaken.

# 4. TEST MODEL DEVELOPMENT

## 4.1 Opening Year Assessment

4.1.1 Should the planning application for the proposed Recycling & Billet Casting Plant be successful, it is intended that the plant would open in 2023. To establish likely baseline traffic conditions in 2023 ('2023 Reference Case Model'), National Road Traffic Forecast (NRTF) factors have been applied to the turning count survey results.

4.1.2 NRTF High Growth has been applied to all the A82(T) through movements, with NRTF Central Growth figures applied to all other movements. The growth factors used are as follows:

**Table 4.1 : NRTF Growth Factors**

| Projected Year | Central Growth | High Growth |
|---|---|---|
| 2017-2022 | 1.057 | 1.074 |

## 4.2 Committed Development

4.2.1 The Highland Council have indicated that this Transport Assessment should take account of two committed developments which will have an impact on the proposed site's area of influence. These are as follows:

- North Road Retail Development – (new model zone 29)
- Kilmallie Road Residential Development – (within exiting model zone 11)

4.2.2 The trip generation developed for both sites is detailed in the main Transport Assessment Report. The 3 Hr trips applied to the AM and PM Peak periods is detailed in Table 4.2.

**Table 4.2 : Committed Developments- Modelled Trips**

| Peak | Direction | Residential Development (3 Hr -Veh) | Retail Development (3 Hr -Veh) | Total (3 Hr -Veh) |
|---|---|---|---|---|
| AM | Inbound | 27 | 113 | 140 |
| | Outbound | 37 | 71 | 108 |
| | | | | |
| PM | Inbound | 43 | 214 | 257 |
| | Outbound | 35 | 241 | 276 |

4.2.3 The residential development was applied to the existing model Zone 11 (B8006) with the existing zone profile.

4.2.4 The retail development was applied in the model as a new zone 29 (at the new roundabout on the A82 – see Figure 3.2). Arrival and departure profiles were applied separately, based on the hourly TRICS trip attraction proportions.

## 4.3 Recycling & Billet Casting Plant

4.3.1 The development of the trip generation for the Recycling & Billet Casting Plant is detailed in the main Transport Assessment Report. As detailed in the main report, the site will operate two shifts per day. The traffic modelling is to assess the impact of the shift changeover during the AM and PM peak periods (worst case scenario).

4.3.2 Table 4.3 shows the development trips applied in the model and the time periods in which the trips were assigned.

**Table 4.3 : Recycling & Billet Casting Plant – Modelled Trips**

| Peak | Time Period | Direction | Billet Plant Development Trips (veh) | Billet Plant Sensitivity Development Trips Sensitivity (veh) |
|---|---|---|---|---|
| AM | 07:00-10:00 | Inbound | 19 | 19 |
| | 07:00-10:00 | Outbound | 8 | 19 |
| PM | 07:00-10:00 | Inbound | 8 | 19 |
| | 07:00-10:00 | Outbound | 19 | 19 |

4.3.3 The development trip distribution as detailed in the main Transport Assessment Report was replicated in the traffic model.

4.3.4 Traffic profiles were applied as flat profiles for the arrival & departure periods detailed in Table 4.2.

## 4.4 Future Year Model Matrices

4.4.1 The 2023 Ref Case Model includes the background growth and committed developments detailed in Section 4.2. The 2023+Development Model includes the further addition of the Recycling & Billet Casting Plant development trips detailed in Figure 4.2.

4.4.2 Table 4.4 shows the resultant impact of the developments on the overall 3 Hr model matrices.

4.4.3 The table shows that the 2023 Reference Case Model has 8% and 10% more trips than the 2017 Baseline in the AM and PM Peak respectively.

4.4.4 The 2023 Plus-Development Model adds further traffic in the network compared to the 2023 Ref Case in both peak periods, resulting in a 8% AM peak growth and 10% PM peak growth over the 2017 Baseline.

4.4.5 The 2023 Plus-Development Model (sensitivity test) adds further development traffic in the network compared to the 2023 Ref Case in both peak periods, resulting in a 9% AM peak growth and 11% PM peak growth over the 2017 Baseline.

**Table 4.4 : Future Year Model Matrices**

| Peak | Matrix | 2017 | 2022 Reference Case | | | | 2022 + Dev | | 2022 + Dev Sens | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Base | Growth | Development Trips | Less Passby | Matrix Total | Development Trips | Matrix Total | Development Trips | Matrix Total |
| AM | Matrix 1 | 6270 | 335 | 248 | -46 | 6805 | | 6805 | | 6805 |
| | Matrix 2 | 647 | 15 | 0 | 0 | 662 | | 662 | | 662 |
| | Matrix 3 | - | - | - | - | - | 11 | 11 | 22 | 22 |
| | Matrix 4 | - | - | - | - | - | 16 | 16 | 16 | 16 |
| | Total | 6917 | 350 | 248 | -46 | 7467 | | 7494 | | 7505 |
| | Diff to Base | - | | | | 550 | | 577 | | 588 |
| | % diff to Base | - | | | | **108%** | | **108%** | | **109%** |
| PM | Matrix 1 | 9408 | 519 | 533 | -60 | 10400 | | 10400 | | 10400 |
| | Matrix 2 | 466 | 8 | 0 | 0 | 474 | | 474 | | 474 |
| | Matrix 3 | - | - | - | - | - | 11 | 11 | 22 | 22 |
| | Matrix | - | - | - | - | - | 16 | 16 | 16 | 16 |
| | Total | 9874 | 527 | 533 | -60 | 10874 | | 10901 | | 10912 |
| | Diff to Base | - | | | | 1000 | | 1027 | | 1038 |
| | % diff to Base | - | | | | **110%** | | **110%** | | **111%** |

# 5. TEST MODEL RESULTS

## 5.1 Introduction

5.1.1 As detailed in Chapter 4, three future year scenarios for 2023 were developed to allow an assessment of the proposed Billet Development.

5.1.2 To compare these future year scenarios against the 2017 baseline, a version of the 2017 baseline was created which did not include the roadworks at the roundabout of A82 / Development. i.e. a network scenario where this work was complete and the roundabout was fully operational.

5.1.3 This revised Base Model has been identified as the '2017 Reference Case Model'. The model scenarios are therefore:

- '2017 Base' = Model network as per day of survey
- '2017 Ref Case' = As per 2017 Base but with roundabout construction works complete
- '2023 Ref Case' = 2017 Ref Case with background growth plus two committed developments
- '2023+Dev' = 2023 Ref Case with Billet Development
- '2023+Dev (Sensitivity)' = 2023 Ref Case with Billet Development with additional development trips

5.1.4 The Chapter details the key model outputs relating to the model test scenarios (excluding 2017 Base).

## 5.2 Journey Time Comparisons

5.2.1 Average journey time comparisons were extracted from the traffic models through two sections of the A82. The two routes were:

- Achintore Rd to Glen Nevis Roundabout (both directions)
- Glen Nevis Roundabout to A830 at Police Scotland roundabout (both directions)

5.2.2 Table 5.1 provides the summarised model results.

**Table 5.1 : Average Journey Times**

| Peak | | Route | Direction | 2017 Ref Case (s) | 2022 Ref Case (s) | *Diff To 2017 Ref Case* (s) | Scenario 2022+Dev (s) | *Diff To 2022 Ref Case* (s) | 2022+Dev Sens (s) | *Diff To 2022 Ref Case* (s) |
|---|---|---|---|---|---|---|---|---|---|---|
| AM | 1 | Achintore Rd to | EB | 140 | 145 | 5 | 146 | 0 | 147 | 1 |
| | | Glen Nevis Rdbt | WB | 120 | 120 | 0 | 120 | 0 | 120 | 0 |
| | 2 | Glen Nevis Rdbt to A830 / | NB | 248 | 252 | 4 | 252 | 0 | 252 | 0 |
| | | Police Scotland Rdbt | SB | 250 | 261 | 11 | 268 | 6 | 261 | 0 |
| PM | 1 | Achintore Rd to | EB | 151 | 160 | 9 | 162 | 2 | 160 | 0 |
| | | Glen Nevis Rdbt | WB | 123 | 123 | 0 | 123 | 0 | 123 | 0 |
| | 2 | Glen Nevis Rdbt to A830 / | NB | 261 | 270 | 9 | 272 | 2 | 272 | 1 |
| | | Police Scotland Rdbt | SB | 412 | 695 | 283 | 715 | 20 | 747 | 52 |

5.2.3 Table 5.1 shows that there is little difference in journey times along route 1 in all test scenarios. The key difference is southbound traffic through the A82 along route 2, particularly in the PM Peak

5.2.4 The results of route 2 southbound show a significant increase in journey times between the 2017 and 2023 Ref Case scenario in the PM peak with an additional 283 seconds (over 4 minutes – 69% increase) over the 2017 Ref Case.

5.2.5 The Billet development adds a further 20 seconds onto the average journey time, resulting in a 73% increase in average journey time over the 2017 Ref Case.

5.2.6 With the additional trips added as part of the sensitivity test, there is a 81% increase over the 2017 Ref Case.

## 5.3 Network Wide Traffic Queueing Comparisons

5.3.1 Traffic models outputs can be extracted for individual junction arms or whole areas of the model network. The total network queuing statistic provides a comparison of the total number of vehicles queueing in the model network at any one time. This is therefore a good statistical comparator for identifying overall network queuing.

5.3.2 Figures 5.1 and 5.2 provide the network wide queue levels (in 5-minute increments) for the AM and PM peaks respectively.

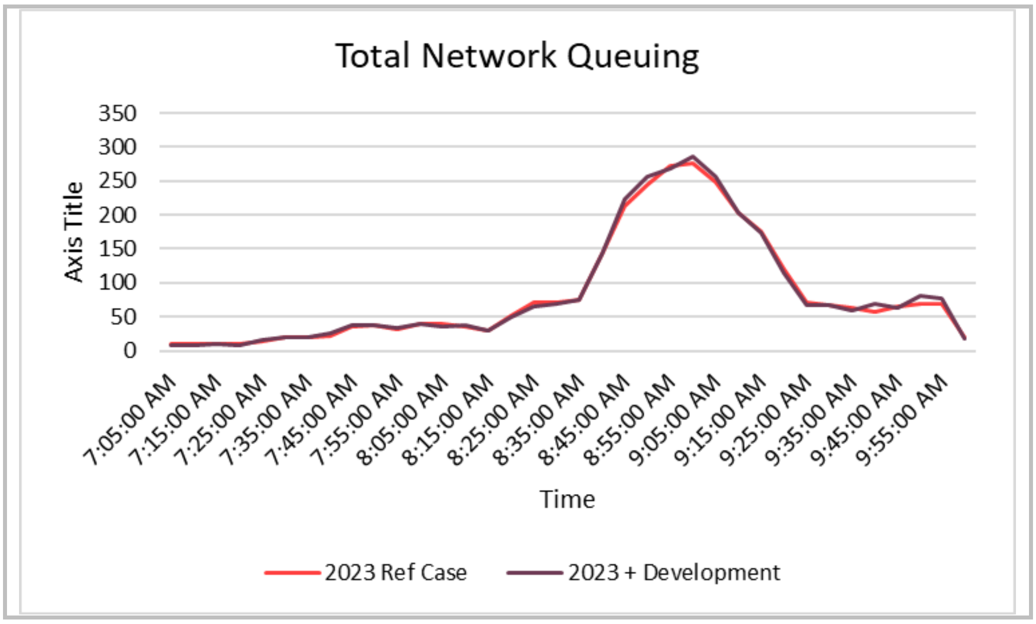


**Figure 5.1 :Total Network Queueing – AM Peak**

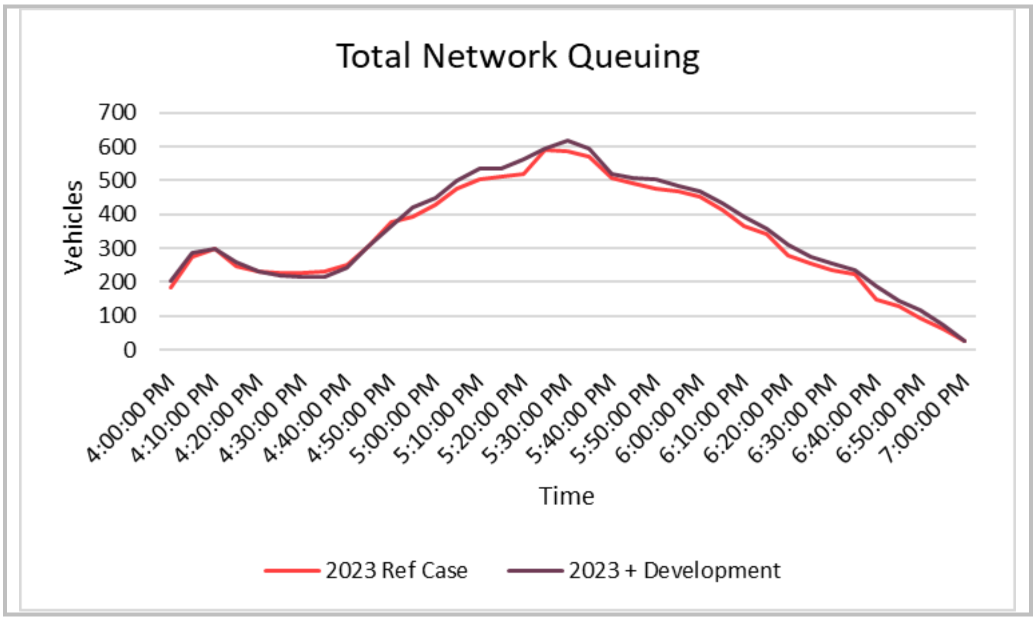


**Figure 5.2 : Total Network Queueing – PM Peak**

5.3.3 When considering the queue levels over the whole peak period, the increase in network wide queuing in the 2019 scenarios was found to be:

- 2023 Ref Case – AM Peak = **21%** increase in queueing over 2017 Ref Case
- 2023+Dev – AM Peak = **25%** increase in queueing over 2017 Ref Case
- 2023+Dev Sen – AM Peak = **23%** increase in queueing over 2017 Ref Case
- 2023 Ref Case – PM Peak = **92%** increase in queueing over 2017 Ref Case
- 2023+Dev – PM Peak = **95%** increase in queueing over 2017 Ref Case
- 2023+Dev Sen – PM Peak = **100%** increase in queueing over 2017 Ref Case

5.3.4 The results suggest that the traffic growth associated with the two committed developments (plus background growth) have a far larger impact on the network queuing than the Billet Development has.

## 5.4 Junction Queue Length Comparisons

5.4.1 Appendix B and C provide individual queue length comparisons at key locations in the model network for the AM and PM peaks respectively.

5.4.2 The key traffic queue locations are summarised as:

**AM Peak**

- High queuing confined to 08:40am – 09:20am in all scenarios
- Key queue locations are:
  - A830 eastbound on approach to Lochy Bridge A82 roundabout
  - A82 northbound approach to / Belford Road Roundabout

**PM Peak**

- Queuing throughout peak period, but highest between 5pm-6pm
- Key queue locations are:
  - All arms of A830 / A82 at Lochy Bridge
  - Southbound routing along length of A82 to Belford Road / Ben Nevis roundabout

# 6. MODEL TESTING SUMMARY

## 6.1 Summary

6.1.1 SYSTRA has been commissioned by ITPEnergised on behalf of Alvance Aluminium Group to undertake a Transport Assessment in support of a planning application for development of a proposed Billet facility on land associated with the existing Lochaber Aluminium Smelter situated adjacent to the A82 (T) North Road in Fort William.

6.1.2 As part of the Transport Assessment, SYSTRA was required to use the Fort William Paramics Microsimulation model of the study area in order to assess the impact of the development.

*Base Model Development*

6.1.3 Traffic surveys were undertaken by Nationwide Data Collection (NDC) at key junctions within the Fort William network on Thursday 21st September 2017. The data from the surveys was utilised in the development of the 2017 Fort William Base Model.

6.1.4 A high level of model calibration and validation was achieved, meeting the requirements of *Transport Analysis Guidance WebTag, Unit M3.1, Highway Assignment Modelling (Department for Transport, January, 2014).*

6.1.5 It was considered that the Fort William Base Model 2017 was fit for model testing of the proposed Smelter Development.

*Future Year Model Development*

6.1.6 An opening year assessment of 2023 required a 2023 Reference Case Model to be developed. The 2023 Reference Case Model included background traffic growth as well as two committed developments:

- North Road Retail Development
- Kilmallie Road Residential Development

6.1.6.1 The vehicle trips associated with the proposed Billet development were applied to replicate the impact of shift changeover during the AM and PM peak periods (worst case scenario).

6.1.6.2 The '2023 Reference Case' network resulted in a 10% increase in trips in the PM peak period (8% in AM peak)

6.1.6.3 The '2023-with-development' network resulted in no additional increase in trips in both peak periods.

6.1.6.4 The '2023-with-development sensitivity test' network resulted in an additional 1% increase in trips in both peak periods.

*Modelling Results*

6.1.7 Outputs form the modelling assessment suggest:

- The traffic growth associated with the two committed developments (plus background growth) have a far larger impact on the network queuing than the Billet Development has.
- Southbound journey times through the A82 are, on average, over 4 minutes longer (69%) in the 2019 Ref Case than the 2017 Ref Case. The addition of the Billet Development increases this by a further 20 seconds. The increase in the sensitivity test is 52 seconds.
- The key queue locations are:
  - A830 / A82 Lochy Bridge – all arms
  - Southbound routing along length of A82 to Belford Road / Ben Nevis roundabout

# A. BASE MODEL QUEUE COMPARISON GRAPHS

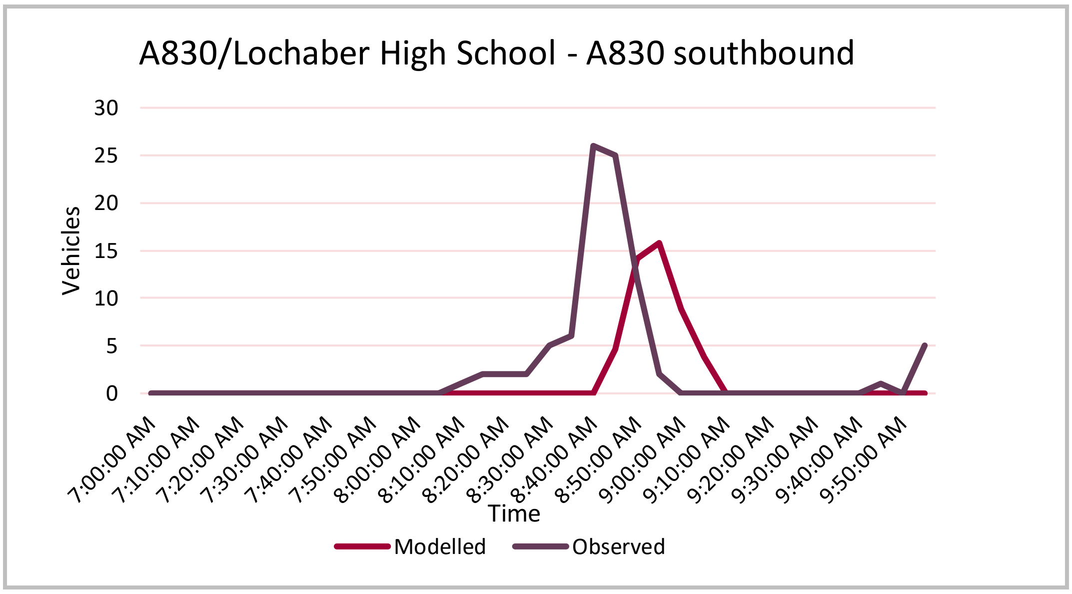


**Figure A.1 : A830/Lochaber High School – A830 southbound, AM Peak**

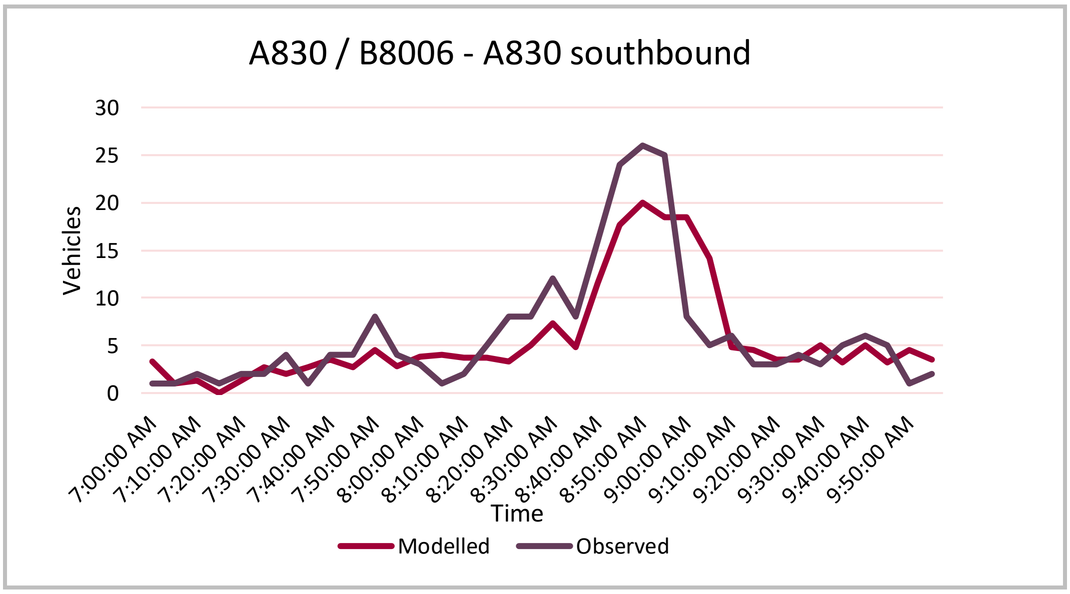


**Figure A.2 : A830/B8006 – A830 southbound, AM Peak**

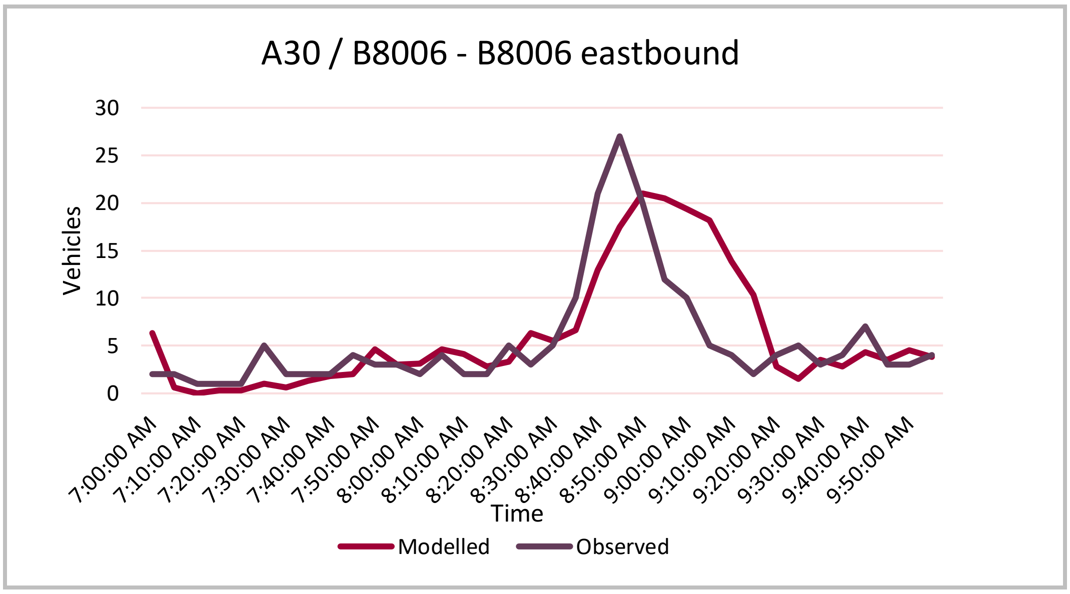


**Figure A.3 : A830/B8006 – B8006 eastbound, AM Peak**

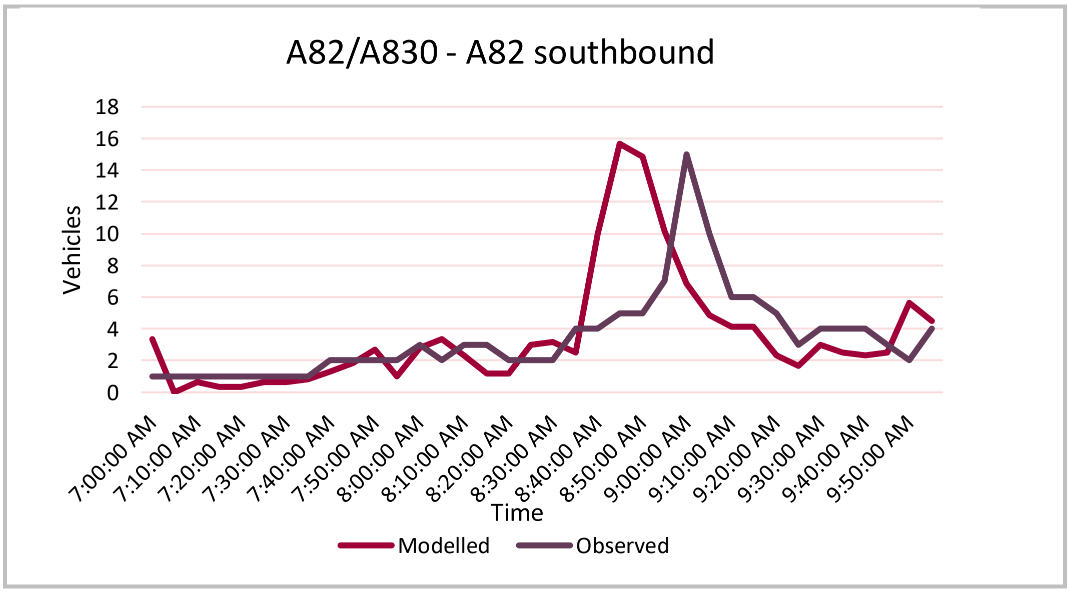


**Figure A.4 : A82/A830 – A82 southbound, AM Peak**

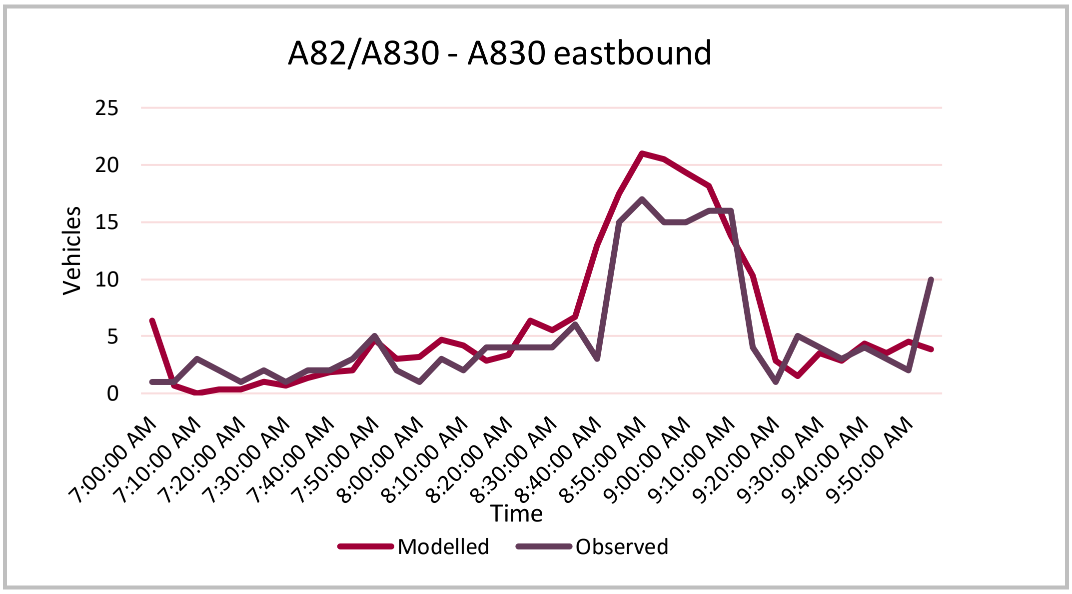


**Figure A.5 : A82/A830 – A830 southbound, AM Peak**

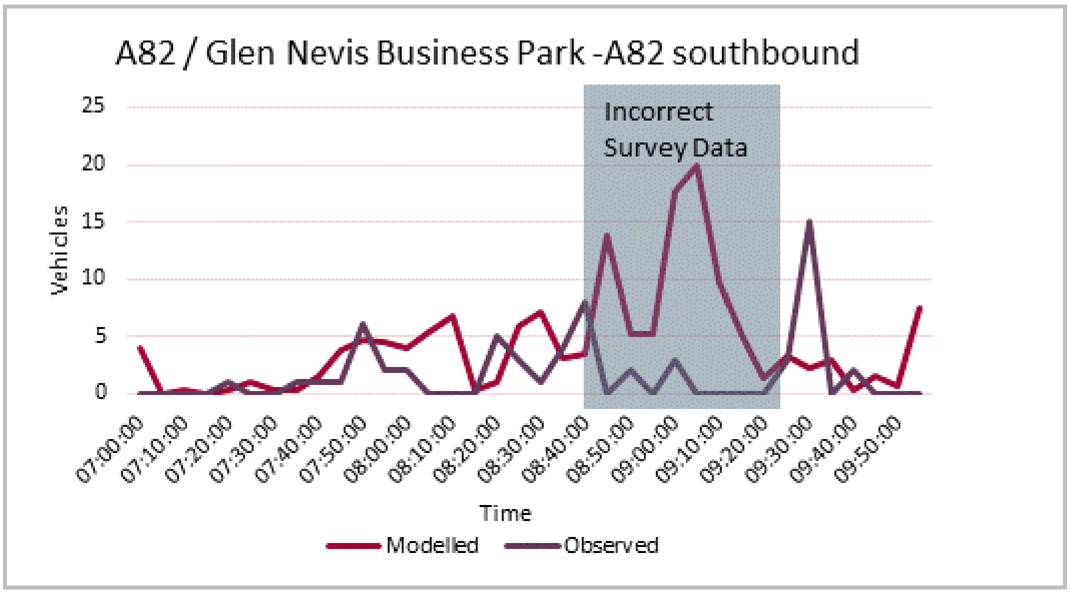


**Figure A.6 : A82/Glen Nevis Business Park – A82 southbound, AM Peak**

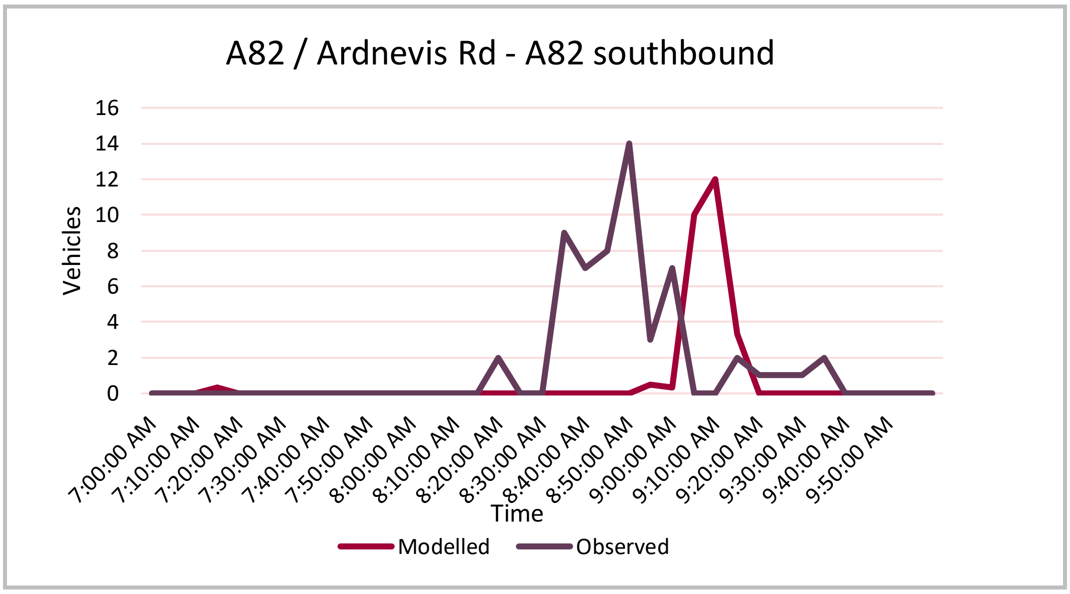


**Figure A.7 : A82/Ardnevis Rd – A82 southbound, AM Peak**

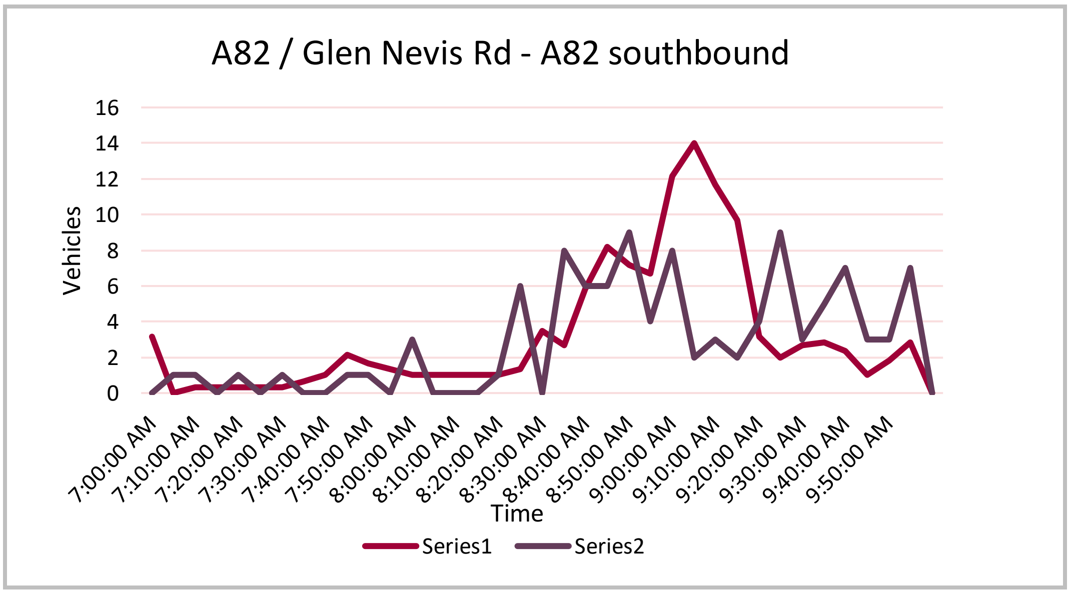


**Figure A.8 : A82/Glen Nevis Road – A82 southbound, AM Peak**

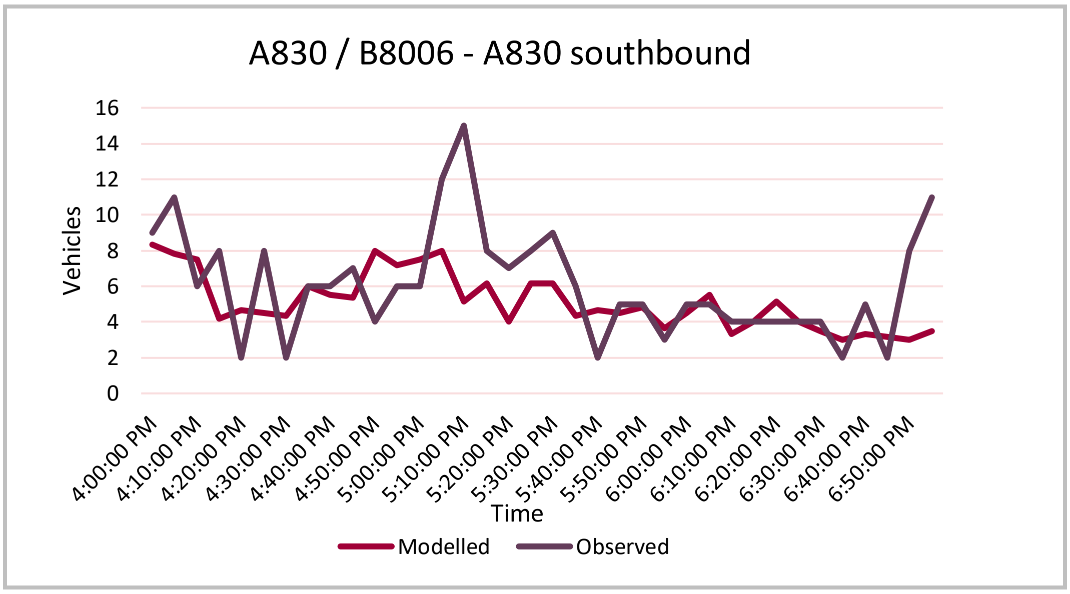


**Figure A.9 : A830/B8006 – A830 southbound, PM Peak**

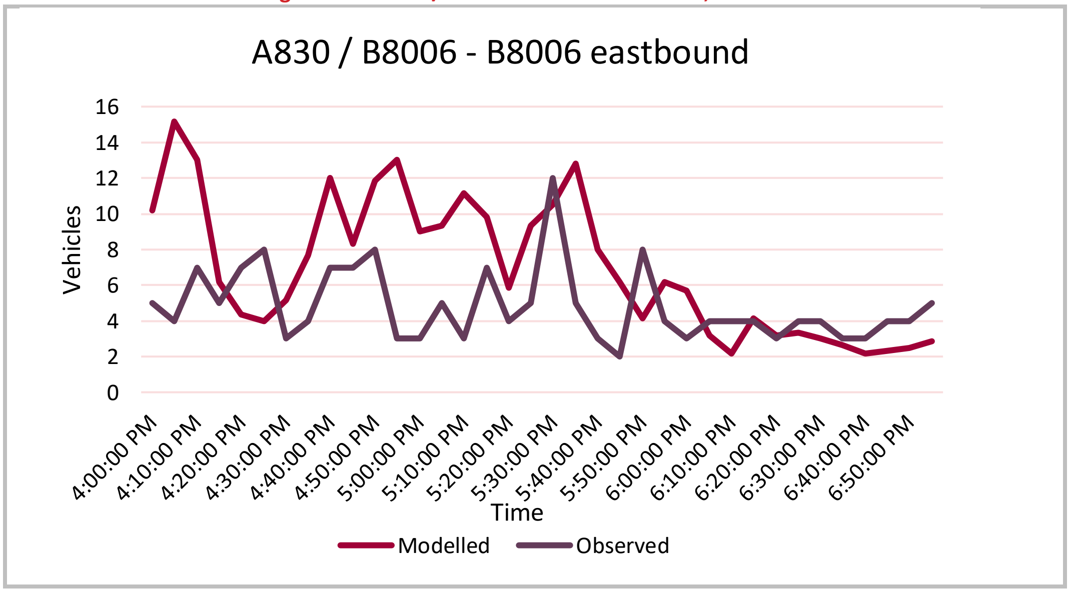


**Figure A.10 : A830/B8006 – B8006 eastbound, PM Peak**

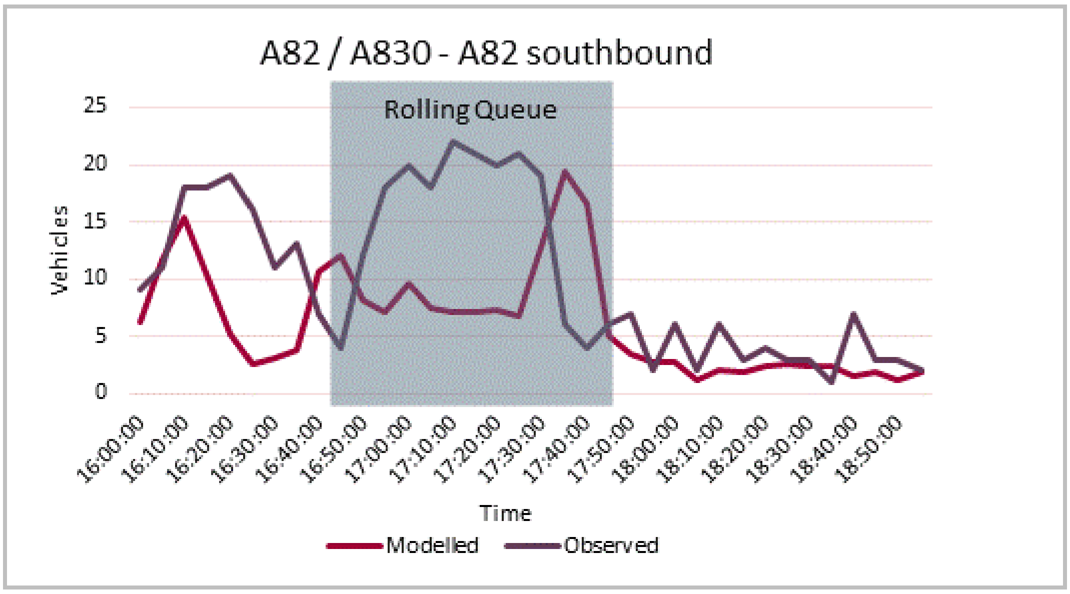


**Figure A.11 : A82/A830 – A82 southbound, PM Peak**

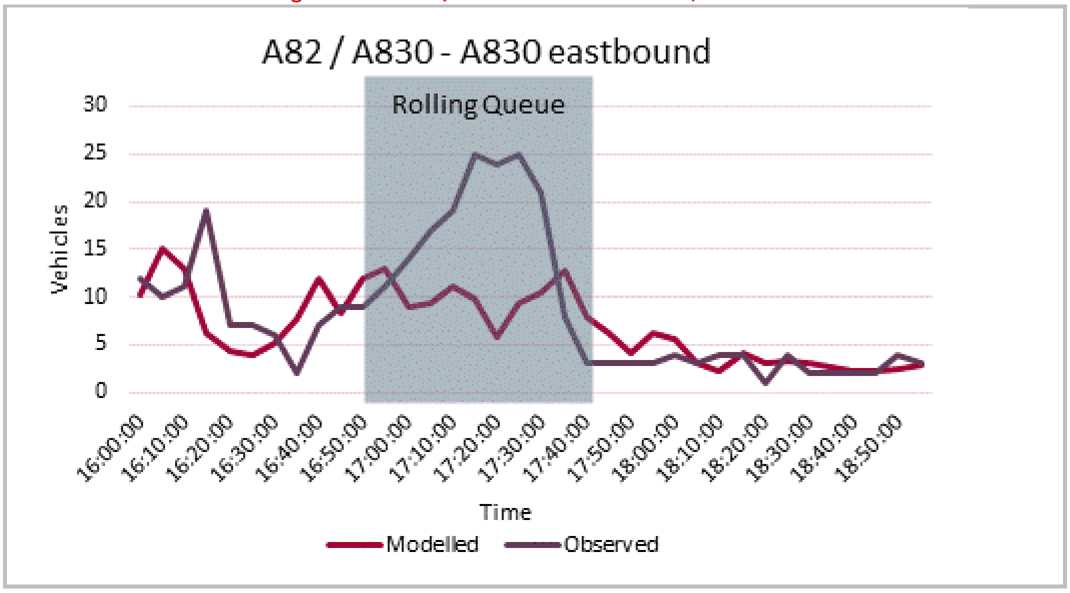


**Figure A.12 : A82/A830 – A830 eastbound, PM Peak**

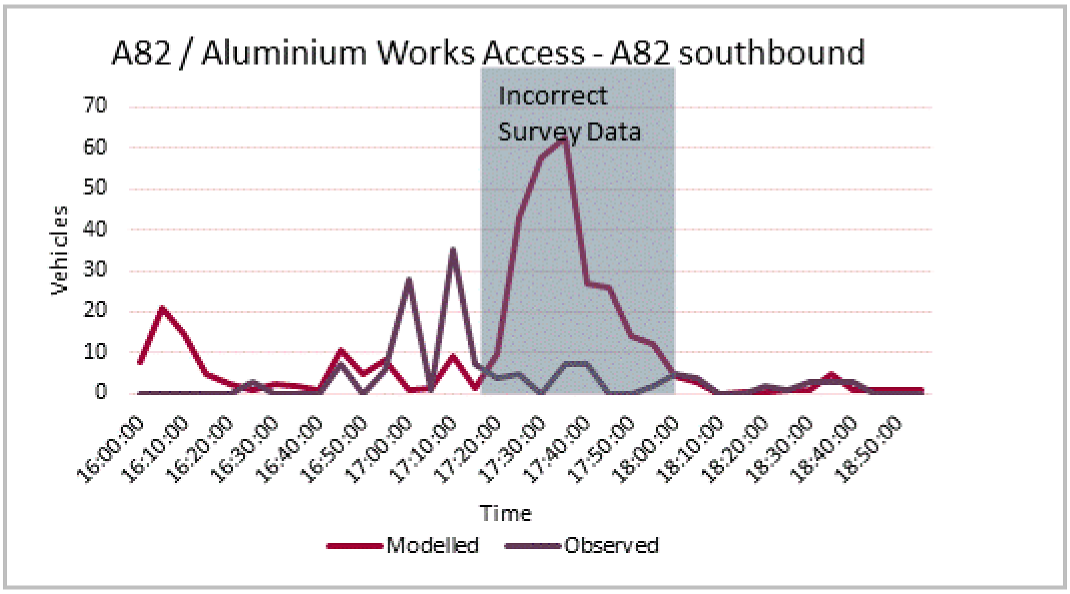


**Figure A.13 : A82/Works Access – A82 southbound, PM Peak**

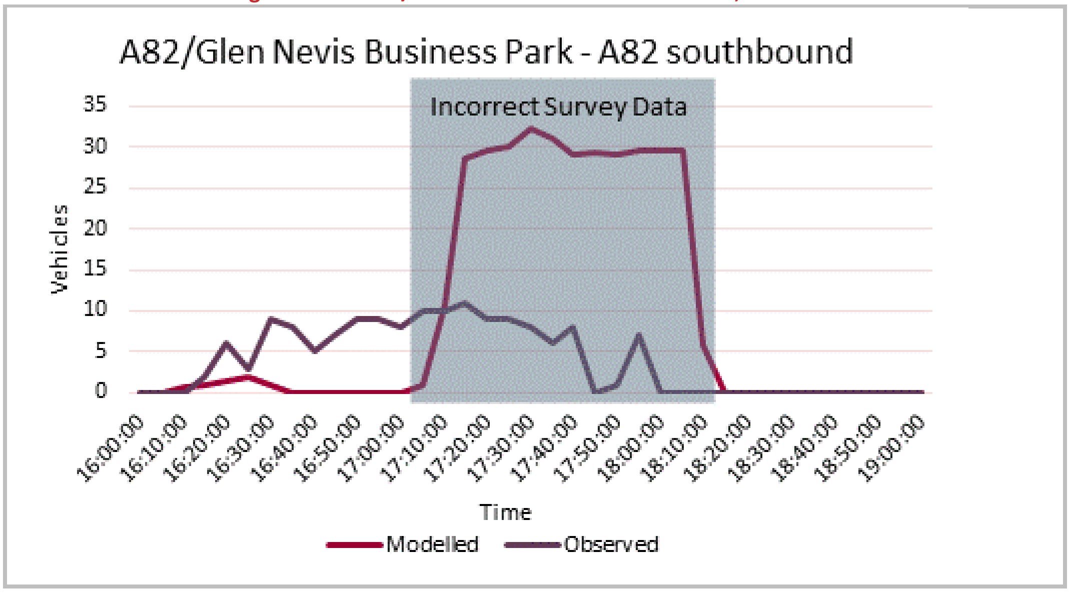


**Figure A.14 : A82/Glen Nevis Business Park– A82 southbound, PM Peak**

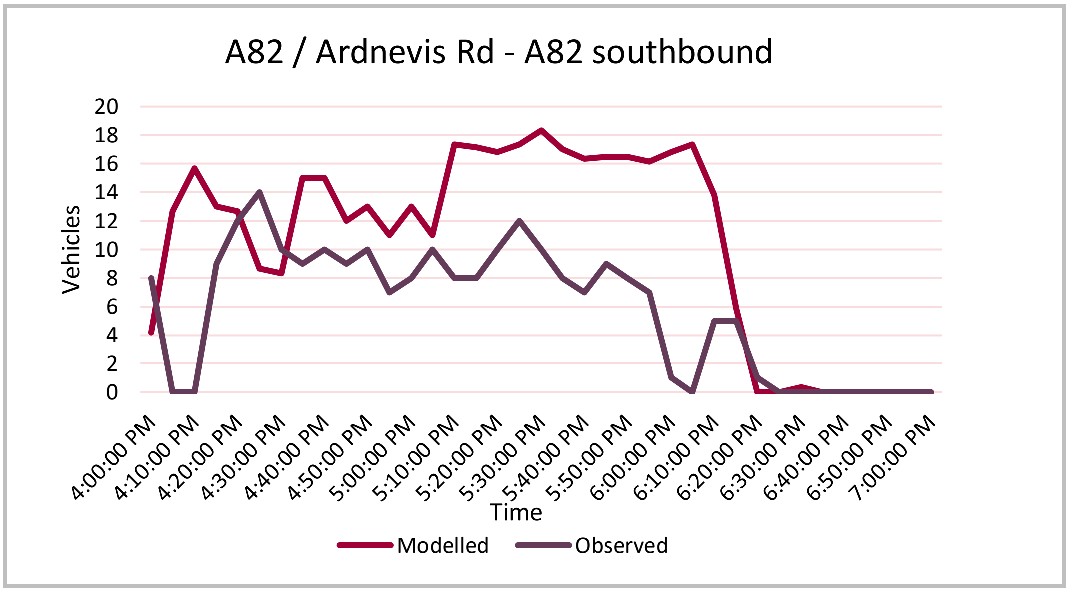


**Figure 6.15 : A82/Ardnevis Rd– A82 southbound, PM Peak**

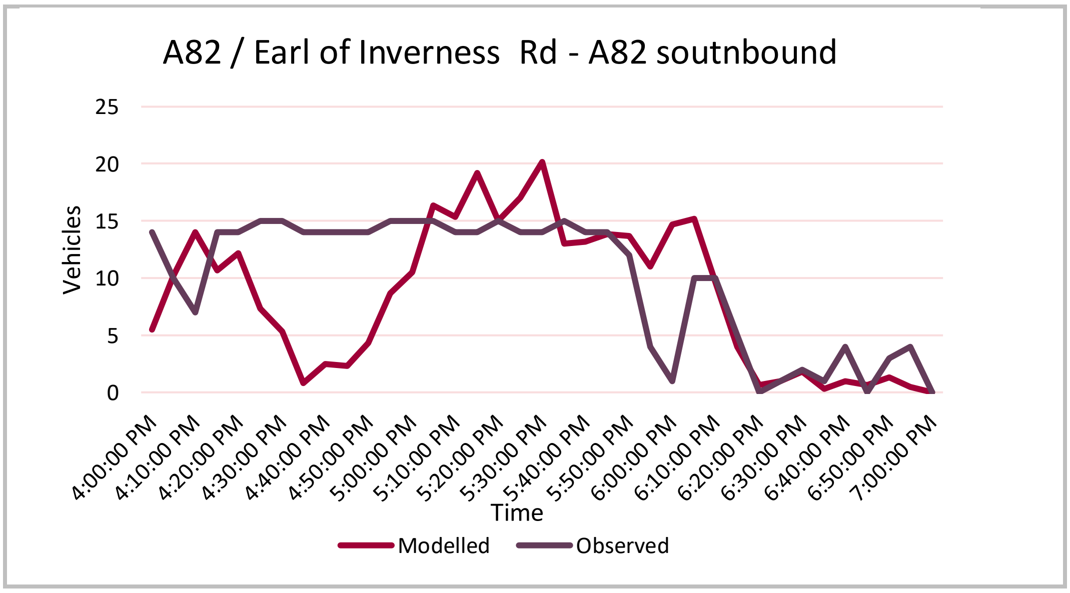


**Figure A.16 : A82/Earl of Inverness Rd – A82 southbound, PM Peak**

# B. TEST MODEL QUEUE COMPARISON GRAPHS – AM PEAK

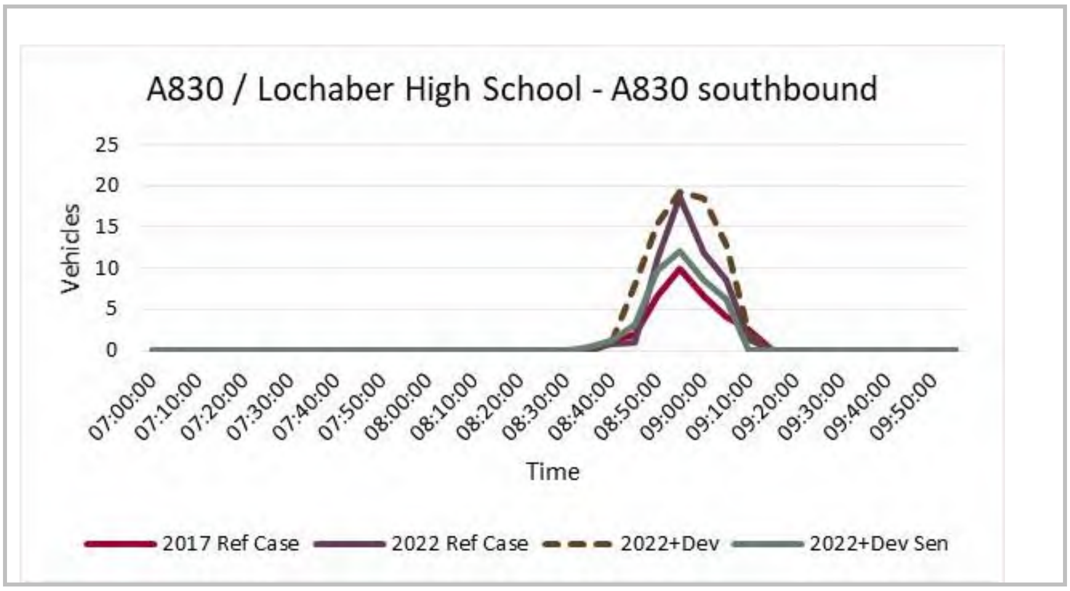


Figure B.17 : A830 / Lochaber High School – A830 southbound

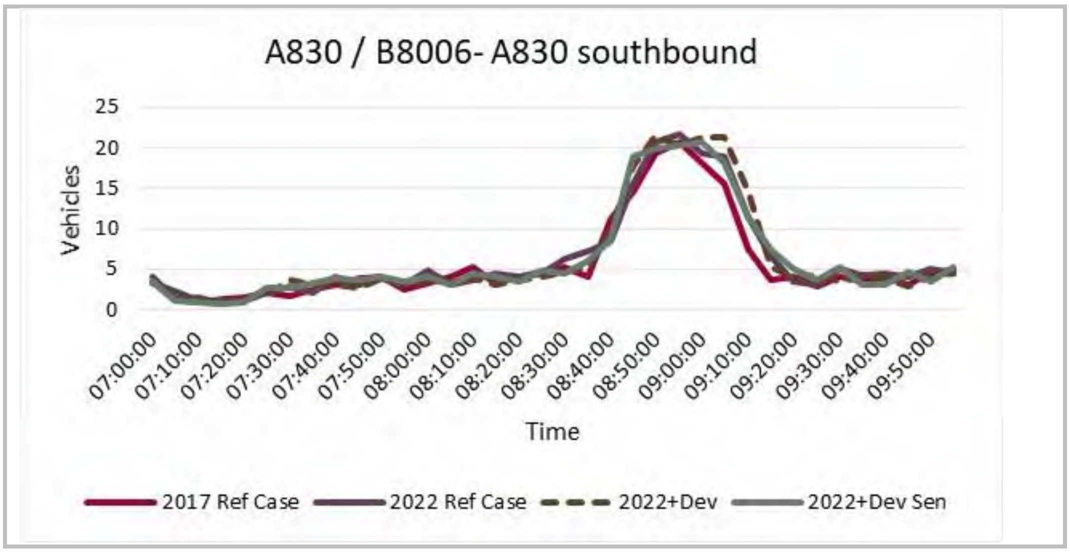


Figure B.18 : A830 / B8006 – A30 southbound

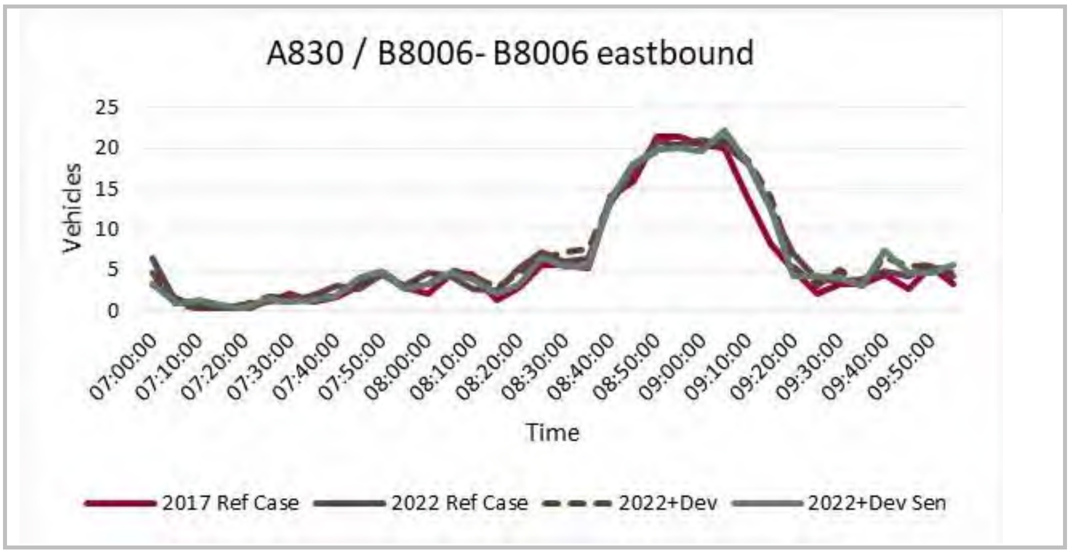


**Figure B.19 : A830 / B8006 – B8006 eastbound**

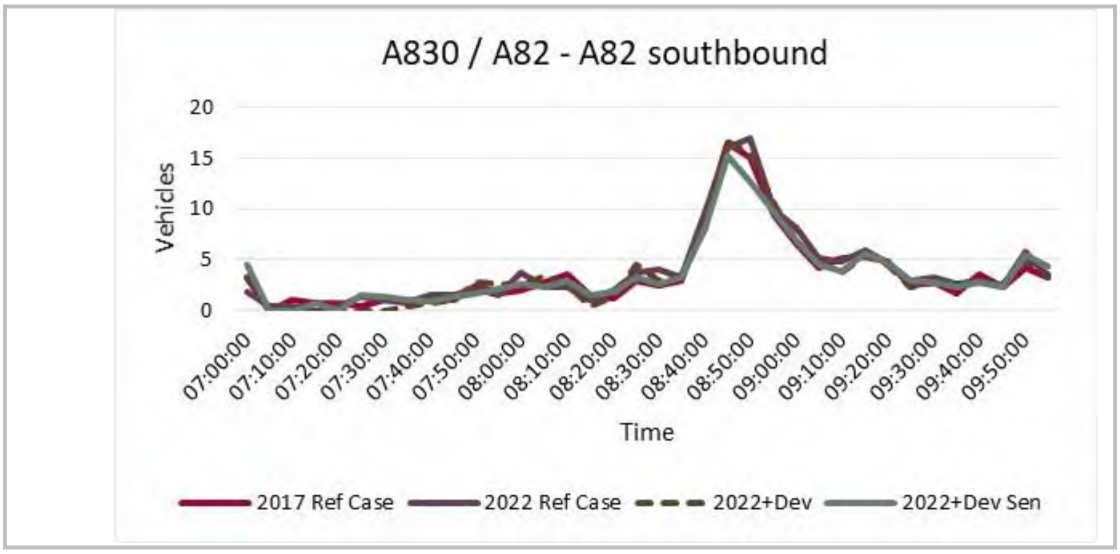


**Figure B.20 : A830 / B8006 – A82 southbound**

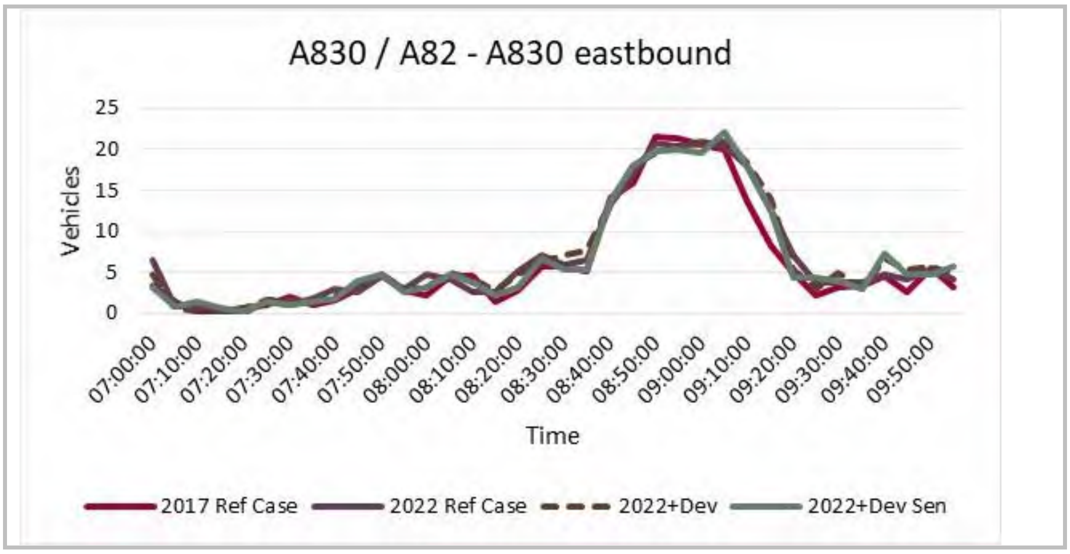


**Figure B.21 : A830 / A82 – A830 eastbound**

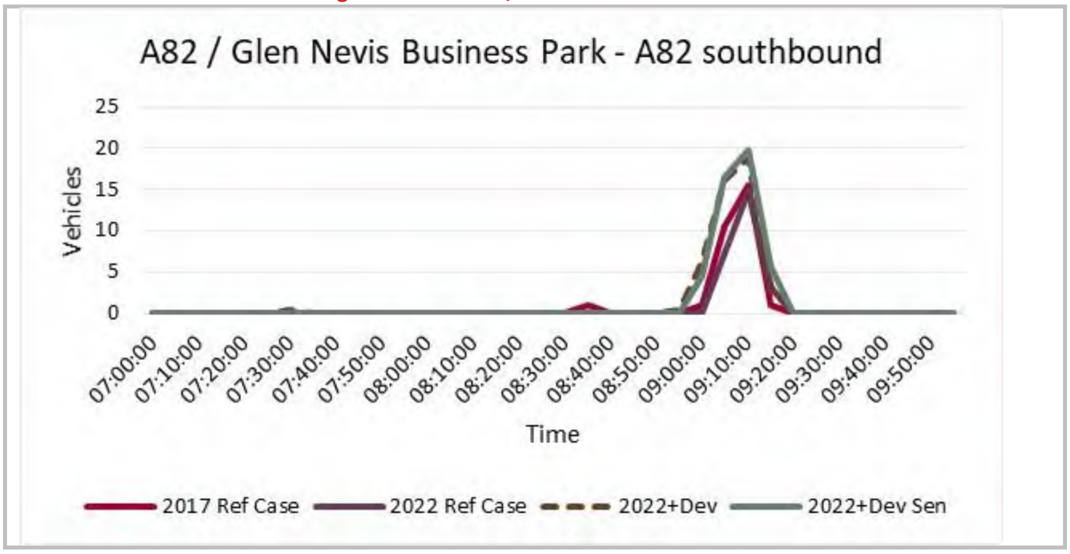


**Figure B.22 : A82 / Glen Nevis Business Park – A82 southbound**

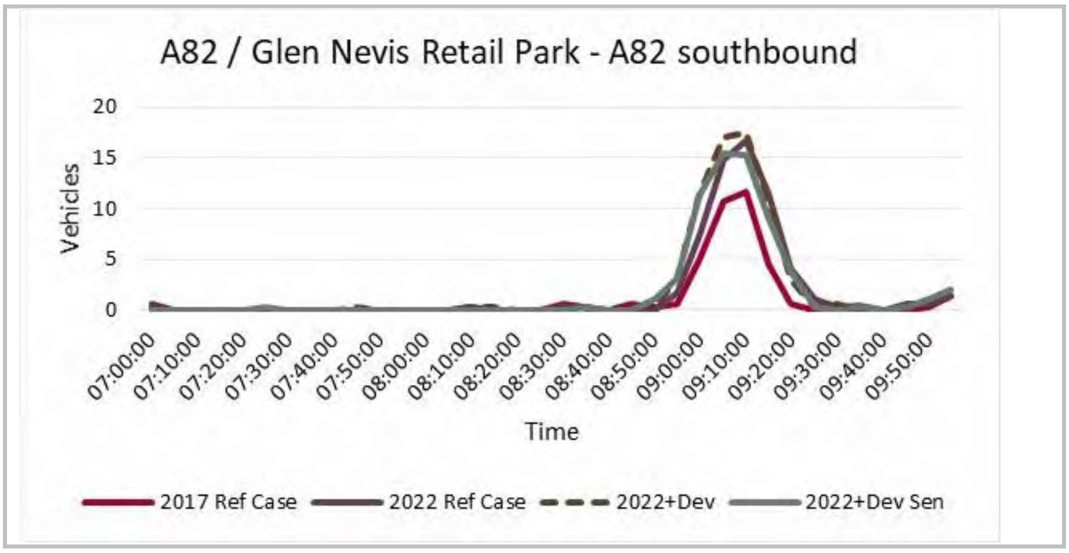


**Figure 6.23 :A82 / Glen Nevis Retail Park – A82 southbound**

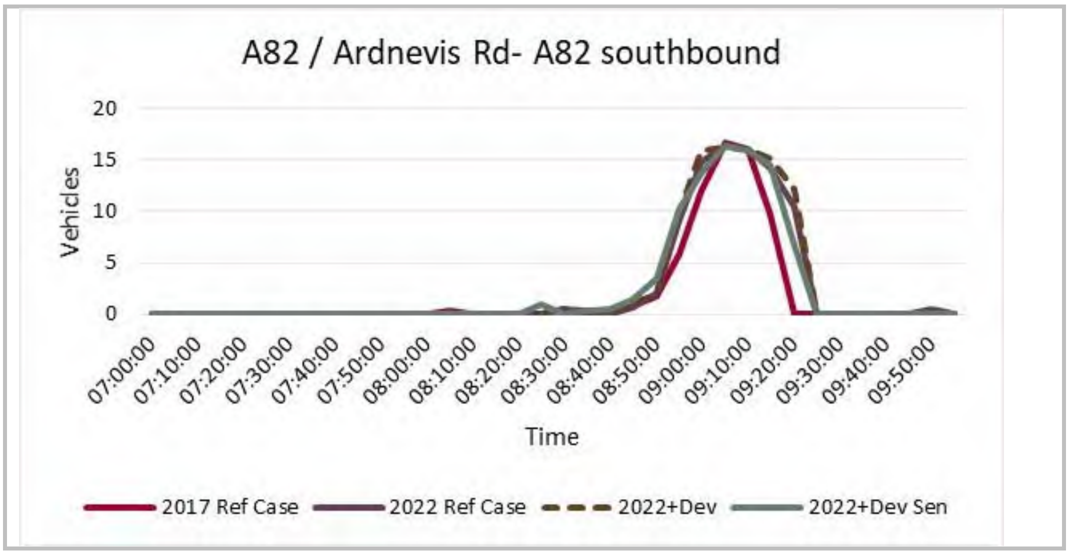


**Figure 6.24 :A82 / Ardnevis Rd – A82 southbound**

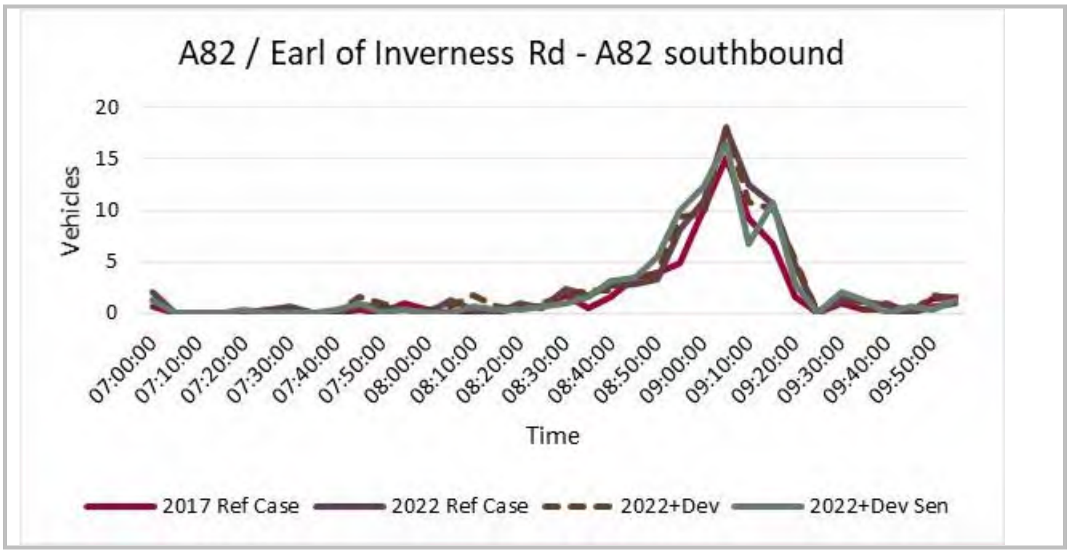


**Figure B.25 : A82 / Earl of Inverness Rd – A82 southbound**

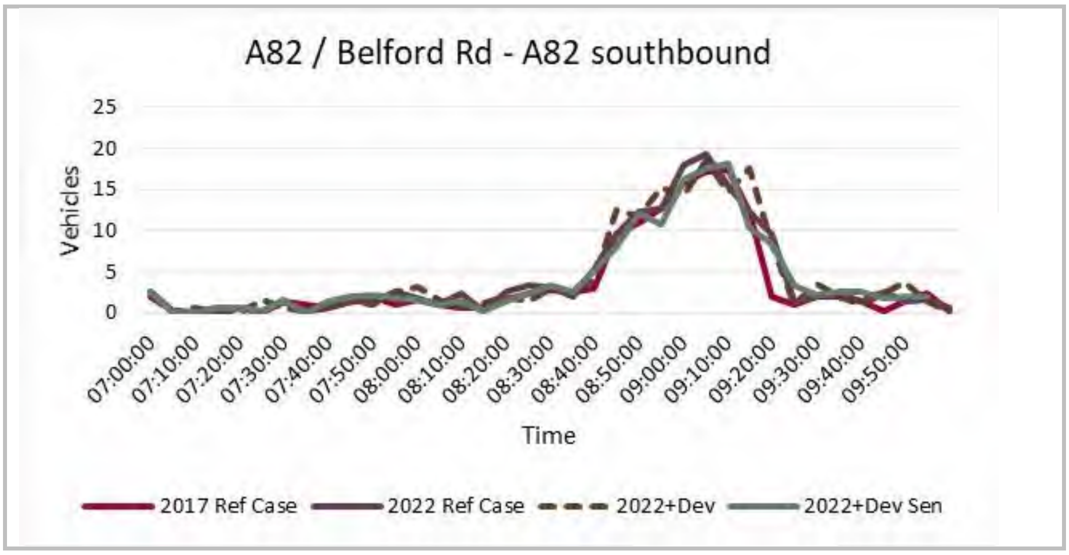


**Figure 6.26 :A82 / Belford Rd – A82 southbound**

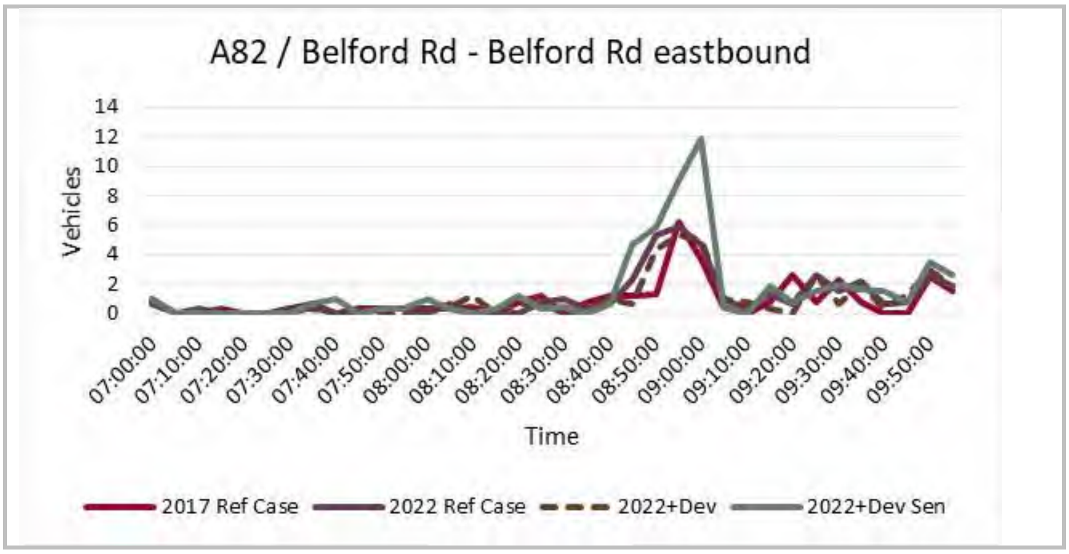


**Figure 6.27 :A82 /Belford Rd – Belford Rd eastbound**

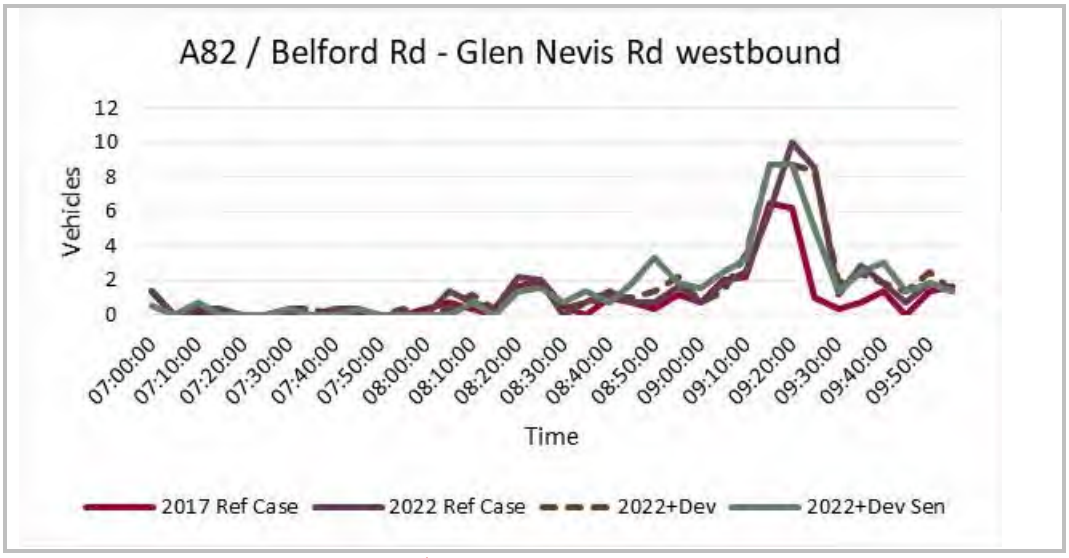


**Figure 6.28 :A82 / Belford Rd – Glen Nevis Rd westbound**

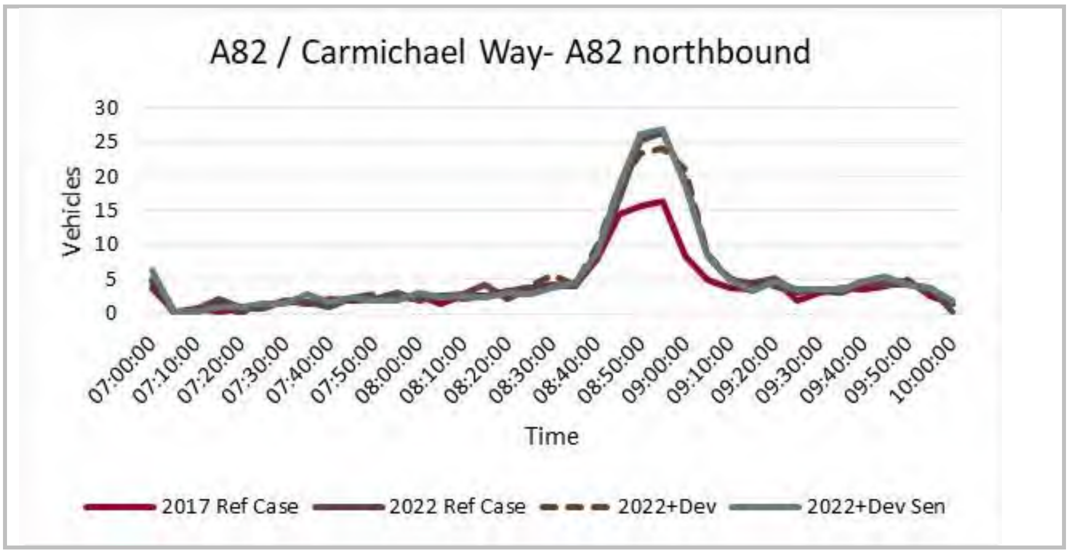


**Figure 6.29 :A82 Carmichael Way – A82 northbound**

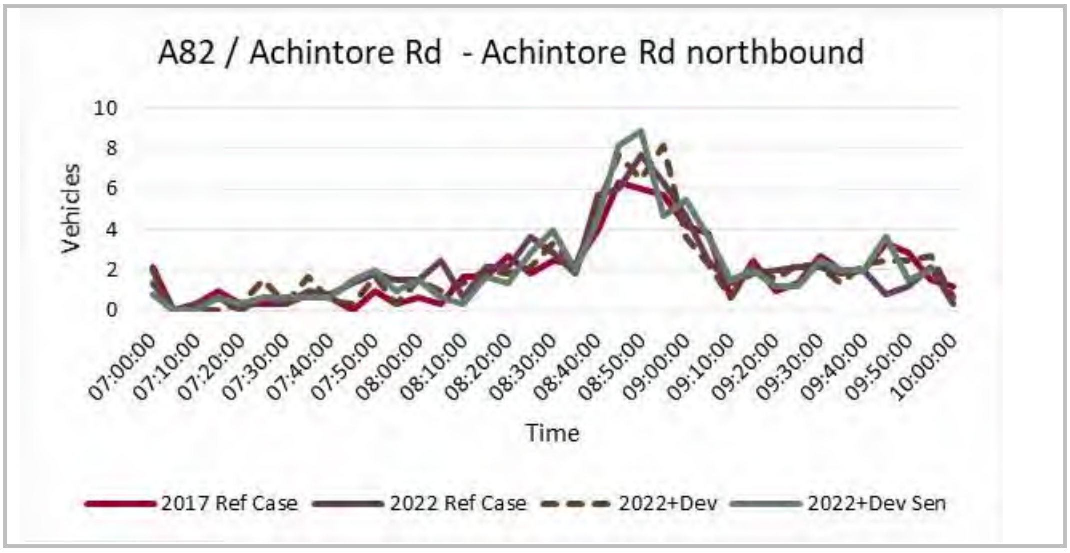


**Figure B.30 : A82 / Achintore Rd – Achintore Rd northbound**

# C. TEST MODEL QUEUE COMPARISON GRAPHS – PM PEAK

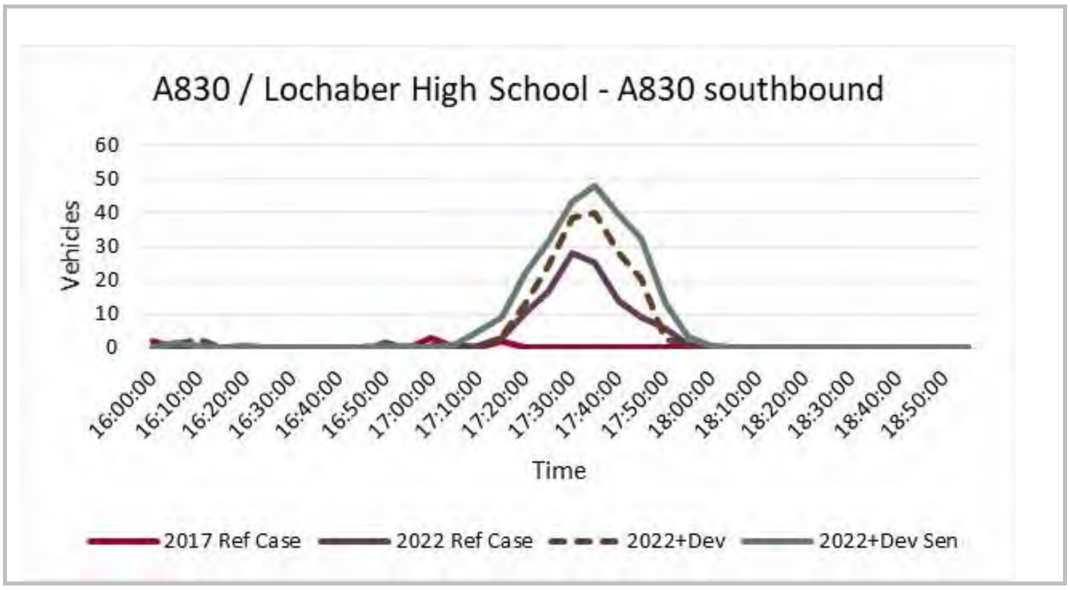


**Figure C.31 : A830 / Lochaber High School – A830 southbound**

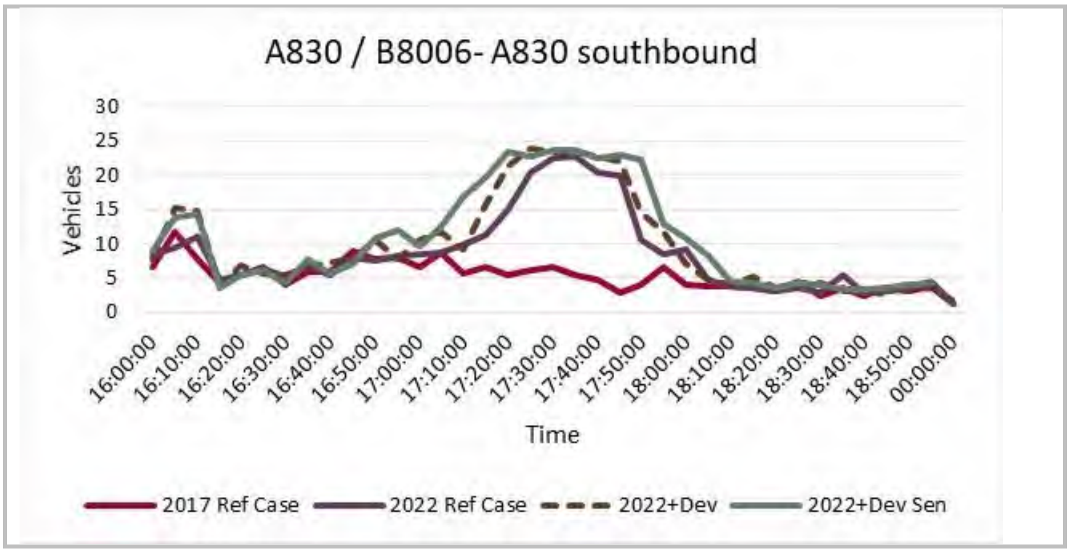


**Figure C.32 : A30 / B8006 – A830 southbound**

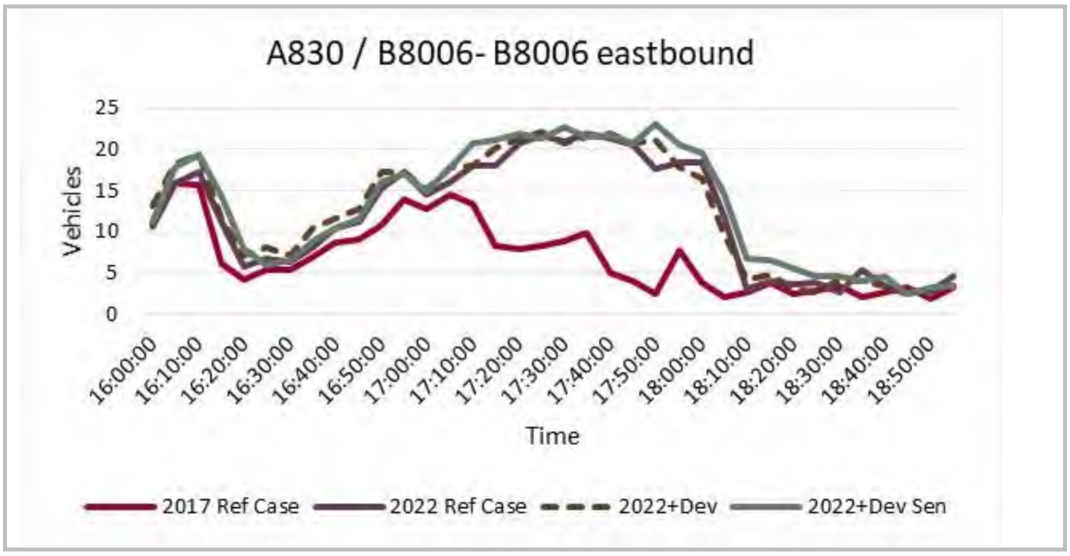


**Figure C.33 : A830 / B8006 – B8006 eastbound**

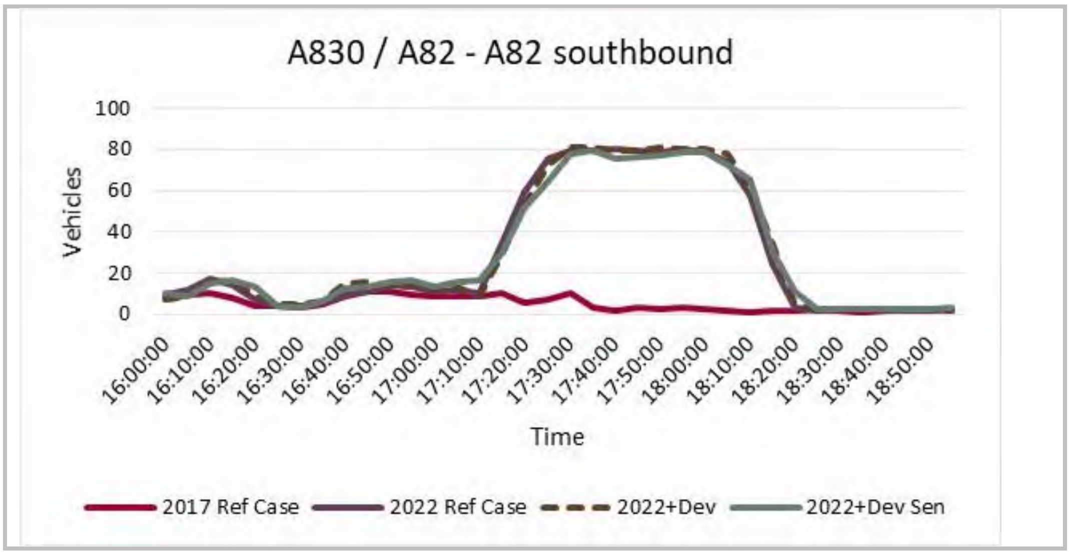


**Figure C.34 : A830 / A82 – A82 southbound**

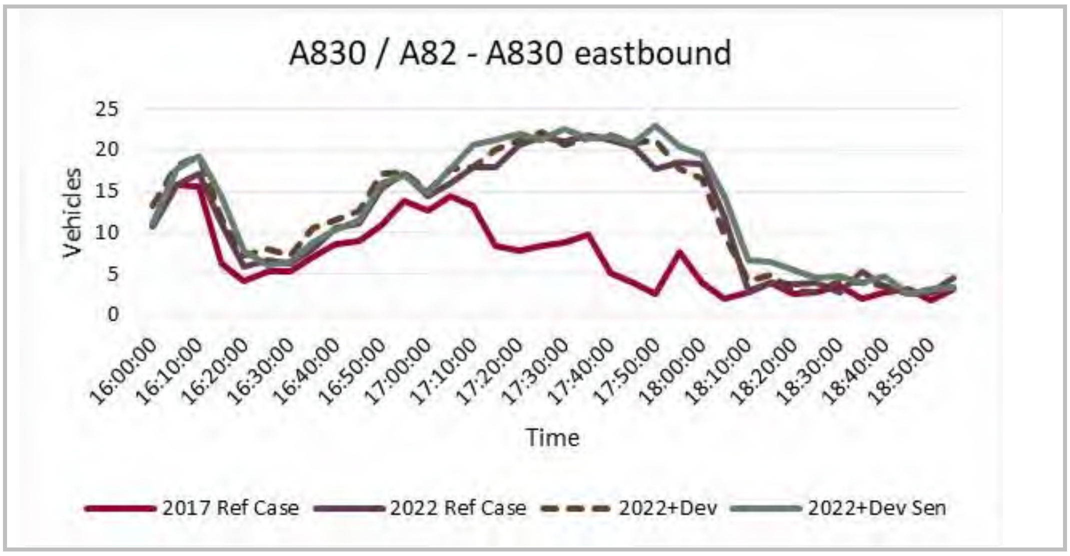


**Figure C.35 : A830 / A82 – A830 eastbound**

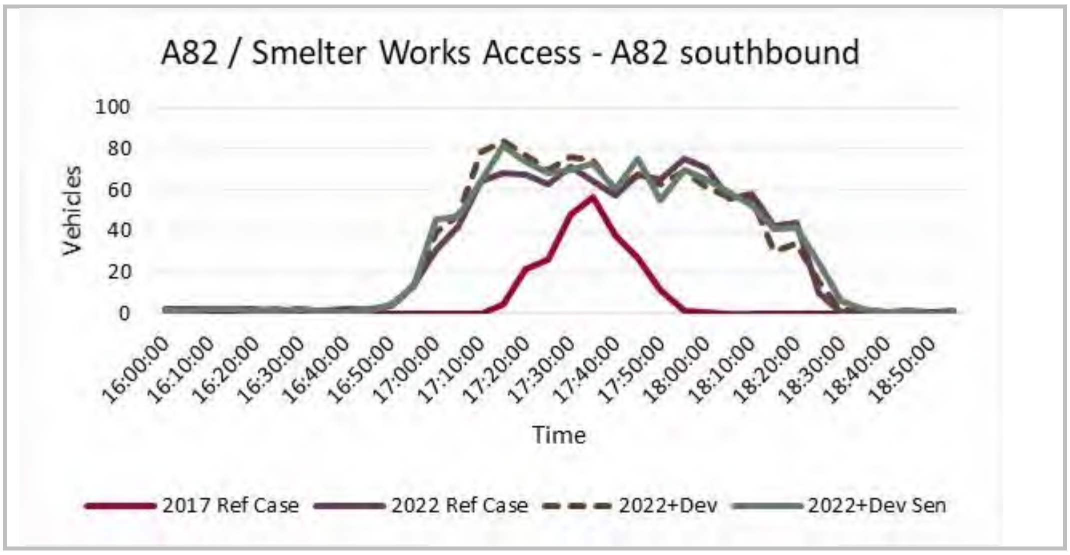


**Figure C.36 : A82 / Smelter Works Access – A82 southbound**

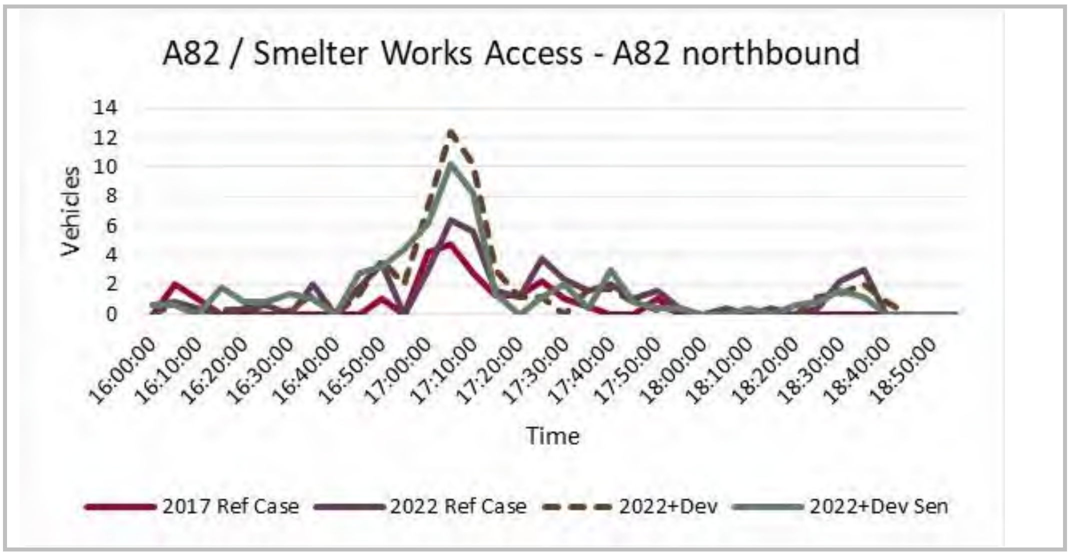


**Figure C.37 : A82 / Smelter Works Assess – A82 northbound**

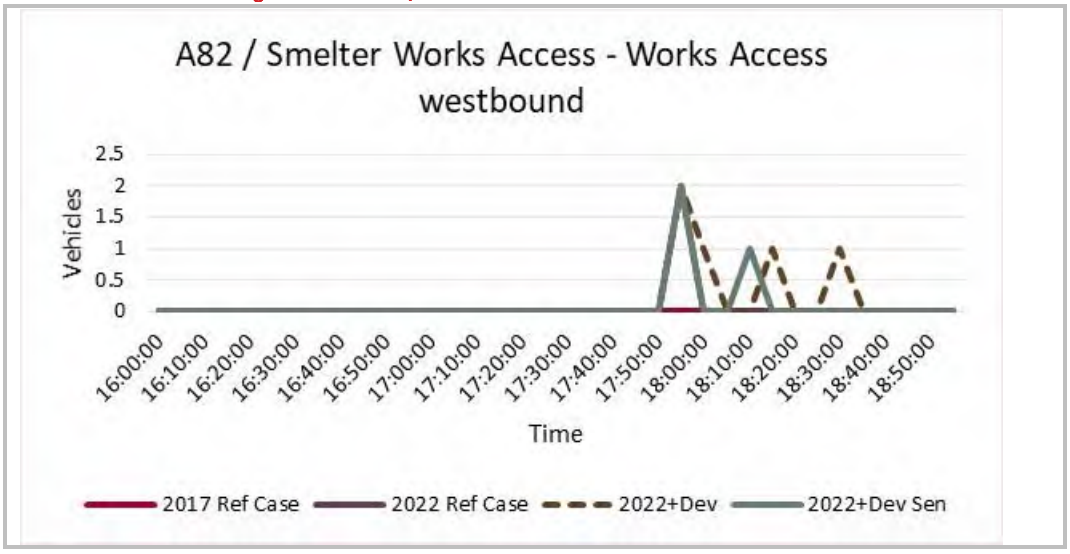


**Figure C.38 : Smelter Works Assess – Works Access westbound**

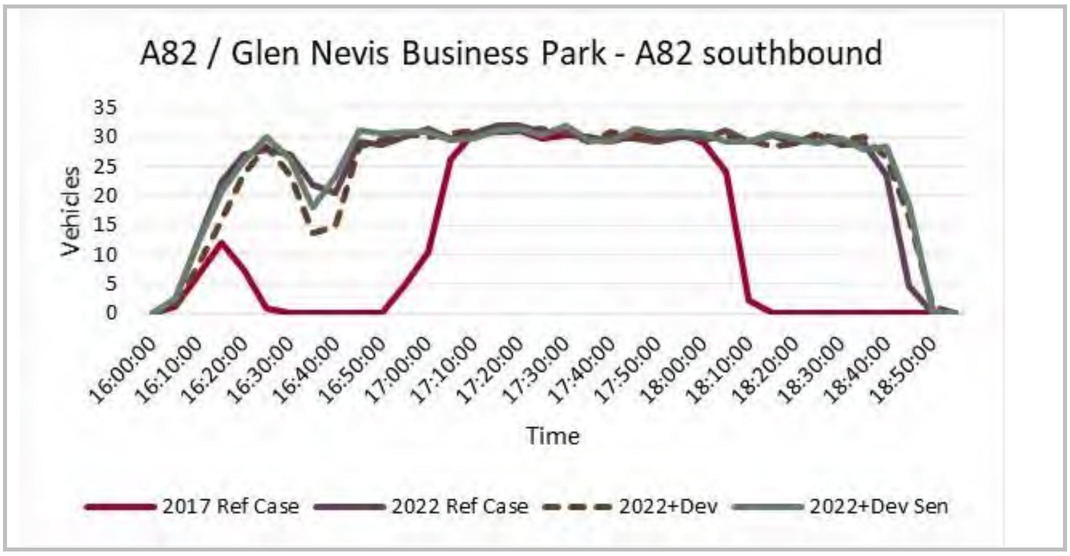


**Figure C.39 : A82 Glen Nevis Business Park – A82 southbound**

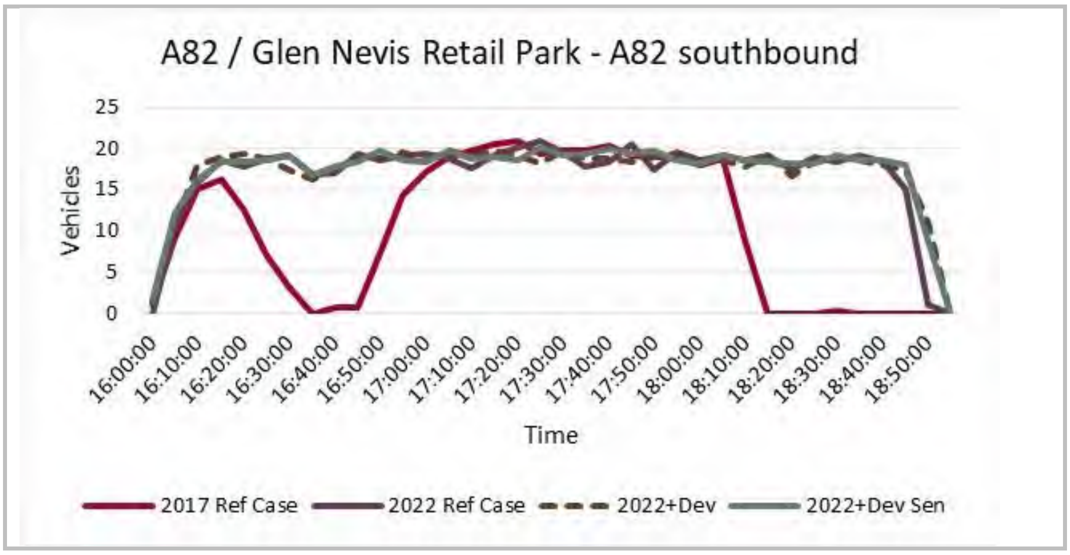


**Figure C.40 : A82 Glen Nevis Retail Park – A82 southbound**

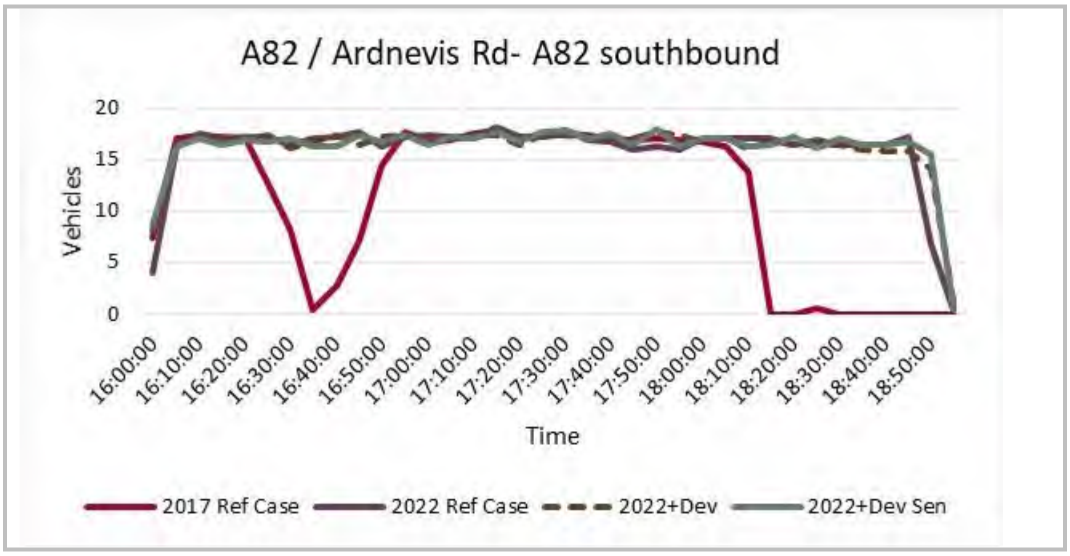


**Figure C.41 : A82 / Ardnevis Rd – A82 southbound**

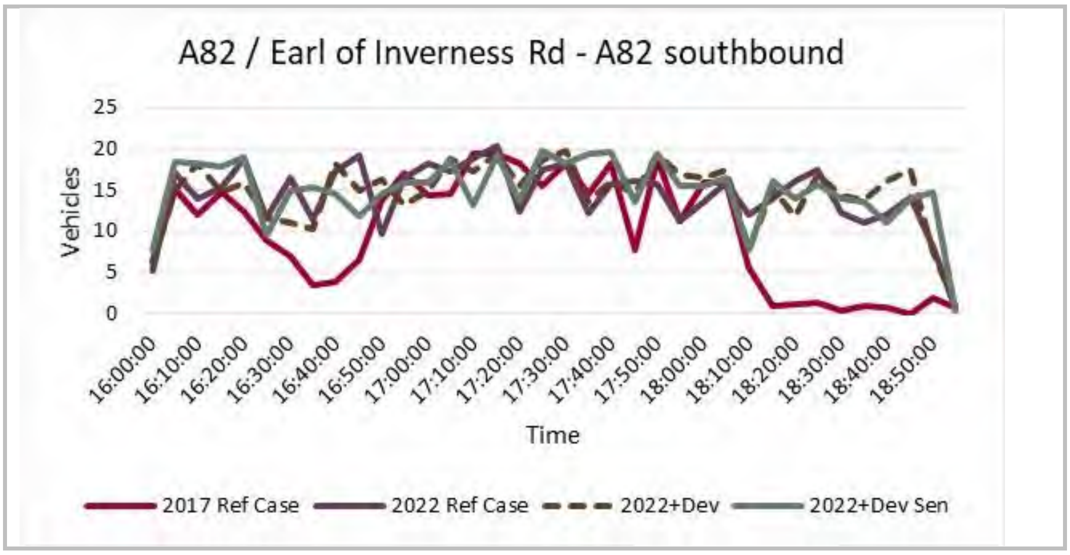


**Figure C.42 : A82 / Earl of Inverness Rd – A82 southbound**

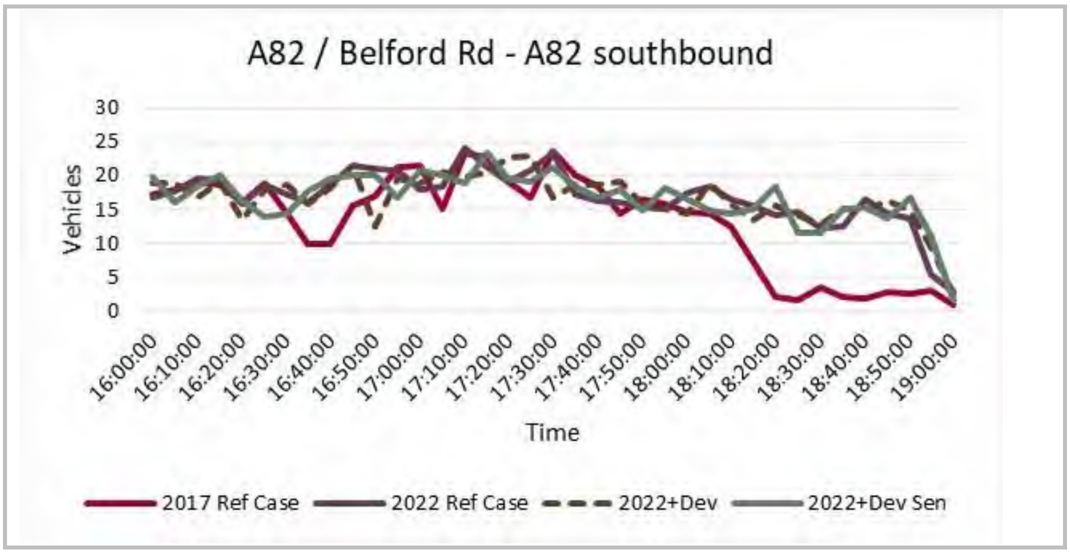


**Figure C.43 : A82 / Belford Rd – A82 southbound**

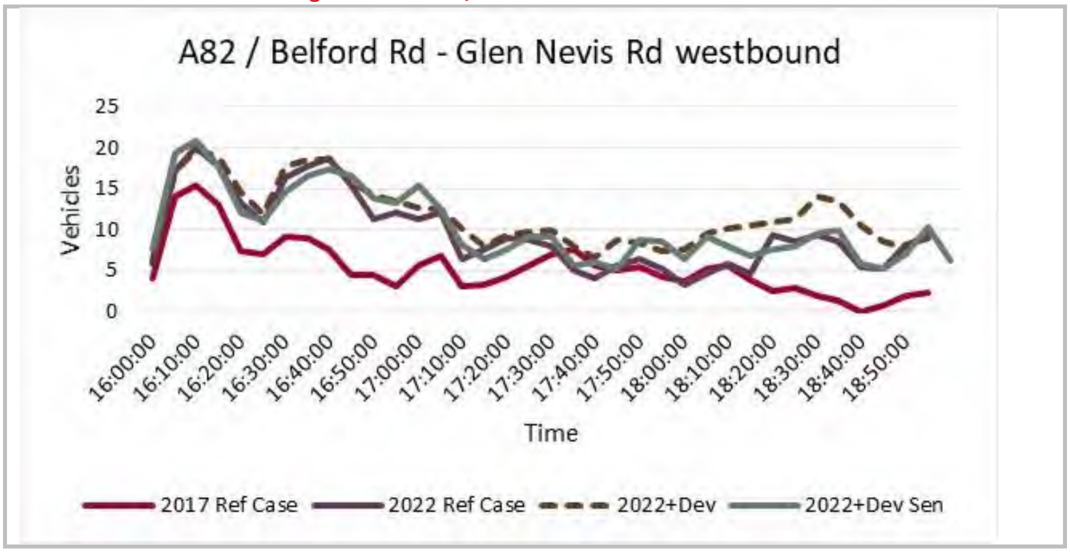


**Figure C.44 : A82 / Belford Rd – Glen Nevis Rd westbound**

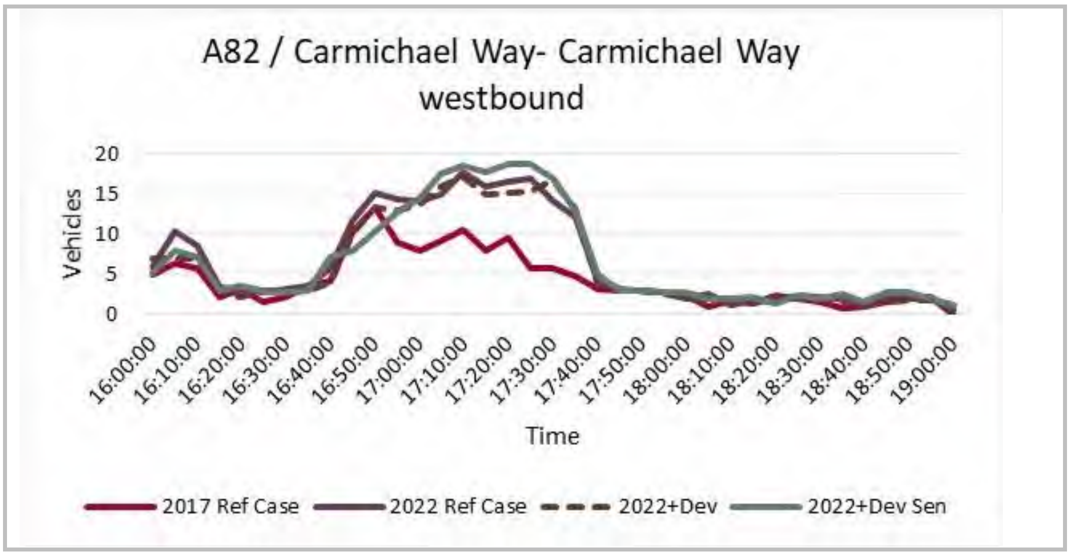


**Figure C.45 : A82 / Carmichael Way – Carmichael Way westbound**

# APPENDIX B

## LOCHABER SMELTER TRAVEL PLAN

**Lochaber Smelter, Fort William**
Reference number GB01T18B57

**08/11/2019**

# LOCHABER SMELTER TRAVEL PLAN

# LOCHABER SMELTER, FORT WILLIAM

LOCHABER SMELTER TRAVEL PLAN

| IDENTIFICATION TABLE | |
|---|---|
| **Client/Project owner** | Liberty British Aluminium |
| **Project** | Lochaber Smelter, Fort William |
| **Study** | Lochaber Smelter Travel Plan |
| **Type of document** | Report |
| **Date** | 08/11/2019 |
| **Reference number** | GB01T18B57 |
| **Number of pages** | 38 |

**APPROVAL**

| Version | Name | | Position | Date | Modifications |
|---|---|---|---|---|---|
| 1 | Author | B Fleming | Consultant | 26/09/2019 | |
| | Checked by | A DeVenny | Projects Director | 27/09/2019 | |
| | Approved by | A DeVenny | Projects Director | 27/09/2019 | |
| 2 | Author | B Fleming | Consultant | 23/10/2019 | JLL comments |
| | Checked by | A DeVenny | Projects Director | 23/10/2019 | |
| | Approved by | A DeVenny | Projects Director | 23/10/2019 | |
| 3 | Author | B Fleming | Consultant | 08/11/2019 | LBA comments – final version |
| | Checked by | A DeVenny | Projects Director | 08/11/2019 | |
| | Approved by | A DeVenny | Projects Director | 08/11/2019 | |

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# 1. INTRODUCTION

## 1.1 General

1.1.1 SYSTRA Ltd (SYSTRA) has been appointed on behalf of Liberty British Aluminium (LBA) to prepare a Travel Plan (TP) for the Lochaber Smelter and its staff based at the facility in Fort William, the Highlands.

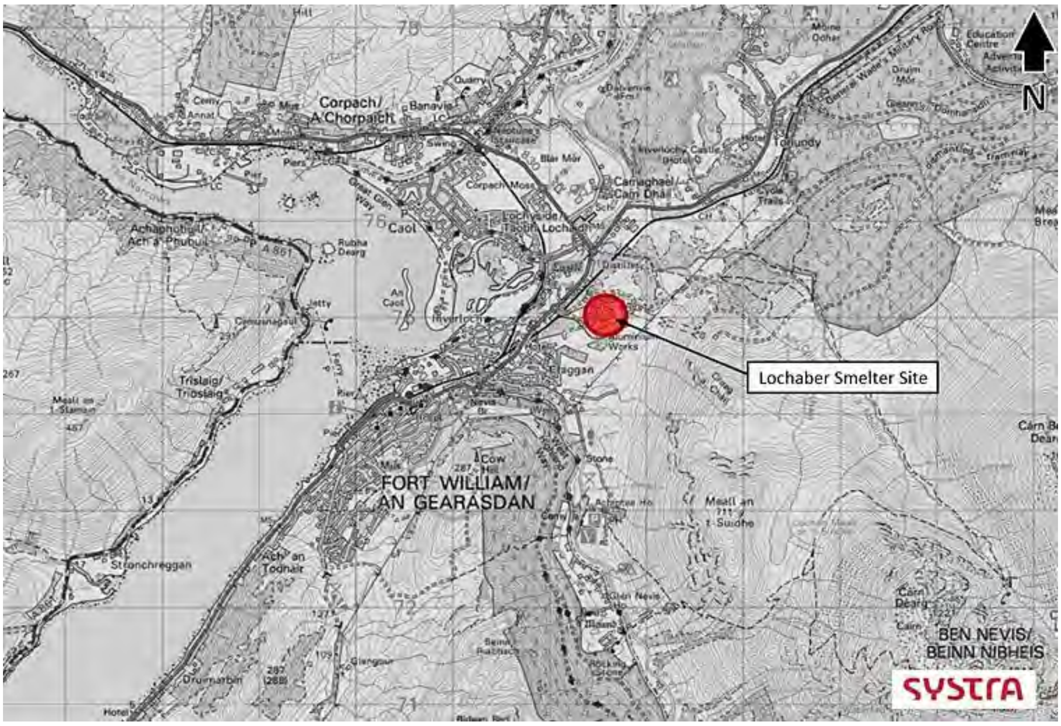



Figure 1. Lochaber Smelter Site Location

## 1.2 Background

1.2.1 Lochaber Smelter is a hydro-powered aluminium smelter which produces around 40,000 tonnes of aluminium annually and employs around 190 staff, specifically trained for the various operations within the plant. Lochaber Smelter is one of the key employers in Fort William. The Smelter lies on the outskirts of the town centre and is accessed directly from the A82 trunk road. The Smelter has been part of the Fort William Landscape for generations and now under new ownership, plans are being brought forward to expand and enhance the facility.

1.2.2 Planning consent was granted in 2018 (subject to Matters Specified in Conditions) for LBA to develop an alloy wheel plant facility as an expansion to the smelter facility which will create up to 400 new jobs at the Lochaber Smelter site.

1.2.3 Condition 26 of the planning consent stipulated that a Travel Plan was required prior to occupation, as follows:

> *'No part of the development shall be occupied until an Operational Travel Plan has been submitted to, and approved in writing by, the Planning Authority, after consultation with Transport Scotland. The Travel Plan is required to give due consideration to the provision for walking, cycling and public transport access to and within the site and will identify:*
>
> - *The measures to be provided;*
> - *The system of management;*
> - *Monitoring;*
> - *Review; and*
> - *Reporting'*

1.2.4 This TP has therefore been prepared on the basis of existing Lochaber Smelter staff and visitor travel behaviours and patterns, but will be applicable to the whole site once the alloy wheel plant is brought forward. It will then be reviewed annually to capture any changes to the baseline situation.

1.2.5 It is considered that the TP has a much greater chance of success if it is implemented now for existing staff in advance of the alloy wheel plant being constructed. It will give new measures an opportunity to tested and to become part of embedded practice before transport loadings are increased as a result of the increased staff numbers associated with the alloy wheel plant.

## 1.3 Policy Guidance & Context

1.3.1 A TP is a site specific management tool designed to encourage people to rethink their travel choices and requirements in order to minimise and manage the impacts of travel on the environment. TPs are not designed to restrict the freedom of car use, instead they set out a strategy for eliminating the barriers preventing individuals from using sustainable travel modes and managing single occupancy car travel. These barriers may be infrastructure orientated or they may be behaviour orientated.

1.3.2 The benefits of a TP for employers, such as Lochaber Smelter, their employees, visitors and the wider community are extensive and include:

- Alleviating car parking shortages;
- Reducing the carbon footprint of the organisation / development;
- Reducing traffic impacts on the local road network;
- Improving the health and wellbeing of the workforce through formation of active travel patterns; and
- Improving the accessibility of a site by a range of travel modes.

1.3.3 The provision and implementation of a TP has the ability to assist in delivering national and local policy and guidance objectives relating to planning, transport, health and the environment.

## 1.4 Lochaber Smelter Travel Planning Approach

1.4.1 Resources are needed to ensure that the TP is successful. A Transport Working Group (TWG) should be appointed and will be responsible for the TP. The Group raise awareness of transport opportunities and constraints at Lochaber Smelter so that appropriate solutions can be implemented in a timely fashion. The TWG will comprise staff representatives and shall meet on a regular basis. It is noted that Lochaber Smelter has already made efforts to form this group on a formal basis

## 1.5 Importance of Travel Plan

1.5.1 The implementation of a successful TP at the Smelter is very important to the future of the facility and to the success of the new alloy wheel plant. Fort William has a relatively unique transport network as a result of its geographical location and its position as a regional service centre to a large rural catchment. It acts as a gateway to the western isles and a staging point for trips further afield. It's location on the trunk road network means that it accommodates large volumes of through traffic heading to and from the Highlands and to and from the Western Isles. Much of this traffic is tourist based and Fort William suffers from considerable congestion at peak times during several months of the year.

1.5.2 Many employees in Fort William travel in from rural areas and public transport is unable to serve large geographical areas where population levels are low. This means that a big proportion of employment trips to and from Fort William are made by car. That said, there are considerable opportunities for a large employer (such as the smelter) to introduce measures that encourage a shift away from the private car and encourage a greater use of sustainable transport modes especially for employees who live within Fort William. The Travel Plan is the key mechanism to bring forward such measures along with measures to manage car use to a sustainable level during peak periods.

# 2. TRAVEL PLAN STRATEGY

## 2.1 Aim

2.1.1 The aim of the Lochaber Smelter TP is to support a realistic shift in staff and visitor travel behaviour away from single-occupancy car travel to sustainable travel alternatives.

## 2.2 Objectives

2.2.1 Objectives give the TP direction and focus and detail how the aim of the TP will be achieved. The objectives of the TP are as follows.

- To maximise the proportion of walking, cycling and public transport trips to and from the development;
- To increase awareness of the sustainable travel options available to both staff and visitors by emphasising health and well-being benefits; and
- Reduce reliance on the private car as a means of accessing the site.

## 2.3 Travel Plan Principles

2.3.1 The following principles illustrate the approach to meeting the Lochaber Smelter TP's aim:

1. To improve the accessibility of Lochaber Smelter for staff and visitors.
2. To raise awareness of the accessibility of the site.
3. To promote healthier lifestyles by encouraging walking and cycling.
4. To minimise the transport element of Lochaber Smelter's carbon footprint.
5. To monitor and manage car usage at Lochaber Smelter (especially during network peak periods).
6. To manage and reduce car parking requirements at Lochaber Smelter
7. To manage staff business travel by reducing the need to travel and the distance travelled. Where business travel is essential, sustainable travel modes will be encouraged.
8. To work in partnership with those accessing Lochaber Smelter and key transport stakeholders and to communicate travel information on a regular basis.
9. To allow Lochaber Smelter the opportunity to assist with the achievement of sustainable travel goals and targets promoted by national and local government policy / guidance.
10. To allocate resources for the implementation of the TP.

## 2.4 Targets

2.4.1 The target of the TP is a 6% reduction in single occupancy car trips to Lochaber Smelter, to be achieved by 2024. This target applies to staff and visitors and will be achieved by increasing the mode share percentage of sustainable travel alternatives, including car sharing. The target of the TP will be agreed with the TWG and has been set to be realistic but it is also a challenge that should not be underestimated.

## 2.5 Staff Mode Share

2.5.1 Table 1 indicates the specific mode share targets for all staff based at Lochaber Smelter to be achieved by 2024. This has been based on a review of the existing mode share which has been obtained from surveys.

Table 1. Lochaber Smelter Staff Current and Target Mode Share

| MODE | EXISTING MODE SHARE % (2019) | TARGET MODE SHARE % (2024) | % CHANGE |
|---|---|---|---|
| Bicycle | 10% | 12% | **2%** |
| Car driver (alone) | 67% | 61% | **-6%** |
| Car driver with passengers | 9% | 11% | **1%** |
| Passenger dropped-off by other person | 1% | 1% | **0%** |
| Passenger in car with colleague | 6% | 8% | **2%** |
| Walk | 6% | 7% | **1%** |
| Other | 1% | 1% | **0%** |

## 2.6 Engagement

2.6.1 For the TP to be successful, it will require resources and active participation from a range of stakeholders including Lochaber Smelter staff, visitors and transport providers (including bus operators).

2.6.2 The implementation of the TP will be led by the TWG. The TWG will be responsible for implementing Actions and monitoring their effectiveness at the Lochaber Smelter site. It is anticipated that one TWG member will take on the role of Travel Plan Coordinator (TPC) thus providing a suitable focus for Action implementation. It is noted that Lochaber Smelter has now appointed a Travel Plan Co-ordinator who has been tasked with taking the TP forward.

### Travel Plan Coordinator

2.6.3 The TPC will implement and manage the TP on a part-time basis. The remit of the TPC should include, but not be limited to the following:

- Provide a point of contact for all travel related enquiries;
- Promote and implement the measures as recommended in this TP;
- Establish and coordinate links with transport operators and key stakeholders including the local authority;
- Process comments and suggestions from office tenants and visitors;
- Review and update the TP periodically in accordance with the monitoring strategy; and
- Report the outcomes of the TP process to the Lochaber Smelter Senior Management Team.

## 2.7 Monitoring, Review & Reporting

2.7.1 The Lochaber Smelter TP is an evolving document which requires monitoring, review and revision to ensure it remains relevant to staff and visitors to the premises. The TWG / TPC will be responsible for monitoring through the collection of quantitative and qualitative data such as travel survey information and an assessment of the number of vehicles accessing the site. This will allow the TPC to assess the effectiveness of Actions in respect of meeting the TP Target.

# 3. EXISTING SITE ACCESSIBILITY AND CONDITIONS

## 3.1 Site Location

3.1.1 Lochaber Smelter is located approximately 3km north-east of Fort William Town Centre. The site is accessed via a recently constructed 4-arm roundabout with the A82 (North Road) which was developed to support the new North Road Retail Park which sits adjacent to the A82.

3.1.2 The general area of Fort William and Lochaber is a popular tourist destination as well as a regional employment centre, offering local services and amenities to a large local residential catchment and hinterland.

## 3.2 Active Travel

3.2.1 Figure 2 indicates the main walking and cycling routes and the location of public transport facilities in the vicinity of Lochaber Smelter. It is noted that additional footway links exist to that shown as the figure demonstrates the links along the main connecting corridors only.

3.2.2 Recent improvements to the walking, cycling and bus infrastructure provision have been made in association with the development of the North Road Retail Park and new roundabout at the A82 / Smelter access.

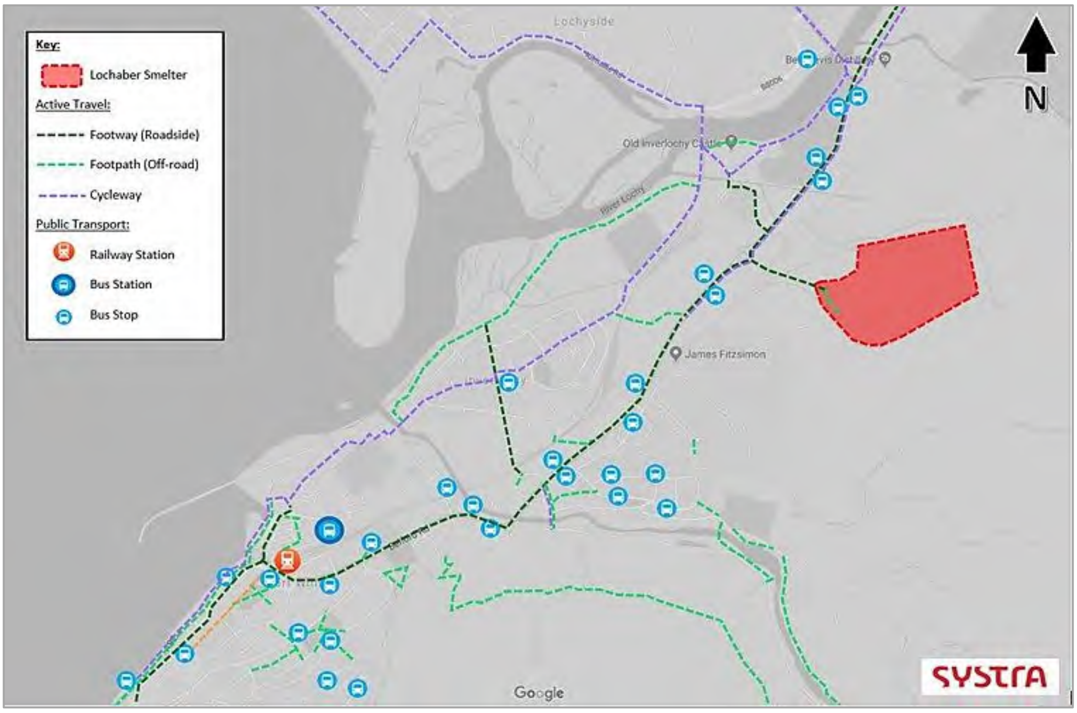



Figure 2. Walking & Cycling Routes and Public Transport Facilities

### Walking

3.2.3 The access road from the A82 into the site has a continuous footway along the northern side of the carriageway with a general width of approximately 1.5m-1.8m and street lighting is also provided along the route and into the Lochaber Smelter Site itself. The general characteristics of the main walking route into the site are indicated by Figure 3. The access road connects to the A82 North Road via a recently constructed roundabout.


**Figure 3. General Characteristics of Access Road Footway**

3.2.4 There is a good level of pedestrian provision at the recently constructed roundabout between the A82 / North Road Retail Park / Lochaber Smelter Access Road. On all arms except the A82 North Road northbound approach arm (as a signalised crossing is provided to the south) there are dropped kerbs and tactical paving, as indicated by Figure 4 which shows the Lochaber Smelter Access Road arm. At the retail park and A82 North Road southbound approach arms, pedestrian refuge islands are also provided.

3.2.5 With the development of the retail park, walking routes between the site and the A82 heading south have been improved in terms of standard and in terms of journey times. Pedestrians to/from Lochaber Smelter can now take a more direct route via the footpaths within the retail park to reach the new signalised crossing which leads onto walking routes into town and to the north, i.e. effectively 'cutting the corner' of the roundabout junction. The route through the retail park is indicated by Figure 5.

**Figure 4. Pedestrian Provision at New A82 Roundabout**

**Figure 5. Pedestrian Route Through Retail Park**

3.2.6 Along the A82 there is good quality footway provision on at least one side of the carriageway and a signalised toucan crossing has recently been provided approximately 160m south of the roundabout, as indicated by Figure 6.

Figure 6. A82 Toucan Crossing

3.2.7 The residential areas of Claggan, Inverlochy and Lochyside are within a 15–20 minute walk from the site which presents good opportunities to encourage walking and cycling trips from these areas for staff members working at the Smelter.

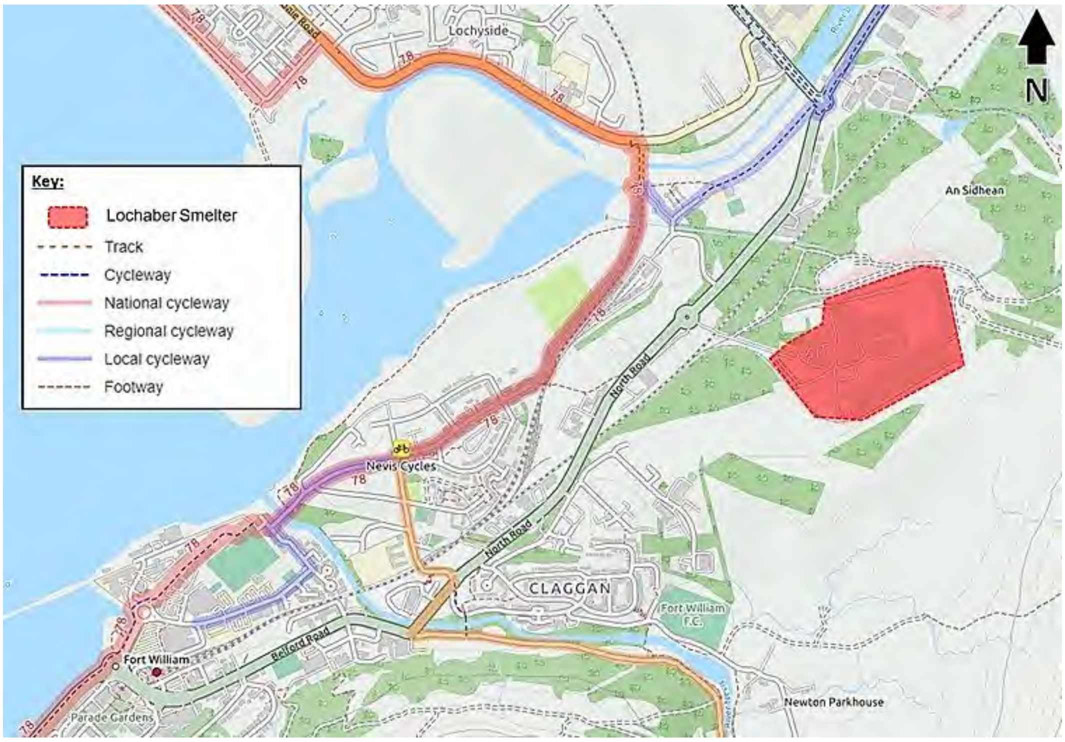
**Cycling**

3.2.8 There are a number dedicated cycle routes in the local area which can be used to link the Lochaber Smelter site with the wider Fort William area as well as to settlements such as Lochyside, Caol, Banavie, Corpach, Claggan and Torlundy which are within an approximate 15 minute cycle.

3.2.9 Improvements to the local cycle infrastructure have been made with the development of the North Road Retail Park in the form of delineated, off-road cycleways along the A82 in the vicinity of the site, as indicated by Figure 7.


Figure 7. Cycleway (and Bus Stop) Along A82 Adjacent to Retail Park

3.2.10 Figure 8 indicates National Cycle Network Route (NCR) 78 "The Caledonia Way" which extends between Fort William and Gairlochy. It is both traffic free and on-road in parts within the vicinity of the site.




*Source: OpenStreetMap*

Figure 8. National Cycle Routes

3.2.11 There is currently a central bike shed for cycle parking at Lochaber Smelter. However, it is understood that these facilities are in need of improvement in terms of standard and capacity and do not cater well for office-based staff as they are located a relatively long walk from the office block.

## 3.3 Existing Public Transport Provision

3.3.1 Lochaber Smelter is served directly by two bus stops on the A82 which are immediately south the A82 / Retail Park / Smelter roundabout, as indicated by Figure 2. These stops have recently been redesigned and upgraded as part of the works to the roundabout. The general characteristics of the bus stop are indicated by Figure 7.

3.3.2 The services that serve the bus stops at the site access junction on the A82 North Road are detailed in Table 2 below.

**Table 2. Bus Timetable**

| OPERATOR | BUS NO. | ROUTE | FREQUENCY | | |
|---|---|---|---|---|---|
| | | | Mon-Fri | Sat | Sun |
| Shiel Buses | N46 / N47 | Upper Achintore + Plantation circular - Corpach | 30 mins | 30 mins | 1 hour |
| Scottish Citylink | 919 | Fort William – Inverness (via Spean Bridge) | Approx. 07:30, 08:40, 10:30, 12:00, 13:30, 14:30, 15:30, 15:43, 17:40 | Approx. 07:30, 08:40, 10:30, 12:00, 13:30, 14:30, 15:43, 17:40 | Approx. 08:40, 10:30, 12:00, 13:30, 14:30, 15:43, 17:40 |
| Shiel Buses | 500 | Fort William - Mallaig | Approx. 13:25, 17:40 | Approx. 15:30 | No service |
| Scottish Citylink | 915 | Glasgow - Uig | Approx. 10:15, 14:00, 18:40 | Approx. 10:15, 14:00, 18:40 | Approx. 10:15, 14:00, 18:40 |
| Shiel Buses | 522 | Fort William - Trislaig | Approx. 11:30, 13:20, 15:00, 17:35 | No service | No service |
| Shiel Buses | N43 | Fort William - Fort William via Clunes + Spean Br | Approx. 13:15, 15:05 | No service | No service |
| Shiel Buses | 502 | Fort William or Ardnamurchan - Mallaig | Approx. 08:55, 15:30 | Approx. 15:30 | No service |
| Shiel Buses | 510 | Fort William - Roy Bridge and Invergarry circular | Approx. 07:10, 07:50 | No service | No service |
| Shiel Buses | 513 | Fort William - Inverness | Approx. 07:30, 15:30, 15:45 | Approx. 07:30 | No service |

| OPERATOR | BUS NO. | ROUTE | FREQUENCY | | |
|---|---|---|---|---|---|
| | | | Mon-Fri | Sat | Sun |
| Shiel Buses | 517A | Upper Achintore and Plantation - Lochaber HS | Approx. 14:40 | No service | No service |

3.3.3 Table 2 indicates that service N46 / N47 that operates a regular service through the residential areas of Upper Achintore (south-west Fort William) and Corpach connecting to the Lochaber Smelter site. Service 919 operates during the day and at peak times between the site and Inverness via Spean Bridge, however, the other services are less frequent and unlikely to be useful for staff at Lochaber Smelter, particularly those working evening and weekend shifts.

## 3.4 Rail Services

3.4.1 Fort William Rail Station is located approximately 2.3km from the site, as indicated by Figure 2. Lochaber Smelter is approximately 30 minutes' walk and within a short cycle distance from the rail station. There are also a number of local connecting buses which provide a link to the bus stops on the A82 in approximately 10 minutes, including the 500, 502, 915 and 920 services.

3.4.2 Fort William Railway Station incorporates 24 bicycle storage spaces as well as facilities for the Nevis Cycles cycle hire scheme. Nevis Cycles offers discounted cycle hire for holders of valid rail tickets. The station also has a 50 space car park.

3.4.3 The West Highland Railway Line connects Glasgow to Mallaig via Fort WIlliam. Within the local area these services stop at Corrour, Tulloch, Roy Bridge, Spean Bridge, Banavie and Corpach as well as a number of other smaller settlements. A typical frequency of one service approximately every 2 hours operates Monday – Saturday. On a Sunday there are three services in a day.

## 3.5 Strategic and Local Road Network

3.5.1 The A82 North Road is a trunk road that extends north – south to the west of the site. This is a key link road connecting Glasgow in the south, to Inverness via Fort William. It also provides links to surrounding settlements such as Kinlochleven and Spean Bridge.

3.5.2 Within Fort William, the A82 North Road is generally single carriageway, with a carriageway width of approximately 6.5m. The stretch of the A82 at the Retail Park roundabout is currently subject to a 40mph speed limit. At the southern end of Fort William, there is a short section of dual carriageway before the road drops back down to single carriageway heading south out of Fort William.

3.5.3 South of Fort William, the A82 provides the main strategic route south through Glencoe to Tyndrum and Crianlarich. It is noted that the A82 between Crianlarich and Tarbert (along Loch Lomondside) has been recently upgraded at Pulpit Rock to widen the road but there are still a number of tight and twisty sections of road. The road is earmarked for further improvements in the coming years.

3.5.4 The A830 connects to the A82 to the north of the site via a roundabout and leads on to settlements at Caol, Corpach, Arisaig and Mallaig. It is covered by a 30mph speed limit through Caol and Corpach and is single carriageway. The road then becomes rural in nature out towards Mallaig and is derestricted in terms of a speed limit.

# 4. STAFF TRAVEL SURVEY

## 4.1 Methodology

4.1.1 In mid 2019, the Lochaber Smelter staff were invited to complete a travel survey. The purpose of the travel survey was to understand how staff travel to the site and to identify any opportunities for encouraging a change in travel behaviour.

4.1.2 Going forward, further travel surveys will be undertaken on an annual basis to monitor travel patterns and travel behaviour. These surveys will be used to assess the effectiveness of the TP Actions in respect of achieving a 6% reduction in single occupancy vehicle trips to the Lochaber Smelter site. This chapter summarises the results of the staff survey.

4.1.3 The online survey was distributed via email to all staff (that have access to a computer) which contained a link to the survey. The survey was 'live' for approximately 3 weeks in May 2019. For those staff without access to email, a paper version of the survey was distributed. In total, 141 staff based completed the online and paper staff travel survey equating to a response rate of approximately 75%. Appendix A contains a copy of the staff questionnaire. The following paragraphs summarise the key staff travel survey results.

4.1.4 A copy of the questionnaire is included in Appendix A.

## 4.2 Staff Shift Patterns

**Staff Trips**

4.2.1 There are currently approximately 175 staff who work shifts at the existing smelter. The plant operates two 12 hour shifts daily as follows:

- Day shift 07:00 – 19:00
- Night shift 19:00 – 07:00

4.2.2 Employees are split into 5 shift groups that operate in a pattern each week, with staff working an average of 3 shifts within this time. The main mode of transport used by staff to travel to work is the private car.

## 4.3 Travel Survey Results

**General**

4.3.1 Of the staff that responded to the survey (141 in total), 88 are operations/maintenance staff whilst the remaining 53 are support functions/admin/management staff. The majority of staff work full-time hours (134 out of 141).

4.3.2 The most common start time for the working day was between 07:45 and 08:15 (46 respondents), followed by 07:00 – 07:30 (38 respondents). The most common time for staff to finish work was reported between 16:00 and 16:30 (49 responses). It is understood that approximately 35 staff that completed the survey work a rotating shift pattern of 07:00 – 19:00 and 19:00 – 07:00.

### Main Mode of Travel

4.3.3 The travel survey asked staff what their main mode of travel to work on a typical day is, where main mode relates to the mode used for the longest part of the journey. The results are indicated by Figure 9Figure 9.

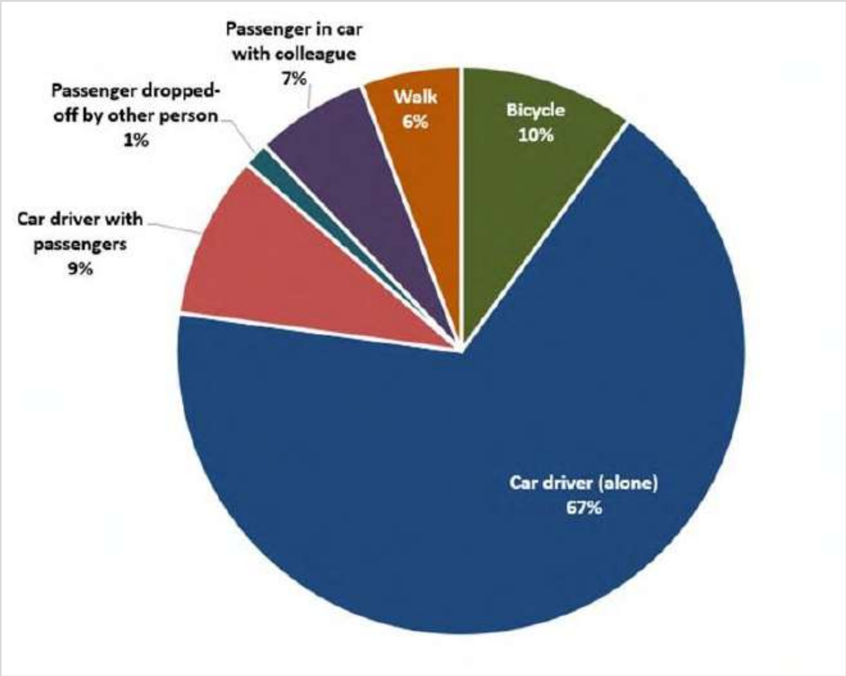



**Figure 9. Staff Mode Share**

4.3.4 Figure 9 demonstrates that the most popular mode for staff travelling to work is by single occupancy car travel with 67% of the mode share. It is noted that 16% of staff travel by active travel modes (10% cycling and 6% walking) and cycling is the second largest mode share. Approximately 16% of staff car share, either as a car driver (9%) or passenger (7%). Only 1% of staff are dropped off at work by someone other than a colleague.

4.3.5 For staff that commute by car, the travel survey asked what their main reasons are for doing so. Staff had the option to tick all reasons that apply and/or state “other”. The responses are indicated by Figure 10.

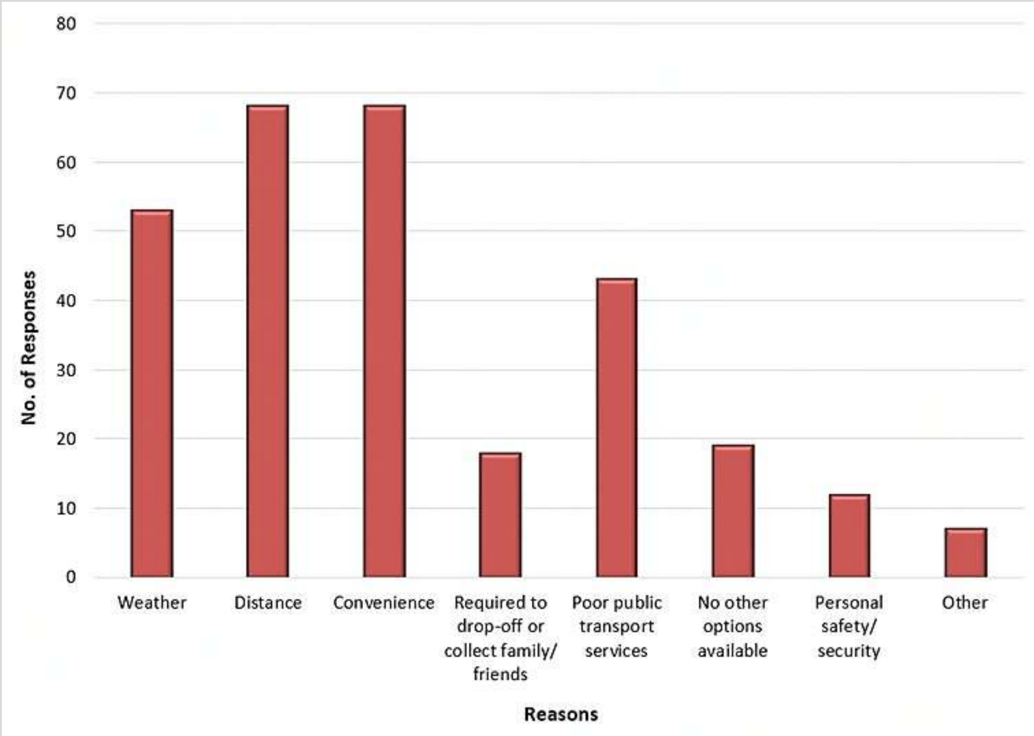



Figure 10. Reasons for Travelling by Car

4.3.6 The results demonstrate that the most popular reasons for commuting by car is the distance in which staff have to travel to each the workplace and the convenience of driving (reasons tied with 68 responses). Weather and poor public transport services available were also commonly reported reasons for travelling by car to Lochaber Smelter with 53 and 43 responses respectively.

4.3.7 Staff that responded with the "other" option were asked to specify the reason why they prefer to commute by car. Examples of responses received are as follows:

- Lack of drying facilities for those that walk or cycle in inclement weather conditions;
- Variable finishing time; and
- Personal reasons (e.g. need to be able to collect children at short notice if required).

**Place of Residence & Journey Time to Work**

4.3.8 Post code information of staff at Lochaber Smelter was provided and the general areas in which staff reside are demonstrated by the heatmap in Figure 11.

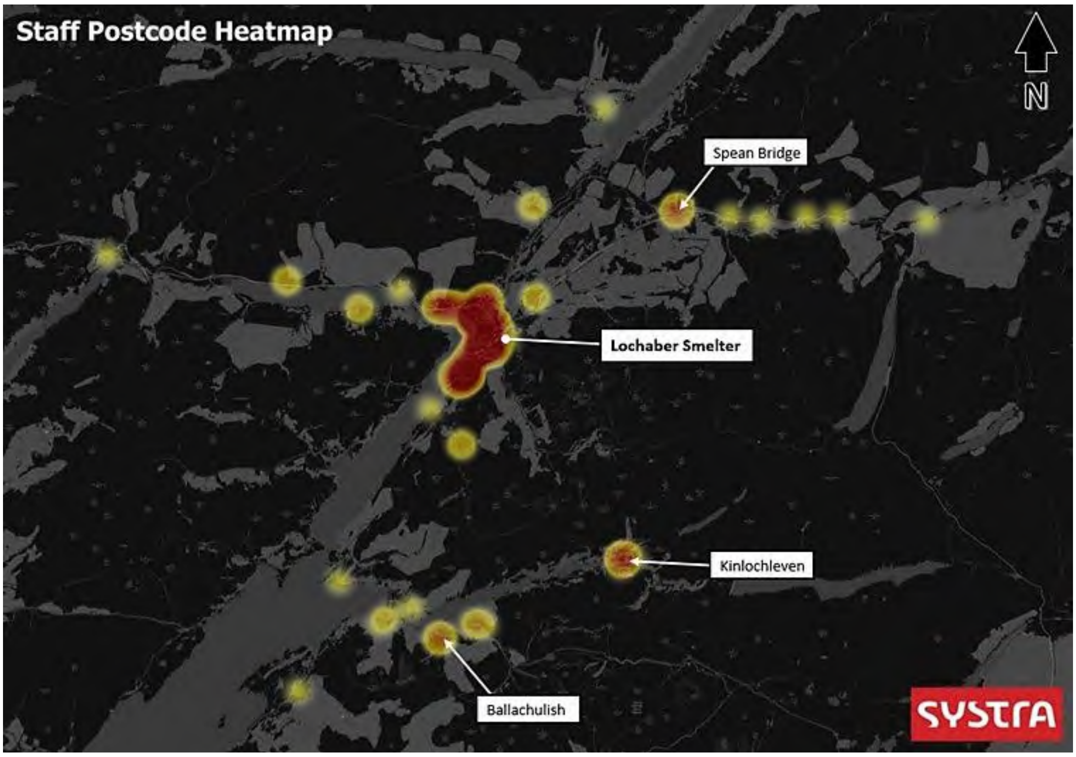



Figure 11. Staff Areas of Residence

4.3.9 Figure 11 demonstrates that the largest proportion of staff live within proximity to the Lochaber Smelter, in Fort William and the villages of Inverlochy, Lochyside, Caol, Corpach and Banavie which surround the bay where the River Lochy meets Loch Linnhe. Smaller clusters of staff reside in Kinlochleven, Spean Bridge and Ballachulish.

4.3.10 The staff travel survey asked respondents to indicate how long their journey to work typically takes. The results are indicated in Figure 12.

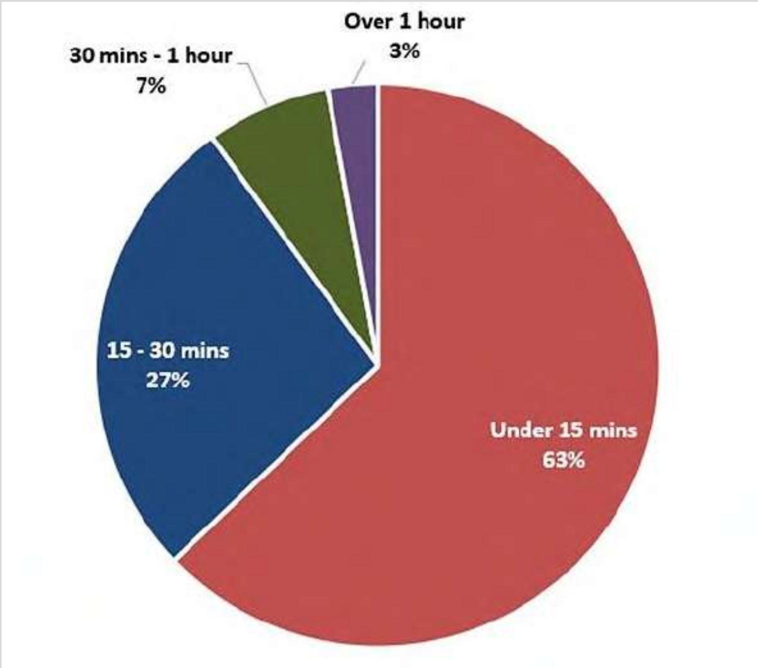



**Figure 12. Staff Typical Journey Time**

4.3.11 Mirroring that which is demonstrated by Figure 11, the majority of staff live within a 15 minutes journey of Lochaber Smelter. The survey found that only 10% of staff have a journey time of over 30 minutes to their workplace.

**Public Transport / Active Travel**

4.3.12 The survey provided staff with list of examples and asked if any of the measures listed would encourage them to use public transport to travel to/from the Lochaber Smelter or support their journey if already travelling by sustainable modes. Staff had the option to tick multiple options. The responses are indicated by Figure 13.

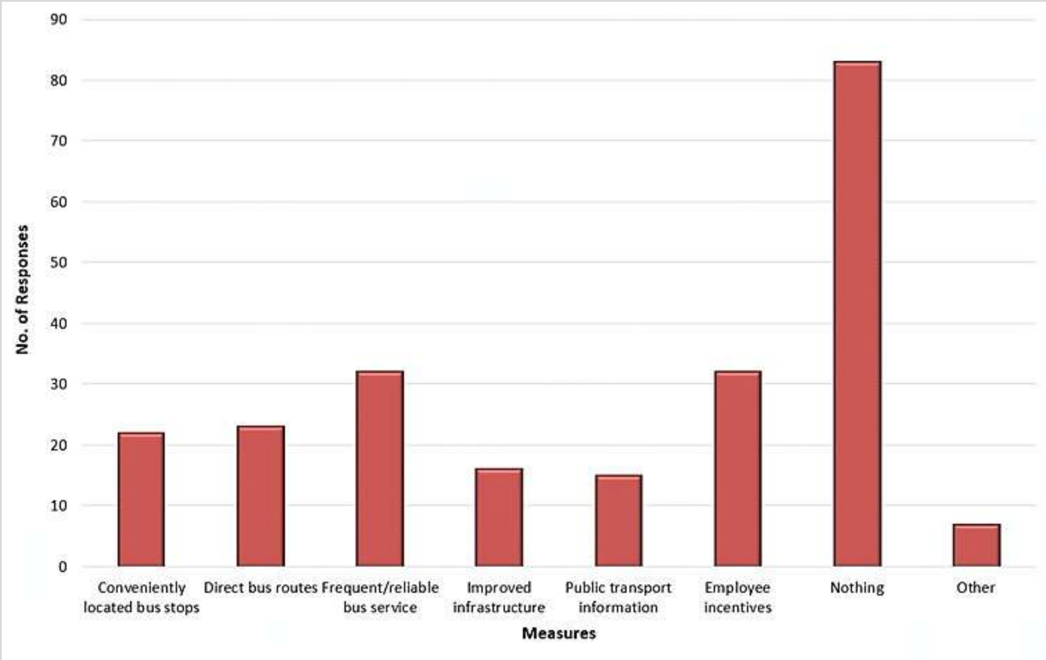



Figure 13. Measures to Encourage Use of Public Transport

4.3.13 The results demonstrate that the largest proportion of staff reported that nothing would encourage them to travel by public transport. The most popular measures reported were “frequent / reliable bus routes” and “employee incentives” with 32 responses respectively. “Conveniently located bus stops” and “direct bus routes” each had just over 20 responses, whilst providing public transport information and improving infrastructure had the fewest votes.

4.3.14 With respect to measures that would encourage walking and cycling by staff, the results are indicated by Figure 14.

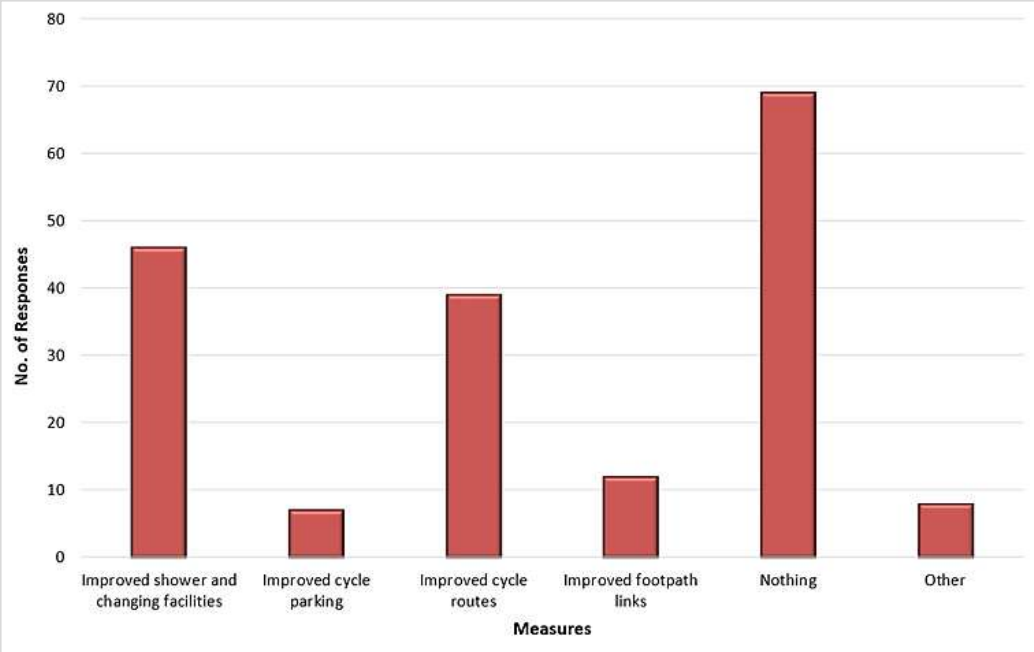



Figure 14. Measures to Encourage Walking / Cycling

4.3.15 The results indicate a similar pattern of responses to the question regarding the encouragement of public transport to travel to work. A total of 69 of respondents stated that nothing would encourage them to walk or cycle to work.

4.3.16 The most popular measure that staff reported would help to encourage them to travel by walking and cycling was to improve the shower and changing facilities on-site, with 46 responses. This is followed by improving cycle routes with 39 responses, then improving footpath links which gained 12 responses respectively. Few staff felt that improved cycle parking would influence their decision.

**Car Sharing**

4.3.17 The travel survey asked if staff that currently do not car share would consider car sharing with fellow employees to work and the results are depicted in Figure 15.

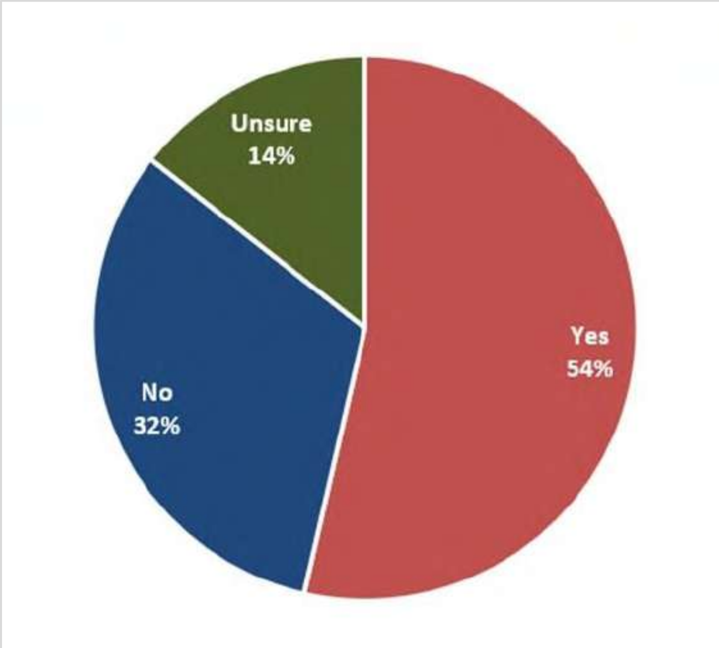



**Figure 15. Would Staff Consider Car-Sharing**

4.3.18 The response indicate that the majority of staff (54%) are open to car sharing with a colleague which is a positive result and represents a good opportunity for exploring the possibility of promoting further car sharing amongst staff.

# 5. ACTIVE TRAVEL PLAN MEASURES

## 5.1 Introduction

5.1.1 This section of the TP details specific measures that will be implemented at the Lochaber Smelter site to support the achievement of the Travel Plan's aim, objectives and targets. The TP measures focus on promoting a higher uptake of public transport and car sharing specifically. However, there are opportunities to better encourage staff to walk and cycle to and from the Lochaber Smelter, and this will also be covered in this section.

5.1.2 The measures have been broken down into the following sections:

- Information and promotion;
- Walking;
- Cycling;
- Public transport; and
- Managing car use.

## 5.2 Information and Promotion

5.2.1 Travel information for staff and visitors is essential to achieve an awareness of sustainable travel options which are available in the local area.

**Accessible Travel Information and Facility Awareness On-Site**

5.2.2 Having up-to-date travel information available for potential travel users is key to the successful implementation of the TP measures. Therefore, the TPC should first ensure that there is a location for such information to be displayed, such as notice boards in the reception and staff areas at each site (such as changing rooms or dining areas). The display should include information regarding:

- Recommended cycling and walking routes that link Lochaber Smelter to useful points, such as the bus stops within the business park and to nearest residential areas;
- Location of cycle parking facilities on-site;
- Bus timetable information, stops locations and approximate walking times to the stops;
- Local taxi information;
- Posters highlighting health benefits and cost benefits of travelling sustainably.

5.2.3 Reception and building management staff should be supported and made aware of the importance of understanding the range of travel options available to / from the site (so that they can then advise others), they should know as a minimum:

- Key bus services serving the site and the location of the nearest bus stops;
- Phone number/web address for relevant online information; and
- Taxi numbers.

**Staff Recruitment & Induction**

5.2.4 It is important that new staff establish sustainable travel habits to the Lochaber Smelter from the beginning, particularly in relation to the new alloy wheel plant facility as there will be an influx of new staff once this facility is operational. During the recruitment process, it should be made clear to applicants that there are different travel options available to access the site.

5.2.5 The TPC should provide a simple checklist of all useful information relating to sustainable and public transport and this will be provided to new staff as part of their induction process. The staff manual should also be updated to provide guidance on travelling sustainably to the site and to include any new incentive measures that are introduced at the site to encourage staff to travel sustainably.

5.2.6 Further information provision measures that can be implemented by the TPC include:

- Website – the LBA Website should have a "how to get here" section that provides visitors with information on how they can get to Lochaber Smelter by a range of transport modes.
- Awareness Event – on an annual basis, the TPC should hold an awareness event or TP launch event so that staff and visitors can be aware of and engage with the TP from the outset.
- LBA / Lochaber Smelter Intranet – Information on sustainable travel options and any local / national sustainable travel events occurring should be disseminated to staff via internal communications.
- Materials – the TPC should look into preparing some leaflets to hand out to staff that highlight the sustainable travel options available to reach the site (similar to the posters created for notice boards). These can be disseminated at the awareness event.

## 5.3 Walking & Cycling

**Cycle to Work Scheme**

5.3.1 Lochaber Smelter already has a 'Cycle to Work' scheme in place which allows the employer to loan cycles and cyclists' safety equipment to employees as a tax-free benefit. Details of the scheme on offer should be included in the new staff induction pack and current staff should reminded of the availability of the scheme via internal communications, such as circular emails or via the intranet.

**Measures**

5.3.2 It is important that the TPC encourages staff to make use of the existing pedestrian and cyclist facilities in the area. To further encourage cycling to the site, a range of measures should be offered which include various information and incentive based measures as well as physical improvements, as detailed below:

**Information / Incentive-based Measures**

- Where available, the provision of local cycling maps, routes and cycling times to key destinations (to be displayed on notice boards; as discussed above);
- The provision of basic on-site cycle tools and equipment (e.g. hand pump, puncture repair kit etc.) in addition to the facilities already available;
- Setting up a bicycle users group (BUG) to encourage regular cyclists, should demand prove sufficient. This could include cycle training and road safety training;
- A route database which would allow cyclists to team up for journeys; and
- Provide a guaranteed lift home should the cyclist become ill or in the event of an emergency.
- Investigate the provision of "free breakfasts" for cyclists or other incentive schemes such as recording the miles covered by commuting cyclists.

**Potential Physical Improvements**

5.3.3 From discussions with the TWG, it is understood that the current shower and changing facilities are insufficient in that no locker space is provided, the facilities are currently geared towards shift workers rather than office-based staff in that they are far away from the office building, and there is limited provision for female staff. These are factors that are being addressed by LBA in the site improvement and expansion works that are being undertaken and a new shower and changing facility will be created that is more suitable for office staff.

5.3.4 In relation to cycle parking, TWG reported that the existing bike shed has limited capacity and requires some maintenance. This issue is known to LBA and is also being addressed through the site improvement and expansion works.

5.3.5 In summary, the following actions will be taken:

- Review current cycle parking standards and undertake maintenance or improvement works where necessary;
- Provide improved shower and changing facilities; and
- Explore the possibility of providing a drying room for staff that walk or cycle in inclement weather conditions (this was suggests by a number of staff via the Travel Survey).

## 5.4 Public Transport

5.4.1 The measures to increase public transport use should focus on the promotion of existing facilities but also look for opportunities to make improvements to better suit the needs of Lochaber Smelter staff and visitors. Measures should include:

- Provision of bus timetables of local bus services, including maps of routes and locations of bus stops near the development (to be displayed notice boards and website);
- Engage in discussions with the local bus operators to explore where improvements to the bus service routes and timetables can be made to better serve the Lochaber Smelter staff, particularly shift workers (further details provided below); and

- Explore the possibility of introducing employee incentives which encourage the use of public transport.

## 5.5 Managing Car Use

5.5.1 Measures such as posters in communal areas and communication should be introduced on an ongoing basis to inform and remind staff about the alternative modes of transport that are available to access the Lochaber Smelter site.

5.5.2 The TPC will create resources which will be made available to all staff, highlighting the economic and environmental impact of private car use and providing detail on the car parking situation at the site.

**Car Sharing**

5.5.3 Car-sharing is perhaps the most attractive alternative to single occupancy vehicle travel because of its door to door directness and convenience. The main benefit of car-sharing is that each person, other than the driver, in the car could equate to a vehicle trip removed from the road / car park. It is understood from the staff survey results that 16% of staff already car share (either as a driver with passengers or passenger in a car) and 54% of staff that currently do not car share would consider it which is a positive result and demonstrates that there is good scope for encouraging car sharing amongst staff.

5.5.4 The main disadvantage is that it requires a degree of commitment to a common schedule. Car-sharing can be implemented by most organisations, although there are certain criteria which can make them more successful, these include:

- Consistent work hours;
- Residential concentrations of employees;
- High percentage of employees with commutes longer than 10 miles, or 20 minutes;
- High percentage of employees with low to moderate salaries; and
- Constrained parking supply.

5.5.5 Measures to encourage car-sharing at Lochaber Smelter include:

- An employee database of staff willing to car-share;
- Provide priority parking spaces for those who car-share;
- Provide basic scheme guidance to staff, laying down ground rules regarding charging for lifts, the importance of timekeeping, procedures for the eventuality of illness etc.; and
- Provide a guaranteed lift home, should the driver fall ill or in an emergency – an employer can pay the cost of the journey home in these circumstances and there will be no tax or NICs to pay.

5.5.6 It is noted that it would be possible to set up a lift share scheme within the body of an existing service provider (such as Liftshare.com) that provides a free-to-use web service. A bespoke Lochaber Smelter lift-share scheme can be used which can be as simple as an excel spreadsheet or can be developed into a web-based facility utilising the system architecture of existing services. Providers are able to personalise the service to specific users and we would recommend that this is explored as an option.

**"Pool Cars"**

5.5.7 A pool car is a company vehicle that is available for use by employees of that company for business trip purposes (although should not be used in place of regular company cars otherwise penalties can be incurred) and are exempt from tax and NICs payments. Pool cars can be an effective means of managing staff's private car usage if a car is required to make a business trip during the working day. In these circumstances, availability of pool cars can allow staff the option for travelling to work by alternative means.

## 5.6 Reducing the Need to Travel

**Flexible and Agile Working**

5.6.1 It is understood from the TWG that 'flexi-time' working is not currently promoted (or indeed practical for a number of staff, such as shift workers) at Lochaber Smelter, however, variable start and finish times can be arranged in advance by agreement with managers.

5.6.2 Where applicable, the TPC should review the possibility of 'agile' working for staff, where applicable. This can be promoted to relevant staff by creating a number of resources demonstrating the benefits of working from home/flexible working e.g. reduced peak hour congestion. The social, economic and health benefits of flexible working will also be promoted. The TPC will engage staff through web-based mediums and senior management.

5.6.3 The TPC will ensure that senior management are aware of the benefits of 'agile' working in respect of traffic and transport. Lochaber Smelter should to develop an agile working policy so that arrangements can be managed effectively.

**Business Travel**

5.6.4 The TPC should establish a Business Travel Network (BTN). The purpose of the BTN will be to act as a Forum for staff for all matters relating to business travel and 'agile' working. The TPC will require assistance in establishing a BTN and it is hoped that other staff in different departments will be in a position to assist.

5.6.5 The remit of the BTN will include, but not be limited to:

- Reducing the need for unnecessary business trips by promoting video and tele-conferencing;
- Promoting 'agile' working;
- Promoting shared business travel trips;
- Reviewing business travel procedures and policies; and
- Promoting sustainable travel modes for business trips.

# 6. TRAVEL PLAN ACTIONS

6.1.1 This Chapter details the Lochaber Smelter TP Actions for implementation which are based on the measures described in Chapter 5. The Actions have been designed to consider:

- The existing and proposed baseline traffic and transport situation;
- Staff travel survey information; and
- The TP Aim, Principles & Target.

6.1.2 All Actions will be agreed with the TWG and would be implemented over a five year period. Actions will be reviewed and updated on a yearly basis to ensure they remain resource efficient and relevant to Lochaber Smelter staff needs.

## 6.2 TP Actions

6.2.1 Table 3 indicates the Actions which will be implemented at the Lochaber Smelter site over the next five years. The Actions are intended to work in tandem with any infrastructure measures proposed as part of the expansion programme in order to deliver the targeted reduction in single occupancy vehicle trips of 6%.

Table 3. Actions to be Implemented at the Lochaber Smelter Site

| ACTION | | DESCRIPTION |
|---|---|---|
| **Governance** | | |
| 1 | Transport Working Group (TWG) | Meetings commenced in 2019 and are held on a quarterly basis. Travel Plan co-ordinator to be appointed Q3 of 2019. A suitable budget will need to be allocated to the implementation of the travel plan and its associated measures. |
| **Reducing the Need to Travel** | | |
| 2 | Establish a Business Travel Network (BTN) | The TPC will establish a BTN to act as a forum for staff for all matters relating to business travel and 'agile' working. This should be undertaken by the end of 2019. The BTN would look at business travel measures such as pool cars to assess what would work well for the business and staff. |
| 3 | Promote 'agile' working (management staff) | Commencing in autumn 2019 the TPC will explore the opportunities to promote 'agile' working to Lochaber Smelter staff, where applicable. |

| ACTION | | DESCRIPTION |
|---|---|---|
| 4 | IT infrastructure | In 2019 the TPC will seek to reduce the need for unnecessary business trips through promoting video / teleconferencing and promoting shared business travel, where applicable. |
| **Active Travel** | | |
| 5 | Travel Options Leaflet- Active Travel | The TPC will prepare and distribute leaflets relating to active travel, promoting the health, social and economic benefits of walking and cycling. This should be undertaken before the end of 2019. |
| 6 | Journey sharing | The TPC will seek to introduce a journey sharing scheme so it is possible for staff to share walking, cycling and public transport trips also. This should be undertaken in years 1-2. |
| 7 | Bicycle User Group (BUG) | The TPC will look into the introduction of a BUG to promote travel to the Lochaber Smelter site via bicycle. This will involve consultation with key groups such as Sustrans and Cycling Scotland. This should be undertaken in years 1-2. |
| 8 | Review of cycle parking, shower & changing facilities | The TPC will undertake a review of the current cycle infrastructure the earliest opportunity. The TPC will also explore the possibility of implementing a drying room for staff equipment. |
| **Managing Car Use** | | |
| 9 | Car sharing scheme. | In 2020 the TPC will introduce a car sharing scheme for staff either as a bespoke Lochaber Smelter scheme or through the promotion of a third party provider's scheme (such as Liftshare.com). Subsequent reviews will consider the effectiveness of the scheme and opportunities for providing dedicated car sharing spaces. |
| **Strategic Communications** | | |
| 10 | Stakeholder communications | In 2019 key stakeholders, such as the local authority and bus operators, will be provided with the opportunity to comment on the TP. Consultation will also identify transport constraints and opportunities for example where improvements can be made to bus services. |

| ACTION | | DESCRIPTION |
|---|---|---|
| 11 | Contact details | In order to field questions from staff and visitors, contact details for the identified TPC will be established and promoted. Contact details will be in place by autumn 2019. |
| 12 | Development of Travel Options Leaflets | Leaflets illustrating the location of bus routes and stops, and cycle routes etc will be designed and distributed in 2019. |
| 13 | Notice boards | In 2019 notice boards displaying travel information will be provided in the main buildings and updated on a regular basis. |
| 14 | Website | In 2019, the corporate website should be updated to include up to date information on accessing the site by a range of transport modes. |
| 15 | Staff recruitment & Induction | In 2019 the TPC will ensure that information regarding the TP and the travel options available are communicated during recruitment of new staff. |
| 16 | Staff manual | In 2019/early 2020 the TPC will review the staff manual to ensure it supports the Aims, Targets and Actions of the TP. |

## 6.3 Monitoring and Review

6.3.1 A TP is an evolving document which requires monitoring, review and revision to ensure that it remains relevant to all users. The monitoring strategy is important for assessing how effectively the Lochaber Smelter TP has been in achieving its aim, objectives and targets. It can help identify measures that are not meeting Lochaber Smelter TP objectives and reallocate resources accordingly.

**Annual Monitoring**

6.3.2 The staff travel surveys should generally take place in the same month and format as the original baseline survey to ensure compatibility of results. This monitoring is an opportunity to measure Lochaber Smelter TP achievements and the mode share against the targets set on an annual basis.

**Reporting**

6.3.3 Following each survey the TPC will review the results to assess the progress of the Lochaber Smelter TP, re-asses the existing measures and where required, investigate additional measures which could be developed.

6.3.4 The results of the travel survey, and findings from the ongoing monitoring activities will be provided in annual monitoring reports. These can be made available to The Highland Council on request to demonstrate the progress being made with travel planning at Lochaber Smelter.

# 7. SUMMARY & CONCLUSIONS

7.1.1 The Aim of the Travel Plan is to: *'support a realistic shift in staff and visitor travel behaviour away from single occupancy car travel to sustainable travel alternatives'.* The Travel Plan target is a 6% reduction in the number of single occupancy car trips to the Lochaber Smelter site to be achieved by 2024.

7.1.2 Travel surveys of the staff conducted in 2019 demonstrate that 67% of staff travel to work by single occupancy car. There is a real opportunity to encourage a shift in travel behaviour away from single occupancy car travel to sustainable travel modes.

7.1.3 Liberty British Aluminium are committed to travel planning at the Lochaber Smelter business premises. This Travel Plan includes Actions focussed on improving transport infrastructure at the site such as implementing a car sharing scheme, improving upon car parking management and encouraging greater use of public transport. These Actions will be implemented over a five year period and are based on an audit of the Lochaber Smelter Site, an understanding of operational requirements at the site and the results of staff travel surveys completed in 2019.

7.1.4 A range of travel planning measures have been presented within this Travel Plan along with an Action Plan for their delivery. It is considered that a worthwhile shift away from single occupancy vehicle trips can be achieved through the implementation of these measures.

7.1.5 The Travel Plan is being implemented now for existing staff and once operational, the staff associated with the new alloy wheel plant will fall under the umbrella of the travel plan.

# APPENDIX A

**Staff Travel Survey – Questionnaire**

# Lochaber Smelter: Staff Travel Survey

1. Which category of staff are you?

- Support Functions / Staff
- Operations / Maintenance Shift

2. What time do you typically start and finish work? (please use 24h-clock format, e.g. 08:00 and 17:00)

Start

Finish

3. Are you part-time or full-time?

- Part-time
- Full-time

4. On a typical day, what is your **main mode** of travel to work? (e.g. if you walk for 10 mins to get on a bus for 15 mins, then bus is your main mode)

- Walk
- Bicycle
- Bus
- Train
- Car driver alone
- Car driver with passengers
- Passenger in car with colleague
- Passenger dropped-off by other person
- Other (please specify)

5. If applicable, how many other employees do you typically car share to work with?

- 0
- 1
- 2
- 3
- 4
- Not applicable

6. Would you consider **car sharing** with a colleague if the opportunity arose?

- Yes
- No
- Unsure
- I already car share with a colleague

7. Would any of the following measures **encourage** you to use public transport to travel to work / **support** your current journey to work by **public transport**? (tick all that apply)

- Conveniently located bus stops
- Direct bus routes
- Frequent/reliable bus service
- Improved infrastructure (e.g. footways, bus stops, shelters, lighting)
- Public transport information (e.g. service routes, timetables)
- Employee incentives (e.g. season ticket loan)
- Nothing
- Other (please specify)

8. Would any of the following measures **encourage** you to walk or cycle to work / **support** your current journey to work by **walking or cycling?** (tick all that apply)

- Improved shower and changing facilities
- Improved cycle parking
- Improved cycle routes
- Improved footpath links
- Improved street lighting
- Nothing
- Other (please specify)

9. If **car** is your main mode of travel to work, what is / are the **main reasons** you travel by car? (tick all that apply)

- Weather
- Distance required to travel
- Convenience
- Required to drop-off or collect family / friends on the way
- Poor public transport services available
- No other options available to you
- Personal safety / security
- Not applicable
- Other (please specify)

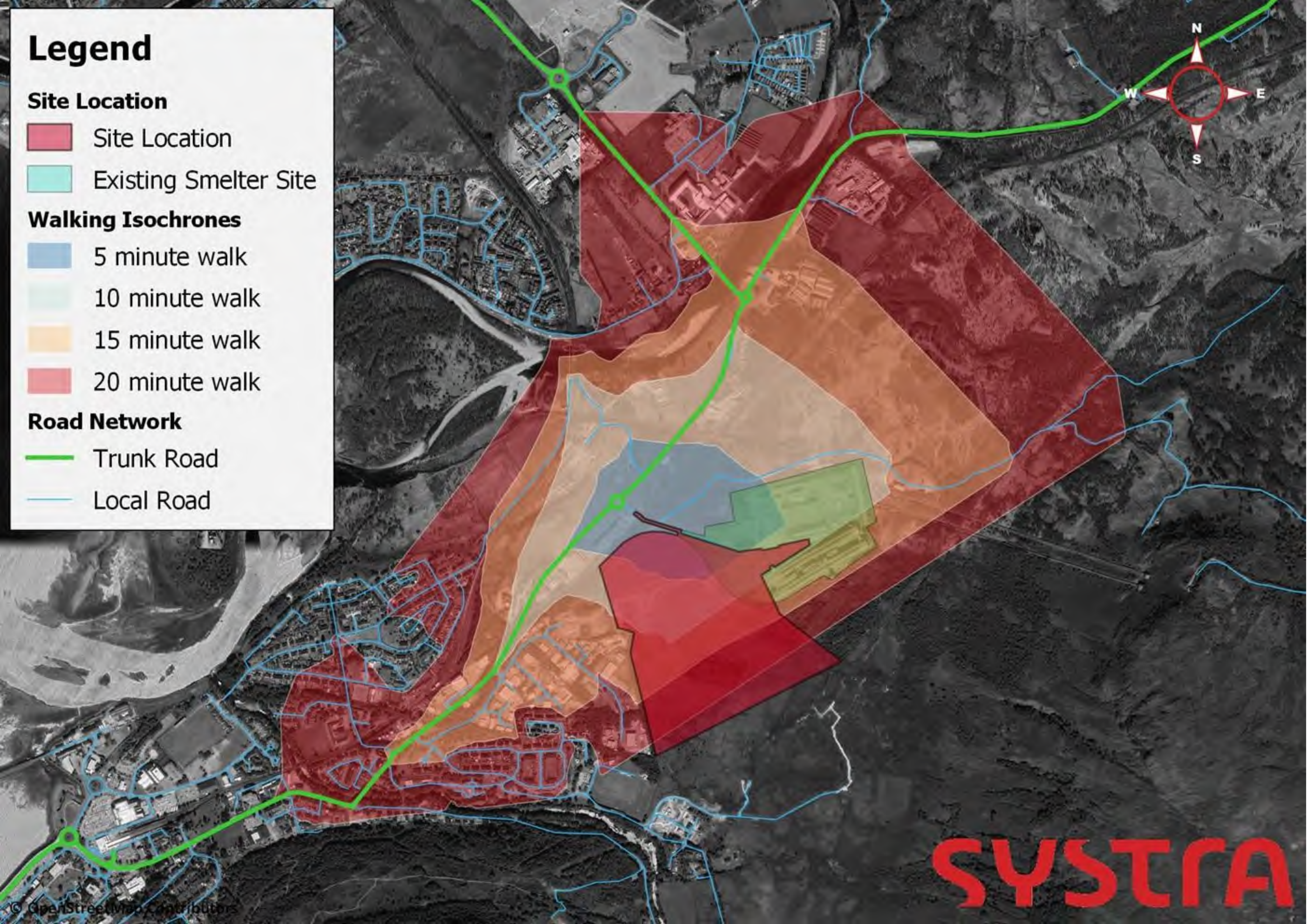
10. How long does your journey to work typically take? (e.g. including walk to public transport)

- Under 15 mins
- 15 - 30 mins
- 30 mins - 1 hour
- Over 1 hour

11. Do you have any general comments about your journey to work?

# APPENDIX C

## ACCESSIBILITY ISOCHRONES


Legend
Site Location
Site Location
Existing Smelter Site
Walking Isochrones
5 minute walk
10 minute walk
15 minute walk
20 minute walk
Road Network
Trunk Road
Local Road
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SYSTRA
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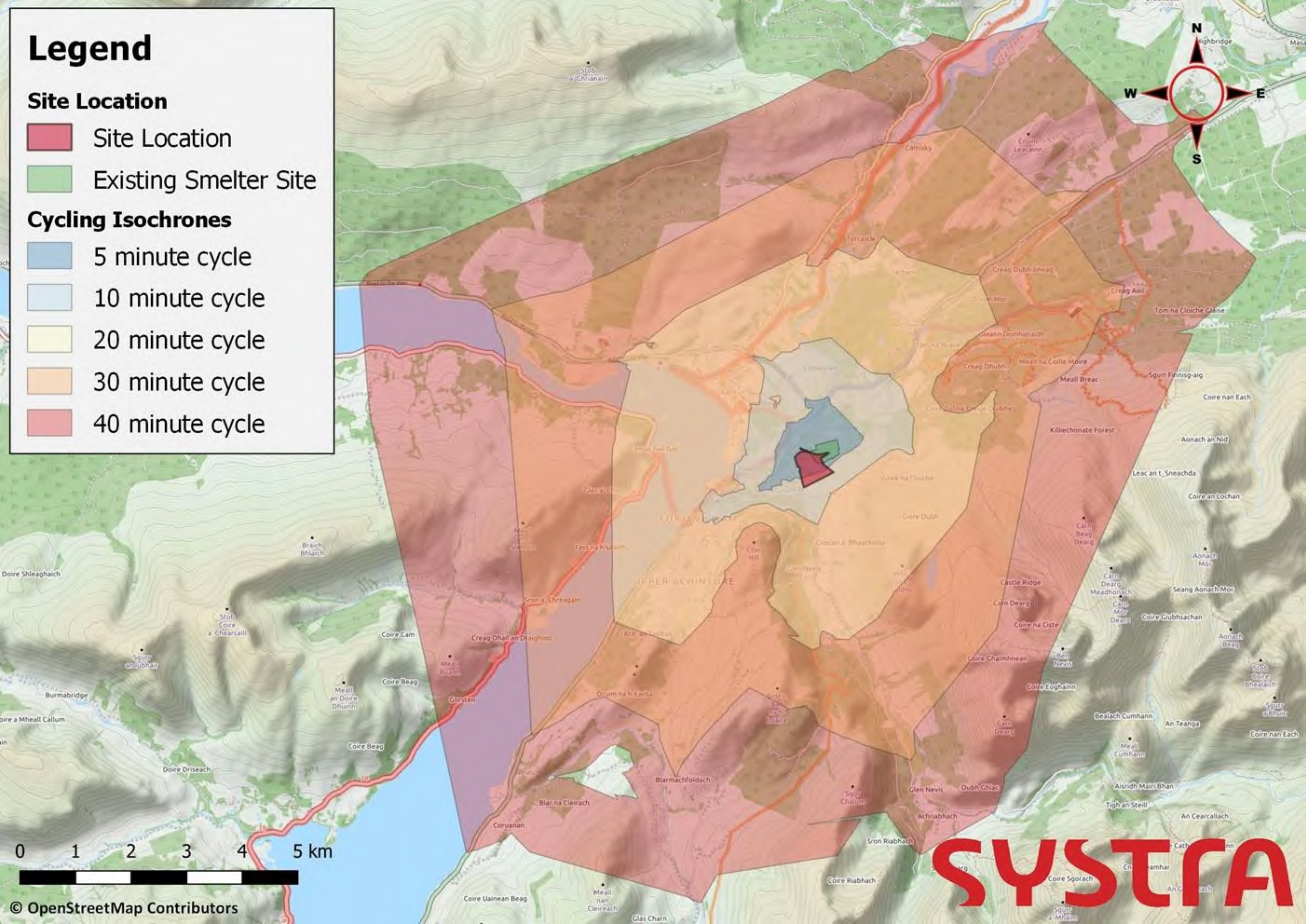

Legend
Site Location
Site Location
Existing Smelter Site
Cycling Isochrones
5 minute cycle
10 minute cycle
20 minute cycle
30 minute cycle
40 minute cycle
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SYSTRA

# APPENDIX D

## SCOPING & PRE-APPLICATION DISCUSSIONS

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**Proposed Billet Processing Development**
**Lochaber Smelter, Fort William**

**22nd January 2021**

**TRANSPORT ASSESSMENT & ENVIRONMENTAL IMPACT ASSESSMENT (TRAFFIC & TRANSPORT CHAPTER) SCOPING LETTER**

Dear Mark,

Following Systra's recent appointment to undertake the traffic and transport consultancy input as part of a forthcoming planning application (20/04580/PAN) for the development of a Billet Processing Plant within the existing Lochaber Smelter site in Fort William, I would like to take this opportunity to propose the following scope for a Transport Assessment (TA) to support the planning application.

Systra also understands that a recent Environmental Impact Assessment (EIA) screening process has resulted in a requirement for a full EIA to be undertaken in support of the application. We therefore append a scoping note for Chapter 9 of the EIA (Access, Traffic & Transport) for your consideration, review and comment.

## Background

The applicant, Alvance British Aluminium, has decided against pursuing further the consented plan to implement an Alloy Wheel Plant (AWP) at the site of the existing Lochaber Smelter in Fort William. Instead a forthcoming application is intended to be brought forward for the proposed construction of a building to house the manufacture of aluminium billet which will use a combination of aluminium from the smelter and imported scrap aluminium.

Systra has been involved with previous applications at the proposed site, including the extant 2017 AWP application (17/05202/FUL). As part of the forthcoming application for a Billet Plant, Systra has been appointed to provide transport consultancy and latterly a TA and EIA Transport chapter to support the application.

## Policy & Guidance

The TA will be undertaken in accordance with local and national transportation policy, with reference to:

- Transport Scotland's, 'Transport Assessment Guidance' (TAG);
- Scottish Planning Policy (SPP);
- Planning Advice Note (PAN) 75, 'Planning for Transport';
- 'Designing Streets' - A Policy Statement for Scotland, 2014;
- Climate Change (Scotland) Act, 2009;
- Scottish National Transport Strategy (NTS), 2016;
- West Highland & Islands Local Development Plan (WestPlan) – September 2019;
- The Highland Council Road and Transport Guidelines for New Developments 2013; and
- Highland Council Guidance on the Preparation of Transport Assessments 2014.

Further relevant policy and guidance will also be referred to within the EIA chapter and this is detailed within the EIA scoping note as presented within Appendix A.

## Proposed Development

The proposed development is very similar in principle to the consented AWP and seeks to utilise the metal handled at the smelter to manufacture a new product. Notwithstanding this, the operation of the proposed development is of a significantly reduced scale to the AWP in terms of the building that will be provided on site. The gross floor area (GFA) of the building will be approximately 10,000 sqm compared with the 34,560 sqm which has been consented for the AWP. In terms of the site extents, this will be in the region of 3.4ha – a substantial reduction from the 24ha of the consented AWP.

The proposed development will employ around 70 members of staff once it becomes operational. Systra notes that this is a reduction to the sites' consented use for an AWP. Therefore, it is fundamental that the TA should outline a comparison of the trip generation between to consented and proposed uses to determine the relative traffic impacts associated with the Billet Plant.

## Sustainable Accessibility

Supporting and encouraging sustainable transport to the development will be the focus of the study. The emerging TA will therefore include a full review of the site accessibility by sustainable modes, identify any gaps in provision and outline any appropriate measures to address these gaps.

Specific consideration will be given to each of the following hierarchy of modes:

- Walking;
- Cycling;
- Public Transport; and
- Car travel.

The TA will identify the pedestrian and cycle routes from the likely main residential catchment areas and highlight areas where these routes could be improved, including by identifying potential crossing points on key routes. The full extent of cycle provision included in the development proposals will be outlined within the TA including the number of cycle parking spaces, which will be in line with guidance given in The Highland Council Road and Transport Guidelines for New Developments 2013. Walking and cycling isochrones will be produced in accordance with national policy. When considering active travel routes through Fort William, cognisance will be given to the 2010 Highland Council Active Travel Plan.

A detailed breakdown of the existing public bus services which may be used by employees will also be included within the TA. This will be compared to proposed shift patterns to determine whether there are viable bus-based travel options available. Whilst public transport will be mainly provided by bus, there is the potential for some staff members to access the site through rail connections. The TA will document existing rail service provision and examine the quality of pedestrian connectivity with the rail station.

## Site Access & Parking

Access to the site will be provided directly from the A82(T) via the A82/Lochaber Smelter roundabout.

Parking numbers and locations for the proposed development will be confirmed within the TA and will be compliant with The Highland Council's published standards.

## Baseline Traffic Conditions

Systra holds a Paramics Microsimulation model which covers the A82(T) corridor through Fort William. This Paramics model has been used previously in support of the AWP application as well as for other transport-related projects which Systra has undertaken in the Fort William area. Systra would therefore consider that the model is an appropriate tool to assess the traffic impact of the proposed development on the road network. The model extends from the A82(T) West End Roundabout to the A82(T) / A830 junction at Lochy Bridge.

Whilst the year of opening has yet to be confirmed (and is subject to ongoing studies which will inform the planning process), it is proposed to adopt National Road Traffic Forecast (NRTF) 'high' growth rate to the trunk road network and the 'central' growth rate to all other movements to achieve the design year levels for background traffic in Fort William. This is consistent with the approach adopted during the production of the TA in support of the AWP.

## Committed Development

We would ask The Highland Council and Transport Scotland to confirm whether there are any committed developments or proposed transport infrastructure schemes which will impact on the identified study network. We would seek to identify these committed developments in the area and obtain associated traffic flow information to take forward to the traffic modelling exercise for the new development.

## Development Trip Generation

The trip generation levels associated with staff and servicing is bespoke to the operation and shift patterns of the proposed development. The TA will provide details of the trip generation associated with the Aluminium Smelter, as well as details of the anticipated trips associated with the new Billet Plant. This will include additional HGV and servicing movements, as well as trips associated with new staff based around the planned shift patterns.

At present, Systra are awaiting the data required to estimate the potential trip generation associated with the proposed Billet Plant. It is noted that HGV movements associated with the Billet Plant are likely to be slightly higher than that previously estimated for the AWP but the billet plant is likely to generate a lower level of overall traffic as a result of a lower staffing requirement.

## Trip Distribution & Assignment

Staff trips associated with the new development will be distributed at the site access junction as per the split associated with the existing Aluminium Smelter. Beyond the site access, staff trips will be distributed based on existing traffic movements on the network.

HGV movements are assumed to approach the development site from the south on the A82(T), and head south when leaving the development.

## Network Analysis

The TA will present the results from the updated Paramics model when considering the addition of development vehicular trip generation. Where the additional trips result in an unacceptable impact on local junctions, mitigation measures will be proposed to address this based on a nil-detriment approach.

## Measures to Support the Development

The TA will seek to identify any gaps in provision with regard to the sustainable transport network. Where gaps in infrastructure or services are identified then supporting measures will be identified and detailed within the TA. In particular, it is recognised that improvements will be required to walking and cycling infrastructure.

## Travel Plan

A full Travel Plan was recently developed for the smelter site and the plan is that the new development will fall under the umbrella of the existing plan. Further information will be provided on the existing Travel Plan within the emerging TA.

## Construction Stage Impacts

It is noted that the traffic and transport impacts associated with the construction stage will be assessed within the EIA which is subject to a separate Scoping Exercise. For continuity, a scoping note for the EIA Traffic & Transportation chapter is presented within Appendix A of this scoping letter.

## Summary of Transport Assessment Deliverable

In summary, the following task list summarises and outlines our understanding of the activities that are required in the preparation of the forthcoming Transport Assessment for this proposed development, in accordance with local and national Transport Assessment Guidelines:

- **Baseline accessibility review** – undertake desk-top exercise into the existing accessibility of the site including a review of the available sustainable transport options as well as a review of the standard and operational characteristics of the existing road network;
- **Development Trip Generation** – Detailed calculation of trip generation potential using a combination of TRICS database data and Census data for staff. A first principles approach would be used to calculate the HGV movements for the development based on a review of the plant processes. Trip distribution and assignment patterns would also be established at this point and network diagrams produced for base, base plus committed development, and base plus development traffic flows. These will form an appendix to the TA;
- **Modelling** – Develop a Paramics Microsimulation model of the study area using the existing model as a starting point. We would modify as necessary following scoping discussions. The following time periods are envisaged: weekday 07:00-10:00 and weekday 15:00-19:00.;
- **Network Analysis** – The model would be used to understand the operation of the network under typical and peak traffic loading and to identify and operational issues that may be caused by the traffic generated by the development. Any required mitigation would be identified and tested as appropriate using the model. The results would be reported within the TA document;
- **Site Access Plans** – Preparation of preliminary design plans (2-D plans) for any off-site junction improvements;
- **Measures to Support the Development** – Consideration of any required improvements to the sustainable transport network to support the development (footway provision, cycle parking, bus stops / service enhancements etc). Car parking provision for the site would also be calculated in accordance with THC standards for inclusion in the TA report and we would provide input to the masterplan as necessary with regard to input on servicing, circulation etc.; and
- **Reporting** – Submission of comprehensive TA report to The Highland Council and Transport Scotland for agreement.

Thank you for taking the time to review our scope of works. I look forward to receiving your feedback on the above proposal, but if you have any questions in the meantime, please do not hesitate to get in touch.

Yours sincerely,


Christopher Hunt
**Engineer**

*+44 (0) 141 343 9697*


Copies:
Alan Kerr – Transport Scotland

# HUNT Christopher

| | |
|---|---|
| **From:** | Mark Clough <mark.clough@highland.gov.uk> on behalf of Transport Planning <Transport.Planning@highland.gov.uk> |
| **Sent:** | Tuesday, February 2, 2021 1:09 PM |
| **To:** | HUNT Christopher |
| **Subject:** | RE: Proposed Billet Plant, Fort William - Scoping |
| **Follow Up Flag:** | Follow up |
| **Flag Status:** | Flagged |

Good afternoon Chris.

I've now looked through the information provided and my thoughts on your proposed TA Scoping are set out below:

- We note your comments that the Applicant will not be progressing their permitted Alloy Wheel Plant proposal (Planning Ref. 17/05202/FUL). To ensure that this can be fully excluded from the committed development considerations within the TA, your Client should ensure that their submission clearly sets out that this Billet proposal is a complete replacement to the previous permission and that there will be no overlap of proposals between the existing permission and any permission secured for this billet proposal.
- With regards to sustainable access, your reference to the 2010 Highland Council Active Travel Plan for Fort William will need updating to the 2019 Fort William Active Travel Masterplan.
- Re. site access, we note that the proposed vehicular egress into the adjacent Glen Nevis Business Park is not referenced. If this is no longer being proposed, we'd be looking for the new Application to be retaining the previously proposed active travel connection through to Ben Nevis Drive. We'd also need information clarifying whether the private access road in from the roundabout on the A82(T) will be suitable for all vehicle and active travel movements expected and if not, set out what improvements would be required to make it suitable for those movements.
- With regards to parking, your submission should be clarifying any parking required for goods vehicles at the site. For completeness, it should also be justifying the adequacy of disabled car parking and cycle parking provisions within the site.
- Your approach to establishing baseline travel conditions needs to reflect and take account of the fact that the existing public roads are heavily influenced by seasonal tourist traffic variations.
- Highland Council Planning Service should be approached for information on committed developments in the local area. This should follow you undertaking a review of the information published on the planning portal within Highland Council website.
- When compiling and reporting trip generations from this development, we'll be looking for the TA to set out daily and peak period traffic numbers predicted to and from this proposed development. This should be segregated to at least large goods vehicles and other vehicles but if data on additional vehicle types will be available, this should be set out in the TA.
- If shift change times are to be used in the TA to demonstrate lower vehicle impacts during existing peak periods on the public road network in the area, it may be necessary to ensure that any permission issued includes a suitably worded Condition requiring changes in shift patterns to be agreed with the Planning Authority prior to being implemented. This would be to ensure that the traffic impacts used as the basis of any permission issued would be protected from such operational changes at the plant. To avoid this, we would expect the TA to have also tested the worst case predicted trip generations on the peak period flow networks. This whole issue would require input from Transport Scotland, as its likely to be their network that would be most impacted by any such future changes to shift change times at the plant.
- Re. the comments about Measures to Support the Development, we'd expect this to make reference to the Travel Plan and the TA should set out what measures this development will benefit from through the Travel Plan being operated at the wider plant.
- Finally, we welcome that your EIA will be considering transport impacts during the construction stage. We'd be looking for this or the TA to include a framework Construction Traffic Management Plan (CTMP) that sets out what the likely construction access needs will be (including predicted vehicle number profiles through

the works), the proposed routing of that construction traffic to and from the site, any works required to safely accommodate that construction traffic and how such construction access needs will be safely managed with the ongoing operational access needs for the wider foundry site.

I hope that this is useful.

Kindest regards
Mark Clough on behalf of the Transport Planning Team

---

**From:** HUNT Christopher <chunt@systra.com>
**Sent:** 22 January 2021 12:12
**To:** Mark Clough <mark.clough@highland.gov.uk>
**Cc:** DEVENNY Alan <adevenny@systra.com>
**Subject:** Proposed Billet Plant, Fort William - Scoping

Good afternoon Mark,

I hope you are well and coping with the latest lockdown restrictions.

I am pleased that Systra has been appointed to undertake the traffic and transportation consultancy as part of a forthcoming planning application to develop an Aluminium Billet Plant within the existing Lochaber Smelter Site in Fort William.

I attach a letter detailing our proposed scope for a Transport Assessment as well as an appended note outlining the scope of an Access, Traffic and Transport chapter of an Environmental Impact Assessment Report. It is noted that the applicant does not intend to submit a formal EIA Scoping Request in relation to the development. However, we have attached an EIA scoping note in relation to the Access, Traffic and Transport chapter.

We would invite comments at this stage on the scope of both assessments and associated methodology.

Best Regards,

**CHRIS HUNT**
Engineer

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**North America:**
Little Falls, Los Angeles, Montreal, New-York, Philadelphia, Washington

# Appendix 10.1 Consultation Log

**Consultation sent by ITPEnergised:**

**From:** Simon Waddell
**Sent:** 07 January 2021 11:26
**To:** Robin Fraser <Robin.Fraser@highland.gov.uk>
**Cc:** Ruth Fain <Ruth.Fain@itpenergised.com>; 'planning.north@Sepa.org.uk' <planning.north@Sepa.org.uk>
**Subject:** Lochaber Billet Plant - approach to baseline noise survey (SEPA ref. PCS/174125) (Highland Council Ref. 20/04655/SCRE)

Good morning Robin,

ITPE are undertaking the noise assessment of the proposed billet plant at the Lochaber Smelter and I would therefore like to agree the scope and approach to the baseline noise survey with you.

Firstly; we note that given the Covid-19 situation, current road traffic and background noise levels in the study area may well be below the 'typical' baseline. That said, we understand that the smelter is still operating as normal and the lower levels of noise from other sources may enable a more accurate characterisation of existing noise from the smelter.

The SEPA response to our Screening Request (SEPA reference PCS/174125) notes the following with regard to noise:

*"We consider that impacts on noise will also be a significant issue in this case with noise from handling of recycled metal and operation of any external plant (e.g. air handling, stacks and vehicle movements) being particularly relevant. A noise assessment will be required and we encourage the developer to provide SEPA with a method statement outlining the proposed approach prior to the works being undertaken. We would welcome a design that will not lead to any increase in rated ambient sound levels."*

I copy in SEPA to this email for further comment.

ITPE undertook the noise assessment in support of the previous application for an alloy wheel plant at the site, for which SEPA requested a similar approach. Our assessment acknowledged that it would be difficult to verify compliance with noise limits based on no increase in ambient noise at off-site locations, therefore noise control measures should be defined on such a basis that compliance can be verified. The assessment therefore also considered design specifications based on achieving intermediate noise levels at the site boundary, such that noise limits at noise sensitive receptors could be achieved. We propose to follow the same approach in the assessment of the billet plant.

Based on the above, I provide our proposed baseline survey locations in Figure 1.

*Figure 1 – Identified Noise Sensitive Receptors (NSRs) and proposed Noise Monitoring Positions (NMPs)*


We propose to undertake measurements as follows:

- **NSR1 / NMP1** – to characterise existing noise from smelter and the prevailing background noise level at residential properties on Glenmhor Terrace – subject to receiving permission we may seek to install a longer-term monitoring location in the garden of a residential property here, with unattended measurements undertaken for a period of 24 – 48 hours, with occasional visits by the surveyor to make observations on the ambient noise environment. Should this not prove feasible we will undertake attended measurements for up to 2 hours during the daytime period and up to 1 hour during the night-time.
- **NMP2** – to characterise existing noise levels from the smelter at/near the north-eastern boundary of the proposed billet plant. Measurements of approximately 1 hour during the daytime period and up to 1 hour during the night-time. We anticipate that noise from the smelter will be fairly continuous / non-varying, however, should substantial variability be observed we may extend the duration of these measurements.
- **NMP3** – to characterise existing noise levels from the smelter at/near the south-western boundary of the proposed billet plant. Measurements of approximately 1 hour during the daytime period and up to 1 hour during the night-time. We anticipate that noise from the smelter will be fairly continuous / non-varying, however, should substantial variability be observed we may extend the duration of these measurements.
- **NMP4** – to characterise existing noise from smelter and the prevailing background noise level at the Ben Nevis Hotel. We anticipate that noise from road traffic on the A82 will be dominant here, and we will undertake attended measurements for up to 1 hour during the daytime period and up to 30 minutes during the night-time.
- **NSR3 / NMP5** - to characterise the prevailing background noise level at the residential properties on Lochiel Road. We note that noise from the smelter may be audible here, and may therefore relocate the monitoring location to a suitable proxy location to undertake attended measurements for up to 1 hour during the daytime period and up to 30 minutes during the night-time.
- **NSR3 / NMP5** - to characterise the prevailing background noise level at the residential properties on Telford Road. We note that noise from the smelter may be audible here, and may therefore

relocate the monitoring location to a suitable proxy location to undertake attended measurements for up to 1 hour during the daytime period and up to 30 minutes during the night-time.

All measurements and observations will be undertaken in accordance with BS4142 and BS7445.

Should any of the proposed measurements prove inaccessible or otherwise inappropriate we may move or exclude them from the survey.

I hope that the above meets with your approval, however, should you have any questions please feel free to call me on my mobile (number below). If you are satisfied with the approach outlined above, I would be most grateful if you could confirm by response.

Many thanks in advance,

Simon

**Simon Waddell | Principal Noise Consultant |** ITPEnergised

Office: +44 (0) 131 557 8325 |Mobile: +44 (0) 7884 278145

4th Floor Centrum House, Dundas Street, Edinburgh EH3 5DQ

www.itpenergised.com

Please note our change of Edinburgh address as of 1st July 2020

**NOTE:DUE TO COVID 19 ADVICE ITPENERGISED ARE WORKING FROM HOME. PLEASE CALL MOBILE NUMBERS**

---

**ITPEnergised incorporates Energised Environments Limited & ITPE Ltd.**

ITPENERGISED

**Response from The Highland Council:**

**From:** Robin Fraser <Robin.Fraser@highland.gov.uk>
**Sent:** 14 January 2021 13:51
**To:** Simon Waddell <simon.waddell@itpenergised.com>
**Subject:** RE: Lochaber Billet Plant - approach to baseline noise survey (SEPA ref. PCS/174125) (Highland Council Ref. 20/04655/SCRE)

Hi Simon, I'm not actually involved in this. The site falls within the Pollution Prevention and Control (Scotland) Regulations 2012. SEPA are the relevant authority, including for noise and it would be them you need to speak to. I understand that they were hit by a cyber attack before Christmas so might not have access to emails. I don't really have a phone number for them other than the Dingwall Office which is 01349 862021. As far as I know they are all working from home but there may be an answering or forwarding service.

Sorry I can't be of more help to you.


Robin Fraser

Environmental Health Officer

Highland Council, Community Services, 38 Harbour Road, Inverness, IV1 1UF

Telephone: +447879661365 E-Mail: robin.fraser@highland.gov.uk

# Appendix 10.2 Baseline Survey

# Site Survey Record Sheet

Project Name: Alvance Billet Plant

Site location: Fort William

Client: Alvance

Date of survey: 19 – 20/01/21

Purpose of survey: *Baseline characterisation, smelter noise characterisation*

Surveyor: Simon Waddell

Reviewer:

| | |
|---|---|
| Sound level meter make/model | Rion NL-52 |
| Sound level meter serial no. | 00264486 |
| Sound level meter serial no. | 00821105 (24 hr measurement) |
| Calibrator make/model | Rion NC-74 |
| Calibrator serial no. | 34167510 |
| Height above ground. | 1.3m (tripod) |
| Relevant guidance: | BS4142 |

| NMP1 - DAYTIME & NIGHT-TIME – East Glen Mhor | | |
|---|---|---|
| Calibration at start of measurement: | 94.0 | |
| Time & date at start of measurement: | 19/01/21 | 09:00 |
| GPS Coordinates of NMP: | NN12439,75456 | |
| SLM file no.(s) | 0001 | |
| Weather conditions: | | |
| Wind speed (m/s): | Still – no wind | |
| Precipitation | Dry | |
| Cloud cover (%) | 1°C, overcast with high cloud | |
| Averaging period used: | 1 min | |
| Broad-band/octave band/ 1/3rd octave band: | Broad band | |
| Dominant noise source(s): | | |
| Road traffic – continuous | | |
| Continuous bird calls | | |
| Transient/lesser noise sources: | | |
| Continuous broad-band industrial fan / whirring sound audible, though substantially masked by road and bird call noise | | |
| | | |
| Time & date at end of measurement: | 20/01/21 | 09:45 |
| Calibration at end of measurement: | 94.0 | |

| NMP1 - DAYTIME & NIGHT-TIME – East Glen Mhor | |
|---|---|
| Photographs of SLM in position | |
|  | |

| NMP3 - DAYTIME - MRT station | | |
|---|---|---|
| Calibration at start of measurement: | 94.0 | |
| Time & date at start of measurement: | 19/01/21 | 09:30 |
| GPS Coordinates of NMP: | NN 12069 74632 | |
| SLM file no.(s) | 0200 | |
| Weather conditions: | | |
| Wind speed (m/s): | Still – no wind | |
| Precipitation | Dry | |
| Cloud cover (%) | 1°C, overcast with high cloud | |
| Averaging period used: | 1 min | |
| Broad-band/octave band/ 1/3rd octave band: | 1/3 Oct | |
| Dominant noise source(s): | | |
| Continuous broad-band whirring from smelter. Banging and fork lift reversing alarm at start of measurement – appears to be from smelter | | |
| 10:17 – occasional thudding/banging from smelter, engine noise, reversing alarms. | | |
| Transient/lesser noise sources: | | |
| | | |
| | | |
| Time & date at end of measurement: | 10:37 – brief/light rain shower | 19/01/21 |
| Calibration at end of measurement: | 93.8 | |
| *(no photo of SLM in position at this location)* | | |

| NMP6 - DAYTIME – Telford Place | | |
|---|---|---|
| Calibration at start of measurement: | 93.8 | |
| Time & date at start of measurement: | 19/01/21 | 10:52 |
| GPS Coordinates of NMP: | NN 11955, 74401 | |
| SLM file no.(s) | 0201, 0202 | Measurement restarted after battery change |
| Weather conditions: | | |
| Wind speed (m/s): | Still – no wind | |
| Precipitation | Dry | |
| Cloud cover (%) | 1°C, overcast with high cloud | |
| Averaging period used: | 1 min | |
| Broad-band/octave band/ 1/3rd octave band: | 1/3 Oct | |
| Dominant noise source(s): | | |
| Frequent fork lift truck movements; engine noise, banging and reversing alarm from construction works at nearby substation. | | |
| Low broad-band whirring/droning from smelter audible | | |
| Bird calls – fairly continuous | | |
| Transient/lesser noise sources: | | |
| 11:02 – helicopter audible for 1 – 2 minutes | | |
| | | |
| Time & date at end of measurement: | 19/01/21 | |
| Calibration at end of measurement: | 94.0 | |

| NMP6 - DAYTIME – Telford Place | |
|---|---|
| Photographs of SLM in position | |
|  |  |

| NMP4 - DAYTIME – Ben Nevis Hotel | | |
|---|---|---|
| Calibration at start of measurement: | 94.0 | |
| Time & date at start of measurement: | 12:28 | 19/01/21 |
| GPS Coordinates of NMP: | NN 11774,74826 | |
| SLM file no.(s) | 0300 | |
| Weather conditions: | | |
| Wind speed (m/s): | Still – no wind | |
| Precipitation | Dry | |
| Cloud cover (%) | 1°C, overcast with high cloud | |
| Averaging period used: | 1 min | |
| Broad-band/octave band/ 1/3rd octave band: | 1/3 Oct | |
| Dominant noise source(s): | | |
| Continuous noise from road traffic, HGVs are major component. | | |
| | | |
| Transient/lesser noise sources: | | |
| | | |
| | | |
| Time & date at end of measurement: | 13:28 | 19/01/21 |
| Calibration at end of measurement: | 94.0 | |

**NMP4 - DAYTIME – Ben Nevis Hotel**

Photographs of SLM in position

| NMP2 - DAYTIME – Smelter car park | | |
|---|---|---|
| Calibration at start of measurement: | 94.0 | |
| Time & date at start of measurement: | 14:55 | 19/01/21 |
| GPS Coordinates of NMP: | NN12371,75009 | |
| SLM file no.(s) | 0400 | |
| Weather conditions: | | |
| Wind speed (m/s): | Still – no wind | |
| Precipitation | Dry | |
| Cloud cover (%) | 1°C, overcast with high cloud | |
| Averaging period used: | 1 min | |
| Broad-band/octave band/ 1/3rd octave band: | 1/3 Oct | |
| Dominant noise source(s): | | |
| Continuous noise from smelter – constant broad-band whirr/hum from fans of extraction system. Occasional/infrequent banging noise from smelter shed (bashing anodes). | | |
| | | |
| Transient/lesser noise sources: | | |
| Occasional HGV movements, car movements in car park. | | |
| | | |
| Time & date at end of measurement: | 15:55 | 19/01/21 |
| Calibration at end of measurement: | 94.0 | |

**NMP2 - DAYTIME – Smelter car park**

Photographs of SLM in position & identified noise sources

| NMP5 - DAY-TIME – Inverlochy | | |
|---|---|---|
| Calibration at start of measurement: | 94.0 | |
| Time & date at start of measurement: | 16:06 | 19/01/21 |
| GPS Coordinates of NMP: | NN11236,74848 | |
| SLM file no.(s) | 0500 | |
| Weather conditions: | | |
| Wind speed (m/s): | Still – no wind | |
| Precipitation | Dry | |
| Cloud cover (%) | 1°C, overcast with high cloud | |
| Averaging period used: | 1 min | |
| Broad-band/octave band/ 1/3rd octave band: | 1/3 Oct | |
| Dominant noise source(s): | | |
| Distant traffic, bird calls. | | |
| | | |
| Transient/lesser noise sources: | | |
| Intermittent/occasional vehicle movements. | | |
| | | |
| Time & date at end of measurement: | 17:06 | 19/01/21 |
| Calibration at end of measurement: | 93.9 | |

## NMP5 - DAY-TIME – Inverlochy

Photographs of SLM in position

| NMP1 - NIGHT-TIME – Glen Mhor | | |
|---|---|---|
| Calibration at start of measurement: | - | |
| Time & date at start of measurement: | Observations at 23:30 | 19/01/21 |
| GPS Coordinates of NMP: | - | |
| SLM file no.(s) | | |
| Weather conditions: | | |
| Wind speed (m/s): | Still – no wind | |
| Precipitation | Dry | |
| Cloud cover (%) | -1°C, fog | |
| Averaging period used: | 1 min | |
| Broad-band/octave band/ 1/3rd octave band: | Broad band | |
| Dominant noise source(s): | | |
| Very quiet, continuous low-level fan noise from smelter is only audible sound. | | |
| | | |
| Transient/lesser noise sources: | | |
| Traffic flow very light at 23:30, no vehicles passed during 5 mins observation. | | |
| | | |
| Time & date at end of measurement: | | |
| Calibration at end of measurement: | | |

| NMP2 - NIGHT-TIME – Smelter car park | | |
|---|---|---|
| Calibration at start of measurement: | 94.0 | |
| Time & date at start of measurement: | 23:39 | 19/01/21 |
| GPS Coordinates of NMP: | As per daytime | |
| SLM file no.(s) | 0600 | |
| Weather conditions: | | |
| Wind speed (m/s): | Still – no wind | |
| Precipitation | Dry | |
| Cloud cover (%) | -1°C, fog | |
| Averaging period used: | 1 min | |
| Broad-band/octave band/ 1/3rd octave band: | 1/3 Oct | |
| Dominant noise source(s): | | |
| Continuous fan noise from smelter. | | |
| 23:50 – car started up in car park – 23:54 – measurement cancelled due to continuous engine noise from car warming up. Noise from smelter very constant & adequately characterised. | | |
| Transient/lesser noise sources: | | |
| Continuous ticking/banging noise from possibly off-site source in direction of railway. | | |
| | | |
| Time & date at end of measurement: | 23:54 | 19/01/21 |
| Calibration at end of measurement: | 93.8 | |

| NMP4 - NIGHT-TIME – Ben Nevis Hotel | | |
|---|---|---|
| Calibration at start of measurement: | 94.0 | |
| Time & date at start of measurement: | 00:00 | 20/01/21 |
| GPS Coordinates of NMP: | As per daytime | |
| SLM file no.(s) | 0601 | |
| Weather conditions: | | |
| Wind speed (m/s): | Still – no wind | |
| Precipitation | Dry | |
| Cloud cover (%) | 1°C, overcast with high cloud | |
| Averaging period used: | 1 min | |
| Broad-band/octave band/ 1/3rd octave band: | 1/3 Oct | |
| Dominant noise source(s): | | |
| Low level fan noise from smelter.. | | |
| | | |
| Transient/lesser noise sources: | | |
| Van manoeuvring at start of measurement. Infrequent vehicles passing on main road, infrequent & distant road traffic. | | |
| | | |
| Time & date at end of measurement: | 00:27 | 20/01/21 |
| Calibration at end of measurement: | 93.7 | |

| NMP3 - NIGHT-TIME – MRT | | |
|---|---|---|
| Calibration at start of measurement: | 94.0 | |
| Time & date at start of measurement: | 00:31 | 20/01/21 |
| GPS Coordinates of NMP: | As per daytime | |
| SLM file no.(s) | 0602 | |
| Weather conditions: | | |
| Wind speed (m/s): | Still – no wind | |
| Precipitation | Dry | |
| Cloud cover (%) | -1°C, fog | |
| Averaging period used: | 1 min | |
| Broad-band/octave band/ 1/3rd octave band: | 1/3 Oct | |
| Dominant noise source(s): | | |
| Smelter fans. | | |
| | | |
| Transient/lesser noise sources: | | |
| Occasional distant/muffled bangs from smelter | | |
| | | |
| Time & date at end of measurement: | 00:56 | |
| Calibration at end of measurement: | 93.8 | |

| NMP6 - NIGHT-TIME – Telford Place | | |
|---|---|---|
| Calibration at start of measurement: | 93.9 | |
| Time & date at start of measurement: | 01:08 | 20/01/21 |
| GPS Coordinates of NMP: | As per daytime | |
| SLM file no.(s) | 0603 | |
| Weather conditions: | | |
| Wind speed (m/s): | Still – no wind | |
| Precipitation | Dry | |
| Cloud cover (%) | -1°C, fog | |
| Averaging period used: | 1 min | |
| Broad-band/octave band/ 1/3rd octave band: | 1/3 Oct | |
| Dominant noise source(s): | | |
| Running water in River Nevis. Continuous low-level hum from direction of substation. Barely audible broad-band drone from smelter fans | | |
| | | |
| Transient/lesser noise sources: | | |
| | | |
| | | |
| Time & date at end of measurement: | 01:38 | 20/01/21 |
| Calibration at end of measurement: | 93.8 | |

| NMP5 - NIGHT-TIME – Inverlochy | | |
|---|---|---|
| Calibration at start of measurement: | 93.9 | |
| Time & date at start of measurement: | 01:45 | 20/01/21 |
| GPS Coordinates of NMP: | As per daytime | |
| SLM file no.(s) | 0604 | |
| Weather conditions: | | |
| Wind speed (m/s): | Still – no wind | |
| Precipitation | Dry | |
| Cloud cover (%) | -1°C, fog | |
| Averaging period used: | 1 min | |
| Broad-band/octave band/ 1/3$^{rd}$ octave band: | 1/3 Oct | |
| Dominant noise source(s): | | |
| Barely audible broad-band drone from smelter fans | | |
| Low-level drone from boiler flue of nearby houses | | |
| Transient/lesser noise sources: | | |
| Very infrequent bird calls. | | |
| | | |
| Time & date at end of measurement: | 02:14 | 20/01/21 |
| Calibration at end of measurement: | 93.9 | |

# Calibration certificates

## Calibrator

ANV MEASUREMENT SYSTEMS

# CERTIFICATE OF CALIBRATION

ilac-MRA

UKAS CALIBRATION 0653

**Date of Issue: 25 February 2020**

**Certificate Number: UCRT20/1234**

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

| Page 1 of 2 Pages |
|---|
| Approved Signatory<br>K. Mistry |

| | |
|---|---|
| Customer | ITP Energised (Energised Environments Limited)<br>7 Dundas Street<br>Edinburgh<br>EH3 6QG |
| Order No. | EE131547 |
| Test Procedure | Procedure TP 1 Calibration of Sound Calibrators |
| Description | Acoustic Calibrator |

| Identification | *Manufacturer* | *Instrument* | *Model* | *Serial No.* |
|---|---|---|---|---|
| | Rion | Calibrator | NC-74 | 34167510 |

The calibrator has been tested as specified in Annex B of IEC 60942:2003. As public evidence was available from a testing organisation (PTB) responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.

| | | |
|---|---|---|
| ANV Job No. | UKAS20/02141 | |
| Date Received | 25 February 2020 | |
| Date Calibrated | 25 February 2020 | |
| Previous Certificate | *Dated* | 27 February 2019 |
| | *Certificate No.* | UCRT19/1248 |
| | *Laboratory* | 0653 |

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

# CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number
UCRT20/1234

Page 2 of 2 Pages

Measurements

The sound pressure level generated by the calibrator in its WS2 configuration was measured five times by the Insert Voltage Method using a microphone as detailed below. The mean of the results obtained is shown below. It is corrected to the standard atmospheric pressure of 101.3 kPa (1013 mBar) using original manufacturers information.

| | *Manufacturer* | *Type* |
|---|---|---|
| Test Microphone | Brüel & Kjær | 4134 |

Results

The level of the calibrator output under the conditions outlined above was

93.98 ± 0.10 dB rel 20 µPa

Functional Tests and Observations

| | | | |
|---|---|---|---|
| The frequency of the sound produced was | 1002.11 Hz | ± | 0.13 Hz |
| The total distortion was | 1.30 % | ± | 6.7 % of Reading |

During the measurements environmental conditions were

| | | | | |
|---|---|---|---|---|
| Temperature | 23 | to | 24 | °C |
| Relative Humidity | 31 | to | 39 | % |
| Barometric Pressure | 98.6 | to | 98.7 | kPa |

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

The uncertainties refer to the measured values only with no account being taken of the ability of the instrument to maintain its calibration.

A small correction factor may need to be applied to the sound pressure level quoted above if the device is used to calibrate a sound level meter which is fitted with a free-field response microphone. See manufacturers handbook for details.

........................................................ END ........................................................

**Note:**

| | | |
|---|---|---|
| Calibrator adjusted prior to calibration? | NO | |
| Initial Level | N/A | dB |
| Initial Frequency | N/A | Hz |

Additional Comments — The results on this certificate only relate to the items calibrated as identified above.

None

Calibrated by: B. Bogdan

R 2

ALVANCE

## Sound Level Meter

MEASUREMENT SYSTEMS

# CERTIFICATE OF CALIBRATION

ilac-MRA

UKAS CALIBRATION
0653

**Date of Issue: 26 February 2020**

**Certificate Number: UCRT20/1246**

Issued by:

ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Page 1 of 2 Pages

Approved Signatory

K. Mistry

| | | | | |
|---|---|---|---|---|
| Customer | ITP Energised (Energised Environments Limited)<br>7 Dundas Street<br>Edinburgh<br>EH3 6QG | | | |
| Order No. | EE131547 | | | |
| Description | Sound Level Meter / Pre-amp / Microphone / Associated Calibrator | | | |
| Identification | *Manufacturer* | *Instrument* | *Type* | *Serial No. / Version* |
| | Rion | Sound Level Meter | NL-52 | 00264486 |
| | Rion | Firmware | | 2.0 |
| | Rion | Pre Amplifier | NH-25 | 54611 |
| | Rion | Microphone | UC-59 | 16776 |
| | Rion | Calibrator | NC-74 | 34167510 |
| | | Calibrator adaptor type if applicable | | NC-74-002 |
| Performance Class | 1 | | | |
| Test Procedure | TP 2.SLM 61672-3 TPS-49 | | | |

*Procedures from IEC 61672-3:2006 were used to perform the periodic tests.*

Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02

*If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003*

| | | | |
|---|---|---|---|
| Date Received | 25 February 2020 | ANV Job No. | UKAS20/02141 |
| Date Calibrated | 26 February 2020 | | |

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

| | *Dated* | *Certificate No.* | *Laboratory* |
|---|---|---|---|
| Previous Certificate | 13 March 2018 | UCRT18/1290 | 0653 |

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

| CERTIFICATE OF CALIBRATION | Certificate Number UCRT20/1246 |
|---|---|
| UKAS Accredited Calibration Laboratory No. 0653 | Page 2 of 2 Pages |

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

| | | | |
|---|---|---|---|
| SLM instruction manual title | Sound Level Meter NL-42 / NL-52 | | |
| SLM instruction manual ref / issue | 11-03 | | |
| SLM instruction manual source | Manufacturer | | |
| Internet download date if applicable | N/A | | |
| Case corrections available | Yes | | |
| Uncertainties of case corrections | Yes | | |
| Source of case data | Manufacturer | | |
| Wind screen corrections available | Yes | | |
| Uncertainties of wind screen corrections | Yes | | |
| Source of wind screen data | Manufacturer | | |
| Mic pressure to free field corrections | Yes | | |
| Uncertainties of Mic to F.F. corrections | Yes | | |
| Source of Mic to F.F. corrections | Manufacturer | | |
| Total expanded uncertainties within the requirements of IEC 61672-1:2002 | Yes | | |
| Specified or equivalent Calibrator | Specified | | |
| Customer or Lab Calibrator | Customers Calibrator | | |
| Calibrator adaptor type if applicable | NC-74-002 | | |
| Calibrator cal. date | 25 February 2020 | | |
| Calibrator cert. number | UCRT20/1234 | | |
| Calibrator cal cert issued by | 0653 | | |
| Calibrator SPL @ STP | 93.98 | dB | Calibration reference sound pressure level |
| Calibrator frequency | 1002.11 | Hz | Calibration check frequency |
| Reference level range | 25 - 130 | dB | |

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

| Environmental conditions during tests | Start | End | | | |
|---|---|---|---|---|---|
| Temperature | 23.53 | 23.22 | ± | 0.30 | °C |
| Humidity | 34.0 | 32.9 | ± | 3.00 | %RH |
| Ambient Pressure | 99.50 | 99.52 | ± | 0.03 | kPa |

Response to associated Calibrator at the environmental conditions above.

| Initial indicated level | 94.0 | dB | Adjusted indicated level | 94.0 | dB |
|---|---|---|---|---|---|
| The uncertainty of the associated calibrator supplied with the sound level meter ± | | | | 0.10 | dB |

| | | | |
|---|---|---|---|
| Self Generated Noise | This test is currently not performed by this Lab. | | |
| Microphone installed (if requested by customer) = Less Than | N/A | dB | A Weighting |
| Uncertainty of the microphone installed self generated noise ± | N/A | dB | |

Microphone replaced with electrical input device - UR = Under Range indicated

| Weighting | A | | | C | | | Z | | |
|---|---|---|---|---|---|---|---|---|---|
| | 11.8 | dB | UR | 15.3 | dB | UR | 21.5 | dB | UR |
| Uncertainty of the electrical self generated noise ± | | | | | | | 0.12 | dB | |

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k$ =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: B. Giles R 1

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
Prior to calibration the instrument's microphone was replaced and the meter was re-aligned.

**Sound Level Meter**

# CERTIFICATE OF CALIBRATION

0653

**Date of Issue: 26 February 2020**

**Certificate Number: UCRT20/1248**

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

| Page 1 of 7 Pages |
|---|
| Approved Signatory<br>K. Mistry |

CUSTOMER: ITP Energised (Energised Environments Limited)
7 Dundas Street
Edinburgh
EH3 6QG

ORDER No: EE131547 Job No: UKAS20/02141

DATE OF RECEIPT: 25 February 2020

PROCEDURE: Procedure TP 9 - Calibration of Filters

IDENTIFICATION:

| | *Manufacturer* | *Model* | *Serial No* |
|---|---|---|---|
| Filters in sound level meter | Rion | NL-52 | 00264486 |

CALIBRATED ON: 26 February 2020

PREVIOUS CALIBRATION: Calibrated on 13 March 2018 Certificate No. UCRT18/1291 issued by this laboratory.

| CERTIFICATE OF CALIBRATION | Certificate Nº UCRT20/1248 |
|---|---|
| UKAS ACCREDITED CALIBRATION LABORATORY No 0653 | Page 2 of 7 Pages |

The sound level meter was calibrated in accordance with the manufacturer's instructions, using an appropriate sound level calibrator, prior to measurements being carried out on the filters. The sound level meter has also undergone a full verification procedure, see certificate UCRT20/1246 issued by this laboratory. The manufacturer claims that the filters were designed in accordance with the Class 1 octave and Class 1 third octave requirements of IEC 61260:1995, and these tolerances are given with the results in this certificate. Base 10 test frequencies have been used throughout the filter calibration, in accordance with manufacturers' information.

**Inter-band level accuracy test**

The meter was set to the single measurement range and the 1 kHz octave filter was selected. A 1 kHz sinusoidal signal was then injected and adjusted to give a reading of 94.0 dB. Following this each filter band was selected in turn, the signal frequency was adjusted to the centre-frequency of the filter, and the sound level meter reading relative to that for the 1 kHz band was noted. A similar test was carried out for the Z setting using a 1 kHz signal.

These tests were then repeated for third octave filters, readjusting the signal level for the 1 kHz filter where necessary.

As the tolerance at the centre frequency in each band is ± 0.3 dB , it is expected (but not explicitly required in IEC 61260:1995), that the relative levels at each centre frequency shall lie within this spread. All bands tested met this expectation.

**Filter shape test**

Using the same measurement range as above, the 1 kHz octave filter was again selected. A sinusoidal signal at the centre frequency of 1 kHz was injected, and its level adjusted to give a reading of 135.0 dB. The frequency of the input signal was then changed to each of the values shown in the table of results in turn, and the new meter reading was noted. Two further octave bands (as shown) were then selected and tested in the same manner, with the signal level being set at the new centre frequency in each case.

The above tests were repeated for the 1 kHz and two other third octave bands (as shown).

All bands tested met the requirements of the standard, which are shown with the results.

| CERTIFICATE OF CALIBRATION | Certificate Nº UCRT20/1248 |
|---|---|
| UKAS ACCREDITED CALIBRATION LABORATORY No 0653 | Page 3 of 7 Pages |

**Uncertainties**

The laboratories expanded measurement uncertainties are estimated as ± 0.16 dB at the centre frequency & at other frequencies within the pass-band of the filter, and ± 0.20 dB for frequencies outside the pass-band. **The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.**

NOTES

1 The attenuation figures given in the table(s) of filter shapes refer to the meter reading at the given frequency relative to that at the centre frequency in question. The required value is denoted as Δ in the column showing attenuation limits.

2 Since the tests carried out cover only a limited subset of the content of IEC 61260:1995, the results obtained do not confer compliance with the full requirements of that standard, and are applicable only to those filter bands tested.

3 Any linearity errors which the sound level meter may exhibit are included in the filter errors shown in this certificate. Since the meter errors may vary with frequency, it cannot be assumed that they are the same as those given in certificate number UCRT20/1246

4 The following firmware was in use at the time of the testing:

| Identification | Version |
|---|---|
| NX-42RT | 1.9 |

# CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0653

Certificate N° UCRT20/1248



## 1/1 octave filters: Inter-band accuracy

| Band (Hz) | Error, dB |
|---|---|
| 4 | N/A |
| 8 | N/A |
| 16 | 0.1 |
| 31.5 | 0.1 |
| 63 | 0.0 |
| 125 | 0.0 |
| 250 | -0.1 |
| 500 | 0.0 |
| 1000 | Ref |
| 2000 | -0.1 |
| 4000 | -0.1 |
| 8000 | 0.0 |
| 16000 | 0.0 |
| 31500 | N/A |
| Z @ 1 kHz | 0.0 |

## 1/1 octave filters: Filter shape

| 1000 Hz band | | 250 Hz band | | 4000 Hz band | | Attenuation |
|---|---|---|---|---|---|---|
| Freq, Hz | Atten, dB | Freq, Hz | Atten, dB | Freq, Hz | Atten, dB | limits, dB |
| 63.096 | 105.3 | 15.849 | 92.5 | 251.190 | 105.9 | $70.0 \leq \Delta \leq \infty$ |
| 125.893 | 101.4 | 31.623 | 94.1 | 501.191 | 101.9 | $61.0 \leq \Delta \leq \infty$ |
| 251.189 | 81.7 | 63.096 | 79.2 | 1000.01 | 63.3 | $42.0 \leq \Delta \leq \infty$ |
| 501.187 | 39.8 | 125.893 | 39.8 | 1995.28 | 39.8 | $17.5 \leq \Delta \leq \infty$ |
| 707.946 | 3.3 | 177.829 | 3.2 | 2818.40 | 3.3 | $-0.3 \leq \Delta \leq 5.0$ |
| 771.792 | 0.2 | 193.866 | 0.1 | 3072.58 | 0.1 | $-0.3 \leq \Delta \leq 1.3$ |
| 841.395 | 0.0 | 211.350 | 0.0 | 3349.68 | 0.0 | $-0.3 \leq \Delta \leq 0.6$ |
| 917.276 | 0.0 | 230.411 | 0.0 | 3651.77 | 0.0 | $-0.3 \leq \Delta \leq 0.4$ |
| 1000.00 | Ref | 251.190 | Ref | 3981.10 | Ref | $-0.3 \leq \Delta \leq 0.3$ |
| 1090.18 | 0.1 | 273.843 | 0.0 | 4340.13 | 0.0 | $-0.3 \leq \Delta \leq 0.4$ |
| 1188.50 | 0.0 | 298.540 | 0.0 | 4731.55 | 0.0 | $-0.3 \leq \Delta \leq 0.6$ |
| 1295.69 | 0.2 | 325.464 | 0.1 | 5158.26 | 0.1 | $-0.3 \leq \Delta \leq 1.3$ |
| 1412.54 | 3.3 | 354.815 | 3.2 | 5623.45 | 3.2 | $-0.3 \leq \Delta \leq 5.0$ |
| 1995.26 | 40.7 | 501.190 | 40.7 | 7943.34 | 40.6 | $17.5 \leq \Delta \leq \infty$ |
| 3981.07 | >110.0 | 1000.01 | >110.0 | 15849.0 | 65.9 | $42.0 \leq \Delta \leq \infty$ |
| 7943.28 | >110.0 | 1995.27 | >110.0 | 31623.0 | 104.6 | $61.0 \leq \Delta \leq \infty$ |
| 15848.9 | >110.0 | 3981.09 | >110.0 | 63096.2 | 103.1 | $70.0 \leq \Delta \leq \infty$ |

| CERTIFICATE OF CALIBRATION | Certificate N° UCRT20/1248 |
|---|---|
| UKAS ACCREDITED CALIBRATION LABORATORY No 0653 | Page 5 of 7 Pages |

1/3 octave filters: Inter-band accuracy

| Band (Hz) | Error, dB | Band (Hz) | Error, dB | Band (Hz) | Error, dB |
|---|---|---|---|---|---|
| 4 | N/A | 5 | N/A | 6.3 | N/A |
| 8 | N/A | 10 | N/A | 12.5 | -0.1 |
| 16 | 0.0 | 20 | 0.0 | 25 | 0.0 |
| 31.5 | 0.0 | 40 | -0.1 | 50 | 0.0 |
| 63 | 0.0 | 80 | 0.0 | 100 | 0.0 |
| 125 | 0.0 | 160 | 0.0 | 200 | -0.1 |
| 250 | -0.1 | 315 | 0.0 | 400 | 0.0 |
| 500 | 0.0 | 630 | 0.0 | 800 | 0.0 |
| 1000 | Ref | 1250 | -0.1 | 1600 | 0.0 |
| 2000 | -0.1 | 2500 | -0.1 | 3150 | 0.0 |
| 4000 | -0.1 | 5000 | 0.0 | 6300 | 0.0 |
| 8000 | 0.0 | 10000 | 0.0 | 12500 | 0.0 |
| 16000 | 0.0 | 20000 | 0.0 | 25000 | N/A |
| 31500 | N/A | | | | |
| Z @ 1 kHz | 0.0 | | | | |

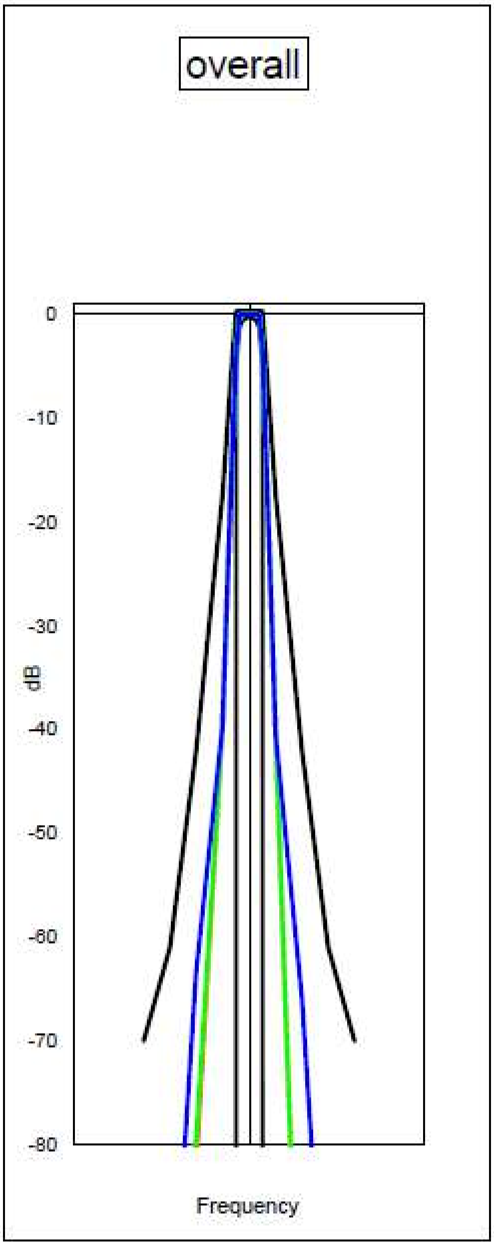
1/3 octave filters: Filter shape

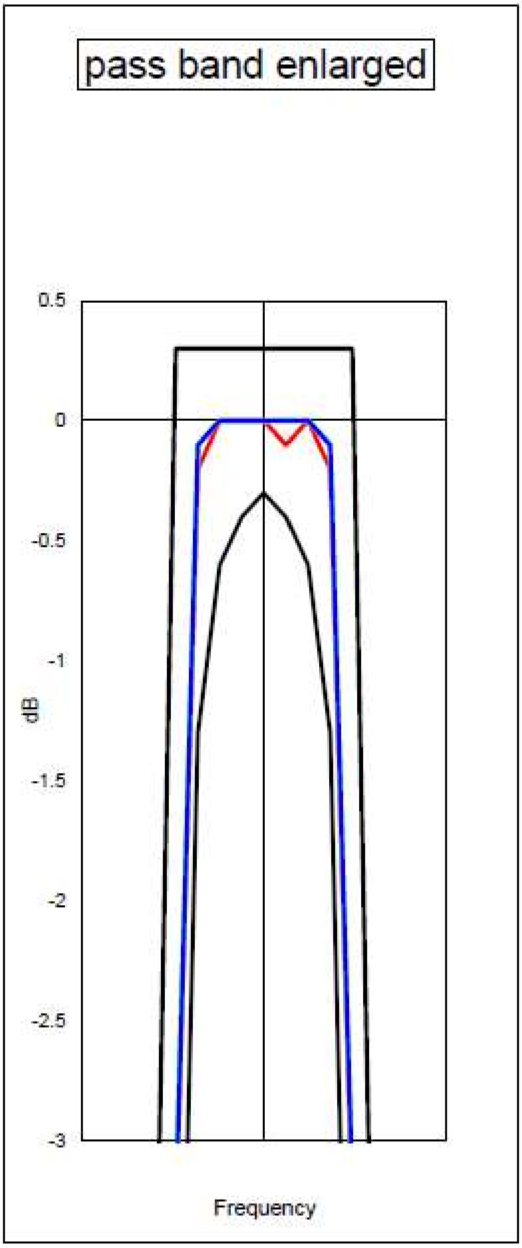
| 1000 Hz band | | 160 Hz band | | 3150 Hz band | | Attenuation |
|---|---|---|---|---|---|---|
| Freq, Hz | Atten, dB | Freq, Hz | Atten, dB | Freq, Hz | Atten, dB | limits, dB |
| 185.460 | 82.3 | 29.394 | 82.0 | 586.480 | 82.4 | $70.0 \leq \Delta \leq \infty$ |
| 327.480 | 65.5 | 51.902 | 65.4 | 1035.59 | 65.5 | $61.0 \leq \Delta \leq \infty$ |
| 531.430 | 47.2 | 84.226 | 47.3 | 1680.54 | 47.2 | $42.0 \leq \Delta \leq \infty$ |
| 772.570 | 22.4 | 122.445 | 22.4 | 2443.10 | 22.4 | $17.5 \leq \Delta \leq \infty$ |
| 891.260 | 3.6 | 141.256 | 3.7 | 2818.43 | 3.7 | $-0.3 \leq \Delta \leq 5.0$ |
| 919.580 | 0.7 | 145.744 | 0.8 | 2907.99 | 0.8 | $-0.3 \leq \Delta \leq 1.3$ |
| 947.190 | 0.0 | 150.120 | 0.1 | 2995.30 | 0.1 | $-0.3 \leq \Delta \leq 0.6$ |
| 974.020 | 0.0 | 154.372 | 0.0 | 3080.14 | 0.1 | $-0.3 \leq \Delta \leq 0.4$ |
| 1000.00 | Ref | 158.490 | Ref | 3162.30 | Ref | $-0.3 \leq \Delta \leq 0.3$ |
| 1026.67 | 0.0 | 162.717 | 0.0 | 3246.64 | 0.1 | $-0.3 \leq \Delta \leq 0.4$ |
| 1055.75 | 0.1 | 167.326 | 0.1 | 3338.60 | 0.1 | $-0.3 \leq \Delta \leq 0.6$ |
| 1087.46 | 0.9 | 172.352 | 0.9 | 3438.87 | 0.9 | $-0.3 \leq \Delta \leq 1.3$ |
| 1122.01 | 3.8 | 177.827 | 3.9 | 3548.13 | 4.0 | $-0.3 \leq \Delta \leq 5.0$ |
| 1294.37 | 22.6 | 205.145 | 22.6 | 4093.19 | 22.7 | $17.5 \leq \Delta \leq \infty$ |
| 1881.73 | 47.6 | 298.235 | 48.7 | 5950.59 | 47.4 | $42.0 \leq \Delta \leq \infty$ |
| 3053.65 | >110.0 | 483.973 | >110.0 | 9656.56 | 68.0 | $61.0 \leq \Delta \leq \infty$ |
| 5391.95 | >110.0 | 854.570 | >110.0 | 17051.0 | >110.0 | $70.0 \leq \Delta \leq \infty$ |

| CERTIFICATE OF CALIBRATION | Certificate N° UCRT20/1248 |
|---|---|
| UKAS ACCREDITED CALIBRATION LABORATORY No 0653 | Page 6 of 7 Pages |

## OCTAVE FILTERS

black IEC 61260 limits
red 1000 Hz band
green 250 Hz band
blue 4000 Hz band

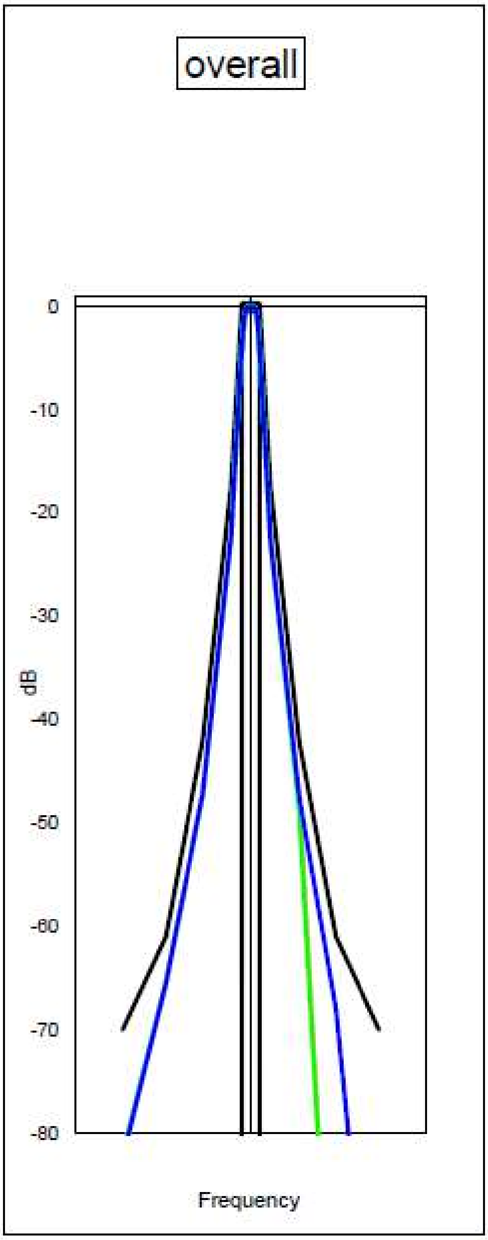


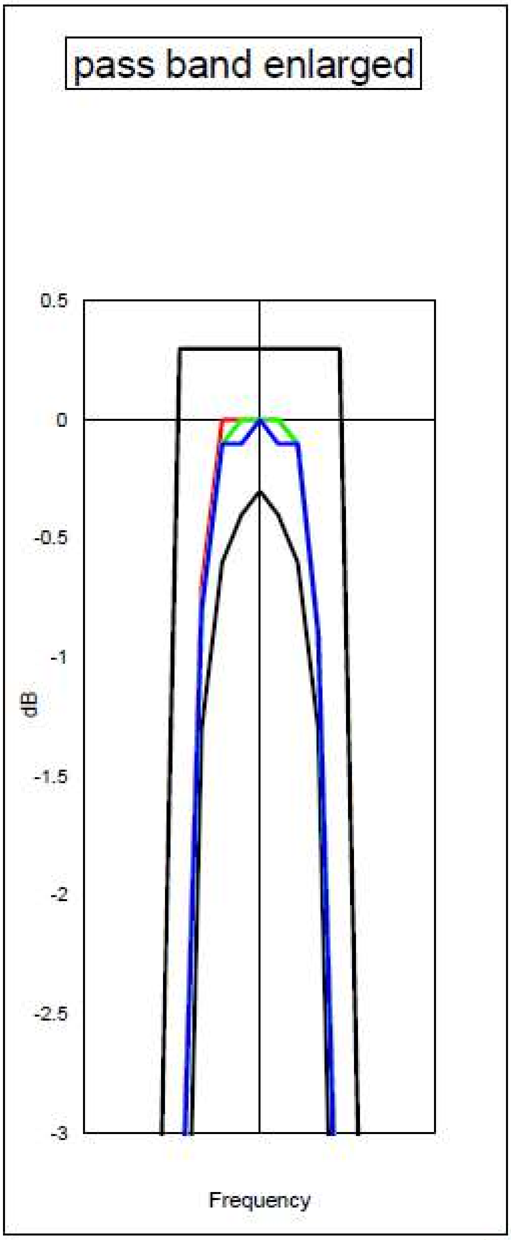



| CERTIFICATE OF CALIBRATION | Certificate N° UCRT20/1248 |
|---|---|
| UKAS ACCREDITED CALIBRATION LABORATORY No 0653 | Page 7 of 7 Pages |

THIRD OCTAVE FILTERS

| | | | |
|---|---|---|---|
| black | IEC 61260 limits | green | 160 Hz band |
| red | 1000 Hz band | blue | 3150 Hz band |




END

R 1

# CERTIFICATE OF CALIBRATION

MEASUREMENT SYSTEMS

0653

**Date of Issue: 11 January 2021**

**Certificate Number: UCRT21/1058**

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

| Page 1 of 2 Pages |
|---|
| Approved Signatory<br>K. Mistry |

| | |
|---|---|
| Customer | ANV Measurement Systems<br>Beaufort Court<br>17 Roebuck Way<br>Milton Keynes<br>MK5 8HL |
| Order No. | ANV MS HIRE |
| Description | Sound Level Meter / Pre-amp / Microphone / Associated Calibrator |

Identification

| *Manufacturer* | *Instrument* | *Type* | *Serial No. / Version* |
|---|---|---|---|
| Rion | Sound Level Meter | NL-52 | 00821105 |
| Rion | Firmware | | 2.0 |
| Rion | Pre Amplifier | NH-25 | 21146 |
| Rion | Microphone | UC-59 | 04086 |
| Rion | Calibrator | NC-74 | 34536109 |
| | Calibrator adaptor type if applicable | | NC-74-002 |

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

*Procedures from IEC 61672-3:2006 were used to perform the periodic tests.*

Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02

*If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003*

Date Received 06 January 2021 ANV Job No. UKAS21/01011

Date Calibrated 11 January 2021

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

| Previous Certificate | *Dated* | *Certificate No.* | *Laboratory* |
|---|---|---|---|
| | 18 February 2020 | UCRT20/1203 | 0653 |

# CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number UCRT21/1058



Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

| | | | |
|---|---|---|---|
| SLM instruction manual title | Sound Level Meter | NL-42 / NL-52 | |
| SLM instruction manual ref / issue | | 11-03 | |
| SLM instruction manual source | | Manufacturer | |
| Internet download date if applicable | | N/A | |
| Case corrections available | | Yes | |
| Uncertainties of case corrections | | Yes | |
| Source of case data | | Manufacturer | |
| Wind screen corrections available | | Yes | |
| Uncertainties of wind screen corrections | | Yes | |
| Source of wind screen data | | Manufacturer | |
| Mic pressure to free field corrections | | Yes | |
| Uncertainties of Mic to F.F. corrections | | Yes | |
| Source of Mic to F.F. corrections | | Manufacturer | |
| Total expanded uncertainties within the requirements of IEC 61672-1:2002 | | Yes | |
| Specified or equivalent Calibrator | | Specified | |
| Customer or Lab Calibrator | | Lab Calibrator | |
| Calibrator adaptor type if applicable | | NC-74-002 | |
| Calibrator cal. date | | 07 January 2021 | |
| Calibrator cert. number | | UCRT21/1028 | |
| Calibrator cal cert issued by | | 0653 | |
| Calibrator SPL @ STP | | 94.00 dB | Calibration reference sound pressure level |
| Calibrator frequency | | 1002.02 Hz | Calibration check frequency |
| Reference level range | | 25 - 130 dB | |

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

| Environmental conditions during tests | Start | End | ± | |
|---|---|---|---|---|
| Temperature | 23.93 | 24.16 | ± 0.30 | °C |
| Humidity | 33.1 | 36.3 | ± 3.00 | %RH |
| Ambient Pressure | 100.48 | 100.40 | ± 0.03 | kPa |

Response to associated Calibrator at the environmental conditions above.

| | | | | | |
|---|---|---|---|---|---|
| Initial indicated level | 94.1 | dB | Adjusted indicated level | 94.0 | dB |
| The uncertainty of the associated calibrator supplied with the sound level meter ± | | | | 0.10 | dB |

| | | | |
|---|---|---|---|
| Self Generated Noise | This test is currently not performed by this Lab. | | |
| Microphone installed (if requested by customer) = Less Than | N/A | dB | A Weighting |
| Uncertainty of the microphone installed self generated noise ± | N/A | dB | |

Microphone replaced with electrical input device - UR = Under Range indicated

| Weighting | A | | | C | | | Z | | |
|---|---|---|---|---|---|---|---|---|---|
| | 12.1 | dB | UR | 17.0 | dB | UR | 22.9 | dB | UR |
| Uncertainty of the electrical self generated noise ± | | | | | | | 0.12 | dB | |

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: B. Giles R 1

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

# Appendix 10.3 Sound Power Data of Construction Plant

**Groundworks**

| Name | Sound power level (dBA) | BS5228 reference | Operating Time Correction (min) | Effective Height of noise source (m) |
|---|---|---|---|---|
| Excavator1 - 40T | 114.4 | BS_5228_2009_C1_13 | 0 | 3 |
| Excavator2 - 40T | 114.4 | BS_5228_2009_C1_13 | 0 | 3 |
| Dump truck 9T | 103.5 | BS_5228_2009_C4_4 | 0 | 2 |
| Dump truck 9T | 103.5 | BS_5228_2009_C4_4 | 0 | 2 |
| Dump truck 9T | 103.5 | BS_5228_2009_C4_4 | 0 | 2 |
| Dump truck 9T | 103.5 | BS_5228_2009_C4_4 | 0 | 2 |
| Dump truck 9T | 103.5 | BS_5228_2009_C4_4 | 0 | 2 |
| Dump truck 9T | 103.5 | BS_5228_2009_C4_4 | 0 | 2 |
| Grader 25T | 114.5 | BS_5228_2009_C6_31 | 0 | 2 |

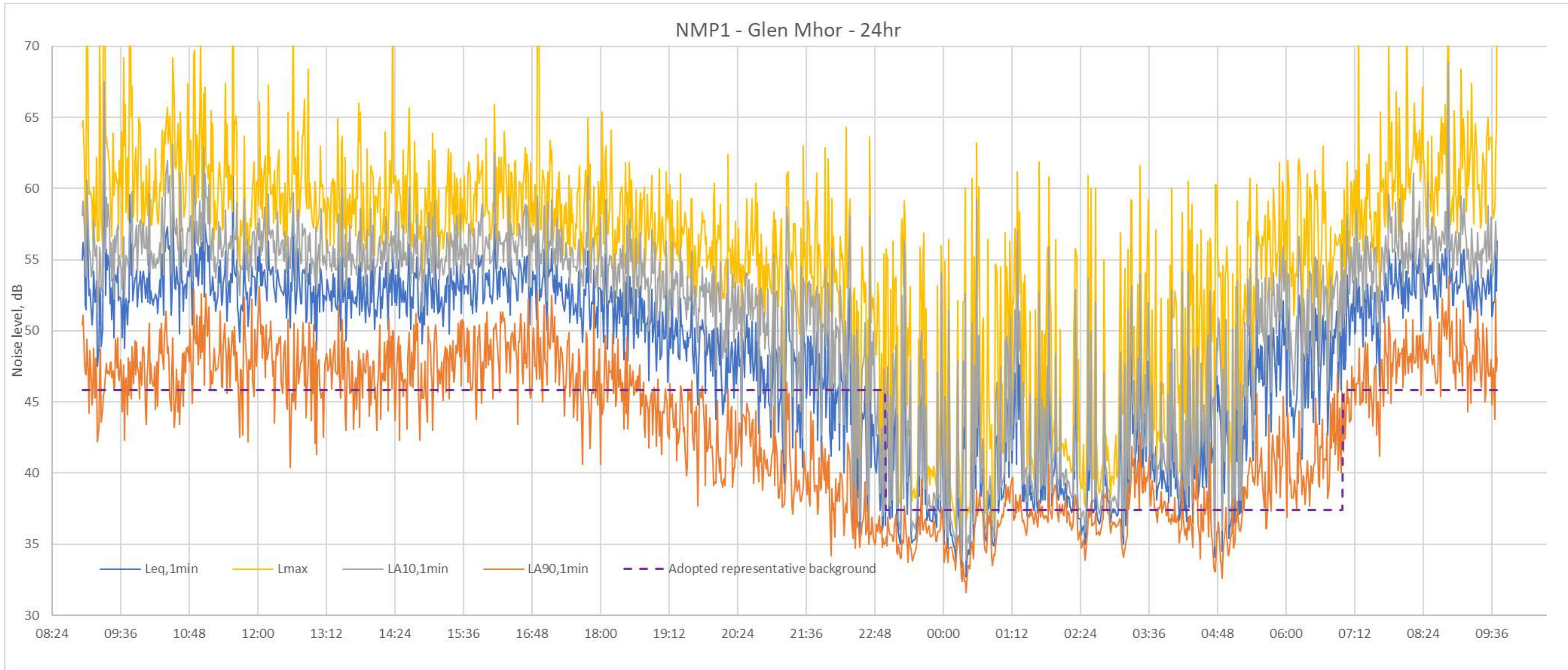
**Foundations - concrete**

| Name | Sound power level (dBA) | BS5228 reference | Operating Time Correction (min) | Effective Height of noise source (m) |
|---|---|---|---|---|
| 7T exc | 95.8 | BS_5228_2009_C2_8 | 0 | 2 |
| Concrete truck idling | 99.1 | BS_5228_2009_C4_19 | 0 | 2 |
| Concrete pump & mixer & arm discharging | 102.8 | BS_5228_2009_C4_28 | 0 | 2 |
| Telehandler | 106.5 | BS_5228_2009_C4_54 | 0 | 2 |
| Road Wagon | 108.6 | BS_5228_2009_C6_21 | 0 | 2 |

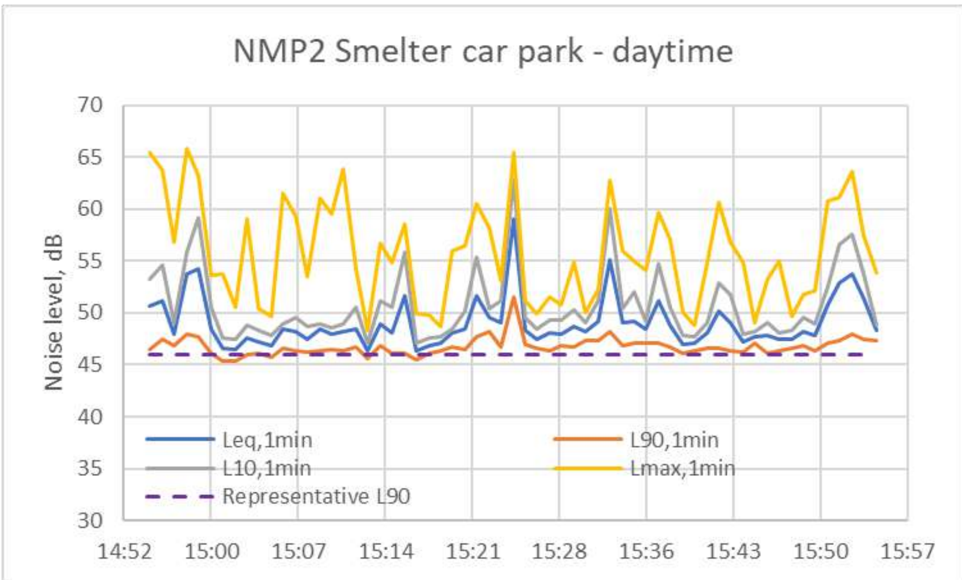
**Building - steelworks**

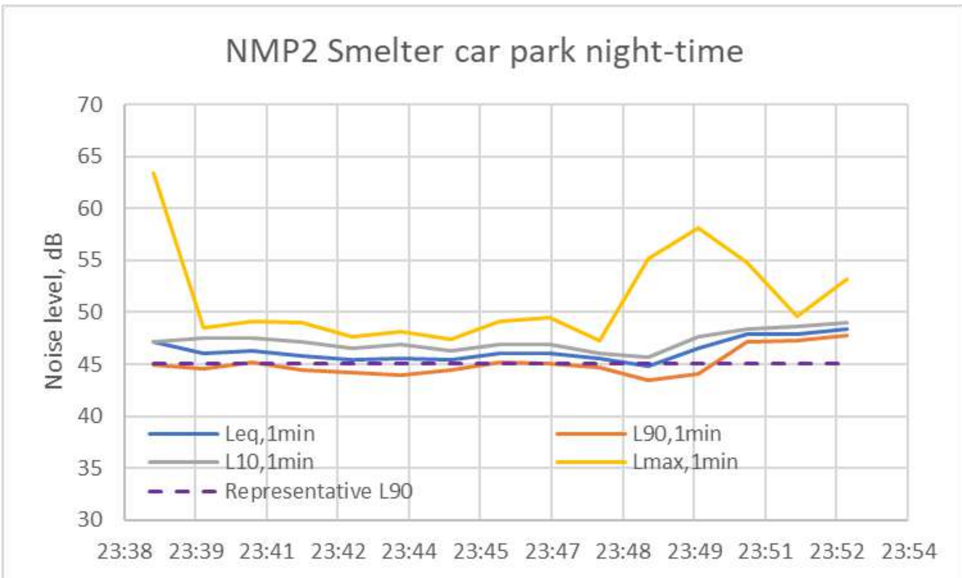
| Name | Sound power level (dBA) | BS5228 reference | Operating Time Correction (min) | Effective Height of noise source (m) |
|---|---|---|---|---|
| 7T exc | 95.8 | BS_5228_2009_C2_8 | 0 | 2 |
| 100T Crane | 99.1 | BS_5228_2009_C4_41 | 0 | 3 |
| Telehandler | 106.5 | BS_5228_2009_C4_54 | 0 | 2 |
| Road Wagon | 108.6 | BS_5228_2009_C6_21 | 0 | 2 |
| Road Wagon | 108.6 | BS_5228_2009_C6_21 | 0 | 2 |
| Lifting platform | 95.1 | BS_5228_2009_C4_57 | 0 | 3 |
| Road Wagon | 108.6 | BS_5228_2009_C6_21 | 0 | 2 |

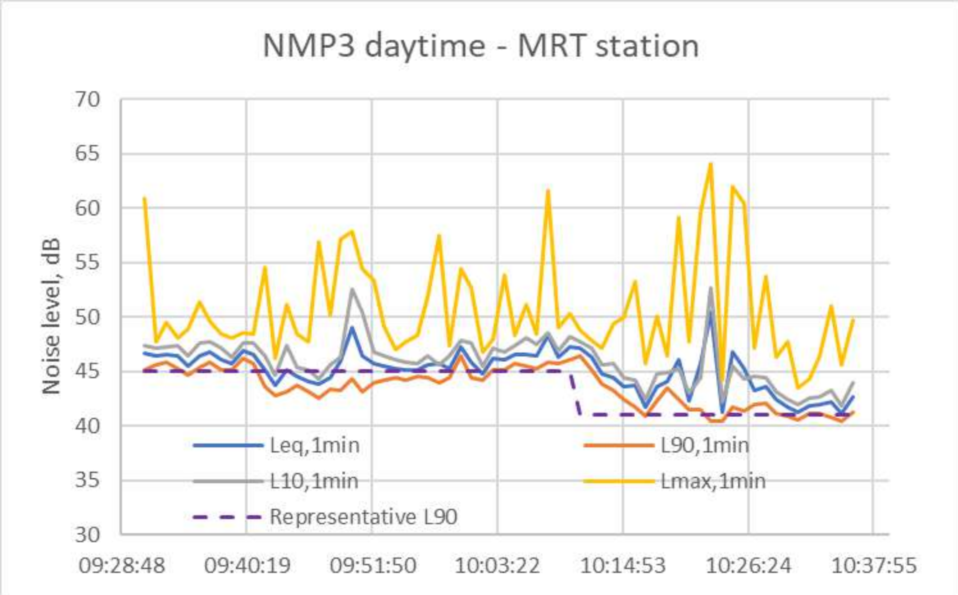
# Appendix 10.4 Baseline Data - Charts

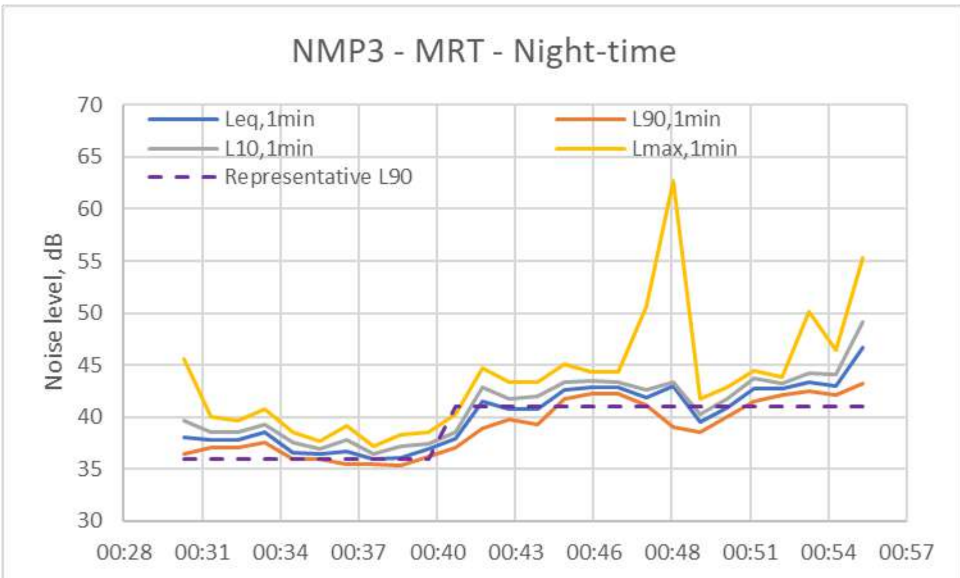


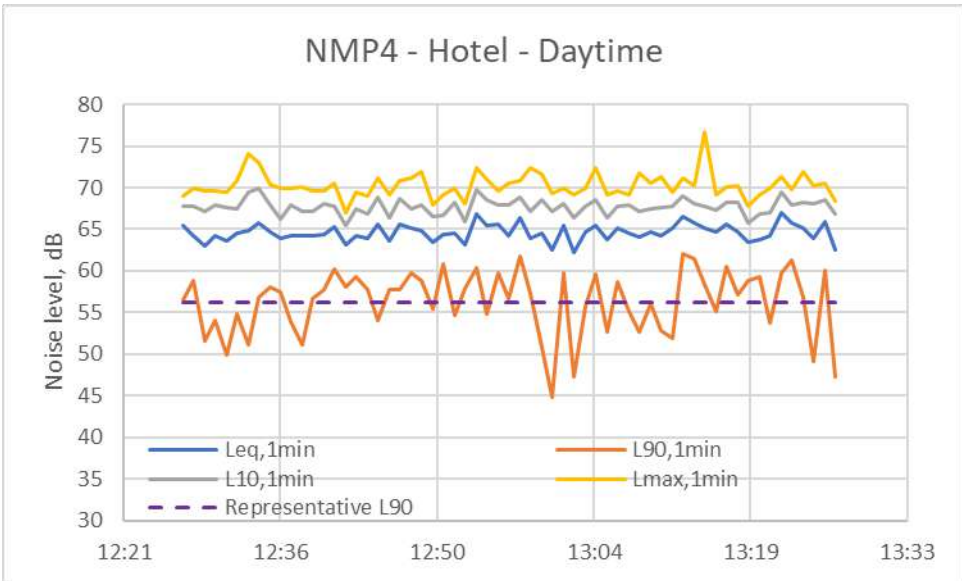
NMP1 - Glen Mhor - 24hr
Noise level, dB
70
65
60
55
50
45
40
35
30
08:24
09:36
10:48
12:00
13:12
14:24
15:36
16:48
18:00
19:12
20:24
21:36
22:48
00:00
01:12
02:24
03:36
04:48
06:00
07:12
08:24
09:36
Leq,1min
Lmax
LA10,1min
LA90,1min
Adopted representative background

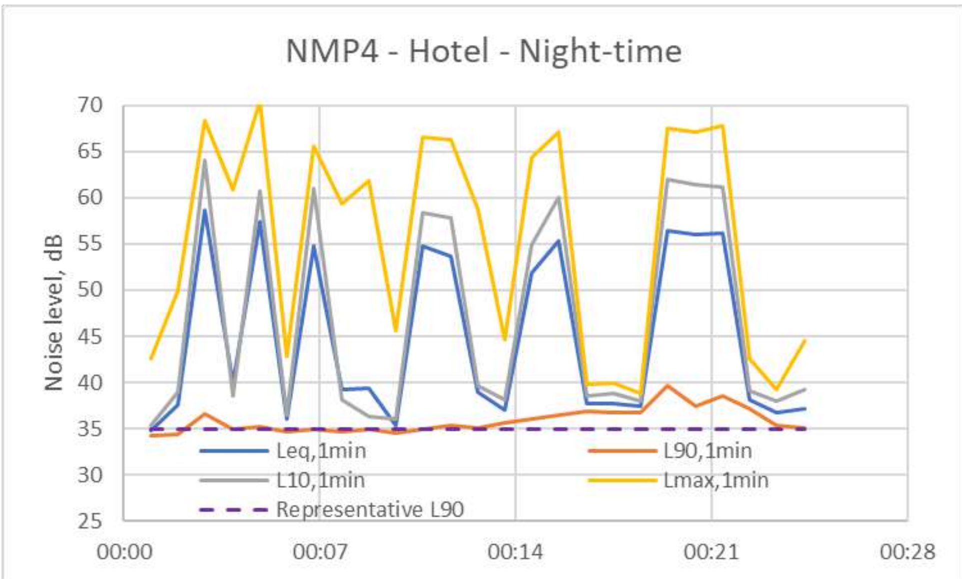

NMP2 Smelter car park - daytime
Noise level, dB
70
65
60
55
50
45
40
35
30
14:52
15:00
15:07
15:14
15:21
15:28
15:36
15:43
15:50
15:57
Leq,1min
L90,1min
L10,1min
Lmax,1min
Representative L90

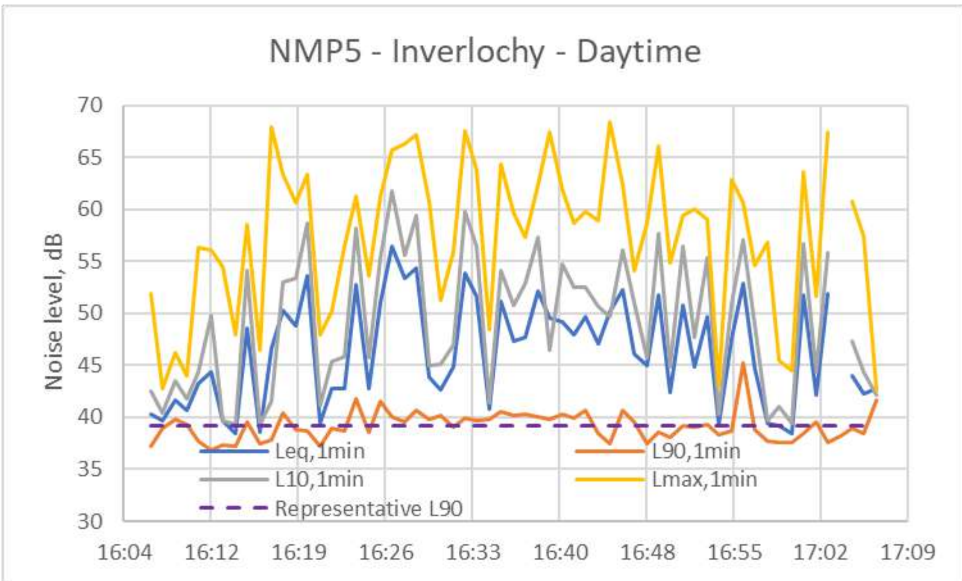

NMP2 Smelter car park night-time
Noise level, dB
70
65
60
55
50
45
40
35
30
23:38
23:39
23:41
23:42
23:44
23:45
23:47
23:48
23:49
23:51
23:52
23:54
Leq,1min
L90,1min
L10,1min
Lmax,1min
Representative L90


NMP3 daytime - MRT station
Noise level, dB
70
65
60
55
50
45
40
35
30
09:28:48
09:40:19
09:51:50
10:03:22
10:14:53
10:26:24
10:37:55
Leq,1min
L90,1min
L10,1min
Lmax,1min
Representative L90

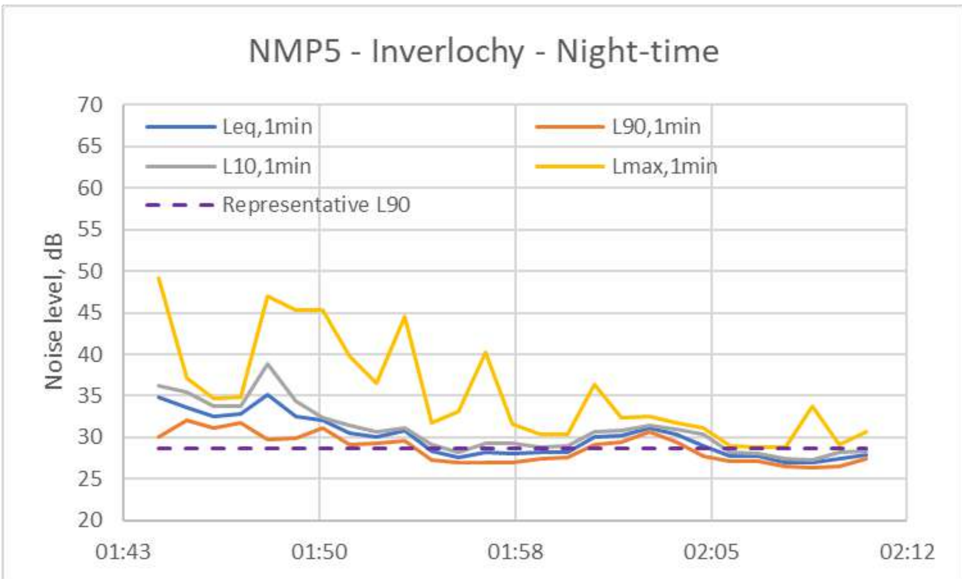

NMP3 - MRT - Night-time
Noise level, dB
70
65
60
55
50
45
40
35
30
00:28
00:31
00:34
00:37
00:40
00:43
00:46
00:48
00:51
00:54
00:57
Leq,1min
L90,1min
L10,1min
Lmax,1min
Representative L90


NMP4 - Hotel - Daytime
80
75
70
65
60
55
50
45
40
35
30
Noise level, dB
12:21
12:36
12:50
13:04
13:19
13:33
Leq,1min
L90,1min
L10,1min
Lmax,1min
Representative L90

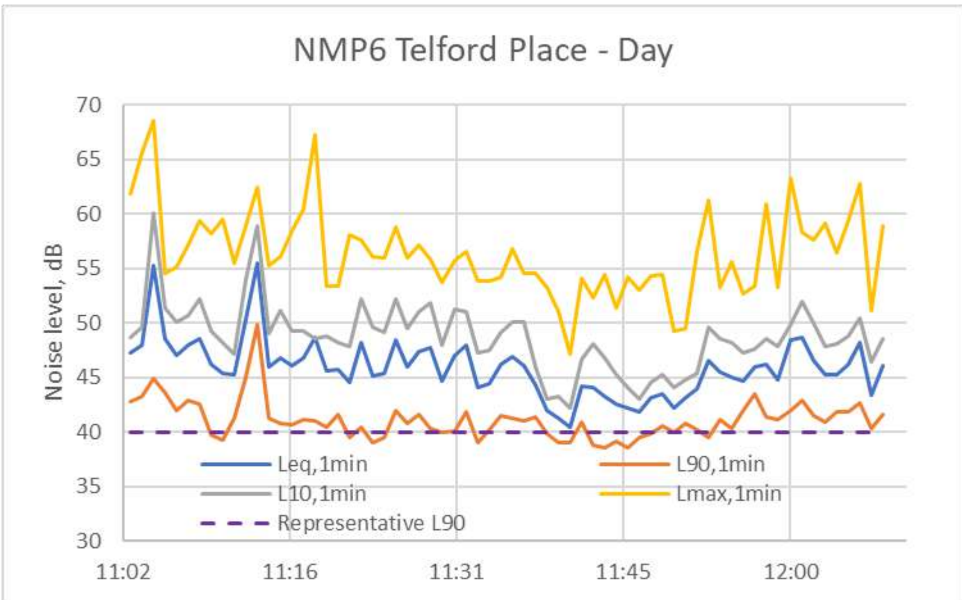

NMP4 - Hotel - Night-time
70
65
60
55
50
45
40
35
30
25
Noise level, dB
00:00
00:07
00:14
00:21
00:28
Leq,1min
L90,1min
L10,1min
Lmax,1min
Representative L90

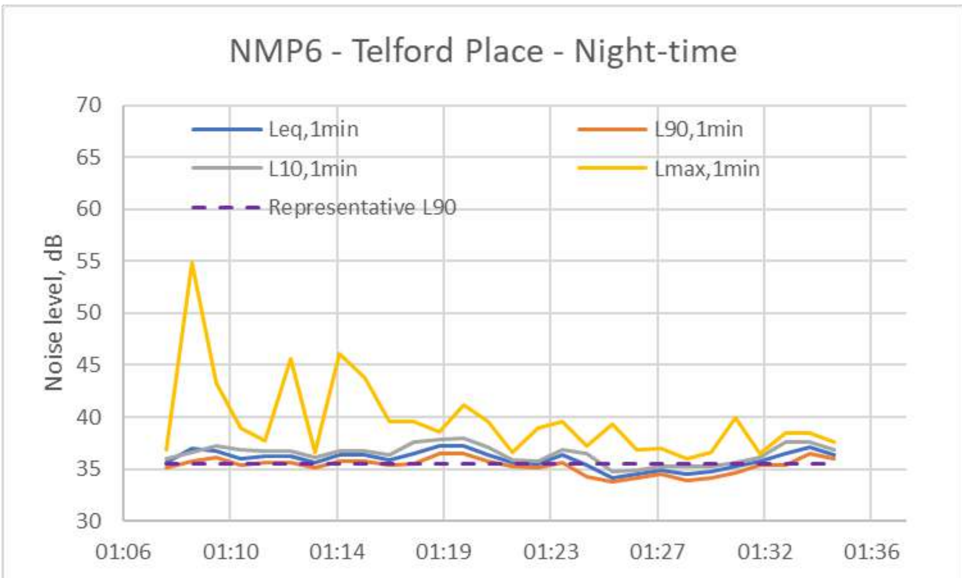


NMP5 - Inverlochy - Daytime
Noise level, dB
70
65
60
55
50
45
40
35
30
16:04
16:12
16:19
16:26
16:33
16:40
16:48
16:55
17:02
17:09
Leq,1min
L90,1min
L10,1min
Lmax,1min
Representative L90

NMP5 - Inverlochy - Night-time
Noise level, dB
70
65
60
55
50
45
40
35
30
25
20
01:43
01:50
01:58
02:05
02:12
Leq,1min
L90,1min
L10,1min
Lmax,1min
Representative L90


NMP6 Telford Place - Day
70
65
60
55
50
45
40
35
30
Noise level, dB
11:02
11:16
11:31
11:45
12:00
Leq,1min
L90,1min
L10,1min
Lmax,1min
Representative L90


NMP6 - Telford Place - Night-time
70
65
60
55
50
45
40
35
30
Noise level, dB
01:06
01:10
01:14
01:19
01:23
01:27
01:32
01:36
Leq,1min
L90,1min
L10,1min
Lmax,1min
Representative L90

## Appendix 10.5 2019 Compliance Survey

# SIMEC Lochaber Power
# Lochaber Smelter,
# Fort William

**Noise Impact Assessment**

**December 2019**

*Carmichael*
*Acoustics*

**SIMEC Lochaber Power**
**Lochaber Smelter**
**Fort William**

**Smelter Noise**
**Noise Impact Assessment**

**Prepared by** ……………………………..

Brian Carmichael
BSc (Hons Env Health), PG Dip Env Health,
PG Diploma Acoustics, MIOA, MREHIS

| | | | | |
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| Created: | Dec 2019 | | | West Lothian<br>EH49 6NE |

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**Executive Summary**

SIMEC Lochaber Power required a routine noise impact assessment to determine the impact of noise emissions from the aluminium smelter on noise sensitive receptors as part of their PPC licence permit issued by the Scottish Environment Protection Agency.

A noise impact assessment was undertaken in accordance with BS4142 to determine the noise impact from the smelter on noise sensitive receptors during the day and night time periods.

The BS4142 assessment indicated that installation noise immissions were towards a *low impact* during the day at all noise sensitive receptors.

At night the significance of the noise impact would be below *adverse* at one receptor and above *adverse* but below *significant adverse* at three receptor locations.

In terms of absolute levels of specific noise, internal noise levels at night within noise sensitive receptors were estimated to be below the WHO sleep disturbance levels.

There is a degree of uncertainty in the predicted noise levels which are likely to be an overestimate of installation noise immissions at receptor locations resulting in a potential noise impact of *adverse* and below *adverse* at night.

Generally the noise impact assessment is consistent with the subjective assessment during the survey when it was considered that installation noise immissions, although audible at receptors at night, were relatively low in level and would not cause a significant noise impact.

## 1. Introduction

Carmichael Acoustics was commissioned by Morgan McConnell HSE Advisor of SIMEC Lochaber Power, Fort William ('the installation') to undertake a noise impact assessment to consider the impact of noise emissions associated with the aluminium smelter operation on noise sensitive receptors in the vicinity.

The purpose of this report is to quantify any noise impact on sensitive receptors associated with the normal operation of the smelter.

This report highlights the findings of a noise survey undertaken on the 19th -21st November 2019

### 1.2 Competency of Author

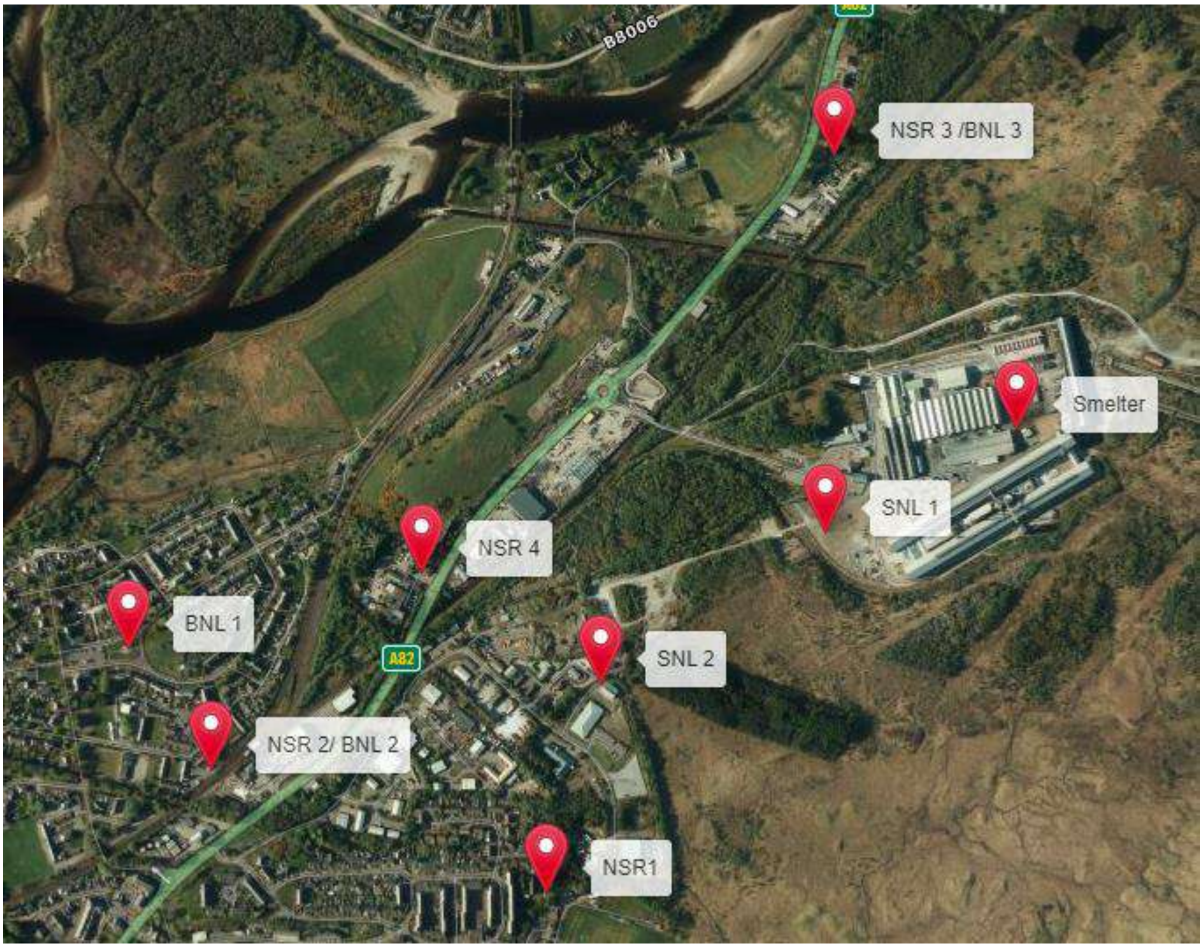
Brian Carmichael BSc (Hons Agric Engineering), BSc (Hons Env Health), PG Dip Env Health, PG Dip Acoustics, MIOA, is a full Member of the Institute of Acoustics (IOA) with 20 years' experience of undertaking and assessing environmental noise reports. Brian is also a member of the Environmental Protection Scotland, Scottish Noise Action Group.

A practising Environmental Health Officer and noise consultant specialising in environmental noise assessments and investigation of noise impacts from industrial and commercial premises.

## 2. Site Location - Operation

The installation is located on the outskirts of Fort William in a mixed industrial/residential area. The location of the smelter is shown on the Installation Location Map below along with reference positions for noise sensitive receptors (NSR), background noise surveys (BNL) and noise measurements of installation noise (SNL).

Installation Location Map




The package generators located on site do not form part of this assessment which is considered under a different PPC Permit. These generators were not operational at the time and it is believed they have not been in operation.

The smelter operates 24/7 and was operating normally during the noise monitoring survey. Noise emissions from the smelter can be heard to varying degrees during the day and night, albeit low level, but at a significant distance from the installation.

Ambient noise levels in the area are dominated by road traffic noise during the day and to a significantly lesser degree during the night when installation noise immissions (continuous broadband) become more distinctive against the residual noise climate.

## 3. Noise Sensitive Receptors

The most relevant noise sensitive residential receptors to the installation are highlighted on the Installation Location Map. The receptors chosen for this noise impact assessment are summarised in Table 1.

Table 1: Noise Sensitive Receptor Locations

| Grid Ref X,Y | Location | Ref | Distance from Installation boundary (m) |
|---|---|---|---|
| 211943 774373 | Telford Place | NSR 1 | 650 |
| 211461 774577 | Nevis Road | NSR 2 | 940 |
| 211943 774373 | Inverlochy Villas | NSR 3 | 360 |
| 211780 774850 | Ben Nevis Hotel & Leisure Club | NSR 4 | 600 |

<u>NSR 1 Telford Place</u>

This location lies in a quiet residential cul-de-sac on the edge of a housing estate which lies approximately 400m south east of the busy A82. As a consequence the noise environment is relatively quiet with contributions to the ambient noise environment during the day from the adjacent industrial estate, distant road traffic and continuous installation noise albeit relatively low level during the day.

At night, the dominant noise source is identical installation noise which is heard during the day with traffic on the A82 just audible when vehicles are passing on the road.
No background noise survey could therefore be undertaken at this location but it was possible to obtain a reasonable measurement of installation noise during the night using the $L_{A99}$ parameter.

<u>NSR 2: Nevis Road</u>

These properties lie on the edge of a housing estate in close proximity to a railway and just west of the A82. Some light commercial buildings exist between the railway and A82 which provides some partial screening to the propagation of noise from the installation.
The noise climate during the day is dominated by road traffic on the A82 with an occasional train passing. Installation noise emissions were not audible during the day.

At night installation noise was clearly audible except when masked by occasional traffic on the A82. Only a daytime background noise survey was therefore possible at this location.

NSR 3: Inverlochy Villas

A small number of receptors are located northwest of the installation. The ambient noise environment is dominated by road traffic noise on the A82. Installation noise was not audible at this location during the day and only just audible at night.
Due to nearby roadworks both during the day and night, no background noise survey was possible. Nevertheless a recent background sound survey undertaken by the author in February 2019 which was considered robust is used for this location.

NSR4: Ben Nevis Hotel & Leisure Club

This receptor lies west of the installation immediately adjacent to the A82 with the ambient noise environment dominated by road traffic noise. Installation noise was generally masked during the day but just audible at night albeit low in noise level.

The above receptor locations generally represent the most exposed noise sensitive receptors in the vicinity of the installation. Continuous noise from the installation at night was heard at a significant distance west and south of the installation. As a result an alternative surrogate location was established at night to undertake background noise surveys. Details of the background noise survey and measurement methodology are detailed in Section 4. Photos of NSR locations are shown in Appendix A.

## 4. Measurement Methodology

All components of the noise monitoring system were calibrated to UKAS accredited standards and conforms to BS EN 61672-1:2003 Sound Level Meter specification – Description and measurement of environmental noise. A list of monitoring equipment is presented as Appendix A.

The noise impact associated with installation noise can be assessed using BS4142:2014:A1 2019, *Methods for Rating and Assessing Industrial and Commercial Sound.* This standard provides a method for comparing the rated sound level with the background sound level in determining the significance of the noise impact.

### 4.1 Background Noise Survey ($LA_{90}$)

Background noise monitoring was undertaken in accordance with BS4142 in free-field conditions, >3.5m from reflecting surfaces (other than the ground) with the microphone positioned at a height of 1.4m. An attended background measurement survey was undertaken during the day and two nights on the 20th and 21st November 2019 respectively. A subjective survey was undertaken on the 19th November to establish suitable background monitoring and receptor locations.

The location of the background monitoring locations are highlighted on the Installation Location Map (Section 1) and summarised below. Photos of the background monitoring locations are shown in Appendix B.

| Ref | Location | Grid Ref X,Y |
|---|---|---|
| **BNL 1** | **Aluminium Worker Lundy Rd** | **211336 774758** |
| Notes:<br><br>Surrogate for noise sensitive receptors NSR 1 (Telford Place). Approximately same distance from A82 without influence form installation plant noise. Ambient noise environment dominated by distant road traffic noise on A82 and local traffic during the day.<br>At night occasional traffic on the A82 was the only significant noise source. Installation noise was barely audible at this location during the night.<br>Also surrogate for receptors NSR 2 (Nevis Road) at night due to installation noise audible at these receptors. | | |

| Ref | Location | Grid Ref X,Y |
|---|---|---|
| **BNL 2** | **Nevis Road** | **211461 774577** |
| Notes:<br><br>At receptor NSR 2 location. Ambient noise during day dominated by road traffic noise on A82 and occasional train bypass. Installation noise was not audible. At night occasional traffic on A82 and very low level installation noise were the main contributors to the ambient noise environment. Insignificant influence of installation noise on background noise level | | |

| Ref | Location | Grid Ref X,Y |
|---|---|---|
| **BNL 3** | **Inverlochy Villa** | **211943 774373** |
| Notes: Not possible to monitor background noise at this location due to local road traffic works. During the daytime installation noise was not audible. Previous background data used for this location and surrogate for NSR 4 (Ben Nevis Hotel and Leisure Club) where installation noise was just audible during the day (during traffic lulls) and night). | | |

Although generally low level, installation noise could be heard at most of the receptor locations. At Nevis Road NSR 2 although installation noise was just audible at night it was at such a low noise level that there was no significant impact on background noise measurements (BNL 2).

The sound level meter system was checked against the calibrator at the beginning and end of measurements in accordance with recommended best practice. No drift in calibration sensitivity was observed from the calibration level of 93.9 dB.

## 4.2 Meteorological Data

Daytime background sound surveys

No wind existed during the day. Conditions were cold with a maximum temperature of 8$^0$C, sunny with 60% cloud cover, no precipitation occurred during the survey.

Night time background sound survey

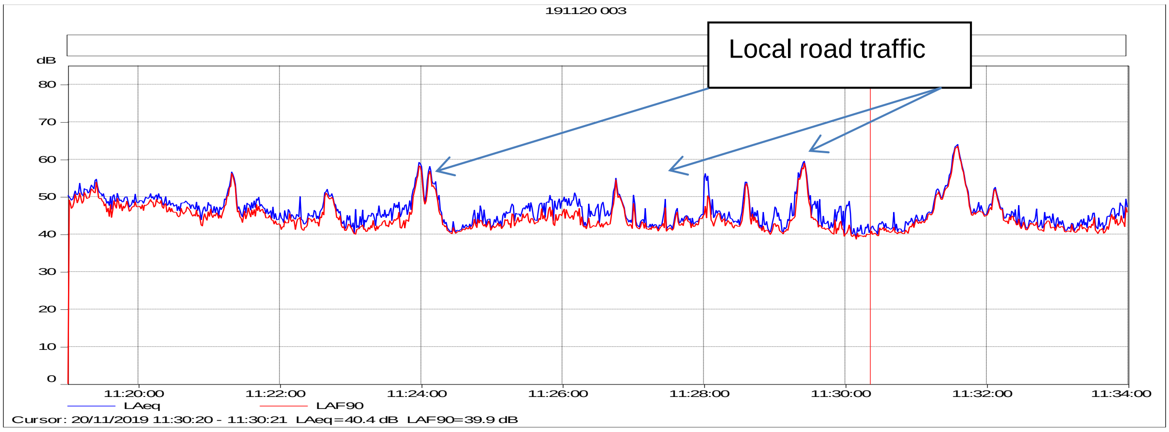
Conditions were cold with a maximum temperature of 5$^0$C and a minimum 3 $^0$C. No wind existed during the surveys; skies were overcast and conditions were considered ideal monitoring conditions dry throughout the survey. During the first night (20$^{th}$) precipitation occurred at around 02.00 and the survey was abandoned.

## 4.3 Results

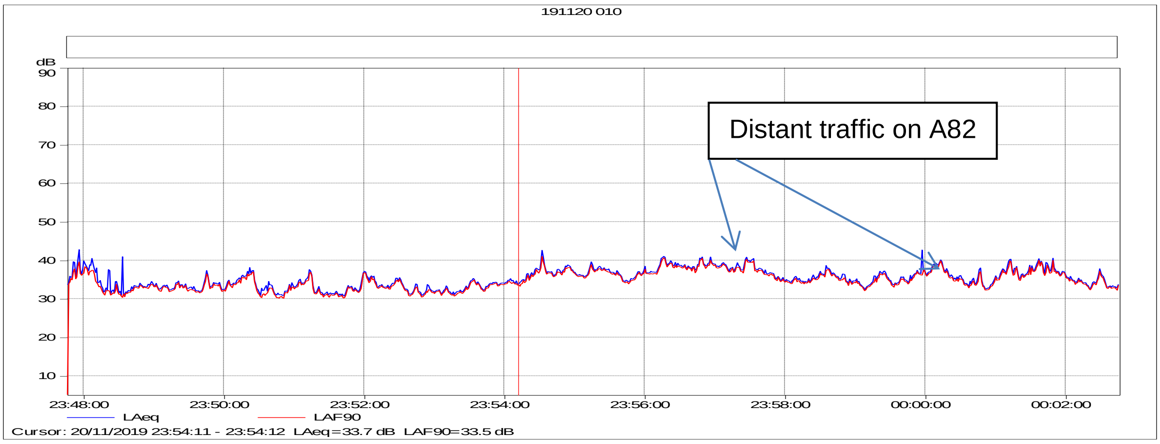
The background sound survey $L_{A90}$ during the day was measured over a combination of 1sec logging over 15min period and 15min logging periods. At night $L_{A90}$ 15min and some 1 sec logging periods were measured.

An example of the 1 second profile measured at the background monitoring locations (BNL 1 and BNL 2) are highlighted below for the day and night periods. A summary of all the day and night time background monitoring results are highlighted in Table 2.

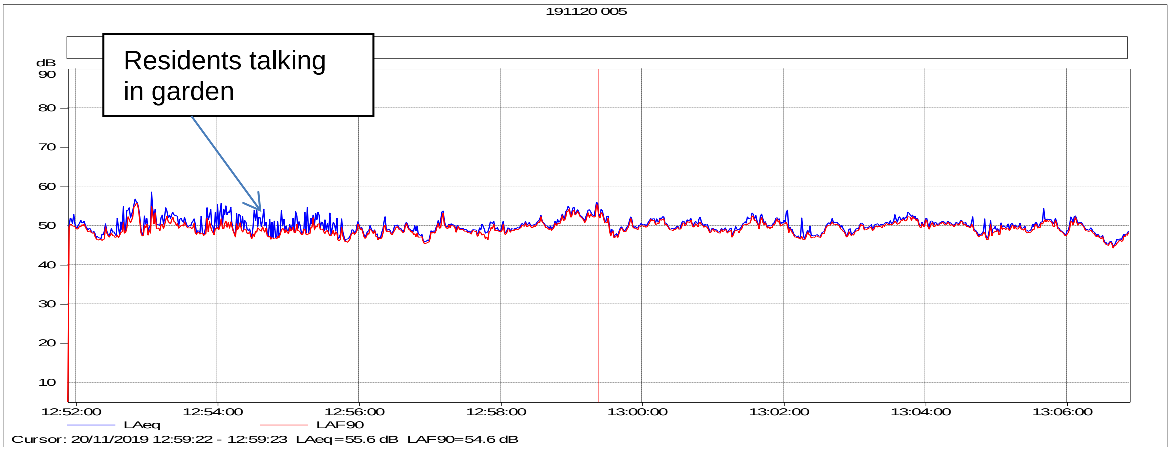
Day (1sec profile, $L_{Aeq}$ $L_{A90}$) Background Location BNL1- Lundy Road




Night (1sec profile, $L_{Aeq}$ $L_{A90}$) Background Location BNL1- Lundy Road




Day (1sec profile, $L_{Aeq}$ $L_{A90}$) Background Location BNL2- Nevis Road




The daytime profile highlights traffic noise as being the dominant noise source during these measurement periods.

At BNL 1 at night, intermittent traffic on the A82 dominated. Very low level continuous plant noise from the installation mentioned earlier was just audible at night at BNL 2. This however was not significant on the measured results.

Maximum noise levels were dominated by road traffic noise.

Table 2: Residual $L_{Aeq}$ and Background $L_{A90}$ sound monitoring results (dB)

| | Date | Start Time | Logging Period hh:mm:ss | $L_{Aeq}$ | $L_{A90}$ |
|---|---|---|---|---|---|
| BNL 1 – Lundy Road **Night** | | | | | |
| File 004 | **19/11/19** | 23:03:04 | 00:15:00 | 44.4 | 31.1 |
| | | | 00:15:00 | 41.8 | 31.3 |
| | | | **00:30:00** | **43.3** | **31.2** |
| File 005 | | 23:40:22 | 00:15:00 | 35.7 | 29.6 |
| | | | 00:15:00 | 30.5 | 28.6 |
| | | | **00:30:00** | **36.3** | **28.8** |
| | | | **Night Average** | **38.1** | |
| **Day** | **20/11/19** | | | | |
| File 03 | | 11:19:00 | 00:15:00 | 49.1 | 41.6 |
| File 04 | | 11:42:42 | 00:15:00 | 50.6 | 40.0 |
| | | | 00:15:00 | 50.1 | 41.8 |
| | | | 00:15:00 | 49.0 | 41.4 |
| | | | 00:15:00 | 51.4 | 40.3 |
| | | | **01:00:00** | **50.4** | **40.4** |
| | | | | | |
| File 08 | | 14:41:45 | 00:15:00 | 50.0 | 39.4 |
| | | | 00:15:00 | 51.7 | 42.3 |
| | | | 00:15:00 | 50.8 | 42.6 |
| | | | **00:45:00** | **50.9** | **41.0** |
| | | | **Day Average** | **50.3** | |
| **Night** | **21/11/19** | | | | |
| File 010 (1 sec) | | 23:47:46 | 00:15:00 | 35.9 | 32.0 |
| File 001 | | 00:07:17 | 00:15:00 | 35.9 | 32.9 |
| | | | 00:15:00 | 36.0 | 31.9 |
| | | | **00:30:00** | **36.0** | **32.3** |
| File 003 | | 01:31:18 | 00:15:00 | 37.0 | 33.1 |
| | | | 00:15:00 | 40.1 | 33.6 |
| | | | **00:30:00** | **38.9** | **33.3** |

| | | | | | |
|---|---|---|---|---|---|
| | | | **Night Average** | **36.9** | |
| **Mode- Day 41 dB $L_{A90}$**<br>**Mode- Night 32 dB $L_{A90}$** | | | | | |
| | | | | | |
| **BNL 2 – Nevis Road** | | | | | |
| **Day** | | | | | |
| File 005 | 20/11/19 | 12:51:53 | 00:15:00 | 50.5 | 47.5 |
| File 006 | | 13:08:15 | 00:15:00 | 50.2 | 46.7 |
| | | | 00:15:00 | 49.1 | 45.1 |
| | | | **00:30:00** | **49.7** | **45.6** |
| File 009 | | 15:32:24 | 00:15:00 | 51.6 | 46.4 |
| | | | 00:15:00 | 49.9 | 47.2 |
| | | | **00:30:00** | **50.9** | **46.9** |
| | | | **Day Average** | **50.3** | |
| **Night** | 21/11/19 | 00:50:01 | 00:15:00 | 39.9 | 35.3 |
| File 002 | | | 00:15:00 | 39.5 | 33.9 |
| | | | **00:30:00** | **39.7** | **34.4** |
| | | | | | |
| File 004 | | 02:00:05 | 00:15:00 | 38.3 | 34.5 |
| | | | 00:15:00 | 38.6 | 34.7 |
| | | | **Night Average** | **39.1** | |
| **Mode Day 46.0 dB $L_{A90}$**<br>**Mode Night 34.0 dB $L_{A90}$** | | | | | |

The background sound measurements were fairly consistent during the 15 min monitoring periods. Comparing these results with the overall $L_{A90}$ measured for the total monitoring period highlights little variation in the background sound levels, particularly during the night. The overall background noise levels measured over the surveys has been established by utilising the approximate mode value for all the data recorded for day and night time periods as being a representative background sound level. The average $L_{Aeq}$ for all noise data measured has also been utilised. This is highlighted in Table 2 above and summarised in Table 3.

Table: 3 Representative Residual and Background Sound Levels dB(A)

| Location | Period | $L_{Aeq}$ | $L_{A90}$ |
|---|---|---|---|
| **BNL 1 – Lundy Rd** | Day | 50.3 | 41.0 |
| | Night | 36.9 | 32.0 |
| **BNL 2 – Nevis Road** | Day | 50.3 | 46.0 |
| | Night | 39.1 | 34.0 |
| **BNL 3*– Inverlochy Villas** | Day | 49.8 | 46.7 |
| | Night | 38.7 | 35.6 |

*Extracted from earlier report 2019, Appendix A

The above results would appear to be fairly consistent with the subjective impression of the acoustic environment at the time. Monitoring at Lundy Road yielded the lowest day time and night time background noise levels. This would be expected as Lundy road is further away from the A82 and therefore less exposed to road traffic noise.

At Nevis Road the measured data is very similar to that obtained during a previous background sound survey at Inverlochy Villas, highlighting the influence of road traffic noise from the A82 in the area. The summarised data is considered to be fairly representative of residual and background noise levels in the area.

## 5. Specific Noise Immissions – Installation Noise

Noise Immissions from the installation are audible to varying degrees at various receptor locations. During the noise survey it was noted that there was a continuous noise broadband noise associated with the installation. Upon further investigation the source of the off-site noise was found to be the stacks of the Fume Treatment Plant (FTP) which dominated noise emissions

A measurement of the FTP noise emissions was undertaken at the location SNL 1 as shown on the Installation Map (Section 2). This location was on the western boundary approximately 260 m from the FTP stacks where noise immissions were dominant. The FTP stacks are approximately 30 m in height. Measured data is highlighted in Appendix C.

In order to estimate the likely noise immissions at receptors, the measured $L_{Aeq}$ can be utilised to determine the potential sound power level associated with the source (FTP). Utilising the following simple equation assuming the source is a point source and radiating spherically due to the height of the stacks;

$$L_{wA} = L_p + 20\log_{10}(r) + 11$$

Source noise level at 260m = $L_{Aeq}$ 50.8 dB

$$L_{wA} = 50.8 + 20\log(260) + 11 = 110 \text{ dB}$$

The approximate estimated sound power level is calculated to be 110dB(A). This is a similar value to that used in previous reports by other consultants. The above equation can be applied to the octave band data measured at 260m to obtain the estimated sound power level at each octave band frequency as calculated in Appendix C. This sound power level can then be used to predict the $L_{Aeq}$ noise level at noise sensitive receptor locations using ISO 9613-2:1996 – Acoustics – *Attenuation of Sound during propagation outdoors,* which includes air and ground absorption. The calculated sound pressure level at noise sensitive receptors from the octave band data in accordance with this standard are shown in Appendix D and summarised in Table 4.

## 5.1 Predicted Noise Level at Receptor Locations

Table 4: Calculated Sound Pressure Level at Noise Sensitive Receptors

| **Receptor** | **Ref** | **Distance from Source (r)** | **$L_{WA\ Source}$ = dB(A)** | ***Calculated Sound Pressure Level at receptor, $L_{Aeq}$ dB** |
|---|---|---|---|---|
| Telford Place | NSR 1 | 880 | 110 | 37.7 |
| Nevis Road | NSR 2 | 1230 | 110 | 34.5 |
| Inverlochy Villas | NSR 3 | 609 | 110 | 38.7 |
| Ben Nevis Hotel & Leisure Club | NSR4 | 866 | 110 | 37.9 |

* $L_{WA}$ – 20log (r) –A(gr) –A(air) -11

The predicted specific noise at NSR 3 is likely to be an overestimate. The predicted noise level is at the measured residual noise level when installation noise was noted to be at a very low noise level and just audible. This may be due to the fact that that the northern building of the installation acts as a partial barrier to the propagation of noise towards this receptor.

The predicted noise level at Telford Place (NSR 1), the most exposed receptor location, was calculated at $L_{Aeq}$ 37.7 dB.  The following Table 5 highlights noise levels measured at night at this location when installation noise (FTP's) was clearly audible and considered to dominate the background sound environment;

Table 5: Measured noise level at Telford Place

| **NSR 1 Telford Place** | **$L_{Aeq}$** | **$L_{A90}$** | **$L_{A99}$** |
|---|---|---|---|
| 10min Period | 39.7 | 36.3 | 34.9 |

A reasonable approximation for installation noise which is continuous and dominates the background noise environment is the $L_{A99}$ parameter. In this case it is estimated that installation noise is approximately $L_{A99}$ 34.9 dB. This is about 3 dB less than the predicted noise level. It is likely that the influence of screening between the installation and receptor locations could account for at least 3 dB(A). The predicted noise level at Telford place and other receptors therefore could be considered as a reasonable estimate albeit potentially an over prediction.

There are no specific characteristics of installation noise immissions that would warrant any character corrections to the predicted specific noise level for tonality, impulsivity or intermittency. Subjectively, at all noise sensitive receptor locations installation noise was low level and broadband in nature. At Telford Place however, noise immissions were readily distinctive above the residual noise environment.

## 6. Environmental Noise Impact

To determine the potential noise impact associated with installation noise the method contained in BS4142 would be appropriate.

BS 4142:2014 *Methods for rating and assessing industrial and commercial sound,* uses outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes.

The assessment method in terms of BS4142 aims to rate sound levels of sources according to their characteristics and compares the rated sound level with the background sound level. The greater difference between the two the greater the magnitude of impact depending on the context in which the sound occurs;

*(a) A difference or around +10dB or more is likely to be an indication of a significant adverse impact depending on the context.*

*(b) A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.*

*(c) The lower the rating level relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or significant adverse impact. When the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

BS4142 requires consideration of the sound and the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention.

Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

The noise impact assessment is detailed in Table 6. Values have been taken from the predicted specific sound levels in Section 5 and background sound levels from Table 3 (Section 4).

The reference period for the assessment is 60min during the day and 15min during the night in accordance with BS4142.

Table 6 : BS4142 Assessment

| | NSR 1 | | NSR 2 | | NSR 3 | | NSR4 | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| Predicted Specific Sound Level $L_{Aeq(1hr)/(15min)}$ | 37.7 | 37.7 | 34.5 | 34.5 | 38.7 | 38.7 | 37.9 | 37.9 |
| Character Correction | | | | | | | | |
| Distinctive | 3 | 3 | - | 3 | - | 3 | - | 3 |
| Tonal | - | - | - | - | - | - | - | - |
| Impulsive | - | - | - | - | - | - | - | - |
| Intermittent | - | - | - | - | - | - | - | - |
| Rating Level $L_{Ar(1\ hour)/\ (15min)}$ | 40.7 | 40.7 | 34.5 | 37.5 | 38.7 | 41.7 | 37.9 | 40.9 |
| Background Sound Level ($L_{A90}$) | 41.0 | 32.0 | 46.0 | 34.0 | 46.7 | 35.6 | 46.7 | 35.6 |
| Rating Level - Background | **-0.3** | **8.7** | **-11.5** | **3.5** | **-8.0** | **6.1** | **-8.8** | **6.3** |

All values in the above table are sound pressure levels, in dB re 2 x 10-5 Pa

Subjectively there was no tonality, impulsivity or intermittency associated with operation of the FTP's noise immissions. No character corrections have therefore been applied. A character correction has been applied where installation noise was readily distinctive against the residual acoustic environment at relevant receptors. Only at NSR1 (Telford Place) was installation noise readily distinctive both during the day and night. . .

The BS4142 assessment indicates that the rated noise immissions from the installation was below background noise levels during the day at all receptors, indicating that the assessment is towards a *low impact*. This concurs with the subjective assessment during the day.

At night the assessment indicates below *adverse impact* at NSR 2 (Nevis Road) and above *adverse impact* but below *significant adverse impact* at receptors NSR 1 (Telford Place), NSR 3 (Inverlochy Villas) and NSR 4 (Ben Nevis Hotel and Leisure Club).

Subjectively installation noise immissions at night although audible were not considered to have an adverse impact on noise sensitive receptors.

## 6.1 Context

BS 4142 describes how the significance of industrial / commercial sound depends not only on the specific sound itself but also the contexts in which that sound occurs. The assessment of impact therefore requires to be set in context before drawing conclusions.

The predicted specific sound level calculated at noise sensitive receptors at night range from $L_{Aeq\ (15min)}$ 34-39 dB which would be a relatively low external sound level at receptor locations.

Assuming a conservative estimate of 10 dB attenuation for an open window at receptors, this would equate to approximately 24-29 dB internally, which is less than the World Health Organisation (WHO) sleep disturbance level ($L_{Aeq}$ 30 dB) for steady state noise levels. As the noise immissions are broadband in nature, there is unlikely to be any significant impact on the internal noise climate at night.

BS 4142 in terms of context states;

> *'where background sound levels and rating levels are low, absolute levels might be as, or more relevant than the margin by which the rating levels exceeds the background. This is especially true at night'*

This is the case for operational noise from the installation, where relatively low backgrounds exist in the vicinity of the installation at night at the most exposed noise sensitive receptor locations.

It is therefore considered that the impact of installation noise, at night, is not significant.

### 6.2 Uncertainty of assessment

Factors reducing uncertainty:

- It is estimated from direct measurement ($L_{A99}$, Table 5) that the predicted noise calculations could be at least 3 B(A) higher than that measured. This is likely to be associated with the influence of partial screening of various buildings between the installation and receptor locations.
- Background sound levels at night were measured during the quietest periods of the night and under conditions that would be representative of typically low background sound levels.
- No correction has been applied to predicted specific sound levels to account for potential barrier effects of the intervening commercial and residential buildings between the receptor and the installation.
- Residual and background measurements may vary on different days – however, the survey was undertaken in completely calm conditions with no influence on the sound climate associated with wind speed and direction.
- All equipment is Class 1 and UKAS calibrated.
- Field calibrations were all satisfactory.
- The author/monitor is qualified and experienced in environmental noise measurements.
- The weather conditions were stable and ideal for background sound monitoring.

- Background sound levels were consistent during the monitoring periods with little variation during each logging period.

Factors increasing uncertainty:

- It has been assumed that the FTP noise immissions (the dominant off-site noise source) operates to the same noise level and characteristics as identified in this report.

Overall, the level of uncertainty associated with this survey is not considered to negatively alter the outcome of the noise impact assessment.

## 7. Conclusion

1. SIMEC Lochaber Power operates 24/7 with the dominant off-site noise immissions associated with the Fume Treatment Plant.

2. The environmental impact of the noise emissions at the installation was assessed as required by the PPC permit issued by the Scottish Environment Protection Agency (SEPA).

3. This report considered the potential noise impact associated with the installation on noise sensitive receptors during the day and night.

4. A noise impact assessment was undertaken in accordance with BS4142 and sound levels of the FTP's were obtained during the night.

5. The BS4142 assessment indicated that installation noise immissions were towards a *low* impact during that day at all noise sensitive receptors.

6. At night the significance of the noise impact would be below *adverse* at one receptor and above *adverse* but below *significant adverse* at three receptor locations.

7 Internal noise levels at night within noise sensitive receptors were estimated to be below the WHO sleep disturbance levels.

8. There is a degree of uncertainty in the predicted noise levels which are likely to be an overestimate of installation noise immissions at receptor locations resulting in a potential noise impact of *adverse* and below.

9. Generally the noise impact assessment is consistent with the subjective assessment during the survey when it was considered that installation noise immissions, although audible at receptors at night, were relatively low level and would not cause a significant noise impact.

10. There have been no complaints regarding the installation noise immissions..

11. For normal operations, it can be concluded that general noise emissions, dominated by the FTP's at the installation, does not cause a significant noise impact at noise sensitive receptors.

## Appendix A

## Noise Monitoring Equipment

**Bruel & Kjaer Sound Analyser Type 2250** **Calib. Date March 2018**
**Serial No. 2645178**

**Bruel & Kjaer Microphone Type 4189** **Calib. Date March 2018**
**Serial No. 2643597**

**Bruel & Kjaer Sound Calibrator Type 4231** **Calib. Date March 2019**
**Serial No. 2651815**

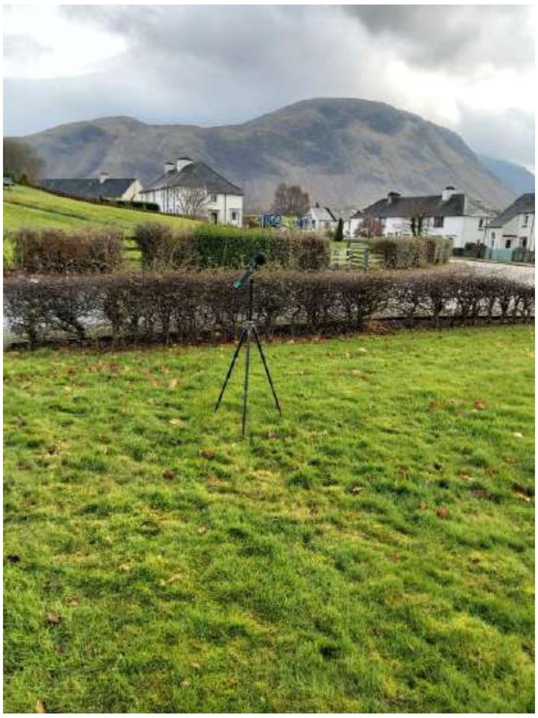
**Tripod**

**Kestrel 1000 Anemometer**
**resolution to 0.1ms-1 / accurate to ±3%**

**APPENDIX B**

**Photos of Background Survey locations and Noise Sensitive Receptors**

**Telford Place NSR 1**



**Lundy Road – Surrogate Background Location BNL1**

**Nevis Road BNL 2**

Table 2: Representative Residual and Background Sound Levels (dB(A))

| Period | $L_{Aeq}$ | $L_{A90}$ |
|---|---|---|
| **Day** | 49.8 | 46.7 |
| **Evening** | 48.0 | 43.3 |
| **Night** | 38.7 | 35.6 |

Background Sound Levels Report Extract-Job No 045/18/BC : Feb 2019

**NSR 1: Telford Place**

**NSR 2: Nevis Road**

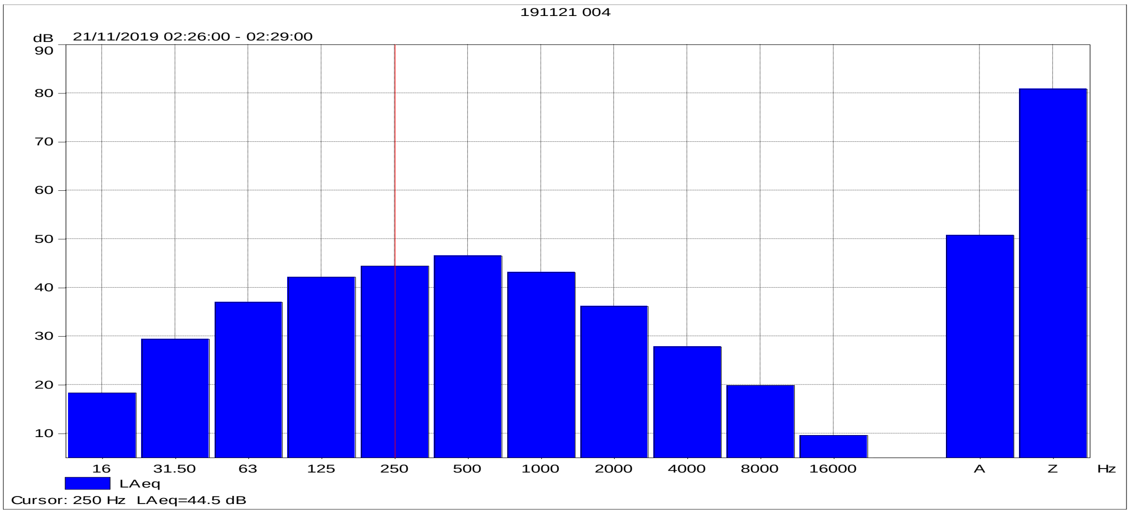
**NSR 3: Inverlochy Villas**


**NSR 4: Ben Nevis Hotel and Leisure Club**

## Appendix C

## Specific Noise Monitoring Results

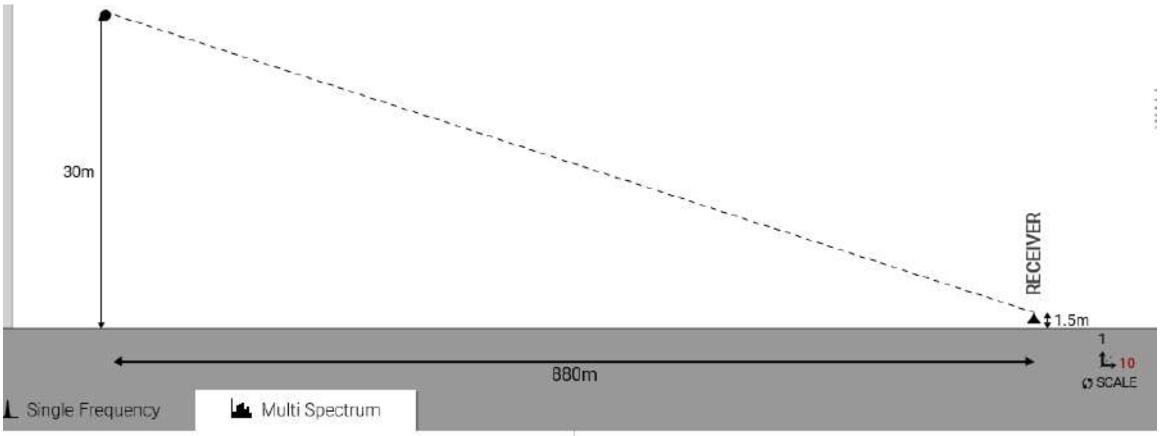
| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sound Power Level calculation from measured Installation noise emissions at 260m from FTP's dB(A) | | | | | | | | | | |
| Lw =Lp +20log (r) +11 | | | | | | | | | | | |
| | | | | Octave Band CentreFrequency Hz | | | | | | | |
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| | Lp | 37 | 42.2 | 44.5 | 46.5 | 43.1 | 36.2 | 27.8 | 19.9 | | |
| +20log (r) +11 | | 59.3 | 59.3 | 59.3 | 59.3 | 59.3 | 59.3 | 59.3 | 59.3 | | |
| | Lw | 96.3 | 101.5 | 103.8 | 105.8 | 102.4 | 95.5 | 87.1 | 79.2 | Lw(A)110.1 | |



## APPENDIX D

## Predicted Octave Band Frequency Sound Pressure Levels at NSR's

### NSR 1 Telford Place




Source

| 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Hz |
|---|---|---|---|---|---|---|---|---|
| 96.3 | 101.5 | 103.8 | 105.8 | 102.4 | 95.5 | 87.1 | 79.2 | dB |

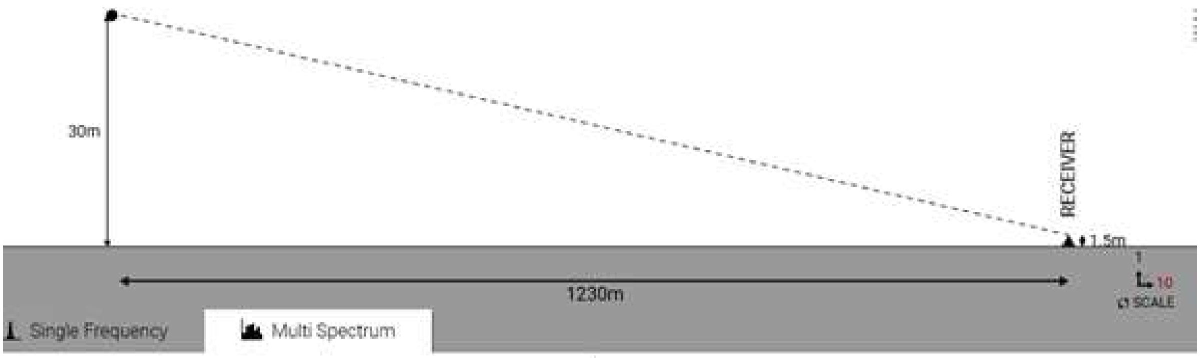
Total Sound Power Level 110.1 dB

Receiver ☐ A-Weight

| 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Hz |
|---|---|---|---|---|---|---|---|---|
| 29.3 | 30.4 | 30.9 | 32.5 | 29.3 | 19.1 | -1.6 | -57.5 | dB |

Resulting Sound Pressure Level 37.7 dB

### NSR 2 Nevis Road




Source

| 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Hz |
|---|---|---|---|---|---|---|---|---|
| 96.3 | 101.5 | 103.8 | 105.8 | 102.4 | 95.5 | 87.1 | 79.2 | dB |

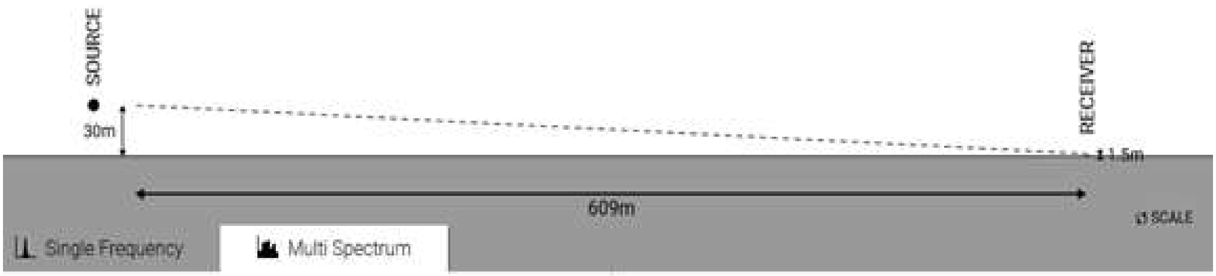
Total Sound Power Level 110.1 dB

Receiver ☐ A-Weight

| 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Hz |
|---|---|---|---|---|---|---|---|---|
| 27.1 | 27.5 | 28 | 28.9 | 25 | 13.4 | -12.3 | -87.3 | dB |

Resulting Sound Pressure Level 34.5 dB

**NSR 3: Inverlochy Villas**




Source

| 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Hz |
|---|---|---|---|---|---|---|---|---|
| 96.3 | 101.5 | 103.8 | 105.8 | 102.4 | 95.5 | 87.1 | 79.2 | dB |

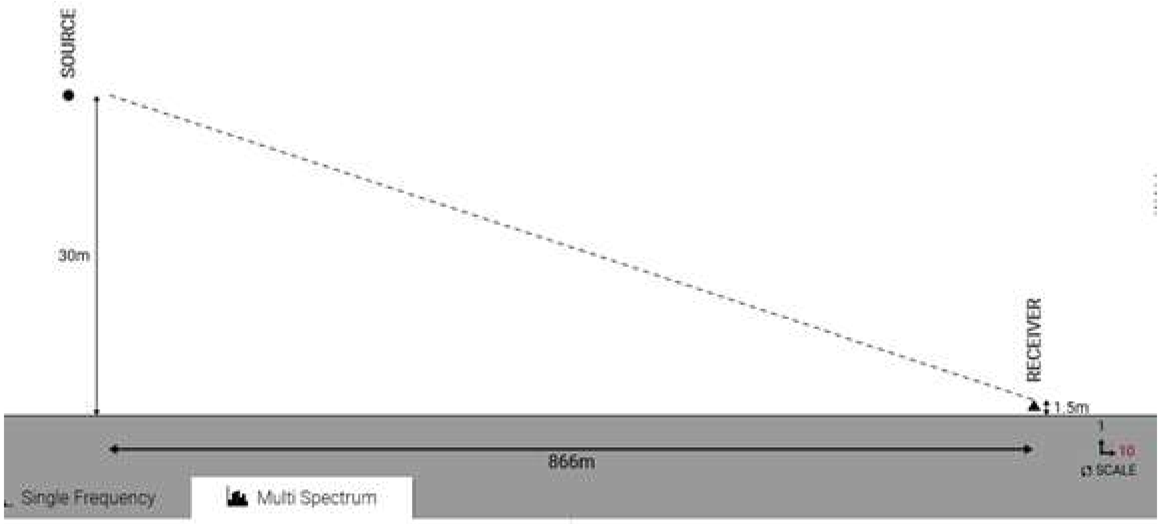
Total Sound Power Level 110.1 dB

Receiver ☐A-Weight

| 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Hz |
|---|---|---|---|---|---|---|---|---|
| 32.5 | 30.9 | 29.4 | 32.4 | 32 | 23.3 | 6.3 | -34.8 | dB |

Resulting Sound Pressure Level 38.7 dB

**NSR 4: Ben Nevis Hotel and Leisure Club**




ource

| 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Hz |
|---|---|---|---|---|---|---|---|---|
| 96.3 | 101.5 | 103.8 | 105.8 | 102.4 | 95.5 | 87.1 | 79.2 | dB |

Total Sound Power Level 110.1 dB

Receiver ☐A-Weight

| 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Hz |
|---|---|---|---|---|---|---|---|---|
| 29.5 | 30.6 | 31.1 | 32.6 | 29.5 | 19.4 | -1.2 | -56.3 | dB |

Resulting Sound Pressure Level 37.9 dB

# Appendix 11.1 Air Quality Impact Assessment

# Alvance Recycling and Billet Casting Facility EIA

## Air Quality Impact Assessment

| | |
|---|---|
| Client: | Alvance British Aluminium |
| Project/Proposal No: | 3539 |
| Version: | 1 |
| Date: | 2021-05-10 |

# Document Information

| | |
|---|---|
| Project Name: | Alvance Recycling and Billet Casting Facility EIA |
| Document Title: | Air Quality Impact Assessment |
| Client Name: | Alvance British Aluminium |
| Client Contact: | James Tangney |
| Client Address: | Lochaber Smelter, North Road, Fort William, PH33 6TH |
| Document Status: | Final for Issue |
| Author: | Jonas Beaugas |
| Reviewed: | Ruth Fain |
| Approved: | Annie Danskin |
| Date: | 2021-05-10 |
| Version: | 1 |
| Project/Proposal Number: | 3539 |
| ITPEnergised Office: | 4th Floor, Centrum House, 108-114 Dundas Street, Edinburgh, EH3 5DQ |

## Revision History

| Version | Date | Authored | Reviewed | Approved | Notes |
|---|---|---|---|---|---|
| 1 | 2021-05-10 | Jonas Beaugas | Ruth Fain | Annie Danskin | Issued to Client |
| | | | | | |
| | | | | | |
| | | | | | |

# Contents

# 1. Introduction

ITPEnergised has been commissioned by Alvance British Aluminium (the Applicant) to undertake an air quality impact assessment (AQIA) to accompany the planning application for an aluminium Recycling and Billet Casting Facility with associated hardstanding, landscaping and drainage (the Proposed Development) to be built and operated at the existing Lochaber Smelter, Fort William within the Highland Council (THC) administrative area.

The Proposed Development location and building footprint are shown on **Drawing 1**.

The AQIA considers potential impacts upon both human and designated ecological receptors.

Potential impacts have been assessed within defined study areas for the construction and operational phases of the Proposed Development.

This AQIA assesses potential impacts associated with the Proposed Development emissions sources solely and in combination with emissions from the Applicant's existing Smelter and Generators (the Smelter and Generators). Other emission sources in the area are assumed to be included in the derived background concentrations and are not explicitly modelled.

This AQIA has included:

- A desktop review of the local baseline air quality.
- Qualitative assessment of construction phase dust impacts in accordance with the Institute of Air Quality Management (IAQM) Assessment of Dust from Demolition and Construction Guidance (IAQM, 2014).
- Screening assessment of construction and operational phase traffic in accordance with the IAQM/Environmental Protection UK (EPUK) Guidance on Land-use Planning and Development Control: Planning for Air Quality (EPUK & IAQM, 2017).
- Air quality impact assessment of the Proposed Development upon human receptors in accordance with IAQM/Environmental Protection UK (EPUK) Guidance on Land-use Planning and Development Control: Planning for Air Quality (EPUK & IAQM, 2017).
- Critical level, nutrient nitrogen deposition and acid deposition impact assessments of the Proposed Development upon designated ecological receptors in accordance with:
    - Habitats Directive AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air (Air Quality Advisory Group, 2014);
    - Habitats Directive AQTAG21 Likely significant effect – use of 1% and 4% long-term thresholds and 10% short-term threshold (Air Quality Advisory Group, 2015).

The methodology used in this AQIA is consistent with the approach used for the 2017 AQIA undertaken for the previously consented Alloy Wheel Facility (AWP) (Planning Reference: 17/05202/FUL).

This AQIA has been prepared by air quality and dispersion modelling specialist Jonas Beaugas, Senior Consultant at ITPEnergised with over six years of experience; and; reviewed and managed by ITPEnergised Air Quality Lead and dispersion modelling specialist Annie Danskin, Associate Consultant and Chartered Environmentalist (CEnv), with over 21 years of experience.

# 2. Legislation, Policy and Guidelines

The following legislation, planning policy and guidance documents have been considered in the preparation of the AQIA.

## 2.1 Legislation

The UK's legislation and regulatory regime, along with national, regional and local planning policy play a key role in the prevention, control and minimisation of atmospheric emissions that are potentially harmful to human health and the environment. Air Quality Standards (AQS)[1] are used as assessment criteria for determining the significance of any potential changes in local air quality resulting from development proposals.

### 2.1.1 European Legislation Transposed into UK Law

The EU has published a Directive on Ambient Air Quality Assessment and Management which came into force in September 1996 (Council of the European Union, 1996). This Directive was intended as a strategic framework for tackling air quality consistently, through setting European wide air quality limit values in a series of daughter directives, superseding and extending existing European legislation. The first four daughter directives were placed into national legislation. A new EU air quality directive (European Parliament and the Council of the European Union, 2008) came into force in June 2008 and was transposed into The Air Quality Standards Regulations in England, Wales, Scotland and Northern Ireland in June 2010 (HM Government, 2010).The directive merged the four daughter directives and one Council decision into a single directive on air quality.

### 2.1.2 National Legislation and Strategy

The Environment Act 1995 (HM Government, 1995) required the preparation of a national air quality strategy setting Air Quality Objectives (AQOs) for specified pollutants and outlining measures to be taken by local authorities through the system of Local Air Quality Management (LAQM) and by others to work in pursuit of the achievement of these objectives. A National Air Quality Strategy (NAQS) was published in 1997 and subsequently reviewed and revised in 2000, and an addendum to the Strategy published in 2002. The current Strategy was published in July 2007 (Welsh Assembly Government, Scottish Executive, Department of the Environment, Department for Environment Food and Rural Affairs, 2007).

The AQOs which are relevant to LAQM have been set into Regulations namely Air Quality (Scotland) Regulations 2000, Air Quality (Scotland) Amendment Regulations 2002 and Air Quality (Scotland) Amendment Regulations 2016 (Scottish Executive, 2016), the latter of which introduces an additional statutory obligation for Scottish Local Authorities to comply with an annual mean standard for $PM_{2.5}$ to align with the World Health Organisation (WHO) guideline value (WHO, 2005).

The AQSs are set for the purpose of protecting human health, vegetation and ecosystems from certain harmful atmospheric pollutants. The Scottish standards take account of the EU objective values and are either effectively identical, or more stringent.

The standards applicable to this AQIA are presented in **Table 1**.

*Table 1 – AQS for Scotland Applicable to this Assessment*

| Pollutant | Concentration | Measured as |
|---|---|---|
| **Human Receptors** | | |
| Nitrogen dioxide ($NO_2$) | 200 µg/m$^3$ not to be exceeded more than 18 times a year | 1-hour mean |
| | 40 µg/m$^3$ | Annual mean |

[1] Air Quality Standards are concentrations recorded over a given time period, which are considered to be acceptable in terms of what is scientifically known about the effects of each pollutant on health and on the environment. They can also be used as a benchmark to indicate whether air pollution is getting better or worse.

| Pollutant | Concentration | Measured as |
|---|---|---|
| Particulate material ($PM_{10}$) | 50 µg/m$^3$, not to be exceeded more than 7 times a year | 24-hour mean |
| | 18 µg/m$^3$ | Annual mean |
| Sulphur Dioxide ($SO_2$) | 266 µg/m$^3$, not to be exceeded more than 35 times a year | 15-min mean |
| | 350 µg/m$^3$, not to be exceeded more than 24 times a year | 1-hour mean |
| | 125 µg/m$^3$, not to be exceeded more than 3 times a year | 24-hour mean |
| Benzene ($C_6H_6$)* | 3.25 µg/m$^3$ | Running annual mean |
| Carbon Monoxide (CO) | 10 mg/m$^3$ | Running 8-hour mean |
| **Ecological Receptors** | | |
| Nitrogen Oxides ($NO_x$) | 30 µg/m$^3$ | Annual mean |
| Sulphur Dioxide ($SO_2$) | 20 µg/m$^3$ | Annual mean |

* Note: Based on consultation with Scottish Environment Protection Agency (SEPA), the AQS for benzene has been used as a surrogate pollutant to assess total volatile organic compounds (TVOCs) and is considered to cover the worst-case scenario (Refer to **Section 3.5.9.2** and **Annex 1**).

The Department for Environment and Rural affairs LAQM Technical Guidance, LAQM TG(16) (DEFRA, 2018) provides advice on where the AQS for pollutants considered in this study apply. These are summarised in **Table 2**.

*Table 2 – Examples of where the AQS Apply*

| Averaging Period | Standards Should Apply to | Standards Should Not Apply to |
|---|---|---|
| 8-hour and 24-hour Means | All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties. | Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term. |
| 1-hour Mean | All locations where the annual mean, 24-hour mean and 8-hour mean apply plus: Kerbside sites of busy shopping streets; Parts of car parks, bus and railway stations, etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more; | Kerbside sites where the public would not be expected to have regular access. |

| | | |
|---|---|---|
| | Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer. | |
| 15-min | All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer. | |

#### 2.1.2.1 The Scottish Government Cleaner Air for Scotland Strategy

The Scottish Government Cleaner Air for Scotland (CAFS) strategy – The Road to a Healthier Future (Scottish Government, 2015), is a national strategy that sets out how the Scottish Government will deliver its commitment to further improving air quality to protect human health.

The CAFS strategy aims to help the Scottish Government achieve the ambitious goal “to have the best air quality in Europe”. A National Modelling Framework (NMF) and National Low Emission Framework (NLEF) has been developed to provide the tools and mechanism to put in place measures to improve air quality.

The majority of the 40 actions included in the CAFS strategy have now been completed or are ongoing and will be taken forward in parallel with new actions outlined in the updated CAFS2 due for publication before the end of 2021.

#### 2.1.2.2 Environmental Protection Act

Section 79, subsection (1)(d) of the Environmental Protection Act 1990 (UK Parliament, 1990) gives the following definitions of statutory nuisance relevant to odour:

“Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance”

Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

If the activity is regulated under the Pollution Prevention and Control (PPC) regulations, Scottish Environment Protection Agency (SEPA) may deal with nuisance issues arising if the nuisance relates to the regulated emissions.

#### 2.1.2.3 National Planning Framework 3

The National Planning Framework 3 (NPF3) was published in June 2014 (Scottish Government, 2014) and sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland.

The NPF3 sets out the Scottish Government’s development priorities and identifies national developments which support the development strategy.

The key planning outcomes for Scotland set out in the NPF3 are the following:

- “**A successful sustainable place** – supporting economic growth, regeneration and the creation of well-designed places;
- **A low carbon place** – reducing our carbon emissions and adapting to climate change;
- **A natural resilient place** – helping to protect and enhance our natural cultural assets and facilitating their sustainable use; and
- **A connected place** – supporting better transport and digital connectivity.”

Preparation of The National Planning Framework 4 (NPF4) is currently underway and is planned to be finalised for review in Parliament in 2021.

#### 2.1.2.4 PAN 51 – Planning, Environmental Protection and Regulation

Planning Advice Note (PAN) 51: Planning, Environmental Protection and Regulation (Scottish Executive, 2006) supports existing policy on the role of the planning system in relation to the environmental protection regimes and summarises the responsibilities of the environmental protection bodies.

With regard to air quality, PAN51 recognises that where proposals are within an Air Quality Management Area (AQMA) or adjacent to them, air quality is likely to be:

*"a material consideration for large scale proposals or if they are to be occupied by sensitive groups such as the elderly or young children or are likely to have cumulative effects"*

For proposals that are likely to yield a significant effect on local air quality, a detailed assessment of air quality impacts will be warranted. PAN 51 also states that:

*"it may be necessary to consider the cumulative effect of developments on air quality leading to a gradual deterioration".*

### 2.1.3 Local Air Quality Management

Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of administration under the system LAQM. This review and assessment of air quality involves considering present and likely future air quality against the objectives and reporting to the Scottish Government by means of an Annual Progress Report (APR). If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the objectives.

There is currently a single AQMA within the Highland Council (THC) administrative area; Inverness City Centre AQMA declared in 2014 due to the exceedance of $NO_2$ annual mean AQO.

The latest publicly available APR at the time of writing is the 2020 APR (THC, 2020).

## 2.2 Planning Policy

THC Local Development Plan (THC, 2012) includes three policies which make direct reference to air quality; namely:

- Policy 28 Sustainable Design
- Policy 72 Pollution
- Policy 73 Air Quality

The above planning policies have been considered as part of this assessment.

## 2.3 Guidance

The AQIA has been informed by the following guidance documents:

- IAQM Assessment of Dust from Demolition and Construction Guidance (IAQM, 2014);
- IAQM/EPUK Guidance on Land-use Planning and Development Control: Planning for Air Quality (EPUK & IAQM, 2017);
- EPS/RTPI Delivering Cleaner Air for Scotland: Development Planning & Development Management (EPS & RTPI, 2017);
- EA Air Emissions Risk Assessment for your Environmental Permit (EA, 2020);

- EA H1 Environmental Risk Assessment for Permits - Annex F: Air Emissions[2] (EA et Al, 2003);
- Habitats Directive AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air (Air Quality Advisory Group, 2014);
- Habitats Directive AQTAG21 Likely significant effect – use of 1% and 4% long-term thresholds and 10% short-term threshold (Air Quality Advisory Group, 2015);
- DEFRA LAQM Technical Guidance, LAQM TG(16) (DEFRA, 2018); and
- Air Pollution Information System (APIS) Critical Load Function Tool – Guidance (APIS, 2016).

For pollutants not included in the NAQS, the assessment has used Environmental Assessment Levels (EALs) from the H1 guidance (EA et Al, 2003). The EALs used in this assessment are provided in **Table 3**.

*Table 3 – EALs Used in this Assessment*

| Pollutant | Concentration | Measured as |
|---|---|---|
| **Human Receptors** | | |
| Hydrogen Fluoride (HF) | 250 µg/m$^3$ | 1-hour mean |
| Hydrogen Chloride (HCl) | 20 µg/m$^3$ | Annual mean |
| | 800 µg/m$^3$ | 1-hour mean |
| **Ecological Receptors** | | |
| Hydrogen Fluoride (HF) | 0.5 µg/m$^3$ | weekly mean |
| | 5 µg/m$^3$ | 24-hour mean |

For Dioxins/Furans, the Tolerable Daily Intake (TDI) of 2 pg /kg/day (picogramme as the World Health Organisation Toxic Equivalent per kilogram bodyweight per day) specified by the Committee on Toxicity (COT) (COT, 2001) was used as assessment criterion.

# 3. Scope and Methodology

## 3.1 Overview

There is currently no statutory guidance on the method by which an AQIA should be undertaken; therefore, this assessment has been carried out with reference to the guidance listed in **Section 2.3**.

[2] The 2010 H1 guidance has been withdrawn by the EA, however the 2003 guidance is still referenced on the SEPA website and can therefore be used in Scotland.

## 3.2 Scope of Work

The scope of work undertaken as part of this AQIA has included:

- Review of Proposed Development proposal, compilation of emission information and development of emissions inventory for the Proposed Development sources and existing emission sources within the wider site.
- Consultation with NatureScot (NS) and submission of a method statement to THC and SEPA.
- Desktop review of baseline conditions and derivation of representative background concentrations at sensitive receptors.
- Desktop review of the study area and selection of sensitive receptors.
- Qualitative assessment of construction phase impacts.
- Screening assessment of road traffic impacts during both construction and operational phases.
- Detailed dispersion modelling of proposed and existing process emissions and assessment of impacts upon human and ecological receptors.
- Derivation of significance of predicted effects in accordance with relevant guidance.

The pollutants emitted by the existing Smelter and Generators and the emissions sources forming part of the Proposed Development considered in this assessment are listed below:

- **$NO_x$ –** Nitrogen Oxides;
- **$NO_2$ –** Nitrogen dioxide;
- **$SO_2$ –** Sulphur Dioxide;
- **CO –** Carbon Monoxide;
- **$PM_{10}$ –** Particulate Matter ($\leq 10\mu m$);
- **HF –** Hydrogen Fluoride;
- **HCl –** Hydrogen Chloride;
- **Cl –** Chlorine;
- **TVOC (as Carbon)–** Volatile Organic Compound; and
- **Dioxins/Furans**.

Fine particulate matter ($PM_{2.5}$), are not included in the assessment as there are no monitoring data available or existing emission limit values (ELVs) for particle size fractions other than $PM_{10}$.

## 3.3 Consultation

ITPEnergised consulted with THC, SEPA and NS officers throughout the preparation of the AQIA.

A summary of the consultation exchanges is provided in **Table 4**.

*Table 4 - Summary of Consultation*

| Consultee | Summary of Consultation Response | Action / Response |
|---|---|---|
| Scottish Environment Protection Agency (SEPA) | SEPA provided their consultee response on the screening opinion to THC on 10th December 2020 which set out a description of matters to be addressed in an | ITPEnergised used this response to prepare a method statement for the AQIA. |

| Consultee | Summary of Consultation Response | Action / Response |
|---|---|---|
| | updated air quality impact assessment.<br><br>In February 2021 ITPEnergised issued a method statement for the AQIA to SEPA.<br><br>ITPEnergised engaged with SEPA throughout the process keeping the officer updated with findings and proposed approach including virtual meetings during which the method statement was confirmed as acceptable with the additional request to include a section on model uncertainty in the AQIA.<br><br>SEPA confirmed in their email of the 15th of March 2021 that "*the critical consideration* [for the Proposed Development] *is whether there has been any increase in impact at any of the designated areas above* [ecological receptors] *what was predicted for the Alloy Wheel Plant.*"<br><br>ITPEnergised queried the use of the Benzene AQS to assess impacts associated with TVOC emissions. On the 16th of March 2021 SEPA confirmed that "*The benzene air quality standard should be used for assessing TVOC impacts unless it can be demonstrated that there are more appropriate AQS/EALs. The use of benzene is considered to cover the worst-case scenario.*"<br><br>SEPA also confirmed the following:<br><br>*"a) The emission rates should be set using the emission limit values in the smelter permit not the latest sample data.*<br><br>*b) The sulphur dioxide release rate can be determined from using the anode content specified in the permit and the work the HSE team at the smelter did in establishing its relationship to the associated BAT-* | The Proposed Development design includes necessary abatement such that impacts at ecological receptors are less than those predicted for the consented Alloy Wheel Facility.<br><br>The assessment of TVOC has been undertaken using both the Benzene AQS and an alternative EAL of 0.3 mg/m$^3$. Justification for this approach is provided in **Section 3.5.9.2**.<br><br>The emission rates for the Smelter have been calculated from the current permitted ELVs. Existing Smelter sources have been modelled assuming continuous 24/7 operation as there are no restrictions on hours of operation in the permit.<br><br>The sulphur dioxide release rate for the Smelter has been calculated based on the permitted maximum production value of 47,500 T per year and $SO_2$ permit limit of 15 kg/t (Refer to **Annex 2**).<br><br>The biofuel generators have been modelled at their permitted maximum number of hours of 500 hr/year and are modelled to reflect the permit restrictions to operate only between 0700-2300 hours. |

| Consultee | Summary of Consultation Response | Action / Response |
|---|---|---|
| | *AEL in the Non-Ferrous Metals BAT conclusions. This was undertaken as part of last year's permit review.*<br><br>*c) The biofuel generators will need to be added as specified in the permit and operating using 500 hours annually."*<br><br>The above emails are provided in **Annex 1**. | |
| NatureScot (NS) | In February 2021 ITPEnergised issued the method statement for the AQIA to NS.<br><br>ITPEnergised also sought to confirm that the list of ecological receptors used as part of the AQIA undertaken for the previously consented AWP remained appropriate and provided an updated table including receptor locations, baseline concentrations and critical loads.<br><br>NS confirmed their agreement with the proposed method and receptors list.<br><br>Following consultation with SEPA; ITPEnergised consulted with NS to request the habitat dataset for the Ben Nevis SAC and to confirm the location of the selected sensitive receptors.<br><br>NS provided a link to the Habitat Map of Scotland (HabMoS) and in April 2021 requested that two receptors be added:<br>- NewEco18 – Oceanic Montane Bryophyte (H4060)<br>- NewEco19 – Snowbed Communities (H6150)<br><br>And two receptors moved: Eco13 and Eco4.<br><br>The above emails are provided in **Annex 1**. | Receptors Eco4 and Eco13 have been moved to the locations specified by NS and NewEco18 and NewEco19 have been added to the list of sensitive receptors considered in this AQIA. |

| Consultee | Summary of Consultation Response | Action / Response |
|---|---|---|
| The Highland Council (THC) | ITPEnergised issued the method statement to THC for comments; however, to date no response has been received. | - |

## 3.4 Study Area & Selected Receptors

### 3.4.1 Construction & Operational Phases – Traffic Emissions

The study area for traffic emissions has been derived in consultation with the appointed traffic consultant (Systra). The study area considered includes the A82 north and south of the Proposed Development site access, (refer to **Drawing 2**).

### 3.4.2 Construction Phase – Dust

The study area for the construction phase dust risk assessment has been defined in accordance with the with the IAQM Assessment of Dust from Demolition and Construction Guidance (IAQM, 2014) which stipulates that "an assessment will normally be required where there is:

*"A 'human receptor' within:*

- *350 m of the boundary of the site; or*
- *50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).*

*A [designated] 'ecological receptor' within:*

- *50 m of the boundary of the site;*
- *50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s)."*

The study area considered as part of the construction phase assessment is shown in **Drawing 2**.

There are >100 human receptors within the above buffers but no designated ecological receptors.

On that basis; the receptors brought forward as part of the assessment of construction phase dust impacts are:

- Human Receptors (Dust soiling); and
- Human Receptors (Human Health).

### 3.4.3 Operational Phase – Emissions to Air

The study area for the operational phase assessment of the Proposed Development emissions to air has been derived based on a review of the local area and professional judgment. The study area includes a 5km$^2$ area centred around the Proposed Development site within which a number of human receptors have been selected (Refer to **Drawing 3**). These typically includes the closest receptors to the Proposed Development in all directions.

Human receptors considered as part of the AQIA are consistent with those considered in the AQIA undertaken for the Alloy Wheel Facility, with the exception of R11 – North Road Retail Park which has been added to the list of receptors.

Ecological receptors considered in the AQIA include specific locations within the Ben Nevis Special Area of Conservation (SAC) which were specified by NS (then Scottish Natural Heritage) for the assessments submitted for the consented Alloy Wheel Facility (Planning Reference: 17/05202/FUL).

On the 20th of April 2021, NS requested that two receptors be added, namely NewEco18 – Oceanic montane bryophyte (with Habitat code H4060) and NewEco19 – Snowbed communities (H6150), and two receptors be moved Eco4 (RevisedEco4) – Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) (H8120) and Eco13 (RevisedEco13) – Calcareous rocky slopes with chasmophytic vegetation (H8210 ) (Refer to **Annex 1**). The list of ecological receptors has therefore been amended accordingly from those set out in the method statement.

The receptors brought forward in the assessment are therefore as listed in **Table 5.**

*Table 5 – Selected Receptors*

| ID on Drawing 3 | Description | Easting | Northing |
|---|---|---|---|
| **Human Receptors** | | | |
| R1 | Hotel near to the A82 | 211813 | 774897 |
| R2 | Residential Property on Grant Place | 211888 | 774499 |
| R3 | Residential Property on Telford Place | 211950 | 774438 |
| R4 | Inverlochy Nursery School | 211256 | 774458 |
| R5 | Residential Property on Lundy Gardens | 211531 | 774658 |
| R6 | Lochaber High School | 212408 | 775917 |
| R7 | Residential property on Glenmhor Terrace | 212414 | 775448 |
| R8 | Residential Property on Carrs Corner | 212859 | 775921 |
| ST1 | Fort William Football Pitch | 212123 | 774297 |
| R9 | Residential Houses on Achintee Road | 212236 | 774102 |
| R10 | Residential on Kilmallie Road | 211887 | 775617 |
| THC | Site of THC Monitor representative of sensitive receptors near Camanachd Crescent | 210853 | 774434 |
| R11 | North Road Retail Park | 211993 | 774957 |
| PR1* | Representative of land allocated for housing within THC LDP | 213125 | 775555 |
| PR2* | Representative of land allocated for housing within THC LDP | 213756 | 775952 |
| **Ecological Receptors** | | | |
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 214142 | 773275 |

| ID on Drawing 3 | Description | Easting | Northing |
|---|---|---|---|
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 217892 | 773265 |
| Eco3 | H4060 - Alpine and Boreal heaths | 213371 | 773597 |
| RevisedEco4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 215347 | 772105 |
| Eco5 | H7130 - Blanket Bogs | 213766 | 774568 |
| Eco6 | H91C0 - Caledonian forest | 215764 | 769201 |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 214385 | 772763 |
| Eco8 | H4030 - European Dry heaths | 213527 | 774710 |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 218129 | 772837 |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 213518 | 773488 |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 218800 | 771050 |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 213111 | 774500 |
| RevisedEco13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 217619 | 769520 |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 213111 | 774500 |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 215473 | 772659 |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 213756 | 775360 |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 213206 | 774811 |

| ID on Drawing 3 | Description | Easting | Northing |
|---|---|---|---|
| NewEco18 | H4060 - Oceanic Montane Bryophyte | 215573 | 772808 |
| NewEco19 | H6150 - Snowbed Communities | 217660 | 772808 |

* Included for consistency with the Alloy Wheel Facility AQIA as locations expected to be allocated for housing within THC LDP.

## 3.5 Dispersion Modelling & Data Processing Methodology

### 3.5.1 Overview

This AQIA has used the latest version of dispersion modelling software ADMS5. This is a modern dispersion model that has an extensive published track record of use in the UK for the assessment of local air quality impacts, including model validation and verification studies (Cambridge Environmental Research Consultants, 2020).

The dispersion modelling study has considered emissions from the Smelter and Generators operating at their permitted Emissions Limit Values (ELVs) and the Proposed Development at its proposed ELVs.

The significance of the change in pollutant concentrations has been assessed only for the process contribution (PC) from the Proposed Development at human and ecological receptors. However, total predicted environmental concentrations (PECs) at receptors include contributions from the Proposed Development, Smelter and Generators, and other sources included in the background concentrations.

Cumulative process contributions from the Proposed Development and the generators at ecological receptors are also provided in **Annex 5** as requested by SEPA.

### 3.5.2 Emissions Sources

A full emission inventory of the modelled sources included in the dispersion modelling study is provided in **Annex 2**.

The modelled source locations are shown on **Drawing 4**.

### 3.5.3 Operating Patterns

The operating pattern of each modelled source has been taken into consideration and was included in the dispersion modelling study. Operating patterns for each source and how they have been modelled are summarised in **Annex 2**.

Existing Smelter sources have been modelled assuming continuous 24/7 operation as there are no restrictions on hours of operation in the permit.

### 3.5.4 Building Downwash Effects

Buildings can have a significant effect on the dispersion of pollutants from sources close to them and increase the maximum predicted ground level concentrations. The main potential effect of a building is to entrain pollutants emitted in close proximity of the building, or from the roof of the building, into the cavity region in the immediate leeward side of the building, resulting in rapid mixing down to ground level. As a consequence, concentrations near the buildings can be increased, with downwind concentrations decreased.

Dimensions for existing and proposed buildings within the wider site have been provided by the Project Architect (Keppie).

A new water canning facility on the Smelter site is proposed which will be covered by a separate planning application. At the time of commencing AQIA, the water canning facility was anticipated to be located immediately west of the Proposed Development. Whilst not including any atmospheric emissions sources itself; the water canning facility in this location was recognised to have the potential to impact the dispersion of the emissions from the Proposed Development sources and therefore has been included in the modelling study. Sensitivity analysis has been undertaken to assess the potential impact of no building, a building in an east-west orientation and a building in a north-south orientation (Refer to **Drawing 4**). The sensitivity analysis found that the presence or absence and orientation of the water canning facility would result in the following maximum difference in PC at all selected receptors:

- Annual mean $NO_2$: 0.007 $\mu g/m^3$;
- Hourly mean (99.79th Percentile) $NO_2$: 0.49 $\mu g/m^3$; and
- Hourly mean (100th Percentile) $NO_2$: 0.28 $\mu g/m^3$;

It can therefore be concluded that the presence or absence and orientation of the water canning facility has no measurable impact upon dispersion and predicted concentrations were very similar for all scenarios.

The modelling study is based on results for the water canning facility with a north-south orientation, considered the most likely choice at the time of assessment. The findings of this AQIA are however representative of the current proposed situation with no water canning facility.

It is understood that at the time of submission, the Applicant is proposing locate the canning building at an alternative location on the existing Smelter site. Potential impacts associated with the canning building will be considered further as part of the planning application for this development.

Some existing and proposed buildings have “saw-tooth” pattern roofs. ADMS does not allow for the modelling of buildings with variable roof heights; therefore; buildings with pitched roofs have been modelled by using the average height between the lowest and highest part of the roof as provided by the architect.

Buildings with similar heights have been grouped together to simplify the building geometry and number of buildings within the model.

The building footprints and heights as modelled are shown in **Drawing 4**.

Full details of the canning building orientation sensitivity analysis are provided in **Annex 4**.

#### 3.5.5 Topographical Effects

The Proposed Development is located at the foot of the Nevis Range and the area in general can be considered to be complex topographically with steep gradients and defined valleys. The local topography has the potential to change the air flow and hence influence the dispersion of emitted pollutants accounting for recirculating flow and plume impaction, depending on the point source locations.

Terrain effects have therefore been included in the detailed modelling to account for the changing heights in the land around the Proposed Development. The terrain file included in the model covers an area extending approximately 10 km in each direction from the Proposed Development.

#### 3.5.6 Meteorological Data and Model Inputs

The dispersion model has used meteorological data representative of the local area to calculate atmospheric conditions at the Proposed Development. The closest world meteorological organisation (WMO) site is Aonach Mor, however the station is located at an altitude of 1,130 m above sea level and is therefore not considered representative of meteorological conditions at the receptors within the study area. Meteorological data have therefore been sourced from the second nearest station, Tulloch Bridge WMO station located approximately 23 km north-east of the Proposed Development site.

A sensitivity analysis of the use of Tulloch Bridge WMO Station versus Aonach Mor WMO Station at selected ecological receptors within the Ben Nevis SAC has been undertaken.

The surface roughness parameters are consistent with those used in the planning application for the previously consented AWP (0.5 m at dispersion site and 0.1 m at meteorological site). The Monin-Obukhov length ($L_{MO}$) has been changed from a value of 10m which is suitable for small towns, preventing the atmosphere from becoming extremely stable; to model-calculated values at both the dispersion site and meteorological site. Changing the $L_{MO}$ to model-calculated allows extremely stable conditions to be modelled. It is considered that stable conditions are important for inclusion in the model as they are likely to cause plume impaction on the western side of Ben Nevis, thus providing a conservative worst-case assessment.

The comparative study showed that for years 2016 to 2020, the use of meteorological data for Tulloch Bridge resulted in the highest predicted concentrations at the selected ecological receptors within the Ben Nevis SAC.

This assessment has therefore used five years of synoptic meteorological data (2016 to 2020) for Tulloch Bridge and reports on the maximum predicted concentrations across all five years at each selected sensitive receptor.

Meteorological year sensitivity analysis was undertaken for years 2016 to 2020 for Tulloch Bridge. The sensitivity analysis concluded that:

- Maximum concentrations at ecological receptors associated with the Proposed Development occurred with 2017 meteorological data;
- Maximum concentrations at long-term human receptors associated with the Proposed Development occurred with 2019 meteorological data; and
- Maximum concentrations at short-term human receptors associated with the Proposed Development occurred with 2020 meteorological data.

This assessment reports on the worst case predicted concentrations at each receptor over the 2016-2020 period. The worst-case meteorological years as detailed above have been used to prepare contour plots.

Full details of the meteorological sensitivity analysis are provided in **Annex 4**.

### 3.5.7 Modelling domain

In addition to the selected receptors listed in **Table 5**; a detailed calculation grid was included in the model runs in order to calculate concentrations across the local area and determine the locations of maximum impact of emissions, ensuring no "hot-spot" locations were missed. The calculation grid was defined to provide a grid resolution of 25 m x 25 m spacing which enabled detailed contour plots of pollution concentration to be prepared.

### 3.5.8 Derivation of Background Concentrations

There are no background monitoring sites within the study area. There are however five THC operated monitoring sites within the study area; one suburban automatic site (FW1) monitoring $NO_2$ and $O_3$, and four roadside passive diffusion tubes (PDT)(FW1 A – D) monitoring $NO_2$ (THC, 2020).

Measured concentrations at FW1 are representative of concentrations in a suburban area and concentrations measured at the PDTs are representative of concentrations along the A82 (Belford Road and North Road).

There are no THC monitoring sites within the study area which monitor concentrations of other pollutants considered in this assessment (Refer to **Section 3.2**).

On that basis background concentrations at selected receptors have been derived as follows:

- **$NO_x$ –** Background concentrations for $NO_x$ at ecological receptors have been sourced from APIS (JNCC Et Al., 2016);
- **$NO_2$ –** Measured $NO_2$ concentration at FW1 are higher than the Scottish Air Quality 2018-base background map concentrations (Scottish Air Quality, 2020) across the study area. In a conservative approach, measured concentrations from 2019 (latest non covid-19 pandemic impacted data available) at FW1 have been used to characterise the background concentrations at all selected receptors away from the A82.

Averaged measured concentrations at FW1A-D for 2019 have been used to characterise the background concentrations at selected receptors near the A82.

- **$SO_2$ –** Background concentrations for $SO_2$ at human receptors have been sourced from the Department for Environmental, Food and Rural Affairs (DEFRA) 2001-based background maps for 2001 (DEFRA, 2001).

  Background concentrations for $SO_2$ at ecological receptors have been sourced from APIS (JNCC Et Al., 2016);

- **CO –** Background concentrations for CO have been sourced from the Department for Environmental, Food and Rural Affairs (DEFRA) 2001-based background maps for 2001 (DEFRA, 2001).
- **$PM_{10}$ –** Background concentrations for $PM_{10}$ have been sourced from the Scottish Air Quality 2018-based background maps for 2019 (Scottish Air Quality, 2020).
- **HF –** Background concentrations for HF have been sourced from the Guidelines for Halogens and Hydrogen Halides in Ambient Air for Protecting Human Health against Acute Irritancy Effects report which states that *"A modelling study suggested that the natural background concentration of fluoride was 0.61 x 10-6 ppm (0.5 x $10^{-6}$ mg/$m^3$). When anthropogenic emissions were included, the background concentration increased to 3.66 x 10-6 ppm (3 x $10^{-6}$ mg/$m^3$)"* (DEFRA, 2002)**.**
- **HCl –** Background concentrations for HCl have been sourced from the last full year of available data (2014) from the UK Centre for Ecology & Hydrology Acid Gases and Aerosols Monitoring Network (UK Centre for Ecology & Hydrology , 2014).
- **TVOC –** Background concentrations for TVOC have been sourced from the Department for Environmental, Food and Rural Affairs (DEFRA) 2001-based background maps for benzene (DEFRA, 2001).
- **Dioxins/Furans–** The average UK daily intake of dioxins and dioxin-like substances has been sourced from the DEFRA and Environment Agency report "Contaminants in Soil: Collation of Toxicological Data and Intake Values for Humans - Dioxins, Furans and Dioxin Like PCB" (DEFRA and Environment Agency, 2003).

All or part of the existing emissions sources associated with the Smelter and Generators are assumed to be captured in the derived background concentrations at human receptors within Fort William, however there are other smaller industrial sources that will also contribute to the background concentrations at these locations. Industrial source contributions were not sector-removed from background concentrations, therefore, in some locations, there will be double-accounting for the emissions associated with the Smelter and the Generators[3]. The derived background concentrations at the human receptors are therefore considered to be highly conservative.

Derived background concentrations at selected receptors are summarised in **Annex 3**.

### 3.5.9 Results Processing

#### 3.5.9.1 Treatment of Nitrogen Dioxide

Emissions of $NO_x$ comprise both $NO_2$ and NO (nitric oxide). Emissions of $NO_x$ will undergo oxidation in the atmosphere to form $NO_2$, however the rate of conversion will depend on a number of factors before equilibrium in the atmosphere is reached.

In line with EA H1 Environmental Risk Assessment for Permits Guidance – Annex F (EA et Al, 2010), this assessment has considered $NO_x$ emissions as 70% $NO_2$ when considering compliance with the long-term

[3] At ecological receptors within the Ben Nevis SAC, contributions from the Smelter and other industrial sources have been assumed to be included in the selected background concentrations and predicted modelled PCs from the Smelter have not been considered in the PEC calculations. PCs from the Proposed Development and the generators have however been considered at the request of SEPA as the generators have operated infrequently but are permitted to operate for up to 500 hours per year and could add to the total concentration (PEC) at the ecological receptors. This is consistent with the approach used in the 2017 AQIA for the consented scheme.

(annual mean) AQS and as 35% $NO_2$ when considering compliance with the short-term (1-hour mean) AQSs. Using these proportions is considered to be a worst-case assessment.

#### 3.5.9.2 Treatment of VOCs and Dioxins/Furans

*VOCs*

There is the potential for emissions of VOCs and dioxins/furans from aluminium recycling processes, which could arise due to paints and coatings used on the recycled material. For the Proposed Development, a typical source of recycled material is anticipated to be aluminium window and door frames and automobile scrap.

All scrap would be stripped of polyamide coatings prior to delivery to site, however, should any residual material remain, a review of a declaration sheet from a manufacturer of such commonly used coatings (Technoform) shows the absence of hazardous chemicals.

In addition, a typical Safety Data Sheet for a commonly used aluminium powder coating for industrial use (Axalta) confirms that the mixture does not contain any substances that are considered to be a persistent Bio-accumulative Toxins (PBTs) or very Bio-accumulative (vPvB) substances, and the Technical Manager of the Aluminium Confederation confirmed in email correspondence that powder coatings do not contain any VOCs.

This information is provided in **Annex 2**.

It is therefore considered that the risk of VOCs and Dioxins/Furans arising from the recycling process at the Proposed Development will be negligible and any trace amounts would be destroyed in the furnace, however, as an extreme worst-case, the emissions of TVOC and dioxins/furans have been modelled at the BAT emission limit values for recycling processes.

The predicted total TVOCs have been assessed against the annual mean AQS for benzene as an extreme worst case, and against a value of 0.3 mg/m$^3$ which is considered to be a low level of concern for human health for TVOCs in air (TECAM Group, 2019).

*Dioxins/Furans*

The predicted annual mean concentrations of dioxins/furans from the Proposed Development have been converted from µg/m$^3$ to pg/m$^3$, and then to a toxic equivalent concentration using the maximum possible international toxic equivalent factor of 1, (expressed as pg I-TEQ /m$^3$. The TEQ was converted to an average daily dose value by inhalation ($ADD_{inh}$) per average adult and child expressed as pg I-TEQ/kg/day using the following equation from the United States Environmental Protection Agency's Human Health Risk Assessment Protocol (HHRAP) (US Environmental Protection Agency, 2021):

$$ADD_{inh} = C_{air} \times IR \times ET \times EF \times ED/(BW \times AT)$$

$ADD_{inh}$ = average daily dose value by inhalation (pg I-TEQ/kg-day)

$C_{air}$ = concentration of contaminant in air (pg/m$^3$)

IR = Inhalation Rate (m$^{3/}$hr)

ET = Exposure time (hours/day)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

BW = Average body weight (kg)

AT = Averaging Time (years)

The calculation of $ADD_{inh}$ is not a complete human health risk assessment for toxic substances but provides an indicative value for the potential for harm from dioxins/furans, should they be emitted from the Proposed Development.

The $ADD_{inh}$ due to the Proposed Development has been assessed against the Tolerable Daily Intake (TDI) of 2 pg /kg/day (picogramme as the World Health Organisation Toxic Equivalent per kilogram bodyweight per day) specified by the Committee on Toxicity (COT) (COT, 2001).

#### 3.5.9.3 Predicted Environmental Concentration (PEC) Calculations

The concentrations of emitted pollutants from the Proposed Development (the Process Contribution (PC)) have been predicted using air dispersion modelling software ADMS5 and combined with the contribution from all other sources included in the background concentrations to obtain the total Predicted Environmental Concentration (PEC).

The PEC calculated at human receptors includes background concentrations, as well as PC from the Proposed Development, the Smelter and Generators. The PEC calculated at ecological receptors includes background concentrations, as well as PC from the Proposed Development and the generators.

The PECs for long-term concentrations have been calculated as follows:

- PEC for long-term concentrations: PC + the background.

For short-term PECs the EA web-based guidance (EA, 2020) states the following:

*"When you calculate background concentration, you can assume that the short-term background concentration of a substance is twice its long-term concentration."*

PECs for short-term concentrations have therefore been calculated as follows:

- PEC for short-term concentrations: PC + twice the background

For the calculation of PECs 'short-term' relates to averaging period of up to 1-hour and 'long-term' relates to averaging period greater than 1-hour.

#### 3.5.9.4 Nutrient Nitrogen Deposition Modelling

The modelling of nutrient nitrogen deposition has been undertaken following the approach and with recommended deposition velocities and conversion factors described in the Habitats Directive AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air (Air Quality Advisory Group, 2014).

The deposition velocity for $NO_2$ used in the assessment is 0.0015 m/s as recommended in AQTAG06 for Grassland.

The modelled total deposition at each receptor was converted from µg/m$^2$/s to kg N/ha/yr using the conversion factors from AQTAG06 of 95.9 for $NO_2$.

#### 3.5.9.5 Acid Deposition Modelling

The assessment of acid deposition has included dry deposition of $NO_2$ and $SO_2$ and wet and dry deposition of HCl as recommended in the Habitats Directive AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air (Air Quality Advisory Group, 2014).

In line with EA H1 Environmental Risk Assessment for Permits Guidance – Annex F (EA et Al, 2010), this assessment has considered $NO_x$ emissions as 70% $NO_2$.  Using this proportion is considered to be a worst-case assessment.

The dry deposition velocities used in the assessment were 0.0015 m/s, 0.012 m/s and 0.025 m/s for $NO_2$, $SO_2$ and HCl respectively. The wet deposition washout coefficient ($\Lambda$) for HCl was calculated by ADMS5 using the following equation:

$$\Lambda = \mathrm{A}P^{B}$$

Where P is the precipitation rate and A&B are constants.

The model has used the default values of A= 0.0001 and B=0.64.

The modelled total deposition at each receptor was converted from µg/m$^2$/s to keq/ha/yr (kg equivalent acid deposition) using the conversion factors from AQTAG06 of 6.84, 9.84 and 8.63 for $NO_2$, $SO_2$ and HCl respectively.

### 3.5.10 Abnormal Operations

The potential effects of abnormal operations cannot be accurately modelled at this planning application stage as the process design and controls are not finalised, however, an attempt to represent abnormal operations has been included assuming the Proposed Development is operating at Best Available Technique (BAT) Emission Limit Values (ELVs) instead of the proposed abated ELVs, i.e. representing a failure of proposed abatement equipment. The BAT ELVs for the Proposed Development are provided in **Annex 2**.

Should abatement measures fail, resulting in abnormal emissions, the process will be alarmed and shut-down within 15-minutes. This is consistent with control measures in place in the existing Smelter.

On that basis the Proposed Development emissions have been modelled at BAT ELVs to obtain the maximum (100$^{th}$ Percentile) 15-minute pollutant concentrations for the worst meteorological year on average (2020 for short-term) at selected human receptors. The calculated change in PC associated with abnormal operations has been compared with the following short-term EALs:

- **$NO_2$ –** 200 µg/m$^3$ hourly mean (Welsh Assembly Government, Scottish Executive, Department of the Environment, Department for Environment Food and Rural Affairs, 2007)
- **$PM_{10}$ –** 50 µg/m$^3$ daily mean (Welsh Assembly Government, Scottish Executive, Department of the Environment, Department for Environment Food and Rural Affairs, 2007)
- **HF –** 250 µg/m$^3$ (EA et Al, 2003)
- **HCl –** 800 µg/m$^3$ (EA et Al, 2003)
- **VOC –** benzene AQS of 208 µg/m$^3$ hourly mean (EA et Al, 2003) and High and Low Level of Concern TVOC Level of 0.3 mg/m$^3$ and 3 mg/m$^3$ (TECAM Group, 2019).

The impacts of short-term abnormal releases of CO and Dioxins/Furans have not been considered as part of this assessment as potential impacts associated with those pollutants would only occur over a period significantly longer than the 15-minute abnormal release period.

### 3.5.11 Consideration of Odour and Fugitive Dust

The potential for odour impacts due to the Proposed Development arises with the potential for emissions of VOCs. As discussed in **Section 3.5.9.2**, the emissions of VOCs are considered to be negligible and therefore it is considered unlikely that there will be odour impacts associated with the Proposed Development. No odour assessment has been carried out in this AQIA.

The potential for fugitive dust impacts is considered to be low as the risk of fugitive dust emissions occurring is low. The recycled material is covered in transit, it is transferred and handled on-site indoors, and there are no shredding operations on-site. Although the process design and controls are not yet finalised, the proposed air handling systems include bag filters and vessels to contain dust removed from the filters by compressed air. It is recognised that these can fail and are acknowledged as a potential source of fugitive dust emission. Fugitive emissions from air handling systems will be assessed at permit application stage when the process design is finalised.

### 3.5.12 AERMOD Modelling Comparison

A selection of ADMS5 model runs were repeated using the AERMOD model in order to compare predicted concentrations, increase confidence in the ADMS5 predictions, and, to provide a better understanding of any model uncertainties.

The focus of the comparison was the prediction of annual and hourly mean concentrations of $NO_2$ at the selected human health receptors and the annual mean $NO_x$ concentrations at ecological receptors. $NO_x$ is the pollutant with the highest mass emission rate from the Proposed Development.

The AERMOD results are provided in **Annex 4** and can be compared with the tables of results for $NO_2$ and $NO_x$ with ADMS5 in **Annex 5**.

In summary, the predicted total annual mean $NO_2$ concentrations at human receptors tend to be slightly higher with AERMOD for receptors closest to the Proposed Development and lower for those further away from the Proposed Development. There is a negligible difference in the predicted concentrations due to emissions from the Proposed Development only across all the receptors. This suggests that the building downwash effects on emissions from the existing Smelter and Generators are more dominant in AERMOD than in ADMS5.

When comparing the results with the assessment criteria, the outcome of impact assessment is unchanged. For both models, the maximum total concentration is predicted at the same location and there is no risk of exceedance of the annual mean AQS.

The same pattern is observed for the short term calculations, with higher predicted hourly concentrations using AERMOD at receptors closest to the Proposed Development, dominated by emissions contributions from existing sources.

From the ADMS5 sensitivity analyses, the maximum predicted annual mean $NO_2$ concentrations at human receptors were found to be greatest when using Tulloch Bridge meteorological data from 2019. AERMOD was run for this scenario over the entire study area and the contour plots of annual mean concentrations of $NO_x$ from both models are shown in **Drawing 23**.

AERMOD is restricted in terms of the number of grid points that can be defined which led to a lower level of detail in the model predictions. The ADMS5 runs were carried out at double the grid resolution of the AERMOD runs providing a more reliable prediction of concentrations across the entire study area.

The contour maps show the greater influence of the buildings on the dispersion pattern with AERMOD than with ADMS with the maximum concentrations predicted closer to the site. The contour maps also highlight that the topographical effects are more influential with ADMS 5 representing the change in flow field around and over the mountain and predicting higher concentrations within the Ben Nevis SAC than AERMOD. In AERMOD, plume impaction on the mountainside is evident in the contour map, but there is no modelling of flow around and over the mountainside. The Proposed Development process contributions were higher at all ecological receptors with ADMS5.

When comparing the ADMS5 annual mean results for $NO_x$ and $NO_2$ with those predicted by AERMOD, the trend will be the same for all modelled pollutants; i.e. if the predicted annual mean concentration of $NO_x$ at ecological receptors is higher with ADMS5, then the predicted annual mean concentrations of all other pollutants that are included in the calculation of deposition effects will also all be higher at all ecological receptors than those predicted using AERMOD.

The choice of model does not materially affect the outcome of assessment at human receptors, but it is considered that AERMOD is not accurately modelling the variation in flow field due to the complex topography of Ben Nevis. It is concluded that the results with ADMS5 represent worst-case impacts at ecologically sensitive receptors and no further model comparisons are required.

### 3.5.13 Model Uncertainty and Conservative Assumptions

This AQIA has been informed by the sensitivity analysis carried out in the 2017 AQIA for the consented Alloy Wheel Facility and the further analysis detailed in **Annex 4** and therefore model uncertainties have been appropriately considered.

Furthermore, the AQIA is considered to be conservative for the following reasons:

- The AQIA is based on the highest predicted concentrations over the five years of meteorological data considered (2016-2020).
- The AQIA has used Tulloch Bridge WMO Station rather than Aonach Mor WMO Station resulting in the worst-case predicted concentrations at receptors within the Ben Nevis SAC being significantly higher. It can however be argued that Aonach Mor WMO Station is more representative of the

meteorological conditions at some habitat locations at higher altitude on Ben Nevis, and therefore PCs will be lower than those included in the AQIA at some receptors.

- The AQIA has used conservative background concentrations in Fort William without any sector-removal (refer to **Section 3.5.8**), therefore the PECs will in some places double account for the contributions from the Smelter and Generators (Refer to **Footnote 3**).
- PEC concentrations include contributions from the generators operating at their permitted number of hours (500 hours per year), however, to date the generators have not operated for more than 50 hours per year. It should also be noted that the Applicant is currently considering decommissioning these generators.
- Emissions from the Smelter have been modelled at permitted ELVs, whereas, recent annual monitoring shows that the Smelter emissions concentrations are routinely lower than permitted ELVs.
- Emissions from the Smelter have been modelled as continuous 24/7 emissions, whereas, several sources routinely operate in day-shift hours only and for less than seven days per week.
- Emissions from the Proposed Development have been modelled as continuous 24/7 emissions. It is likely that there will be periods when not all furnaces are operational simultaneously, depending on production rates.
- The emissions from the proposed development have been calculated assuming 100,000 tonnes of billet production per annum using 100% recycled material. In reality, and dependant on the billet product specification and availability of recycled material; a proportion of the material used will comprise primary aluminium from the existing Smelter. When primary aluminium from the existing Smelter is used, the emissions from the melting furnaces will be significantly lower than have been assumed in this AQIA.
- The $SO_2$ release rate for the Smelter has been calculated based on the permitted maximum production value of 47,500 T per year and $SO_2$ permit limit of 15 kg/t (Refer to **Annex 2**).
- Emissions of Dioxins/Furans and TVOCs from the Proposed Development have been included, modelled at BAT ELVs, and assessed against the most stringent criteria, however it is considered that the risk of these emissions arising from the process is low and the predicted effects are a significant over-estimate.

## 3.6 Assessment Methodology

### 3.6.1 Construction & Operational Phases – Traffic Emissions Screening

Construction phase and operational phase traffic generations have been screened against the EPUK and IAQM land-Use Planning & Development Control guidance Stage 2 criteria (EPUK & IAQM, 2017) of:

*"A change of Light Duty Vehicle (LDV) flows of:*

- *More than 100 Annual Average Daily Traffic (AADT) within or adjacent to an Air Quality Management Area (AQMA);*
- *More than 500 AADT elsewhere;*

*A change of Heavy Duty Vehicle (HDV) flows of:*

- *More than 25 AADT within or adjacent to an AQMA;*
- *More than 100 AADT elsewhere."*

If the Proposed Development construction phase and operational traffic generation do not exceed the above criteria, a detailed assessment of traffic emissions is not required.

### 3.6.2 Construction Phase - Dust

The IAQM guidance on the assessment of dust from demolition and construction (IAQM, 2014) was used in this assessment to determine the risk category due to dust arising from the construction phase of the Proposed Development upon human receptors.

The Proposed Development risk category (negligible, low, medium or high) has been allocated for each relevant activity (demolition, earthworks, construction and trackout) based on the following two factors:

- The scale and nature of the works, which determines the potential dust emission magnitude as small, medium or large; and
- The sensitivity of the area to dust impacts, which is defined as low, medium or high sensitivity.

These two factors were then combined to determine the risk category with no mitigation applied for each relevant activity.

### 3.6.3 Operational Phase – Emissions to Air

#### 3.6.3.1 Assessment of Impacts upon Human Receptors

The IAQM/EPUK Guidance on Land-use Planning and Development Control: Planning for Air Quality (EPUK & IAQM, 2017) provides a suggested framework of impact descriptors with respect to assessment of long-term (annual mean) and short-term (1-hour mean or less) air quality objectives. The guidance presents a practical way of assigning a meaningful description to the degree of an impact, by expressing the magnitude of incremental change as a proportion of a relevant assessment level which is summarised below.

The change in pollutant concentrations with respect to baseline concentrations has been assessed at selected representative receptors within the study area. The absolute magnitude of pollutant concentrations with the Proposed Development is also described, and this is used to consider the risk of the AQSs being exceeded in each scenario.

The criteria used to assess the significance of impact at long-term and short-term receptors are summarised in **Table 6** and **Table 7** respectively.

*Table 6 - Impact Descriptors for Long-term Receptors*

| Long Term Average Concentrations at Receptor in Assessment Year | % Change in Concentration Relative to Air Quality Assessment Level (AQAL) | | | |
|---|---|---|---|---|
| | 1 | 2-5 | 6-10 | >10 |
| 75% or less of AQAL | Negligible | Negligible | Slight | Moderate |
| 76-94% of AQAL | Negligible | Slight | Moderate | Moderate |
| 95-102% of AQAL | Slight | Moderate | Moderate | Substantial |
| 103-109% of AQAL | Moderate | Moderate | Substantial | Substantial |
| 110% or more of AQAL | Moderate | Substantial | Substantial | Substantial |

Note: A change of less than 0.5% of the AQAL is so small as to be described as Negligible. The EPUK and IAQM refer to the AQSs as AQAL.

The IAQM guidance specifies that when considering short-term concentrations, the study should consider the maximum predicted hourly concentration due to the process in any year and should be assessed "without the need to reference background or baseline concentrations".

*Table 7 - Impact Descriptors for Short-term Receptors*

| Maximum Process Contribution Relative to AQAL | 11-20% | 21-50% | >51% |
|---|---|---|---|
| **Magnitude** | Small | Medium | Large |
| **Impact Descriptor** | Slight | Moderate | Substantial |

Note: A change of less than 10.5% of the AQAL is to be described as Negligible.

There are no available guidance or methods to assess impacts associated with AQSs with averaging periods between one hour and one year. For such AQSs the assessment is based on professional judgment and mainly refer to the achievement of the AQSs at relevant sensitive receptors.

#### 3.6.3.2 Dioxins/Furans

Dioxins/Furans have not been compared against an AQAL. Instead, predicted annual mean concentrations from the Proposed Development have been converted to a daily intake by inhalation for assessment against the Tolerable Daily Intake (TDI) (COT, 2001).

#### 3.6.3.3 Assessment of Impacts upon Ecological Receptors

There is no set method to derive impacts upon ecological receptors, rather AQTAG21 (Air Quality Advisory Group, 2015) provides a method to derive potential likely significant effect (Refer to **Section 3.6.4.2**).

The predicted PC for the Proposed Development solely and the predicted PEC for the Proposed Development cumulatively with the generators, have been calculated as a percentage of the critical levels, nutrient nitrogen critical loads, and the critical load function for total acid deposition at all selected ecological receptors.

The APIS critical load function guidance (JNCC Et Al., 2016) was used to determine the parameters to be used in the calculations to assess exceedance of the critical load function, and the PC and PEC as percentage of the critical load function at all selected ecological receptors.

### 3.6.4 Assessment of Significance

#### 3.6.4.1 Construction Phase (Human and Ecological Receptors) and Operational Phase (Human Receptors)

The derived IAQM risk categories (construction) and impact descriptors (operation) at individual receptors have also been considered for the Proposed Development in overall terms. The potential for the Proposed Development to contribute to or hinder the successful implementation of policies and strategies for the management of local air quality over a larger domain than at individual receptors, was considered if relevant and overall risk categories/impact descriptors derived.

**Table 8** summarises how the significance of effects of the overall risk categories/impact descriptors have been derived as part of this AQIA.

*Table 8 – IAQM Risk Categories / Impact Descriptors and Resulting Significance*

| IAQM Risk/Impact Descriptor | Significance |
|---|---|
| High/Substantial | A significant effect that is likely to be a material consideration in its own right. |
| Medium/Moderate | A significant effect that may be a material consideration in combination with other significant effects; but is unlikely to be a material consideration in its own right. |
| Low/Slight | An effect that is not significant but that may be of local concern. |
| Negligible | An effect that is not significant. |

#### 3.6.4.2 Operational Phase (Ecological Receptors)

The significance of effects at ecological receptors has used the criteria provided in **Table 9**.

*Table 9 - Summary of 'likely significant effect' threshold for all installations with the exception of intensive farming*

| If PC… | Then… |
|---|---|
| < 1% long-term benchmark; critical level and load | Conclude 'no likely significant effect' alone or in-combination |
| > 1% long-term benchmark; critical level and/or load | There is a potential for a likely significant effect, consider the Predicted Environmental Concentration (PEC):<br>PEC: PC + background |
| < 10% short-term benchmark; critical level | Conclude 'no likely significant effect' alone or in-combination |
| > 10% short-term benchmark; critical level | Conclude potential for 'likely significant effect' alone and in-combination |
| **If PEC…** | **Then…** |
| < 70% long-term benchmark; critical level and load | Conclude 'no likely significant effect' alone and in- combination and proceed with permit determination. |
| > 70% long-term benchmark; critical level and/or load | Conclude potential for 'likely significant effect' alone and in-combination |

In accordance with AQTAG21 'long-term' relates to averaging period of one year and 'short-term' relates to averaging period of less than one year.

Where it is concluded that there is the potential for 'likely significant effect", engagement with NatureScot will be required and there may be a need for further assessment.

#### 3.6.4.3 Dioxins/Furans

For Dioxins/Furans, the assessment of significance has used the same criteria for the PC and PEC as for the ecological receptors using the TDI as the long-term benchmark.

# 4. Baseline Conditions

## 4.1 Baseline - Dust

A background level of dust exists in all urban and rural locations in the UK. Dust can be generated on a local scale from vehicle movements and from the action of wind on exposed soils and surfaces. Dust levels can be affected by long-range transport of dust from distant sources into the local vicinity.

Residents within the study area currently experience dust deposition at a rate that is determined by the contributions of local and distant sources. This baseline rate of soiling is considered normal and varies dependent on prevailing climatic conditions. The tolerance of individuals to deposited dust is therefore shaped by their experience of baseline conditions.

Typical existing local sources of particulate matter includes wind-blown dust from agricultural land, exhaust emissions from energy plant, industry (including the Smelter and Generators) and road vehicles, brake and tyre wear from road vehicles and the long-range transport of material from outside the wider area.

There are no THC monitoring site measuring particulate matter within the study area. The baseline levels of dust within the study area have therefore been characterised using the 2018-base Scottish Air Quality $PM_{10}$ (Scottish Air Quality, 2020) background map concentrations for year 2019.

All potential sources of dust within the area have been present for a significant amount of time and are therefore captured within the background maps.

$PM_{10}$ background map concentrations for 2019 within the study area range between 6.48 to 7.03 $\mu g/m^3$ and are therefore significantly below the annual AQS of 18 $\mu g/m^3$ (<40% of the AQS).

## 4.2 Baseline – Air Quality

Due to the lack of THC monitoring sites, other than those monitoring $NO_2$, within the study area; baseline concentrations at receptors within the study area have been characterised using the same approach used to derive background concentrations at selected receptors (Refer to **Section 3.5.8**). Baseline concentrations are as follows:

**Human Receptors:**

- **$NO_2$ –** 8.1 to 22.0 $\mu g/m^3$ [4]
- **$SO_2$ –** 1.41 to 3.69 $\mu g/m^3$
- **CO –** 0.12 to 0.13 $mg/m^3$
- **$PM_{10}$ –** 6.40 to 7.03 $\mu g/m^3$
- **HF –** 0.003 $\mu g/m^3$
- **HCL –** 0.39 $\mu g/m^3$
- **TVOC –** 0.09 to 0.12 $\mu g/m^3$
- **Dioxins/Furans –** Average daily intake of 0.03 pg ITEQ/kg-BW/day

**Ecological Receptors:**

- **$NO_x$ –** 2.02 $\mu g/m^3$
- **$SO_2$ –** 0.53 $\mu g/m^3$
- **HF –** 0.003 $\mu g/m^3$

Baseline concentrations are significantly below the relevant standards and air quality within the study is therefore good.

## 4.3 Baseline – Deposition

Baseline nutrient nitrogen and acid deposition at selected ecological receptors within the Ben Nevis SAC are provided in **Annex 3**.

Baseline nutrient nitrogen deposition is below the maximum critical load relevant for the sensitive habitat at all selected ecological receptors.

[4] $NO_2$ concentrations have been derived from THC 2020 Annual Progress Report (THC, 2020)

Baseline acid deposition is above the maximum critical load relevant for the sensitive habitat at 12 of the 17 selected receptors and below the maximum critical load at five of the 17 selected receptors[5].

# 5. Assessment Results

## 5.1 Construction Phase

### 5.1.1 Construction Phase – Dust

The construction dust risk assessment detailed in **Annex 6** concluded that without specific site mitigation there are human receptors with medium to high sensitivities subject to a low risk of dust soiling and low risk of impacts on human health during the earthworks, construction and track-out phases.

Experience in the UK is that good construction management is capable of mitigating the impact of fugitive emissions of particulate matter effectively. In all but the most exceptional circumstances, risk of dust impacts at receptors can be controlled to ensure that they are negligible or low at worst.

Good practice and site-specific mitigation measures to be implemented during construction will be included in a Construction Environmental Management Plan (CEMP). The measures recommended for inclusion in the CEMP with respect to mitigating against potential dust nuisance and human health impacts are outlined in **Annex 6**.

The risk of dust impacts associated with the Proposed Development construction activities will therefore be negligible and therefore **not significant** once good practice and site-specific mitigation measures are implemented.

### 5.1.2 Construction Phase - Traffic

The construction phase of the Proposed Development will result in an estimated increase in LDV and HDV of 120 and 90 AADT respectively. Construction traffic generation on the local road network is therefore below the EPUK & IAQM criteria of 500 and 100 AADT for LDV and HDV respectively. On that basis impacts on air quality associated with the change in traffic during the construction phase of the Proposed Development will be negligible and therefore **not significant**.

## 5.2 Operational Phase

### 5.2.1 Operational Phase – Traffic

The operational phase of the Proposed Development will result in an increase in LDV and HDV of 22 and 62 AADT respectively, based on maximum production per annum. Operational phase traffic generation on the local road network is therefore below the EPUK & IAQM criteria of 500 and 100 AADT for LDV and HDV respectively. On that basis impacts on air quality associated with the change in traffic during the operational phase of the Proposed Development will be negligible and therefore **not significant**.

### 5.2.2 Operational Phase – Emissions to Air (Human Receptors)

Full details of the assessment results are provided in **Annex 5**.

Contour plots of predicted PCs from the Proposed Development are provided in **Drawings 5** to **14**.

#### 5.2.2.1 Nitrogen Dioxide

The predicted annual mean PECs of $NO_2$ are significantly below the AQS level at all selected sensitive receptors assessed.

[5] Of the 19 receptors selected one is not sensitive to acidification and another has a critical load of 0.

The maximum predicted annual mean PEC of $NO_2$ at a selected sensitive receptor is 21.1 µg/m$^3$ (53% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

The maximum predicted annual mean Proposed Development PC of $NO_2$ at a selected sensitive receptor is 0.9 µg/m$^3$ (2% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

Using the criteria in **Table 6**, the impact descriptor associated with the change in annual mean $NO_2$ concentrations at all selected sensitive receptors relevant for long-term exposure, has been assessed as negligible.

Using the criteria in **Table 8**, the significance of effect associated with the change in annual mean $NO_2$ at all selected sensitive receptors is **not significant**.

The predicted hourly mean (99.79$^{th}$ percentile) PECs of $NO_2$ are significantly below the AQS level at all selected sensitive receptors assessed.

The maximum predicted hourly mean (99.79$^{th}$ percentile) PEC of $NO_2$ at a selected sensitive receptor is 72.8 µg/m$^3$ (36% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

The maximum predicted hourly mean (99.79$^{th}$ Percentile) Proposed Development PC of $NO_2$ at a selected sensitive receptor is 6.2 µg/m$^3$ (3% of the AQS) and is predicted at R11 retail park on North Road.

The maximum predicted hourly mean (100$^{th}$ percentile) Proposed Development PC of $NO_2$ at a selected sensitive receptor is 15.6 µg/m$^3$ (8% of the AQS) and is predicted at R3 a residential property on Telford Place.

Using the criteria in **Table 7**, the impact descriptor associated with the change in hourly $NO_2$ concentrations (100$^{th}$ percentile) has been assessed as negligible at all selected sensitive receptors.

Using the criteria in **Table 8**, the significance of effect associated with the change in hourly mean $NO_2$ at all selected sensitive receptors is **not significant**.

#### 5.2.2.2 Carbon Monoxide

The predicted running 8-hr mean PECs of CO are significantly below the AQS level at all selected sensitive receptors assessed.

The maximum predicted running 8-hr mean PEC of CO at a selected sensitive receptor is 0.14 mg/m$^3$ (1.4% of the AQS) and is predicted at R8 a residential property on Carrs Corner.

The maximum predicted running 8-hr mean Proposed Development PC of CO at a selected sensitive receptor is 0.004 mg/m$^3$ (0.04% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

Effects associated with the change in CO running 8-hr mean are assessed to be negligible and **not significant**.

#### 5.2.2.3 Particulate Matter (≤10µm)

The predicted annual mean PECs of $PM_{10}$ are significantly below the AQS level at all selected sensitive receptors assessed.

The maximum predicted annual mean PEC of $PM_{10}$ at a selected sensitive receptor is 8.1 µg/m$^3$ (45% of the AQS), and is predicted at PR1 a site representative of land allocated for housing within THC LDP.

The maximum predicted annual mean Proposed Development PC of $PM_{10}$ at a selected sensitive receptor is 0.22 µg/m$^3$ (1% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

Using the criteria in **Table 6**, the impact descriptor associated with the change in annual mean $PM_{10}$ concentrations at all selected sensitive receptors relevant for long-term exposure, has been assessed as negligible.

Using the criteria in **Table 8**, the significance of effect associated with the change in annual mean $PM_{10}$ at all selected sensitive receptors is **not significant**.

The predicted daily mean (98.08th percentile) PECs of $PM_{10}$ are significantly below the AQS level at all selected sensitive receptors assessed.

The maximum predicted daily mean (98.08th percentile) PEC of $PM_{10}$ at a selected sensitive receptor is 17.4 µg/m³ (35% of the AQS) and is predicted at PR1 a site representative of land allocated for housing within THC LDP.

The maximum predicted daily mean (98.08th percentile) Proposed Development PC of $PM_{10}$ at a selected sensitive receptor is 0.8 µg/m³ (2% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

Effects associated with the change in $PM_{10}$ daily mean are assessed to be negligible and **not significant**.

#### 5.2.2.4 Hydrogen Fluoride

The predicted hourly mean PECs of HF are significantly below the AQS level at all selected sensitive receptors assessed.

The maximum predicted hourly mean PEC of HF at a selected sensitive receptor is 7.9 µg/m³ (3% of the AQS) and is predicted at ST1 Fort William football pitch.

The maximum predicted hourly mean Proposed Development PC of HF at a selected sensitive receptor is 2.2 µg/m³ (1% of the AQS) and is predicted at ST1 Fort William football pitch.

Using the criteria in **Table 7**, the impact descriptor associated with the change in hourly HF concentrations has been assessed as negligible at all selected sensitive receptors.

Using the criteria in **Table 8**, the significance of effect associated with the change in hourly mean HF at all selected sensitive receptors is **not significant**.

#### 5.2.2.5 Hydrogen Chloride

The predicted annual mean PECs of HCl are significantly below the AQS level at all selected sensitive receptors assessed.

The maximum predicted annual mean PEC of HCl at a selected sensitive receptor is 0.477 µg/m³ (2% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

The maximum predicted annual mean Proposed Development PC of HCl at a selected sensitive receptor is 0.05 µg/m³ (0.23% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

Using the criteria in **Table 6**, the impact descriptor associated with the change in annual mean HCl concentrations at all selected sensitive receptors relevant for long-term exposure, has been assessed as negligible.

Using the criteria in **Table 8**, the significance of effect associated with the change in annual mean HCl at all selected sensitive receptors is **not significant**.

The predicted hourly mean PECs of HCl are significantly below the AQS level at all selected sensitive receptors assessed.

The maximum predicted hourly mean PEC of HCl at a selected sensitive receptor is 7.8 µg/m³ (1% of the AQS) and is predicted R11 retail park on North Road.

The maximum predicted hourly mean Proposed Development PC of HCl at a selected sensitive receptor is 2.2 µg/m³ (0.3% of the AQS) and is predicted at ST1 Fort William football pitch.

Using the criteria in **Table 7**, the impact descriptor associated with the change in hourly HCl concentrations has been assessed as negligible at all selected sensitive receptors.

Using the criteria in **Table 8**, the significance of effect associated with the change in hourly mean HCl at all selected sensitive receptors is **not significant**.

#### 5.2.2.6 Volatile Organic Compound

Using Benzene AQS

The predicted annual mean PECs of TVOCs are significantly below the AQS level at all selected sensitive receptors assessed.

The maximum predicted annual mean PEC of TVOC at a selected sensitive receptor is 1.293 µg/m$^3$ (40% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

The maximum predicted annual mean Proposed Development PC of TVOC at a selected sensitive receptor is 1.174 µg/m$^3$ (36% of the AQS) and is predicted at R7 a residential property on Glenmhor Terrace.

Using the criteria in **Table 6**, the impact descriptor associated with the change in annual mean TVOC concentrations relevant for long-term exposure, has been assessed as negligible at four receptors, slight at three receptors, and moderate at five receptors.

Using the criteria in **Table 8**, the significance of effect associated with the change in annual mean TVOC is **significant** at five of the selected sensitive receptors and **not significant** at all other selected sensitive receptors.

Using EAL of 0.3mg/m$^3$

The predicted annual mean PECs of TVOC are significantly below the AQS level at all selected sensitive receptors assessed.

The maximum predicted annual mean PEC of TVOC at a selected sensitive receptor is 1.293 µg/m$^3$ (0.4% of the AQAL) and is predicted at R7 a residential property on Glenmhor Terrace.

The maximum predicted annual mean Proposed Development PC of TVOC at a selected sensitive receptor is 1.174 µg/m$^3$ (0.4% of the AQAL) and is predicted at R7 a residential property on Glenmhor Terrace.

Using the criteria in **Table 6**, the impact descriptor associated with the change in annual mean TVOC concentrations relevant for long-term exposure, has been assessed as negligible at all selected sensitive receptors.

Using the criteria in **Table 8**, the significance of effect associated with the change in annual mean TVOC at all selected sensitive receptors is **not significant**.

Due to the predicted absence of TVOCs from the recycled material used in the Proposed Development it is considered that the latter approach is the most appropriate in the assessment of significance.

#### 5.2.2.7 Dioxins/Furans

The maximum predicted Proposed Development PC to $ADD_{inh}$ for an adult is 0.00123 pg I-TEQ/kgBW/day which is 0.06% of the TDI, and is predicted at R7, a residential property on Glenmhor Terrace.

The maximum predicted Proposed Development PC to $ADD_{inh}$ for a child is 0.00207 pg I-TEQ/kgBW/day which is 0.1% of the TDI, and is predicted at R7, a residential property on Glenmhor Terrace.

The maximum predicted total $ADD_{inh}$ for an adult is 0.03123 pg I-TEQ/kgBW/day which is 1.56% of the TDI, and is predicted at R7, a residential property on Glenmhor Terrace.

The maximum predicted total $ADD_{inh}$ for a child is 0.132 pg I-TEQ/kgBW/day which is 6.56% of the TDI, and is predicted at R7 a residential property on Glenmhor Terrace.

The predicted Proposed Development PC to $ADD_{inh}$is less than 1% of the TDI for both adults and children at all receptors. The predicted significance of effect at all selected receptors is assessed to be negligible and **not significant**.

### 5.2.3 Operational Phase – Emissions to Air (Ecological Receptors)

Full details of the assessment results are provided in **Annex 5**.

Contour plots of predicted PCs from the Proposed Development are provided in **Drawings 15** to **22**.

#### 5.2.3.1 Oxide of Nitrogen

*Proposed Development Only PC*

The maximum predicted annual mean Proposed Development PC of $NO_x$ at a selected sensitive receptor is 1.3 µg/$m^3$ (4% of the Critical Level) and is predicted at Eco16.

The predicted annual mean Proposed Development PC of $NO_x$ is greater than 1% of the long-term benchmark or critical level at four of the selected sensitive receptors.

*Proposed Development + Generators PC*

The maximum predicted annual mean Proposed Development + generators PC of $NO_x$ at a selected sensitive receptor is 2.8 µg/$m^3$ (7% of the Critical Level) and is predicted at Eco16.

The predicted annual mean Proposed Development + generators PC of $NO_x$ is greater than 1% of the long-term benchmark or critical level at six of the selected sensitive receptors.

*PEC*

The predicted annual mean PECs of $NO_x$ are significantly below the Critical level at all selected sensitive receptors assessed.

The maximum predicted annual mean PEC of $NO_x$ at a selected sensitive receptor is 4.0 µg/$m^3$ (13% of the Critical Level) and is predicted at Eco16.

The predicted annual mean Proposed Development PEC of $NO_x$ is significantly lower than 70% of the long-term benchmark or critical level at all selected sensitive receptors.

#### 5.2.3.2 Hydrogen Fluoride[6]

*HF - Weekly Mean*

The predicted weekly mean PECs of HF are significantly below the Critical Level at all selected sensitive receptors assessed.

The maximum predicted weekly mean PEC of HF at a selected sensitive receptor is 0.05 µg/$m^3$ (9.8% of the Critical Level) and is predicted at Eco16.

The maximum predicted weekly mean Proposed Development PC of HF at a selected sensitive receptor is 0.05 µg/$m^3$ (9.8% of the Critical Level) and is predicted at Eco16.

The predicted weekly mean Proposed Development PC of HF is lower than 10% of the short-term benchmark; critical level at all selected sensitive receptors.

*HF - Hourly Mean*

The predicted hourly mean PECs of HF are significantly below the Critical Level at all selected sensitive receptors assessed.

The maximum predicted hourly mean PEC of HF at a selected sensitive receptor is 0.05 µg/$m^3$ (1% of the Critical Level) and is predicted at Eco16.

The maximum predicted hourly mean Proposed Development PC of HF at a selected sensitive receptor is 0.05 µg/$m^3$ (1% of the Critical Level) and is predicted at Eco16.

[6] The generators do not emit any HF.

The predicted hourly mean Proposed Development PC of HF is lower than 10% of the short-term benchmark, critical level at all selected sensitive receptors.

#### 5.2.3.3 Nutrient Nitrogen Deposition

*Proposed Development Only PC*

The maximum predicted Proposed Development PC of nutrient nitrogen deposition as a percentage of the Critical Load at a selected sensitive receptor is 0.88% and is predicted at Eco16.

The predicted Proposed Development PC of nutrient nitrogen deposition is lower than 1% of the long-term benchmark; critical load at all selected sensitive receptors.

*Proposed Development + Generators PC*

The maximum predicted Proposed Development + generators PC of nutrient nitrogen deposition as a percentage of the Critical Load at a selected sensitive receptor is 1.34% and is predicted at Eco16.

The predicted Proposed Development + generators PC of nutrient nitrogen deposition is greater than 1% of the long-term benchmark; critical load at three selected sensitive receptors.

*PEC*

The predicted PECs of nutrient nitrogen deposition are below the Critical Load at all selected sensitive receptors assessed.

The maximum predicted PEC of Nitrogen Nutrient as a percentage of the Critical Load at a selected sensitive receptor is 97.3% of the Critical Load and is predicted at Eco16.

The predicted PEC of Nitrogen Nutrient is greater than 70% of the long-term benchmark; critical load at seven selected sensitive receptors.

#### 5.2.3.4 Acid Deposition

*Proposed Development Only*

The maximum predicted Proposed Development PC of acid deposition as a percentage of the Critical Load Function at a selected sensitive receptor is 3.32% and is predicted at Eco12.

The predicted Proposed Development PC of acid deposition is greater than 1% of the long-term benchmark; critical load at four selected sensitive receptors.

*Proposed Development + Generators*

The maximum predicted Proposed Development + generators PC of acid deposition as a percentage of the Critical Load Function at a selected sensitive receptor is 5.82% and is predicted at Eco12.

The predicted Proposed Development PC of acid deposition is greater than 1% of the long-term benchmark; critical load at five selected sensitive receptors.

*PEC*

The predicted PECs of Acid Deposition are above the Critical Load Function at 13 selected sensitive receptors.

The maximum predicted PEC of acid deposition as a percentage of the Critical Load Function at a selected sensitive receptor is 172.2% and is predicted at Eco12.

The predicted PEC of Nitrogen Nutrient is greater than 70% of the long-term benchmark; critical load at 15 selected sensitive receptors.

#### 5.2.3.5 Likely Significance of Effects

The likely significance of effects at selected ecological receptors has been assessed using the criteria summarised in **Table 9**.

A summary table is provided in **Annex 5**.

Assessment of impacts at sensitive ecological receptors concluded that:

- The change in long-term critical level of $NO_x$ predicted to be >1% at four selected receptors, therefore the PECs need to be considered. The PECs at these ecological receptors are predicted to be significantly below 70% of the $NO_x$ critical level and therefore it is concluded that there are no likely significant effects.
- The change in short-term critical levels of HF is predicted to be <10% at all selected receptors, therefore it is concluded that there are no likely significant effects.
- The change in long-term nutrient nitrogen deposition is predicted to be <1% at all selected receptors, therefore PECs do not need to be considered and it is concluded that there are no likely significant effects.
- The change in long-term acid deposition is predicted to be >1% at four selected receptors, therefore PECs need to be considered. PECs are predicted to be >70% of the relevant critical load for acid deposition at these four selected receptors.

With regard to acid deposition, the potential for likely significant effects has been identified at four sensitive receptors, namely:

- Eco12 - Siliceous rocky slopes with chasmophytic vegetation (H8220);
- Eco14 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) (H6230);
- Eco16 - Old sessile oak woods with Ilex and Blechnum in the British Isles (H91A0); and
- Eco17 - Northern Atlantic wet heaths with Erica tetralix (H4010).

Whilst the Proposed Development contributions are predicted to exceed the 1% criterion at Eco12, 14, 16 and 17, it should be noted that the potential for likely significant effects at these receptors is not caused by the small incremental change in acid deposition predicted at these locations due to the operation of the Proposed Development alone (maximum of 3.32% of the Critical Load Function), or in conjunction with the generators operating at their maximum permitted hours (maximum of 5.82% of the Critical Load Function) (Refer to **Annex 5**). Rather, as shown in **Table 10**, the baseline (current load) of acid deposition is >70% of the Critical Load Function at each receptor already, indicating that the potential for likely significant effects already appliess.

***Table 10 – Current Load and PEC as Percentage of Critical Load Function***

| Receptors ID | Current Load as Percentage of Critical Load Function | PEC as Percentage of Critical Load Function |
|---|---|---|
| Eco12 | 166.4% | 172.2% |
| Eco14 | 153.6% | 159.0% |
| Eco16 | 71.5% | 73.9% |
| Eco17 | 104.4% | 108.7% |

It is noted that the PC acid deposition in keq/ha/year associated with the Proposed Development at these receptors is calculated to be between 2% and 45% lower than the acid deposition associated with the previously consented AWP as shown in

**Table** 11. Overall, the Proposed Development would therefore result in a lesser effect at each receptor compared to that predicted for the consented AWP scheme.

*Table 11 – Alloy Wheel Facility and Proposed Development Comparison of Acid Deposition at Eco12, 14, 16 and 17*

| Receptors ID | Consented Alloy Wheel Facility PC (keq/ha/year) | Proposed Development PC (keq/ha/year) |
|---|---|---|
| Eco12 | 0.0184 | 0.0179 (2% reduction) |
| Eco14 | 0.0184 | 0.0179 (2% reduction) |
| Eco16 | 0.0248 | 0.0208(16% reduction) |
| Eco17 | 0.0306 | 0.0170 (45% reduction) |

**Table 12** below provides the total area of H8220, H6230, H91A0 and H4010 habitats within the SAC and area where the Proposed Development Acid Deposition is greater than 1% of the relevant Critical Load Function.

*Table 12 – Habitat Area Within the SAC where Proposed Development Acid Deposition are Greater than 1% of the Relevant Critical Load Function*

| Receptor | Total Area of the Habitat within the SAC (ha) | Total Area of the Habitat where Proposed Development Acid Deposition is >1% of Relevant CL Function (ha) | Total Area of the Habitat where Proposed Development Acid Deposition is >1% of Relevant CL Function as Percentage of the Total Area of the Habitat within the SAC |
|---|---|---|---|
| Eco12 - H8220 - Siliceous rocky slopes | 5,101.80 | 20.44 | 0.4% |
| Eco14 - H6230 - Species-rich Nardus grassland | 1,383.26 | 58.05 | 4.2% |
| Eco16 - H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | Unknown | Unknown | 0.02% (7.85 ha)* |
| Eco17 - H4010 - Wet heaths | 5,615.53 | 26.38 | 0.5% |

*The Habitat Map of Scotland (HabMoS) dataset does not include all areas of H91A0 and the location confirmed by NS as Eco16 is not marked as H91A0 within the dataset. For Eco16 the percentage quoted above represents the total area of the SAC where the Proposed Development acid deposition is greater than 1% of the relevant critical load function.

It is therefore clear that the Proposed Development has the potential to only impact a small proportion of the H8220, H6230, H91A0 and H4010 habitats. This is further illustrated on **Drawings 19 – 22**.

Based on the above analysis of potential ecological effects, the Proposed Development is not considered likely to result in measurable effects upon qualifying features of the Ben Nevis SAC. The effects of emissions associated with the Proposed Development are therefore assessed to be minor and **not significant**.

### 5.2.4 Abnormal Operations

The results of the modelling study of abnormal operations as detailed in **Section 3.5.10** are provided in **Annex 5** and can be summarised as follows:

- The change in $NO_2$ short-term concentrations would result in a negligible impact at five receptors, slight impact at six receptors and moderate impact at four receptors.
- The change in $PM_{10}$ short-term concentrations would result in a negligible impact at 11 receptors, and slight impact at four receptors.
- The change in HCl short-term concentrations would result in a negligible impact at all receptors.
- The change in TVOC short-term concentrations would result in a negligible impact at eight receptors, slight impact at six receptors and moderate impact at one receptor when assessed using the Benzene EAL of 208 $\mu g/m^3$.

  The change in TVOC short-term concentrations would result in a negligible impact at 11 receptors and slight impact at four receptors when assessed using the low level of concern EAL of 0.3 $mg/m^3$.

  The change in TVOC short-term concentrations would result in a negligible impact at all receptors when assessed using the high level of concern EAL of 3 $mg/m^3$.
- The change in HF short-term concentrations would result in a negligible impact at all receptors.

The above assessment is highly conservative for the following reasons:

- It considers the maximum 15-min concentration ($100^{th}$ Percentile); and
- It assumes that all three proposed sources would fail simultaneously.

# 6. Additional Mitigation Measures

## 6.1 Construction Phase

Impacts during the construction phase have been assessed to be negligible and therefore no further mitigation measures are proposed.

Good practice and site-specific mitigation measures to be implemented during construction will be included in a Construction Environmental Management Plan (CEMP). The measures recommended for inclusion in the CEMP with respect to mitigating against potential dust nuisance and human health impacts are outlined in **Annex 6**.

## 6.2 Operational Phase

The AQIA includes the assessment of the impact of emissions from the Proposed Development that can be achieved with abatement technologies applied (refer to **Annex 2**) to reduce emission concentrations to significantly below the BAT ELVS.

Impacts during the operational phase have been assessed to be negligible at all selected human receptors.

Likely significant effects are predicted at four ecological receptors (Eco12, 14, 16 & 17) due to the predicted change in total acid deposition and the high baseline level of acid deposition. However, the predicted effects at these receptors are lower than those predicted for the previously consented AWP, even allowing for all the worst-case assumptions included in the model.

The Proposed Development is not considered likely to result in measurable effects upon qualifying features of the Ben Nevis SAC. The effects of emissions associated with the Proposed Development are therefore assessed to be minor and **not significant**.

No further mitigation measures are therefore proposed.

# 7. Conclusion

This report is the AQIA for the Proposed Development, an aluminium Recycling and Billet Casting Facility to be built and operated at the Applicant's existing facility in Fort William within THC administrative area.

This AQIA has included:

- A review of Proposed Development proposal, compilation of emission information and development of emissions inventories for the Proposed Development sources and existing emission sources within the wider site (Smelter and Generators).
- Consultation with SEPA and NatureScot (NS) and submission of a method statement to THC, SEPA and NS.
- Desktop review of baseline conditions and derivation of representative background concentrations at sensitive receptors.
- Desktop review of the study area and selection of sensitive receptors.
- Qualitative assessment of construction impacts.
- Screening assessment of road traffic impacts during both construction and operational phases.
- Detailed dispersion modelling of proposed and existing process emissions and assessment of impacts upon human and ecological receptors.
- Derivation of the significance of predicted effects in accordance with relevant guidance.

This AQIA has been undertaken to assess compliance with relevant EALs and assess the potential impacts associated with the change in pollutant concentrations. This AQIA has been undertaken in accordance with relevant guidance documents.

Detailed dispersion modelling using the ADMS5 modelling software was undertaken to predict pollutant concentrations due to emissions from the Proposed Development, Smelter, Generators, and existing background concentrations, at existing sensitive human and ecological receptor locations within the study area.

A number of sensitivity analyses have been undertaken to minimise modelling uncertainty and numerous conservative assumptions have been made to ensure that this AQIA is based on the worst-case scenario.

ADMS5 modelling results have also been compared to AERMOD modelling results and abnormal operations and their potential impacts have been considered.

A number of mitigation measures have been included in the Proposed Development design to minimise any potential impacts associated with construction and operational phases including:

- Emission reduction compared to BAT ELVs of:
  - 90% for HCl at BP2Large and Small;
  - 81% for $NO_x$ at BP2Large and 80% at BP2Small;
  - 33% for CO at BP2Large and 67% at BP2Small;
  - 33% for TVOC at BP2Small.
- Good-practice mitigation measures and site-specific mitigation measures outlined in **Annex 6** to be adopted to minimise identified risks during the construction phase.

This AQIA was based on the following conservative assumptions:

- The AQIA is based on the highest predicted concentrations over the five years of meteorological data considered (2016-2020).

- The AQIA has used Tulloch Bridge WMO Station rather than Aonach Mor WMO Station resulting in the worst-case predicted concentrations at receptors within the Ben Nevis SAC being significantly higher. It can however be argued that Aonach Mor WMO Station is more representative of the meteorological conditions at some habitat locations at higher altitude on Ben Nevis, and therefore PCs will be lower than those included in the AQIA at some receptors.
- The AQIA has used conservative background concentrations in Fort William without any sector-removal, therefore the PECs will in some places double account for the contributions from the Smelter and Generators.
- PEC concentrations include contributions from the generators operating at their permitted number of hours (500 hours per year), however, to date, the generators have not operated for more than 50 hours per year. It should also be noted that the Applicant is currently considering decommissioning these generators.
- Emissions from the Smelter have been modelled at permitted ELVs whereas, recent monitoring shows that the Smelter emissions are routinely lower than permitted ELVs .
- Emissions from the Smelter have been modelled as continuous 24/7 emissions, whereas several sources operate in day-shift hours only and for less than seven days per week.
- Emissions from the Proposed Development have been modelled as continuous 24/7 emissions. It is likely that there will be periods when not all furnaces are operational simultaneously, depending on production rates.
- The emissions from the proposed development have been calculated assuming 100,000 tonnes of billet production per annum using 100% recycled material. Depending on the product specification and availability of recycled material, there will be a portion of primary aluminium from the Smelter used in the billet production, therefore reducing the emissions from the melting furnaces.
- The $SO_2$ release rate for the Smelter has been calculated based on the permitted maximum production value of 47,500 T per year and $SO_2$ permit limit of 15 kg/t.
- Emissions of Dioxins/Furans and TVOCs from the Proposed Development have been included, modelled at BAT ELVs, and assessed against the most stringent criteria, however it is considered that the risk of these emissions arising from the process is low and the predicted effects are a significant over-estimate.

This AQIA concludes that:

- Impacts associated with the change in traffic flows associated with the Proposed Development construction and operational phases are negligible and therefore **not significant**.
- Unmitigated construction phase dust impacts have been assessed as Low, resulting in minor and therefore **not significant** effects.
- The good-practice mitigation measures and site-specific mitigation measures outlined in **Annex 6** will be adopted to minimise identified risks such that the residual effect of dust is negligible and therefore **not significant**. These will be included in a Construction Environmental Management Plan (CEMP) submitted by the contractor to the local authority for approval prior to the commencement of any works.
- PECs at human receptors are below the relevant EALs. The changes in pollutant concentrations at selected human receptors associated with the Proposed Development only are predicted to result in negligible effects and are therefore concluded to be **not significant**.
- Potential effects of Dioxins/Furans have been compared with the TDI and are concluded to be **not significant.**
- The change in long-term critical level of $NO_x$ is predicted to be greater than 1% at four selected receptors, therefore the PECs need to be considered. The PECs at these ecological receptors are significantly below 70% of the $NO_x$ critical level and therefore it is concluded that there are **no likely significant effects** of airborne $NO_x$.

- The change in short-term concentration of HF is predicted to be <10% of the critical level at all selected receptors, therefore it is concluded that there are **no likely significant effects**.
- The change in long-term nutrient nitrogen deposition is predicted to be <1% of the critical load at all selected receptors, therefore PECs do not need to be considered and it is concluded that there are **no likely significant effects**.
- The change in PC long-term acid deposition is predicted to be >1% at four selected receptors (Eco12, 14, 16 & 17), therefore PECs needed to be considered. However, it is noted that the PC acid deposition associated with the Proposed Development is between 2% and 45% lower than the PC acid deposition calculated for the previously consented AWP. Overall, even allowing for conservative assumptions, the Proposed Development is predicted to result in a lower impact compared to that calculated for the previously consented scheme.
- Predicted PECs are greater than 70% of the relevant critical load for acid deposition at receptors Eco12, 14, 16 and 17. The calculated change in long-term acid deposition at receptors Eco12, 14, 16 and 17 corresponds to a potential for likely significant effects. However, where the potential for likely significant effect has been predicted, the area of habitat being affected is predicted to be small (between 0.02% and 4.2%).
- The Proposed Development contributions, whilst exceeding the 1% criterion at Eco12, 14, 16 and 17, do not cause any exceedances of the critical load function or the 70% criterion as the baseline critical load is already >70% of the Critical Load Function at all four locations.
- Based on the detailed analysis of potential ecological effects, the Proposed Development is not likely to result in measurable effects upon the Ben Nevis SAC. The effects of emissions associated with the Proposed Development are therefore assessed to be minor and **not significant**.

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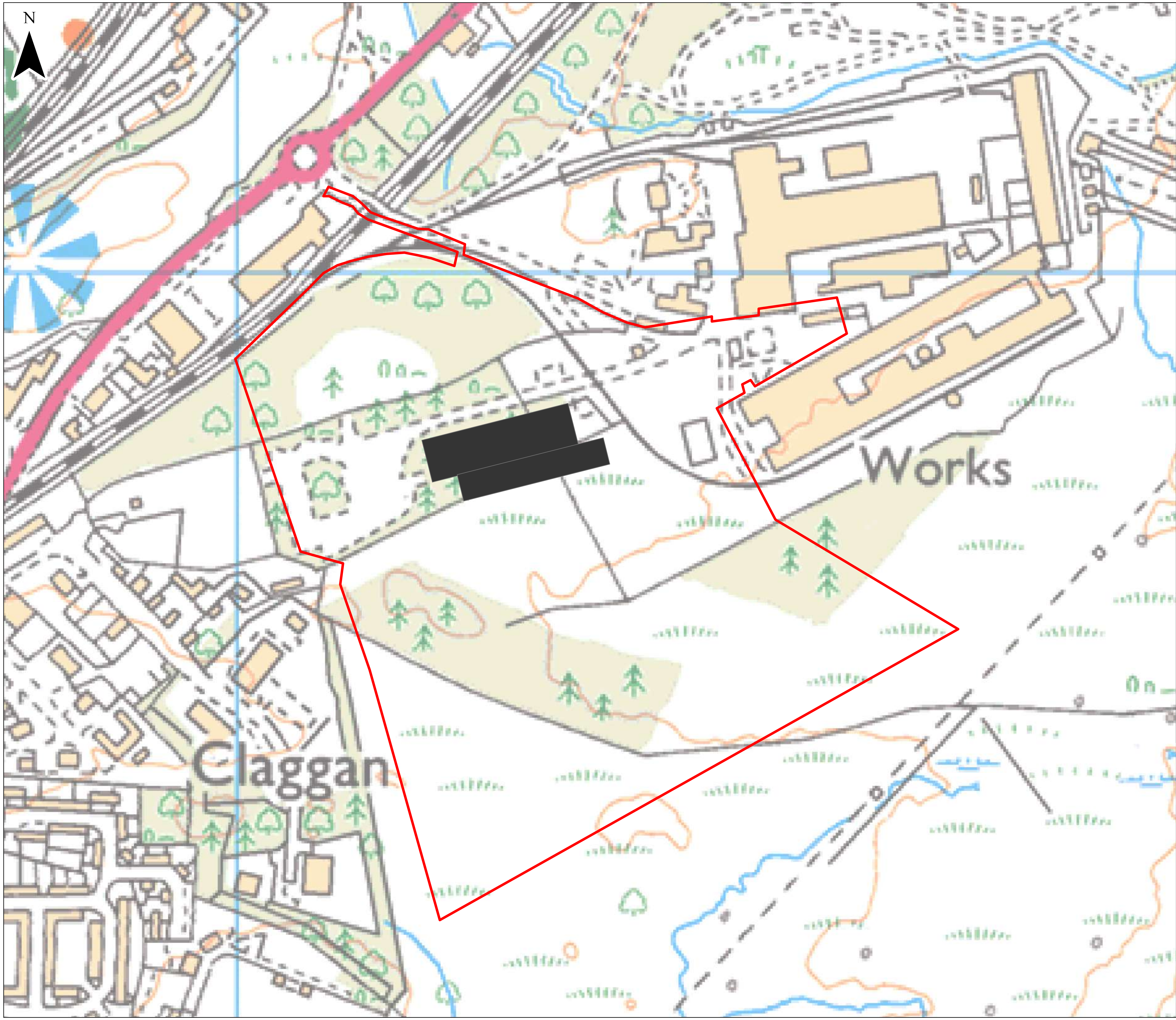
# Drawings

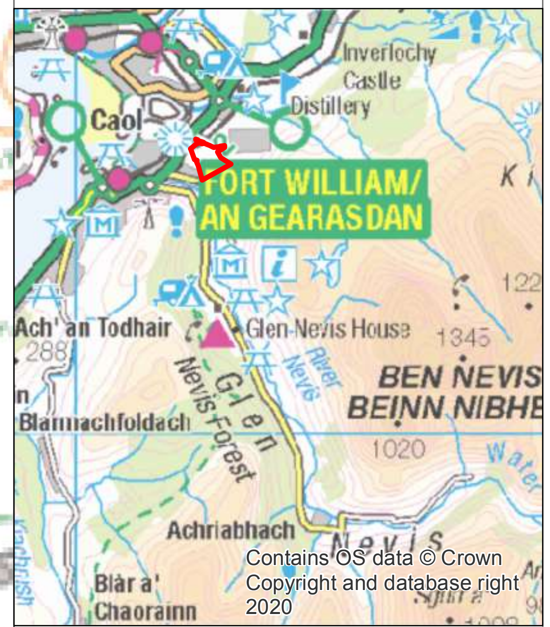



**KEY**

Site Boundary

Proposed Development Building

Insert Map Not To Scale




0 100 200 m

**Scale 1:130,000 @ A3**

ALVANCE

ITPENERGISED

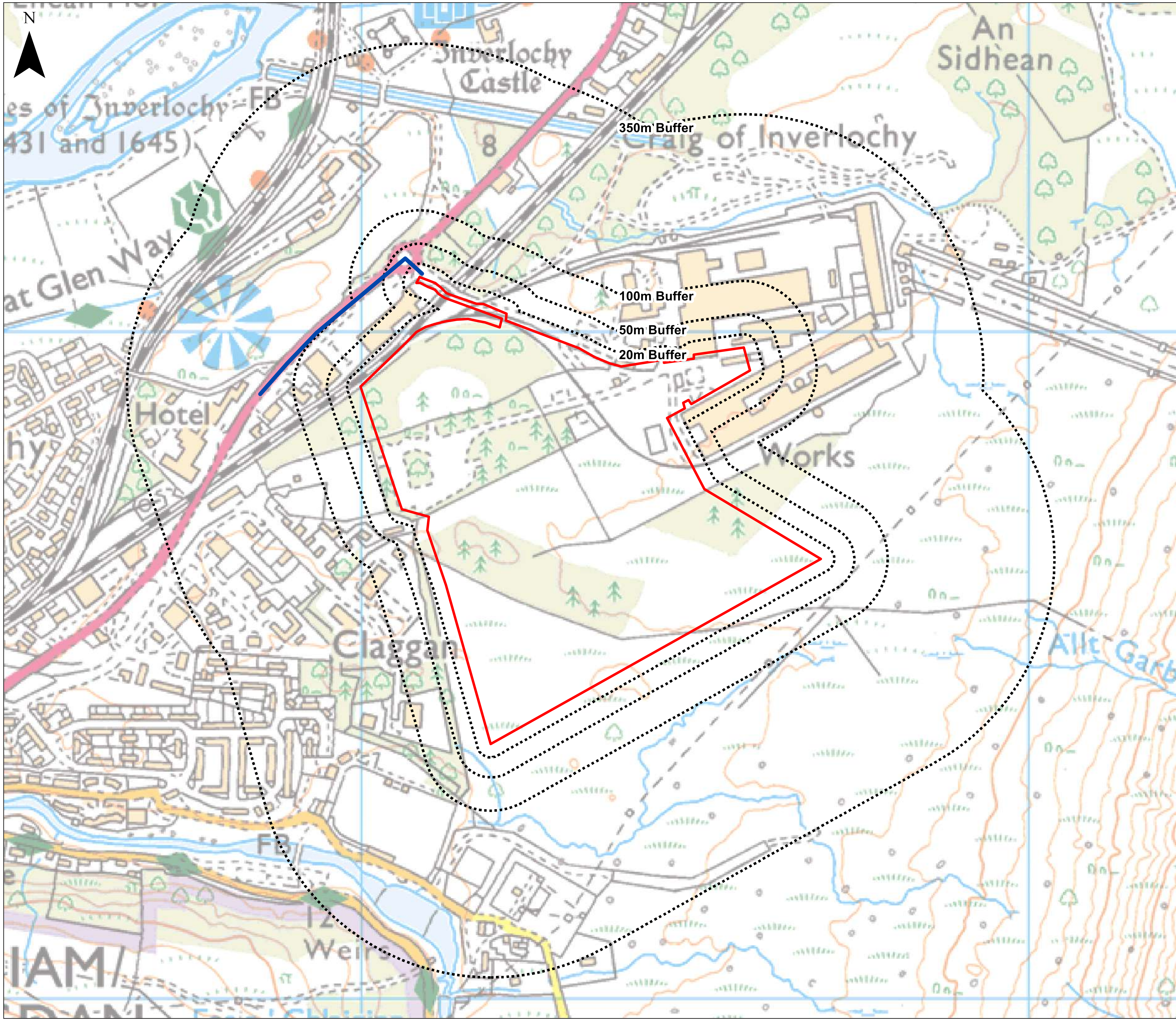
Alvance British Aluminium
Air Quality Impact Assessment

**Drawing 1**

**Layout & Location**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

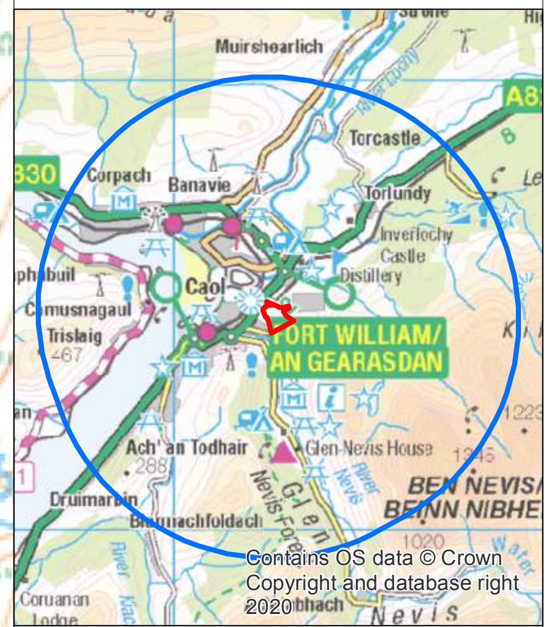
Project Number: 3539




**KEY**

- Site Boundary
- Anticipated Track-out Route
- 20 to 350m Buffer Around Site Boundary
- 5km Buffer Around Site Boundary

Insert Map Not To Scale




0 150 300 m

Scale 1:5,500 @ A3

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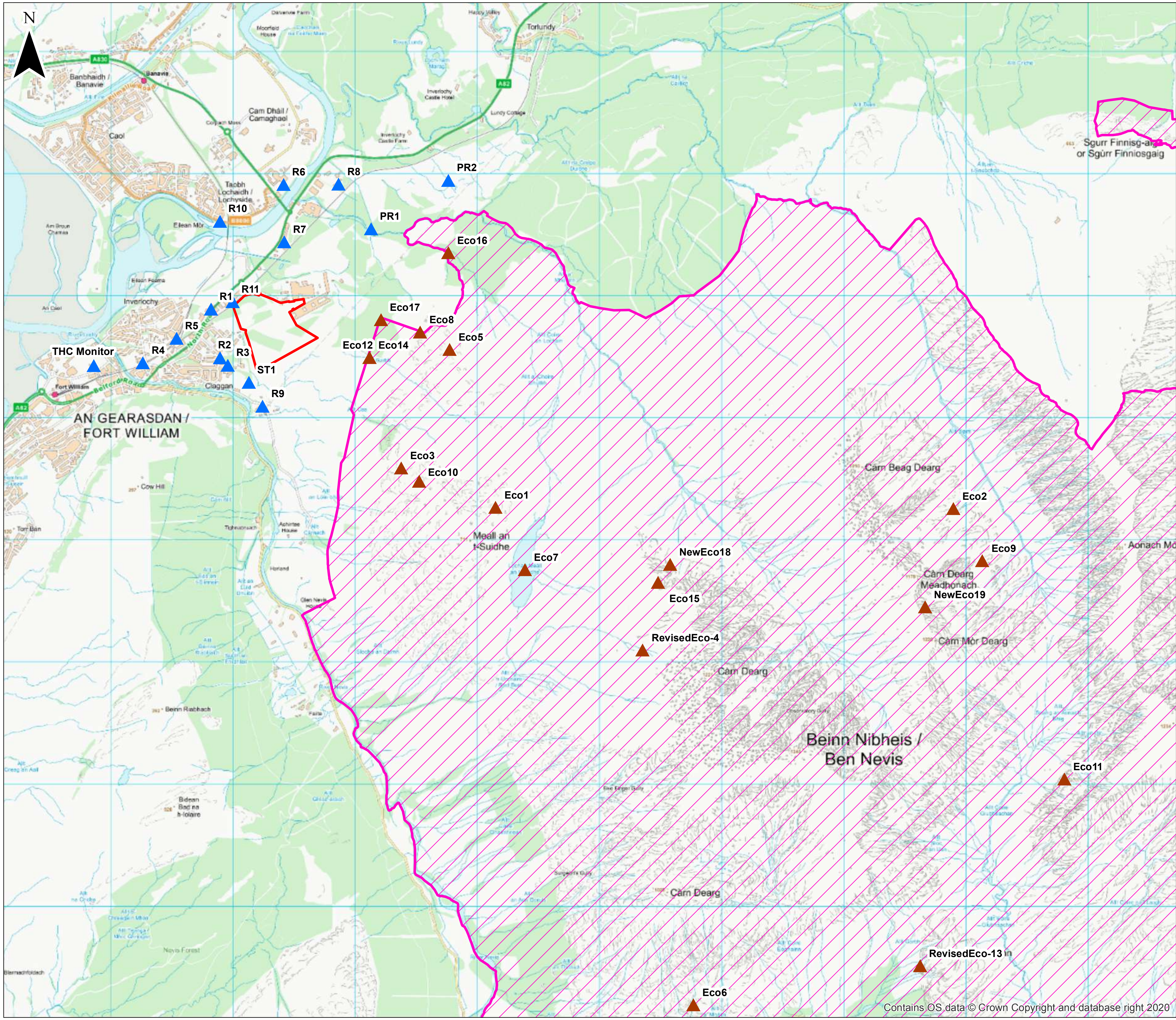
Air Quality Impact Assessment

**Drawing 2**
**Study Areas for Operational Road Traffic and Construction Dust Risk Assessments**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

- Site Boundary
- Selected Ecological Receptor
- Selected Human Receptor
- Ben Nevis Special Area of Conservation

0 0.75 1.5 km

Scale 1:30,000 @ A3

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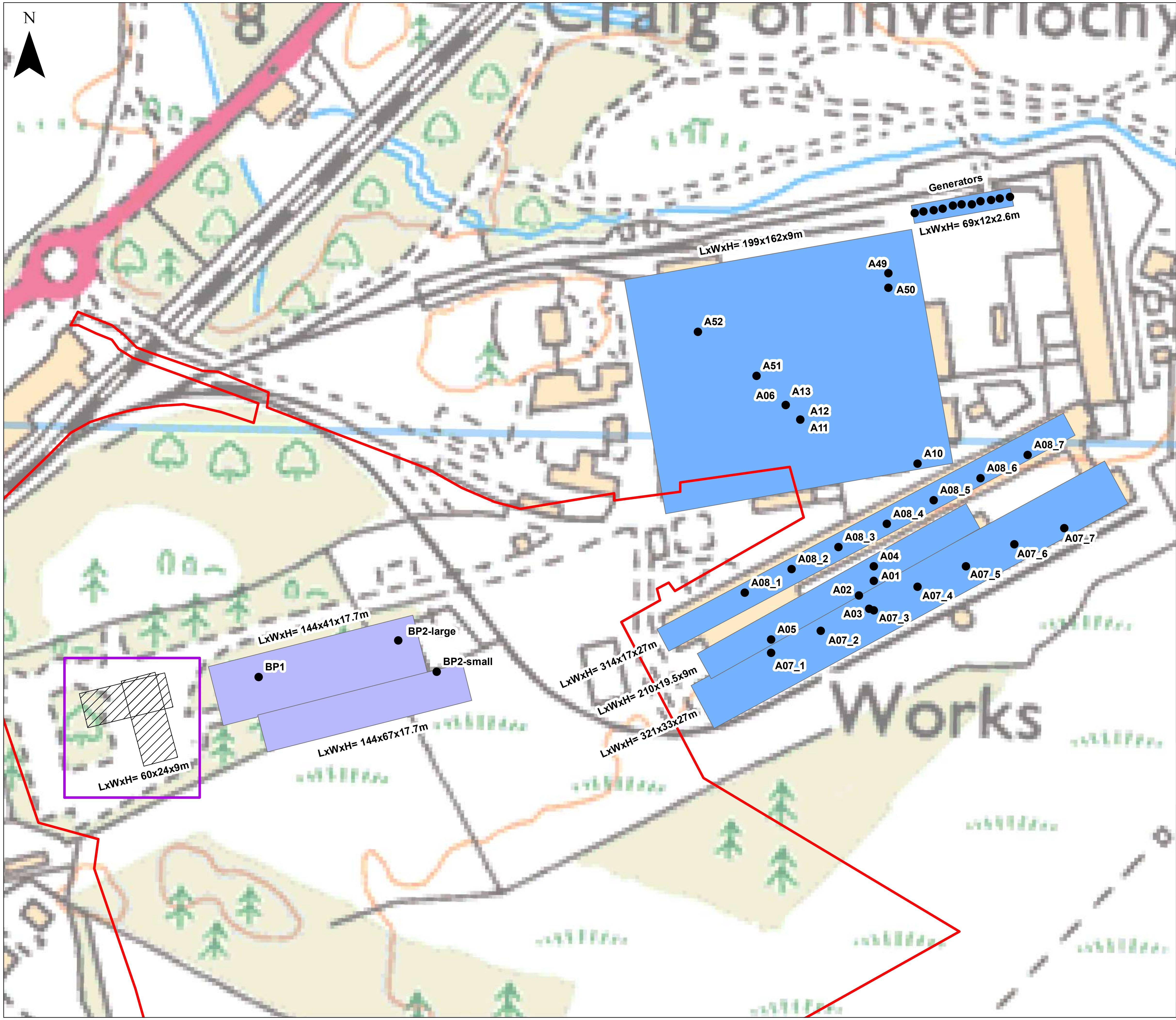
Air Quality Impact Assessment

**Drawing 3**
**Selected Receptors and Study Area for Operational Industrial Emissions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

Site Boundary

**Modelled Buildings**

Existing Building

Proposed Billet Building

Area Considered as part of the Canning Building Sensitivity Analysis:
- East-West (EW) Orientation
- North-South (NS) Orientation
- No Canning Building

Initial Canning Building EW or NS Orientations

Modelled Source

0 75 150 m

**Scale 1:2,500 @ A3**

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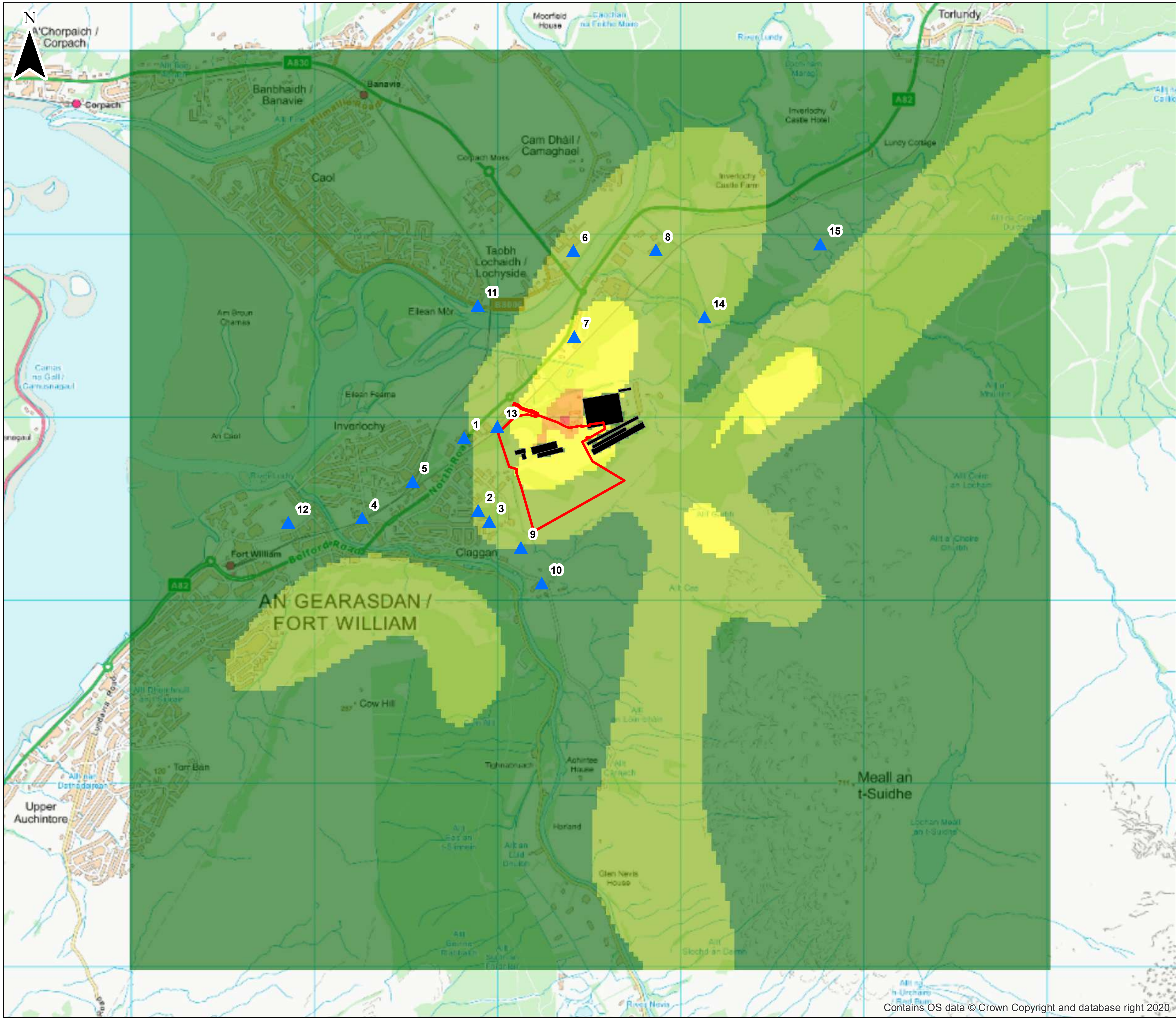
Air Quality Impact Assessment

**Drawing 4**

**Modelled Sources & Buildings**

Date: 04/05/2021 | Drawn by: JB | Checked by: AD | Version: V1

Project Number: 3539




**KEY**

Site Boundary

Modelled Buildings

Selected Human Receptor

**Annual Mean $NO_2$ PC**

**ug/m$^3$**

< 0.2 (<0.5% of AQS)

0.2 - 0.6 (0.5-1.5% of AQS)

0.6 - 2.2 (1.5-5.5% of AQS)

2.2 - 4 (5.5-10% of AQS)

>4 (>10% of AQS)

0 0.5 1 km

Scale 1:1,000,000 @ A3

ALVANCE

ITPENERGISED

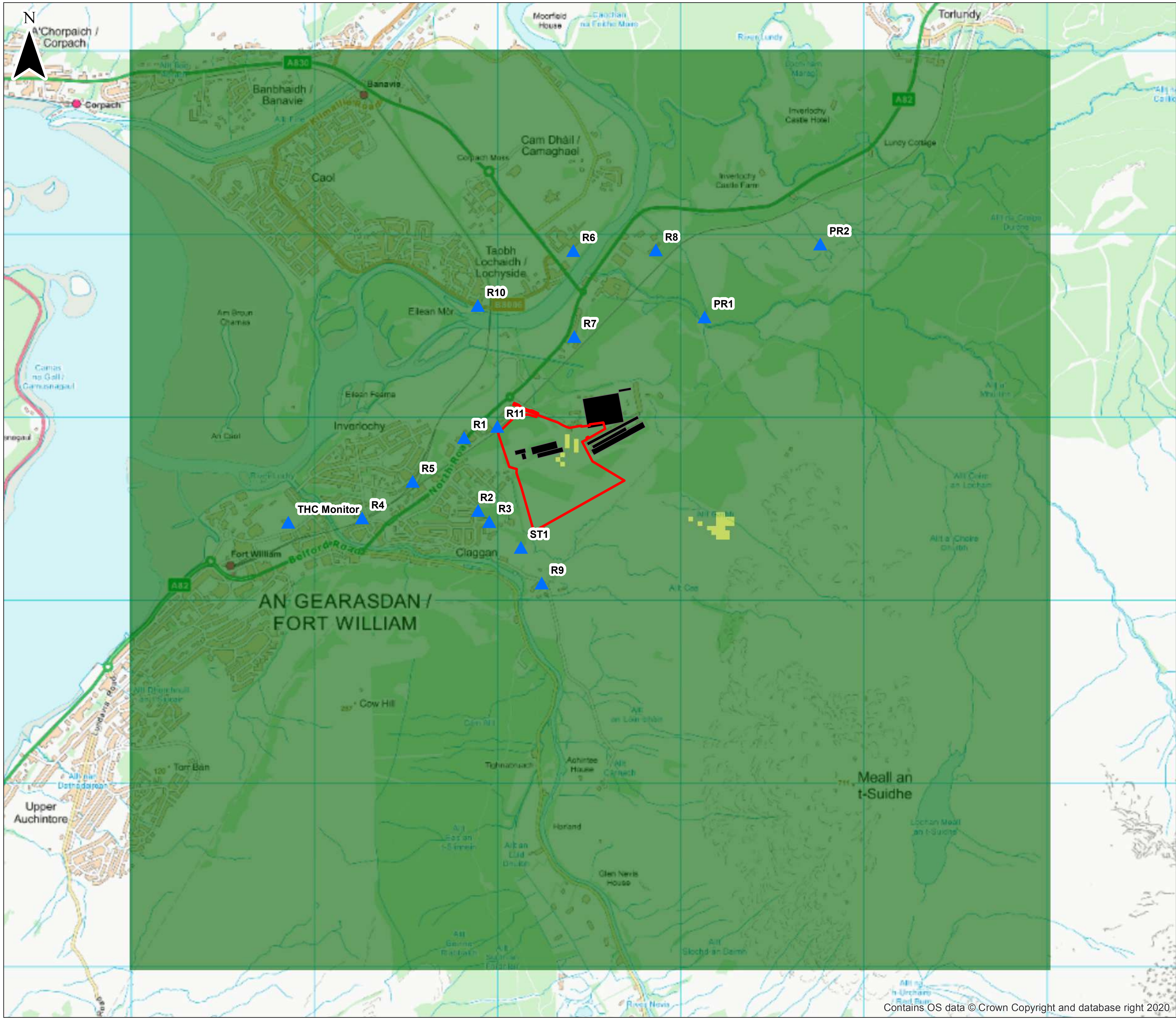
Alvance British Aluminium
Air Quality Impact Assessment

**Drawing 5**

**Annual Mean $NO_2$ Process Contributions**

| Date: 22/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

- Site Boundary
- Modelled Buildings
- Selected Human Receptor

**Hourly $NO_2$ 99.79$^{th}$ Percentile PC**

**ug/m$^3$**

- 0 - 22 (<10.5% of AQS)
- 22 - 41 (10.5-20.5% of AQS)
- 41 - 101 (20.5-50.5% of AQS)
- >101 (>50.5% of AQS)

0 0.5 1 km

**Scale 1:20,000 @ A3**

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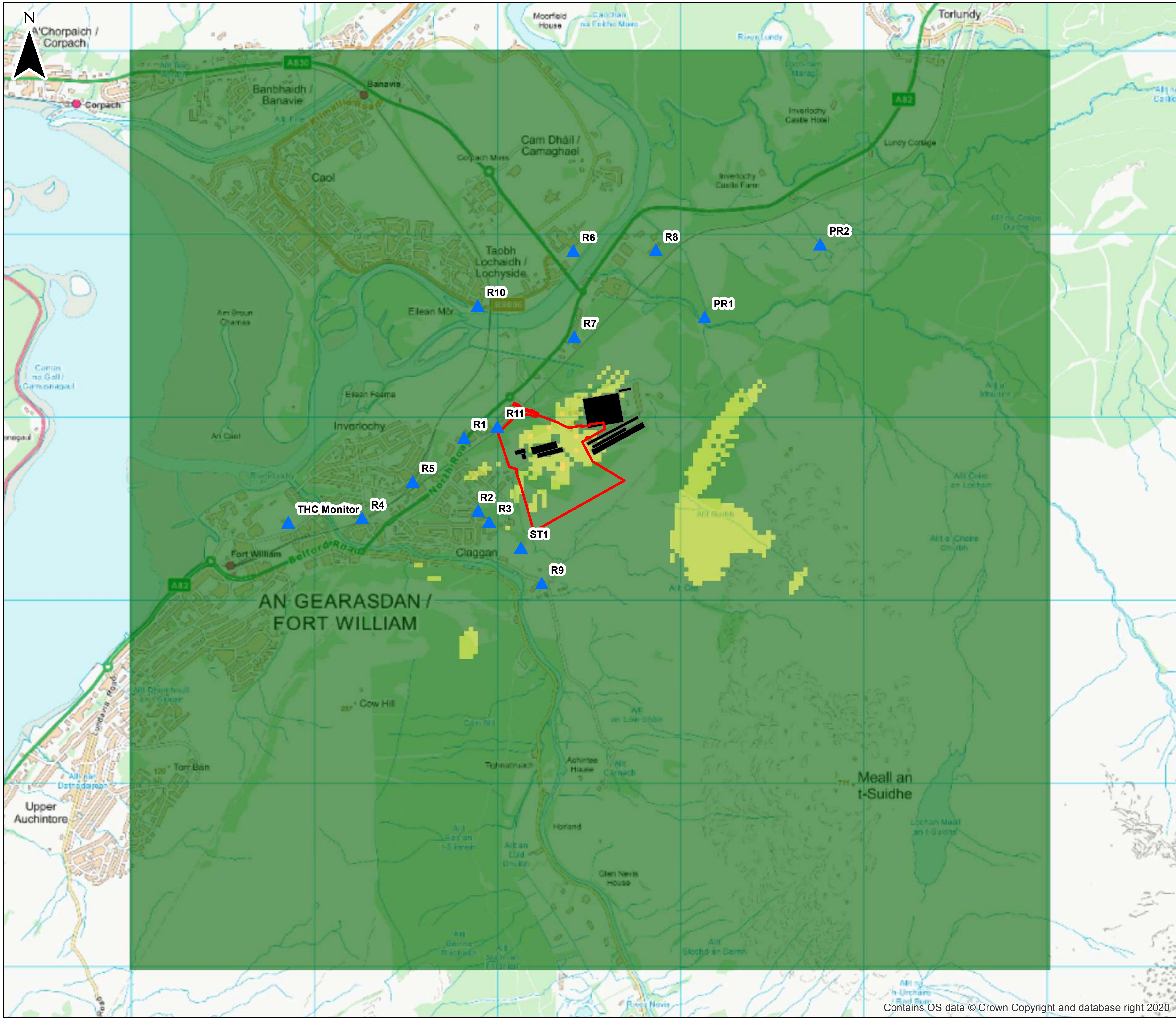
Air Quality Impact Assessment

**Drawing 6**
**Hourly Mean $NO_2$ 99.79$^{th}$ Percentile**
**Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

Site Boundary

Modelled Buildings

Selected Human Receptor

**Hourly $NO_2$ 100th Percentile PC**

**ug/m$^3$**

0 - 22 (<10.5% of AQS)

22 - 41 (10.5-20.5% of AQS)

41 - 101 (20.5-50.5% of AQS)

>101 (>50.5% of AQS)

0 0.5 1 km

Scale 1:20,000 @ A3

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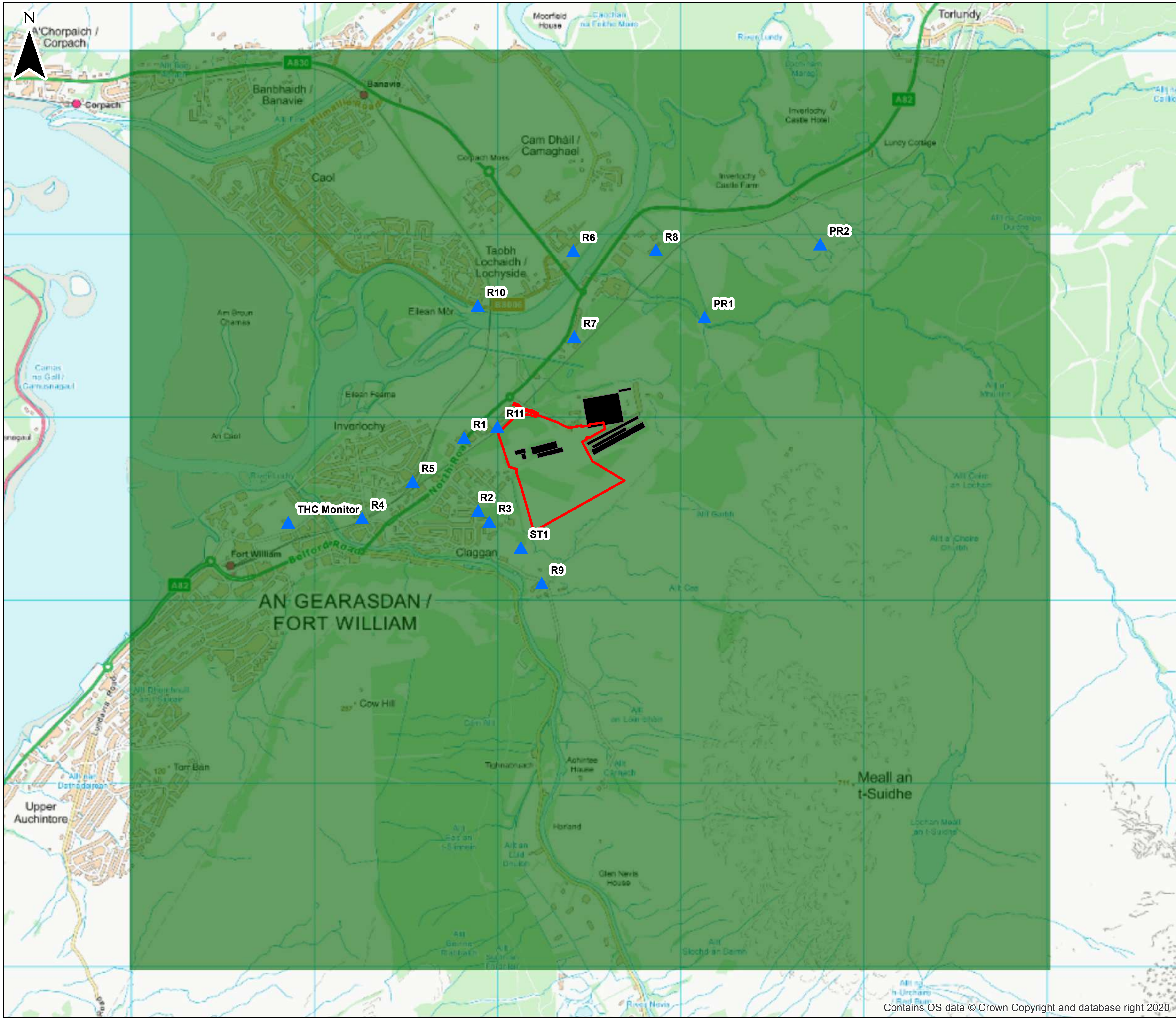
Alvance British Aluminium
Air Quality Impact Assessment

**Drawing 7**
**Hourly Mean $NO_2$ 100th Percentile**
**Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
| --- | --- | --- | --- |

Project Number: 3539




**KEY**

Site Boundary

Modelled Buildings

Selected Human Receptor

**8 Hour Running CO Mean PC**

**mg/m$^3$**

<0.1 (<1% of AQS)

0.1 - 0.25 (1 - 2.5% of AQS)

0.25 - 0.5 (2.5 - 5% of AQS)

0.5 - 1 (5 - 10% of AQS)

>1 (>10% of AQS)

0 0.5 1 km

Scale 1:20,000 @ A3

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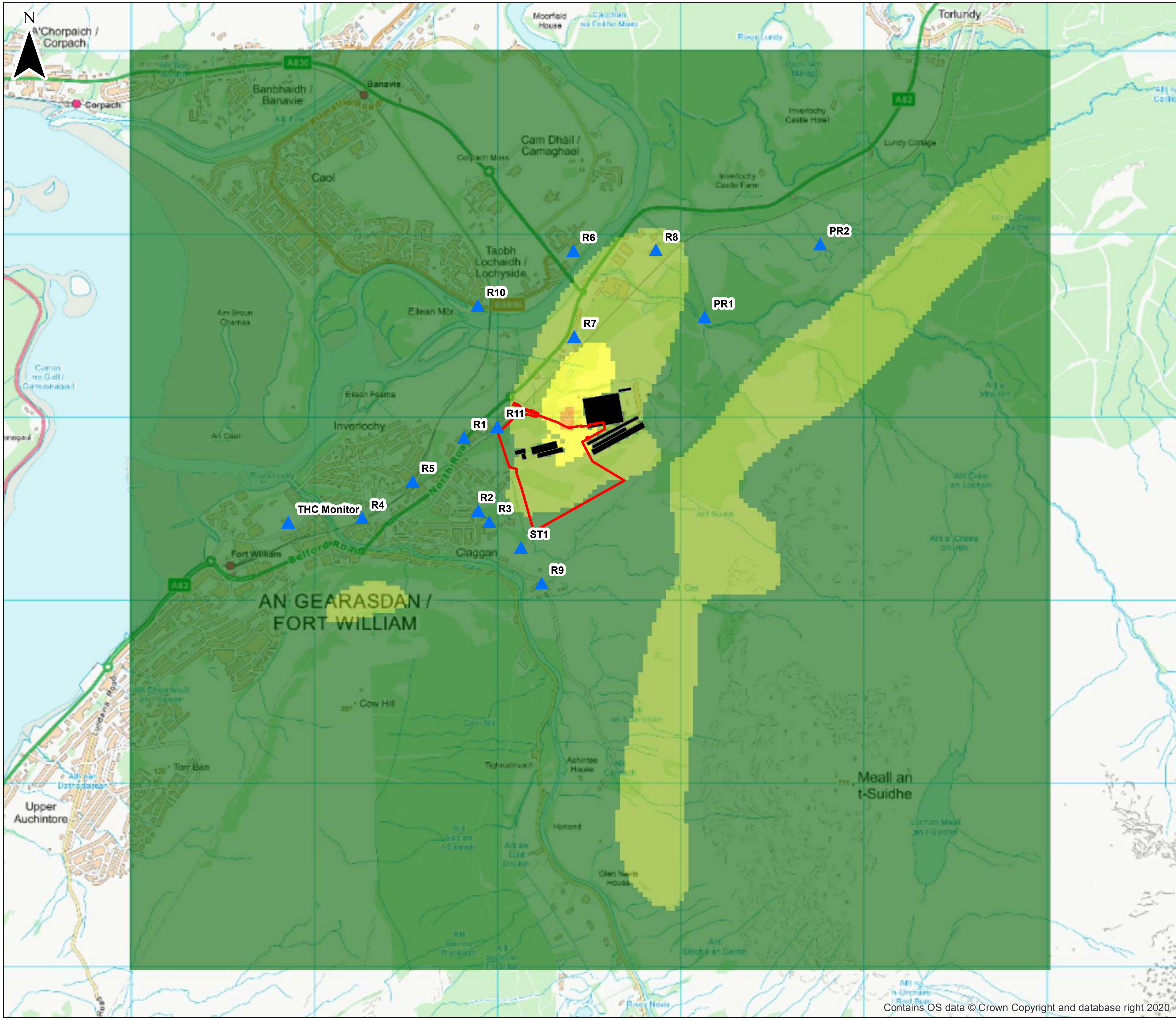
**Drawing 8**
**8 Hour Running Mean CO**
**Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

Site Boundary

Modelled Buildings

Selected Human Receptor

**Annual Mean $PM_{10}$ PC**

**ug/m$^3$**

<0.09 (<0.5% of AQS)

0.09 - 0.27 (0.5-1.5% of AQS)

0.27 - 0.99 (1.5-5.5% of AQS)

0.99 - 1.8 (5.5-10% of AQS)

>1.8 (>10% of AQS)

0 0.5 1 km

**Scale 1:20,000 @ A3**

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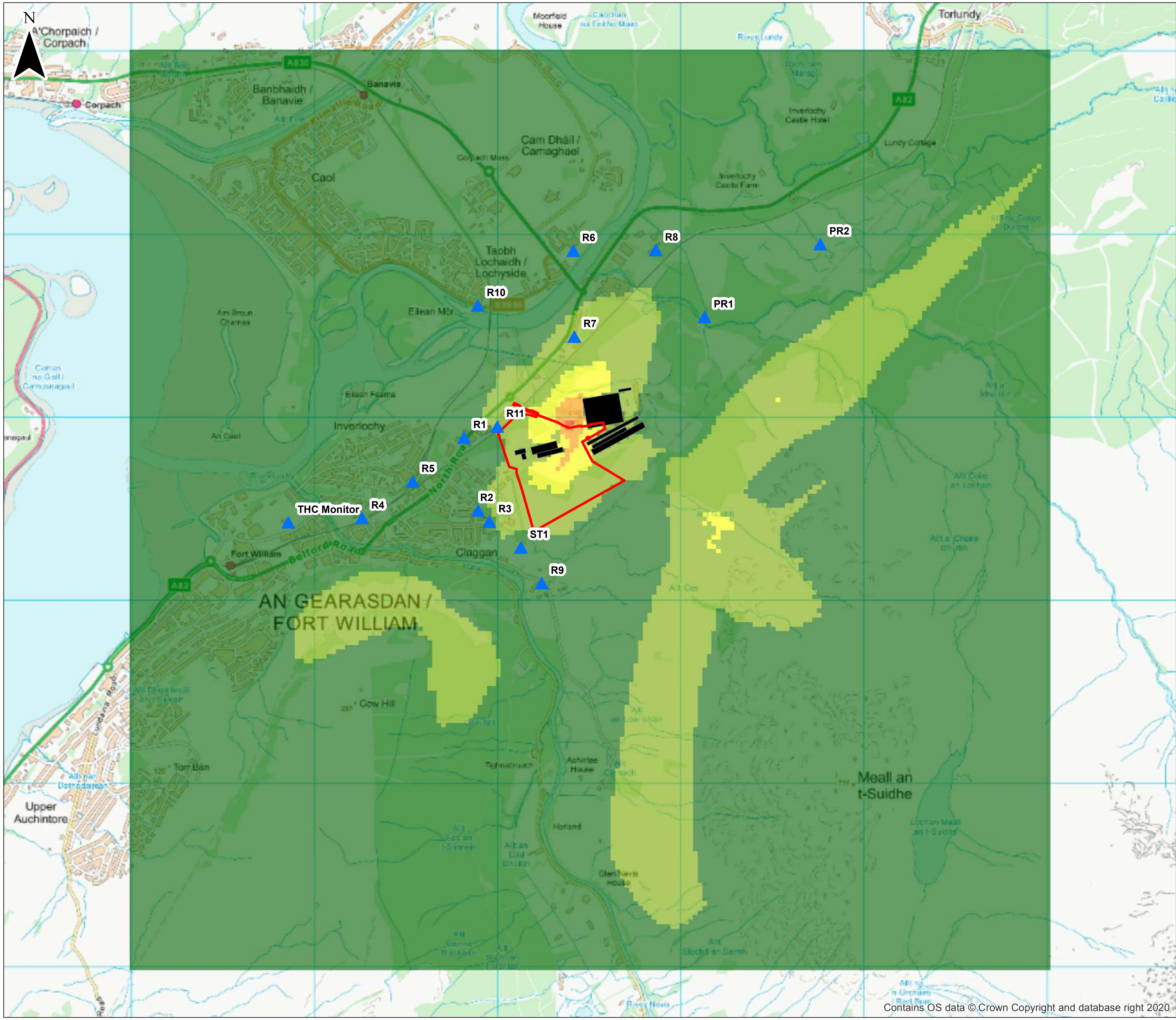
Air Quality Impact Assessment

**Drawing 9**

**Annual Mean $PM_{10}$ Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

Site Boundary

Modelled Buildings

Selected Human Receptor

**Daily Mean $PM_{10}$ 98.08th Percentile PC ug/m$^3$**

<0.5 (<1% of AQS)

0.5 - 1.25 (1 - 2.5% of AQS)

1.25 - 2.5 (2.5 - 5% of AQS)

2.5 - 5 (5 - 10% of AQS)

>5 (>10% of AQS)

0 0.5 1 km

Scale 1:20,000 @ A3

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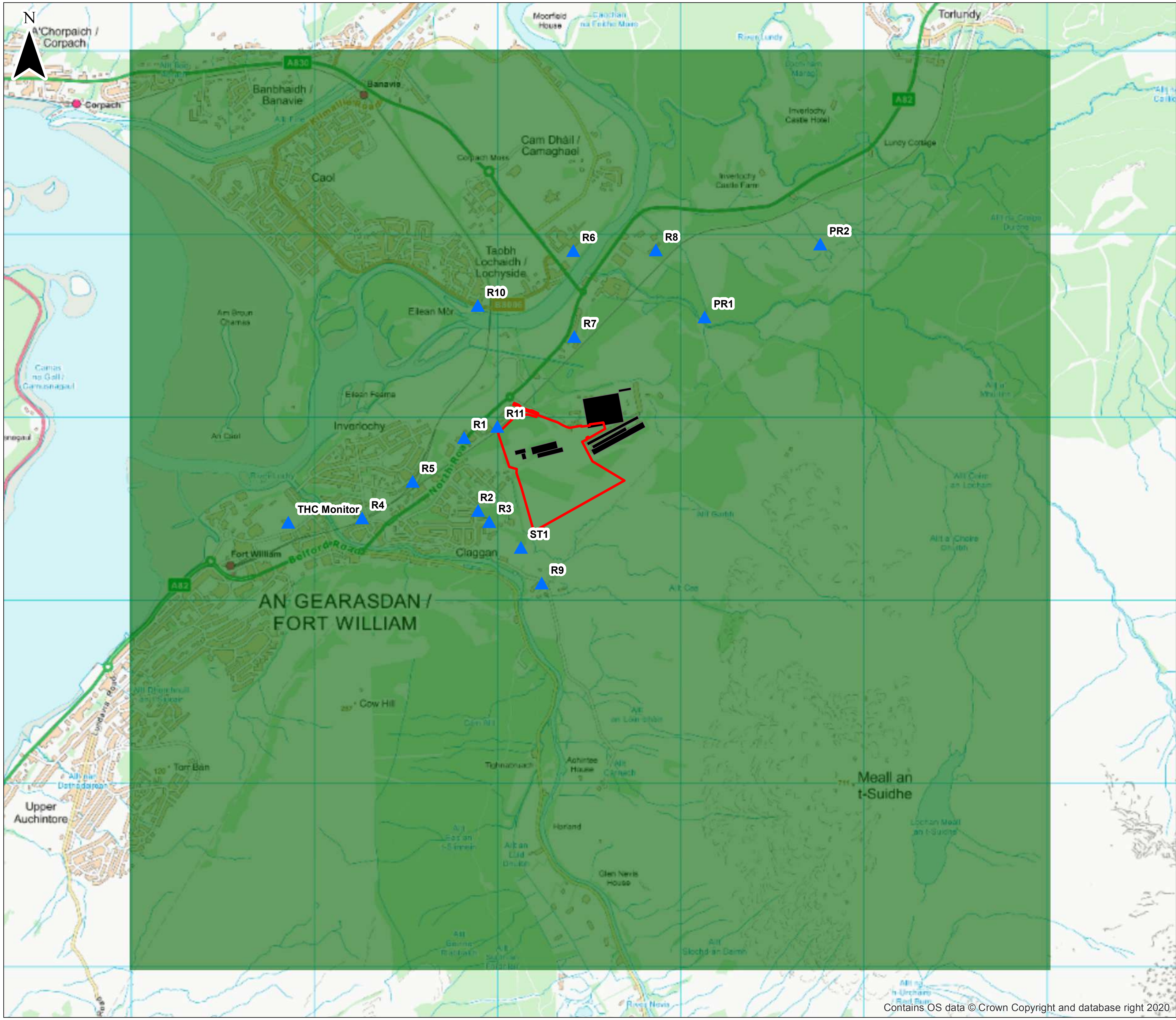
Air Quality Impact Assessment

**Drawing 10**
**Daily Mean $PM_{10}$ 98.08 Percentile**
**Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

- Site Boundary
- Modelled Buildings
- Selected Human Receptor

**Hourly HF PC**

**ug/m$^3$**

- <26.25 (<10.5% of AQS)
- 26.25 - 51.25 (10.5 - 20.5% of AQS)
- 51.25 - 126.25 (20.5 - 50.5% of AQS)
- >126.250 (>50.5% of AQS)

0 0.5 1 km

Scale 1:20,000 @ A3

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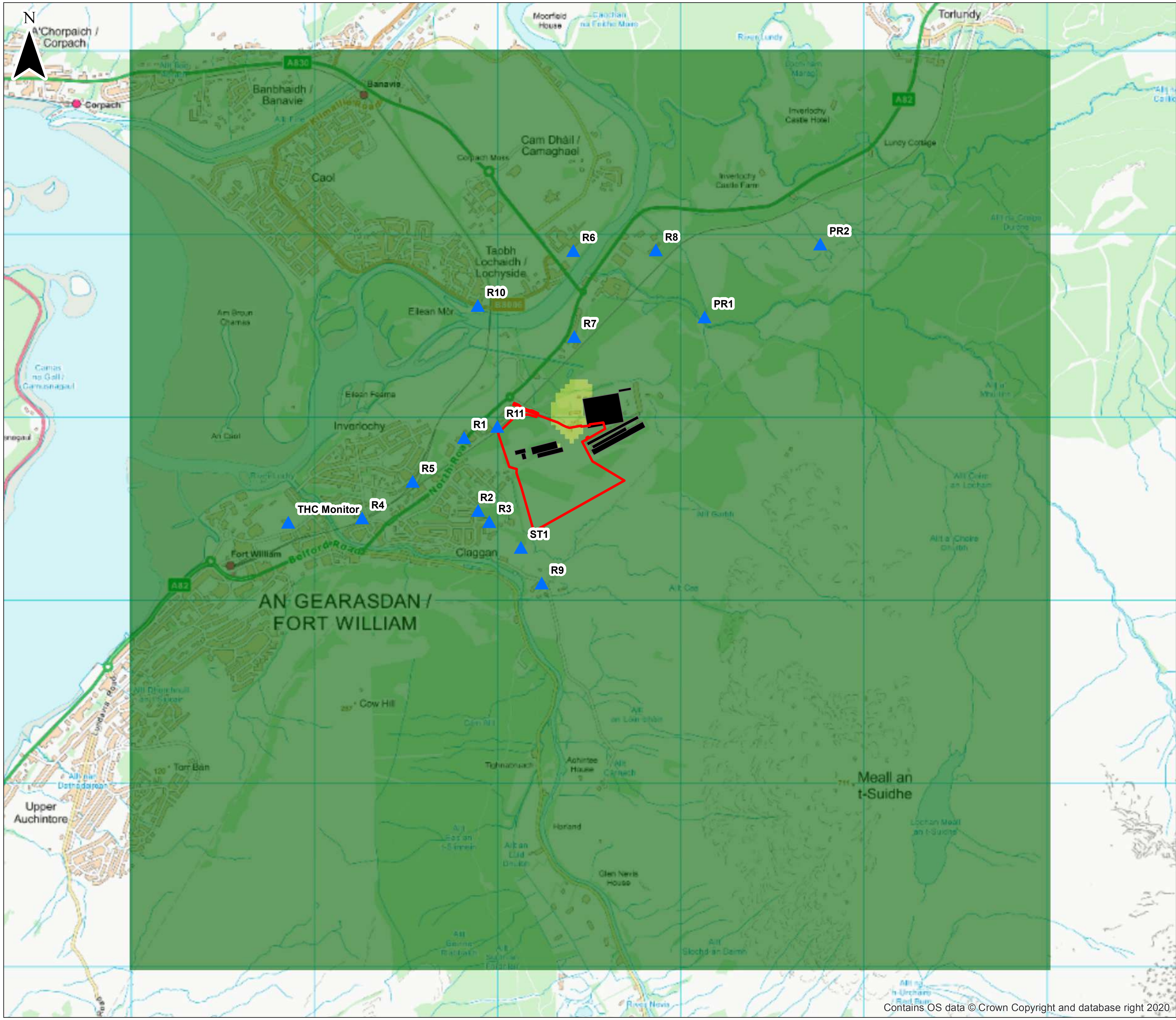
Air Quality Impact Assessment

**Drawing 11**

**Hourly HF Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

Site Boundary

Modelled Buildings

Selected Human Receptor

**Annual Mean HCl PC**

**ug/m$^3$**

<0.1 (<0.5 of AQS)

0.1 - 0.3 (0.5 - 1.5% of AQS)

0.3 - 1.1 (1.5 - 5.5% of AQS)

1.1 - 2 (5.5 - 10% of AQS)

>2 (>2% of AQS)

0 0.5 1 km

**Scale 1:20,000 @ A3**

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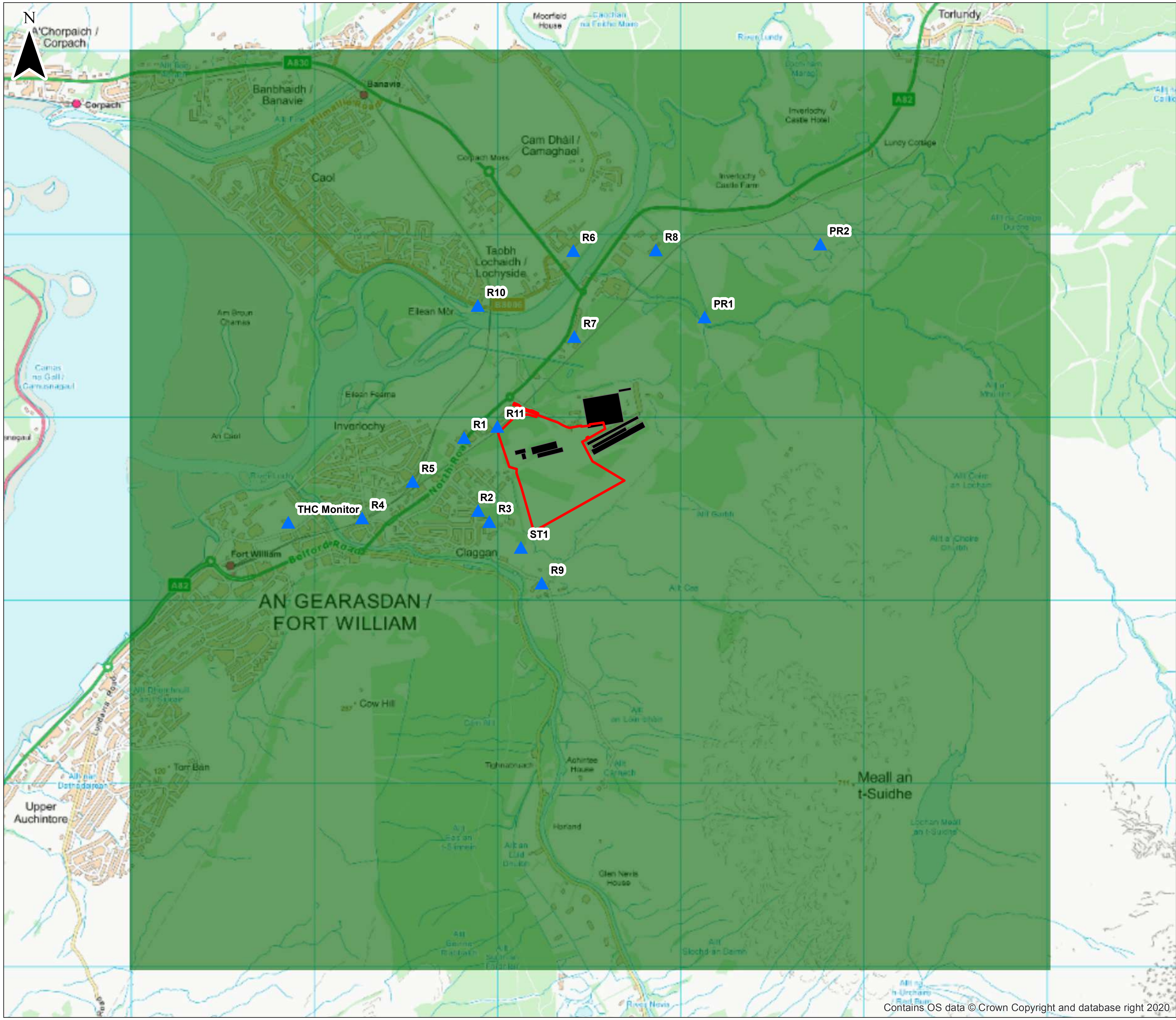
Air Quality Impact Assessment

**Drawing 12**

**Annual Mean HCl Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539

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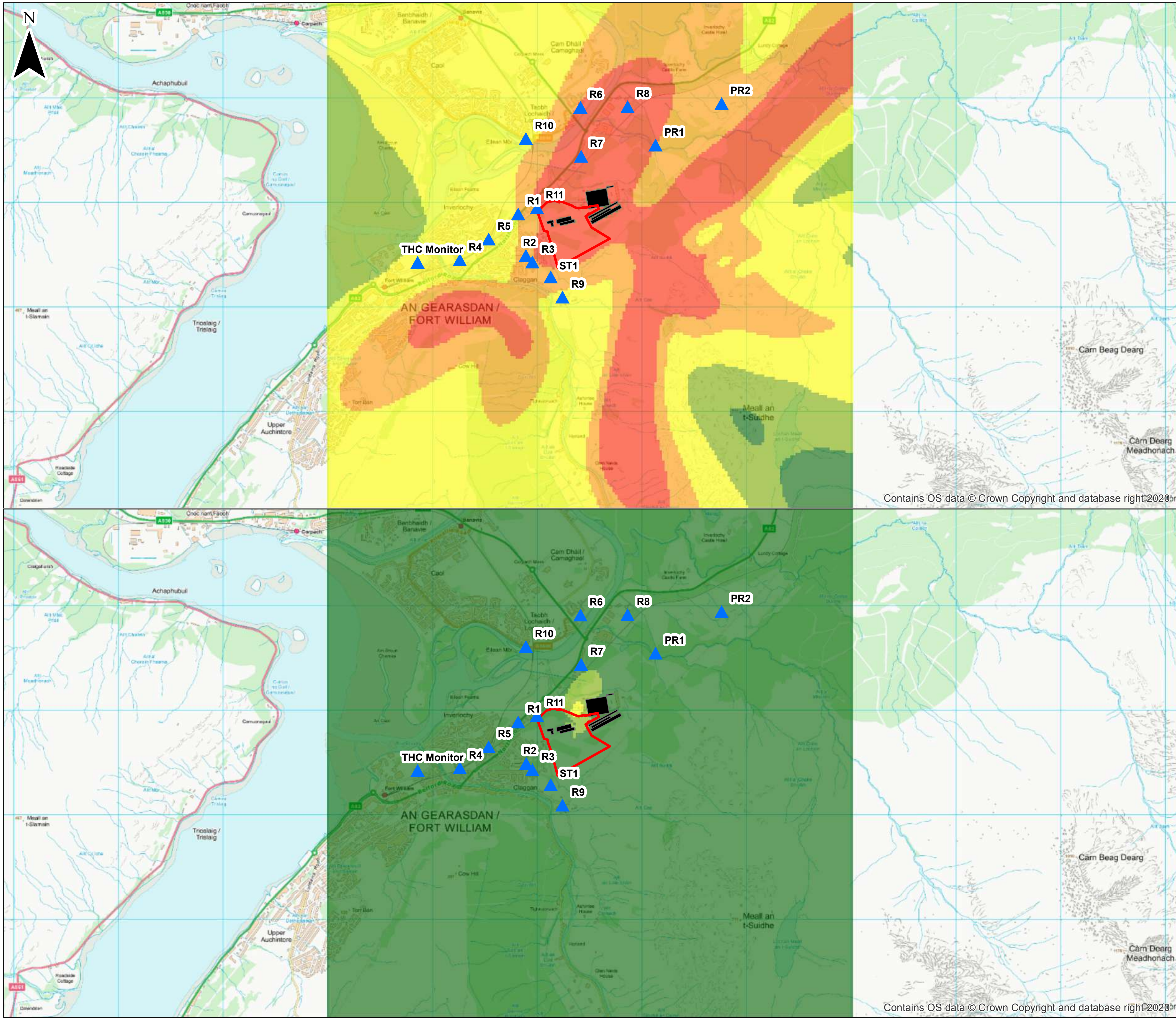
Air Quality Impact Assessment

**Drawing 13**

**Hourly HCl Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

Site Boundary

Modelled Buildings

Selected Human Receptor

**Annual Mean VOC PC (Benzene: 3.25 ug/m$^3$ AQS)**

**ug/m$^3$**

<0.01625 (<0.5% of AQS)

0.01625 - 0.04875 (0.5 - 1.5% of AQS)

0.04875 - 0.17875 (1.5 - 5.5% of AQS)

0.17875 - 0.325 (5.5 - 10% of AQS)

>0.325 (>10% of AQS)

**Annual Mean VOC PC (0.3 mg/m$^3$ EAL)**

**ug/m$^3$**

<1.5 (<0.5% of EAL)

1.5 - 4.5 (0.5 - 1.5% of EAL)

4.5 - 16.5 (1.5 - 5.5% of EAL)

16.5 - 30 (5.5 - 10% of EAL)

>30 (>10% of EAL)

0 1 2 km

**Scale 1:35,000 @ A3**

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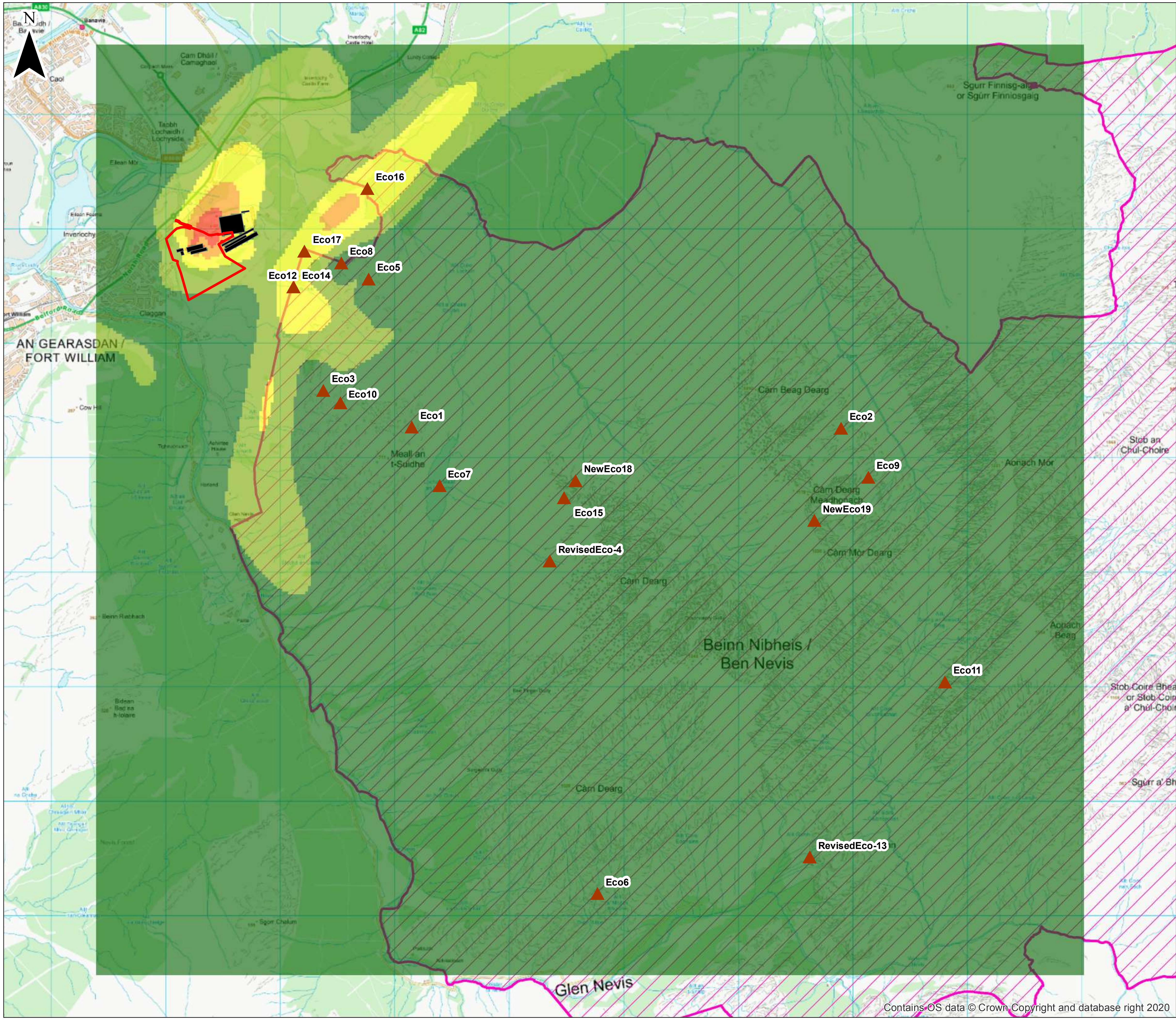
Air Quality Impact Assessment

**Drawing 14**

**Annual Mean VOC Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

- Site Boundary
- Modelled Buildings
- Ben Nevis Special Area of Conservation
- Selected Ecological Receptor

**Annual Mean $NO_x$ PC**

**ug/m$^3$**

- <0.3 (<1% of Critical Level)
- 0.3 - 0.75 (1 - 2.5% of Critical Level)
- 0.75 - 1.5 (2.5 - 5% of Critical Level)
- 1.5 - 3 (2.5 - 5% of Critical Level)
- >3 (>10% of Critical Level)

0 0.75 1.5 km

**Scale 1:32,000 @ A3**

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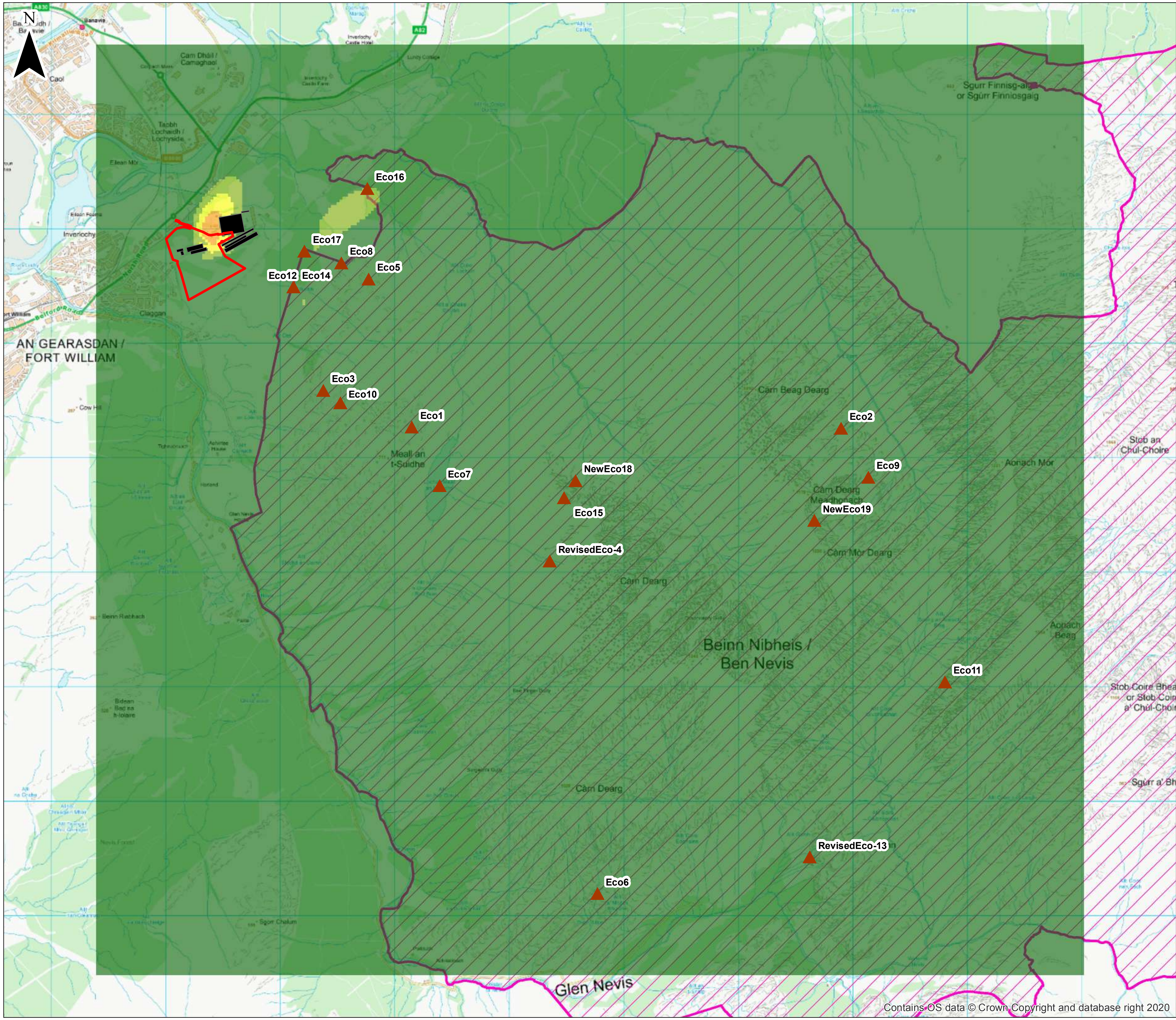
Alvance British Aluminium
Air Quality Impact Assessment

**Drawing 15**

**Annual Mean $NO_x$ Process Contributions**

| Date: | Drawn by: | Checked by: | Version: |
|---|---|---|---|
| 23/04/2021 | JB | AD | V1 |

Project Number: 3539




**KEY**

- Site Boundary
- Modelled Buildings
- Ben Nevis Special Area of Conservation
- Selected Ecological Receptor

**Weekly Mean HF PC**

**ug/m$^3$**

- <0.05 (<10% of Critical Level)
- 0.05 - 0.075 (10 - 15% of Critical Level)
- 0.075 - 0.125 (15 - 25% of Critical Level)
- 0.125 - 0.25 (25 - 50% of Critical Level)
- >0.25 (>50% of Critical Level)

0 0.75 1.5 km

Scale 1:32,000 @ A3

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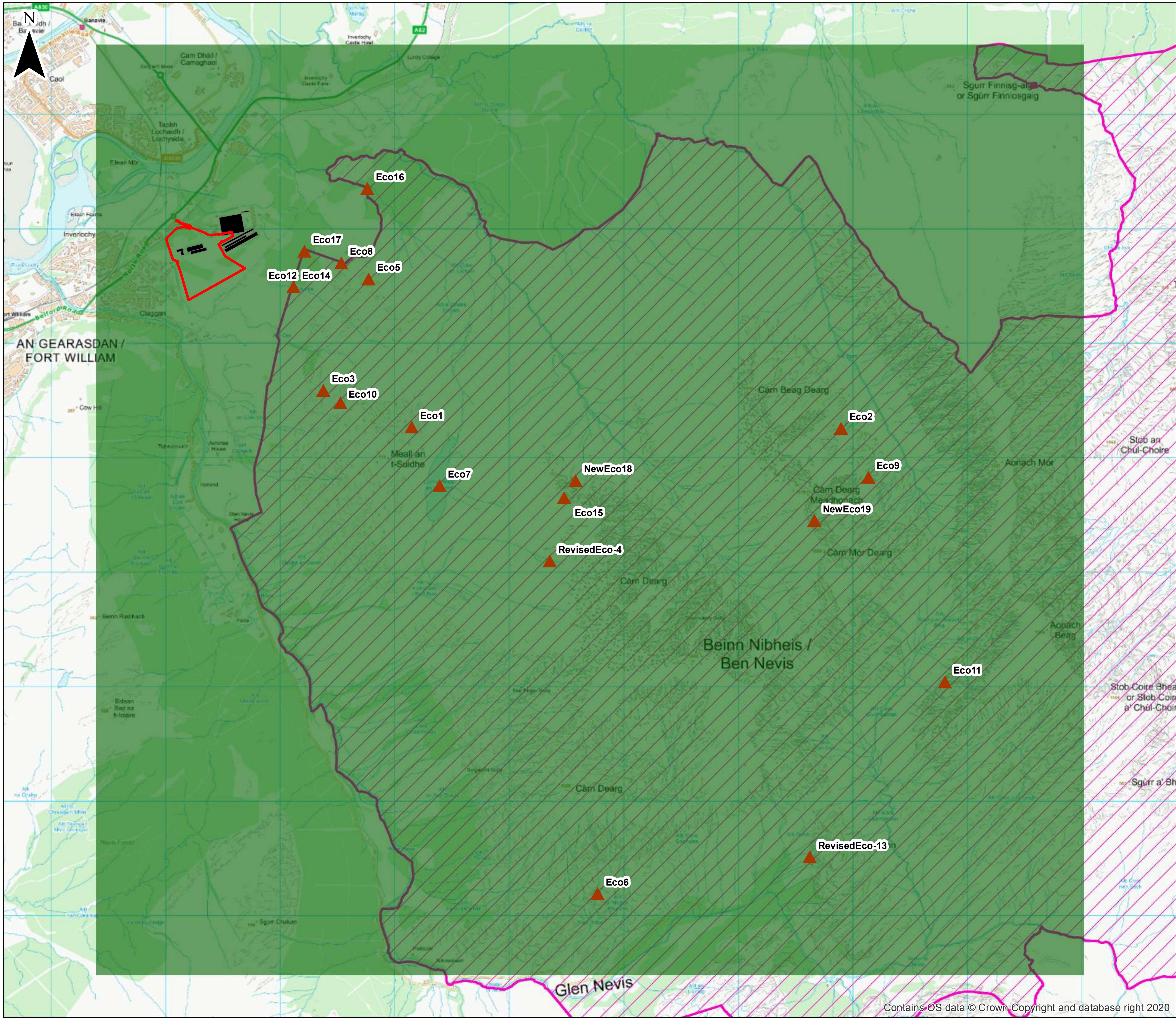
Air Quality Impact Assessment

**Drawing 16**

**Weekly Mean HF Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




KEY

- Site Boundary
- Modelled Buildings
- Ben Nevis Special Area of Conservation
- Selected Ecological Receptor

**Daily Mean HF PC**

$ug/m^3$

- <0.5 (<10% of Critical Level)
- 0.5 - 0.75 (10 - 15% of Critical Level)
- 0.75 - 1.25 (15 - 25% of Critical Level)
- 1.25 - 2.5 (25 - 50% of Critical Level)
- >2.5 (>50% of Critical Level)

0 0.75 1.5 km

Scale 1:32,000 @ A3

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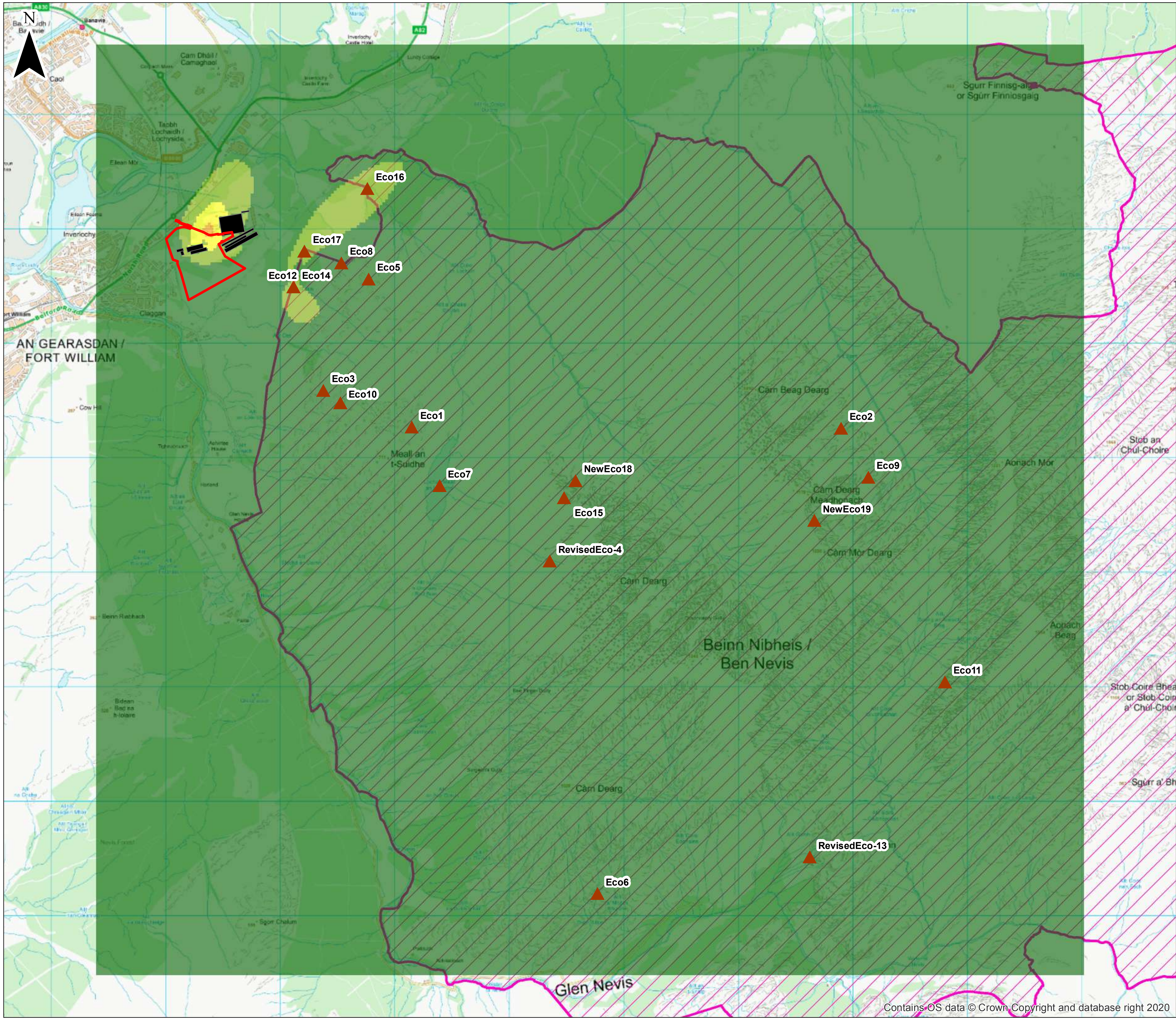
Air Quality Impact Assessment

**Drawing 17**

**Daily Mean HF Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

Site Boundary

Modelled Buildings

Ben Nevis Special Area of Conservation

Selected Ecological Receptor

**Nitrogen Nutrient Deposition PC**

**% of Critical Load Max = 10 kg N/ha/year**

<1%

1 - 2.5%

2.5 - 5%

5 - 10%

>10%

Please note that this drawing was prepared for a Critical Load Max of 10 kg N/ha/year

0 0.75 1.5 km

Scale 1:32,000 @ A3

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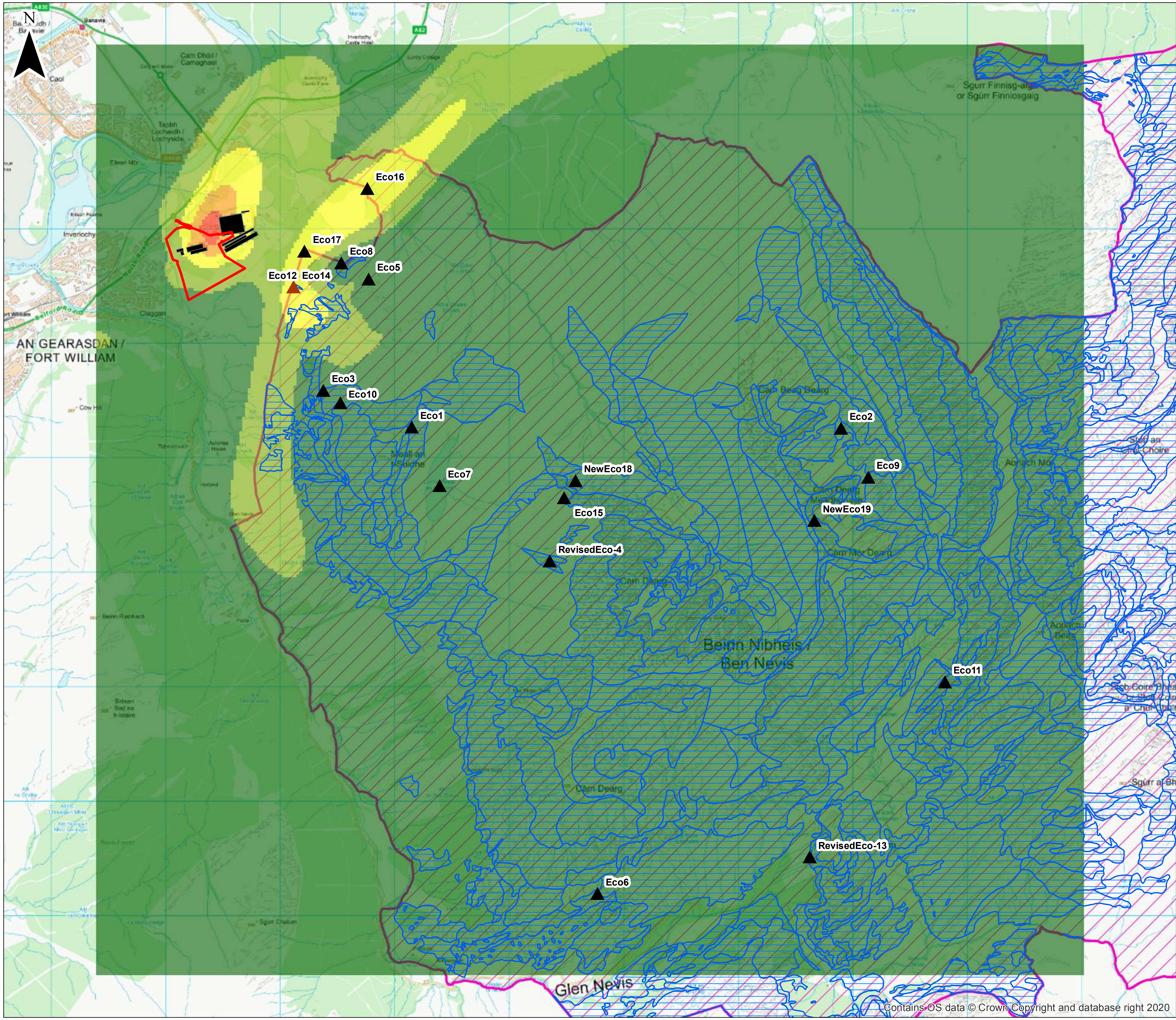
Air Quality Impact Assessment

**Drawing 18**

**Nutrient Nitrogen Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

Site Boundary

Modelled Buildings

Ben Nevis Special Area of Conservation

Selected Ecological Receptor

Eco12

**Habitat**

H8220 - Siliceous rocky slopes

**Acid Deposition PC**

**% of Critical Load Min (N) = 0.178 keq/ha/year**

<1%

1 - 2.5%

2.5 - 5%

5 - 10%

>10%

Please note that this drawing was prepared for a Critical Load Min (N) = 0.178 keq/ha/year and more specifically for receptor Eco12

0 0.75 1.5 km

Scale 1:32,000 @ A3

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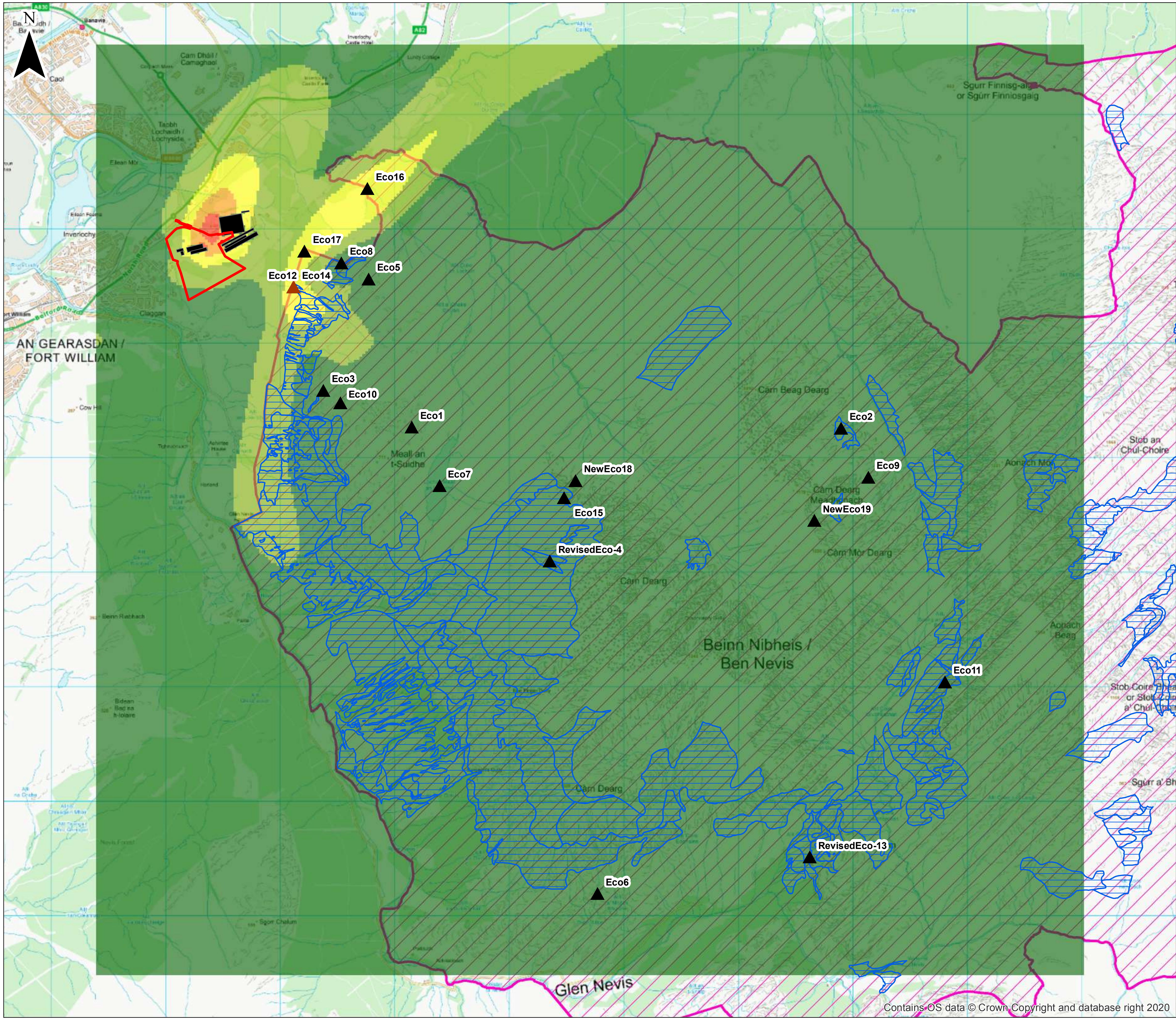
Air Quality Impact Assessment

**Drawing 19**

**Acid Deposition Process Contributions - Eco12**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

- Site Boundary
- Modelled Buildings
- Ben Nevis Special Area of Conservation
- Selected Ecological Receptor
- Eco14

**Habitat**

- H6230 - Species-rich Nardus grassland

**Acid Deposition PC**

**% of Critical Load Min (N) = 0.223 keq/ha/year**

- <1%
- 1 - 2.5%
- 2.5 - 5%
- 5 - 10%
- >10%

Please note that this drawing was prepared for a Critical Load Min (N) = 0.223 keq/ha/year and more specifically for receptor Eco14

0 0.75 1.5 km

Scale 1:32,000 @ A3

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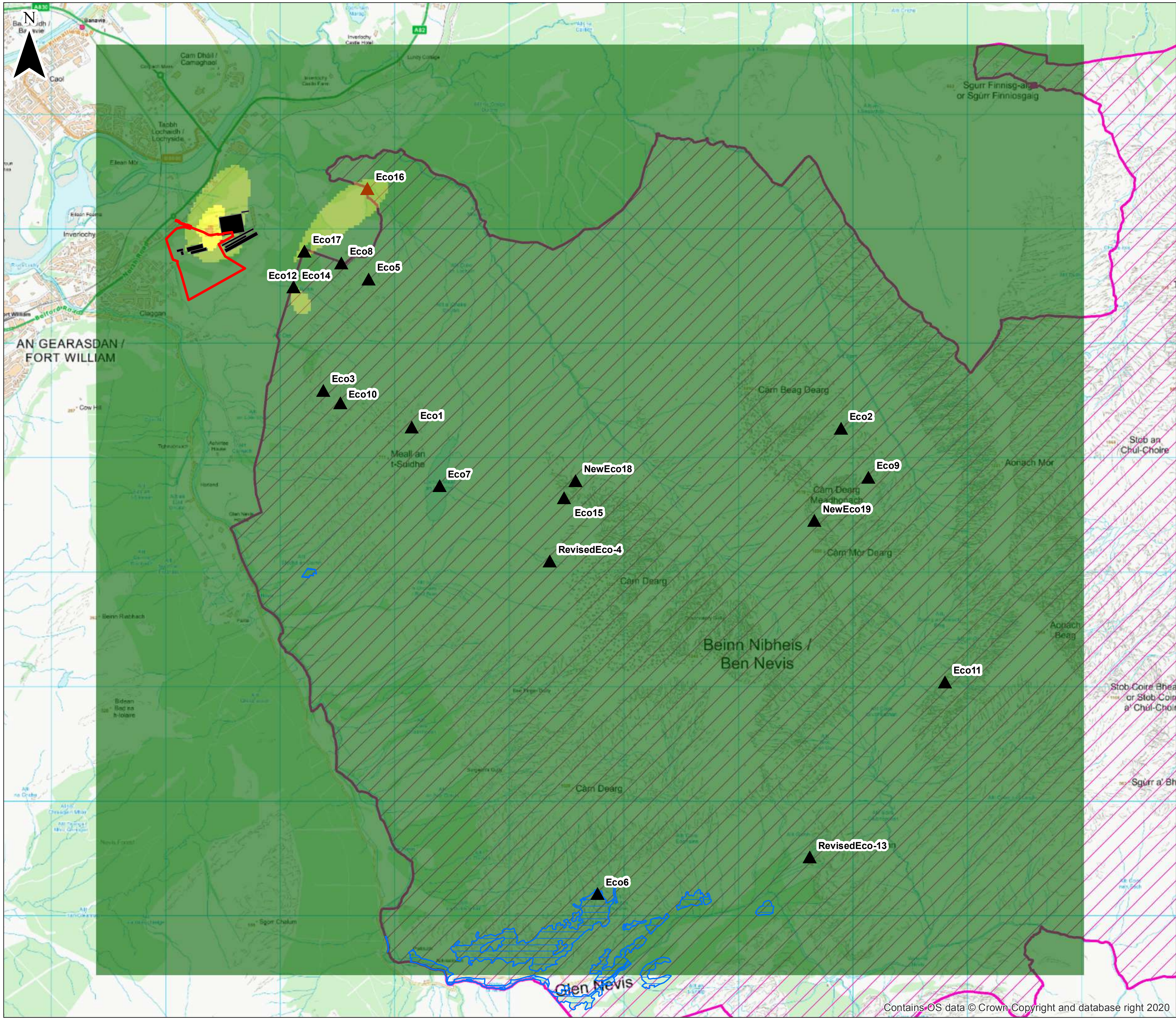
Air Quality Impact Assessment

**Drawing 20**

**Acid Deposition Process Contributions - Eco14**

Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1

Project Number: 3539




**KEY**

- Site Boundary
- Modelled Buildings
- Ben Nevis Special Area of Conservation
- Selected Ecological Receptor
- Eco16

**Habitat**

- H91A0 - Old sessile oak woods

**Acid Deposition PC**

**% of Critical Load Min (N) = 0.142 keq/ha/year**

- <1%
- 1 - 2.5%
- 2.5 - 5%
- 5 - 10%
- >10%

Please note that this drawing was prepared for a Critical Load Min (N) = 0.142 keq/ha/year and more specifically for receptor Eco16

0 0.75 1.5 km

**Scale 1:32,000 @ A3**

ALVANCE

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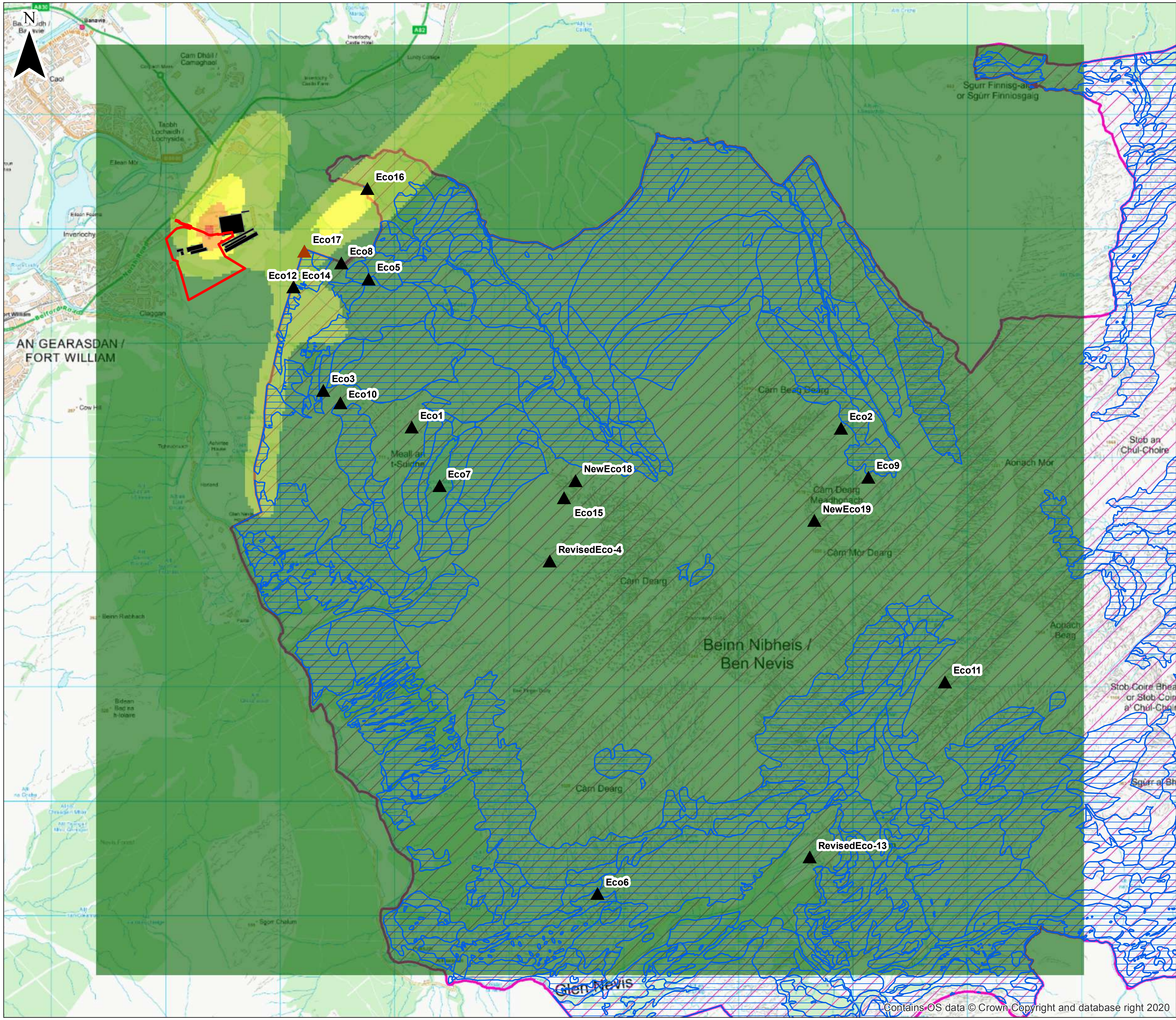
Alvance British Aluminium
Air Quality Impact Assessment

**Drawing 21**

**Acid Deposition Process Contributions - Eco16**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

Site Boundary

Modelled Buildings

Ben Nevis Special Area of Conservation

Selected Ecological Receptor

Eco17

**Habitat**

H4010 - Wet heaths

**Acid Deposition PC**

**% of Critical Load Min (N) = 0.642 keq/ha/year**

<1%

1 - 2.5%

2.5 - 5%

5 - 10%

>10%

Please note that this drawing was prepared for a Critical Load Min (N) = 0.642 keq/ha/year and more specifically for receptor Eco17

0 0.75 1.5 km

Scale 1:32,000 @ A3

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Alvance British Aluminium
Air Quality Impact Assessment

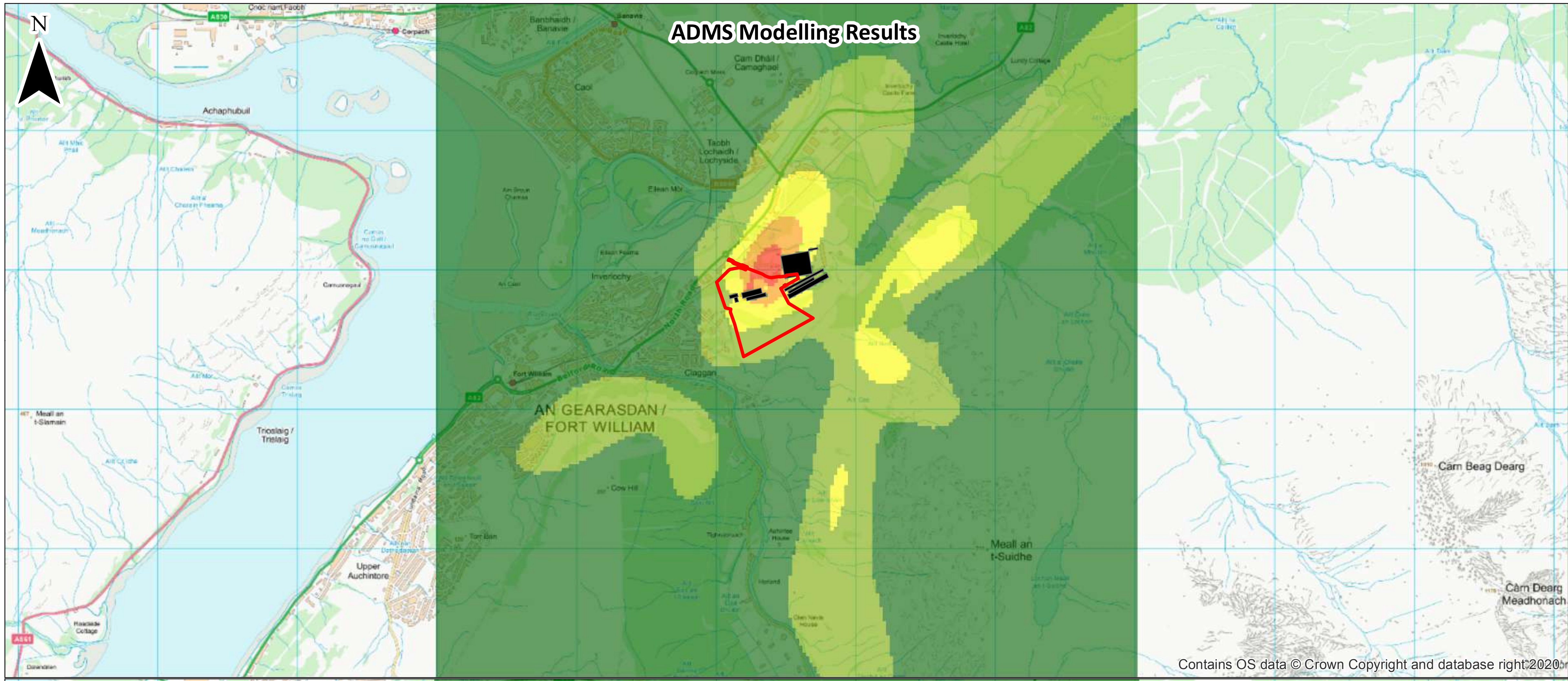
**Drawing 22**

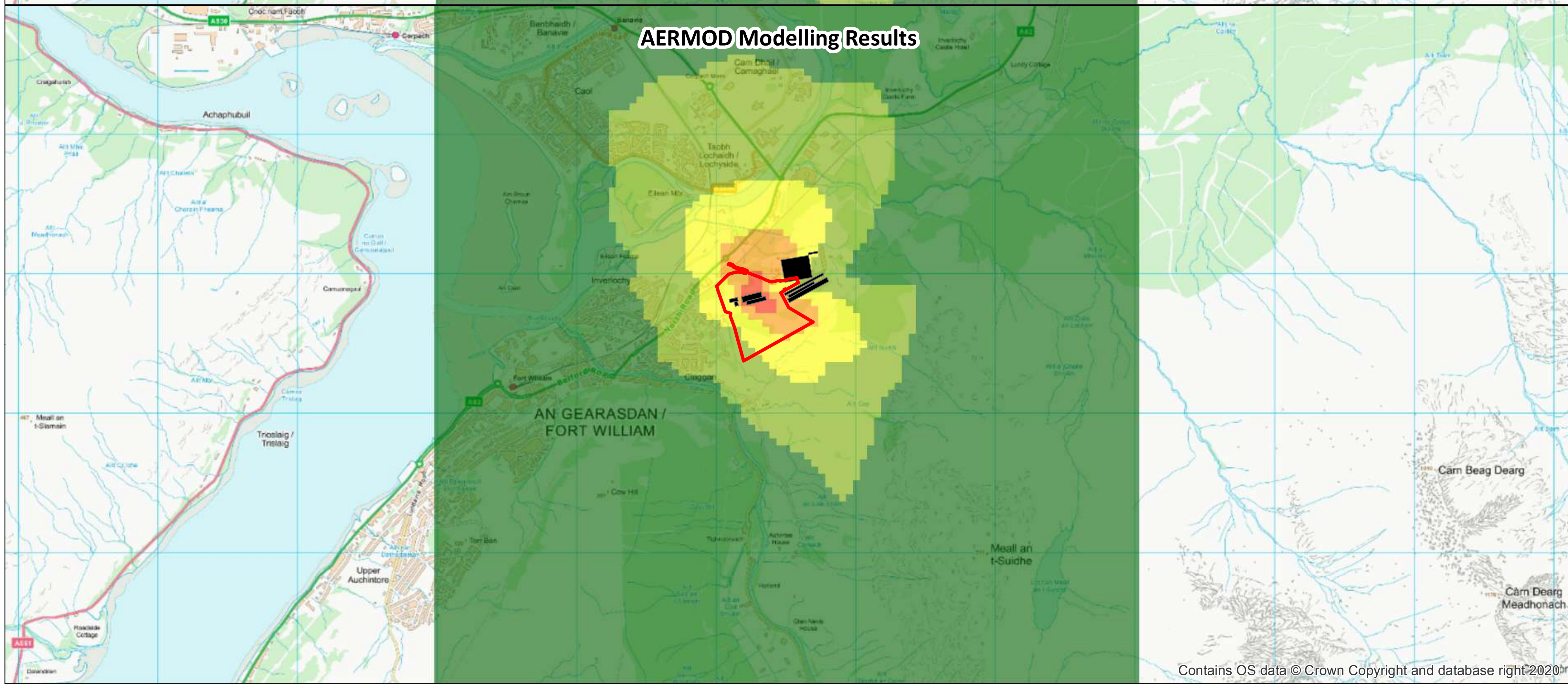
**Acid Deposition Process Contributions - Eco17**



| Date: 27/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

Site Boundary

Modelled Buildings

**Annual Mean $NO_x$ PC**

**ug/m$^3$**

<0.3 (<1% of Critical Level)

0.3 - 0.75 (1 - 2.5% of Critical Level)

0.75 - 1.5 (2.5 - 5% of Critical Level)

1.5 - 3 (2.5 - 5% of Critical Level)

>3 (>10% of Critical Level)

0 0.95 1.9 km

Scale 1:35,000 @ A3

ALVANCE

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Air Quality Impact Assessment

**Drawing 23**
**ADMS vs AERMOD Annual Mean $NO_x$ Process Contributions**

| Date: 23/04/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539

# Annex 1 – Consultation Log

## SEPA

**SEPA’s Initial Advice dated: 10/12/2020**

SEPA
Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

Our ref: PCS/174125
Your ref: 20/04655/SCRE

Contact by email:
Susan Haslam

10 December 2020

Susan Macmillan
The Highland Council
Charles Kennedy Building
Achintore Road
Fort William
PH33 6RQ

Submitted to Online Planning Portal

Dear Mrs Macmillan

**The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017**
**Town and Country Planning (Scotland) Acts**
**Erection of aluminium billet production facility with associated hardstanding, landscaping and drainage**
**Liberty Aluminium Lochaber Ltd, North Road, Fort William, PH33 6TH**

Thank you for consulting SEPA on the screening opinion for the above development proposal by your email received on 30 November 2020.

## Advice to the planning authority

Based on the information submitted to us and taking into consideration the assessment of a previous wheel plant proposal for this site (17/05202/FUL) which has a number of similarities we consider that, with respect to interests relevant to our remit, the proposed development will be **unlikely to have a significant effect** (in the context of the Regulations) on the environment and therefore Environmental Impact Assessment (EIA) is not required. This is however based on the assumption that modest or plainly and easily achievable environmental mitigation measures will be put in place as detailed below.

Whether or not EIA is required we request that the information outlined below is provided as part of the application. This advice has been significantly influenced by the approach taken to the previous wheel plant application. Much of the baseline data collected as part of that application will still be relevant to this new application, but other aspects such as air quality and noise assessment will need to be updated.

### 1. Pollution Prevention and Control (Scotland) Regulations 2012

1.1 The site has a permit to operate under the Pollution Prevention and Control (Scotland) Regulations 2012. The existing Part A permit controls elements such as discharges to the air and water, odour, noise, arrangements for the storage of chemicals, accidents / incident response and decommissioning up to the stage when the PPC permit is surrendered. Due to the scale of the proposed plant, the applicant will be required to apply to us to make a substantial variation to the existing PPC permit due to the addition of a Schedule 1, Section 2.2, paragraph (b) (ii) Part A PPC activity.

1.2 When commenting on planning applications for development which will also be regulated by SEPA, Planning Advice Note (PAN) 51 Planning, Environmental Protection and Regulation states that “it is good practice to use the Environmental Statement to provide all the technical information required for all permissions and licences, not just planning permission”. While information requirements for the PPC variation might be more detailed and demanding than the planning application in some respects, nevertheless it is important that as much information for both is made available at the planning application stage. Twin-tracking applications for consent under planning and environmental regulation regimes avoids duplication of effort, speeds the overall consenting process and ensures that the requirements of PPC are given due consideration at an early stage when proposals are at their most fluid and appropriate modifications more easily made with less expense to the developer. We therefore encourage the developer to twin track their planning and PPC variations applications.

1.3 Our general planning requirements for a development which is also be covered by PPC is that the planning application includes:

(a) A general description of the proposed process, techniques and technology choice.

(b) EITHER – details of proposed processes, techniques and technologies, an assessment of environmental impact associated with technology choice, including the process of producing a detailed list of receptors, a description of potential impact on sensitive receptors, proposed mitigation measures and emissions standards to be achieved;
OR – a demonstration that, assuming a worst-case scenario with sensitive receptors present, the development could reasonably achieve through existing technology agreed defined emissions standards;

(c) A statement relating to potential for abnormal or unusual events (e.g. non-routine emissions), the frequency and expected duration of the events, and the potential impact on sensitive receptors, in order to demonstrate the suitability of the location.

Determination of BAT

1.4 It should be noted that we can only grant a variation to a PPC permit where the applicant has demonstrated compliance with the PPC Regulations and that the installation will operate in accordance with BAT. We appreciate that certain aspects of the proposals are still at the early development stage. Until we know what the exact processes that are going to be involved constitute then we cannot guide the applicant as to all the relevant BAT standards and guidance that should be followed. However based on the information currently available, as a minimum the application will need to include information to show it can meet the standards set out in Non-Ferrous Metals BAT Conclusions. We do not expect a full and complete BAT justification at the planning stage, however, sufficient information should be provided to allow us to take a view on likely consentability of the proposed development under our pollution control regimes. The rest of this section outlines those issues which will be regulated under PPC where we have specific information requests which we ask be addressed at the planning stage.

Assessment of air quality including odour

1.5 Providing sufficient information on impacts of the production facility on air quality will be an important issue in relation to us being able to determine whether the proposal is capable of being authorised. Assessment of the previous application for the site indicated that consideration of potential impacts on local sensitive habitats and human health was especially important. We strongly encourage the developer to provide us with a method statement outlining the proposed approach to modelling the potential air quality impacts prior to the work commencing. Guidance on the content of the method statement can be found at: Medium combustion plant | Scottish Environment Protection Agency (SEPA)

1.6 It is noted that it is anticipated that there will be less emissions sources form the billet plant compared to the alloy wheel facility but our initial discussions with the developer indicate that the furnaces could be notably larger. Consequently, there is the possibility that there may be greater mass emissions of pollutants from these sources and it is this that determines actual environmental impact and therefore potential consentability. However we do appreciate that this may have been mitigated by recent improvements at the smelter. The method statement should clarify this and also enable us to compare these sources to those previously assessed for the wheel plant. In relation to this the reduction in biofuel generating plant operation is noted but the air quality assessment will need to take account of the permitted operating hours (500 hours) as a worst-case scenario. This would be consistent with the approach undertaken for the previous application.

1.7 The application should include an assessment of local baseline air quality focusing particularly on the air quality objectives outlined in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland.

1.8 Consideration should also be given to the potential effects of the different phases of development (if phasing is proposed), focusing particularly on whether at any stage the development will result in any of the air quality objectives being exceeded or will contribute to exceedences already taking place. Assessment can involve monitoring or modelling, or a combination of these. If modelling it to be used then we encourage the developer to use both AERMOD and ADMS modelling at the same time for comparison as this will increase confidence in the modelling results, providing a better understanding of any modelling uncertainties which may exist, and the air quality risks and impacts on the surrounding environment. If any potentially negative effects on air quality are identified, the assessment should also propose appropriate mitigation measures to deal with this.

1.9 The contribution that the different phases of installation development could have to ambient levels of Air Quality Strategy pollutants will also be assessed in detail as part of the PPC variation determination. Therefore it is important that, as far as possible, the information used in the assessment should be as accurate and as complete as possible. We understand that not all design issues will have been resolved at the planning application stage, but to avoid unnecessary duplication of work it is advantageous to ensure that the emission data used is as robust as possible. This may also avoid delay in consenting if for example a substantially revised or updated air quality impact assessment is required for PPC permitting purposes.

1.10 The applicant should note that the method for determining stack indicated in Table 3.1 of the screening report is incorrect as the air quality impact assessment should demonstrate that the stack height for significant emissions sources has been optimised. The use of D1 is a basic tool for air quality mitigation but a higher stack may be required to satisfy PPC requirements to show that potential impact from dispersion has been minimised. D1 also does not take into consideration potential impact on designated natural habitats which is an important consideration for this location.

1.11 The assessment should also include other potential sources such as emergency relief devices, abnormal operating conditions and emissions from standby equipment. The proposed different phases of operation should be outlined, accompanied by an assessment of effects at each stage. Other emissions may require assessment depending on the techniques proposed.

1.12 The meteorological data used to represent the local area should be carefully chosen and justified. We are content with the approach taken to the last application, but the data will need to be updated to cover the last five years.

1.13 The submission should include an assessment of the impact of potential odour emissions from the proposed facility, including likely discharge concentrations where available, and the impact of discharges during routine, non-routine and abnormal activities to allow us to comment on the consentability of the proposals. An approach similar to that taken to the previous application will be acceptable with full details assessed at the PPC application stage .The applicant should refer to the following guidance: SEPA Odour Guidance Note, IPPC Horizontal Guidance Note H4 parts 1 and 2 in addition to any other guidance identified during the process design considerations.

1.14 The application should demonstrate that the PPC requirements for the assessment of fugitive dust and particulate emissions are also met. The significant dust sources associated with the proposed plant could include air handling systems (including raw material handling, dust filtration plant, pressure relief systems, vehicle movement and handling of wastes). Any assessment of fugitive dust should include assessment of the normal anticipated operational emissions in addition to abnormal and non-routine operations.

1.15 Cumulative assessment for air quality (and noise and vibration) should consider future developments in the surrounding area. This should take into consideration developments which have gained approval but are not yet built. These sources should be indicated in the method statement indicated above. It is our understanding that it is not the intention of the developer to renew the planning consent for the wheel plant (17/05202/FUL) which expires soon. If it is not considered that a meaningful start has already been made on the development and the wheel plant consent expires prior to the new application being submitted then we are content with the approach of the wheel plant being excluded in terms of cumulative effects assessment.

<u>Noise and vibration</u>

1.16 We consider that impacts on noise will also be a significant issue in this case with noise from handling of recycled metal and operation of any external plant (e.g. air handling, stacks and vehicle movements) being particularly relevant. A noise assessment will be required and we encourage the developer to provide SEPA with a method statement outlining the proposed approach prior to the works being undertaken. We would welcome a design that will not lead to any increase in rated ambient sound levels.

<u>Drainage</u>

1.17 A detailed Drainage Impact Assessment should form part of the planning submission. It should follow recognised best practice and guidance and set out the strategy for the management of foul drainage, any aqueous effluents and surface waters. We would be very happy to provide advice on a draft version prior to its formal submission.

1.18 The application should include information showing how connection to the public foul sewer will be made; the previously submitted Drainage Impact Assessment confirmed that connection was available to the west. As this was an issue with the previous application we presume that the principle of connection has now been discussed and agreed with Scottish Water.

1.19 Confirmation should be provided as to whether the plant results in any other form of aqueous effluent and if so details (estimated volumes, chemical content etc) provided. Our preference is that this is also directed to the public foul drainage system. We ask that either confirmation is provided that Scottish Water have agreed the principle of accepting any such discharge or information on proposed private treatment, expected standards and discharge is required. Any direct discharges to the water environment should be subject to at least a H1 screening assessment which should ascertain the need for modelling. If detailed modelling of a discharge is required then as outlined elsewhere we strongly encourage the developer to provide us with a method statement outlining the proposed approach prior to the work commencing.

1.20 Information on surface water drainage should be provided. Proposals should follow recognised best practice such as The SUDS Manual, CIRIA C736 and the relevant BAT reference documents. Roof rainwater should be harvested to help reduce overall water requirements and information should be provided on the pollution hazard level for different areas of the site (for example material handing storage and handling areas, working yard areas, roads, carparking) clearly demonstrating that suitable treatment is provided. If there is the potential for oil contamination then oil interceptors should be include as part of the design. Consideration should also be given to drainage from accidents and how that will be captured. Note that under PPC we do not control the quantity of discharge of surface water. However section 2.6 of the previous Flood Risk Assessment did identify a potential groundwater flooding issue and should the foot print of this development overlap with the area of potential flood risk shown in the previously submitted Flood Risk Assessment then information should be provided on how drainage will be designed to address the issue.

## 2. Disturbance and re-use of excavated peat and other carbon rich soils

2.1 As it was with the previous application minimising peat disturbance will be an important aspect of this development. As well as the existing policy provided in Scottish Planning Policy and in the Highland Wide Local Development Plan the recently published National Planning Framework Position Statement makes it clear that restricting peat extraction and development on peat is a key opportunity to achieve net-zero emissions by 2045. Peatland protection and restoration is identified as a likely priority policy change for National Planning Framework 4.

2.2 We ask that the application be supported by a Peat Management Plan which brings together in a coherent manner all the relevant information provided in the previous application and adapted to ensure it is applicable to this new development. It should cover and include the following:

- A layout plan overlain with peat survey results showing the location of all peat probes with depths. We are content that enough survey information was collected with the previous application and no new data is required.

- A justification of the location of development in relation to the areas of peat on site, especially in relation to the areas of deepest peat. We were generally content that this was demonstrated for the previous application so a similar approach could be taken here.

- The measures to be taken to minimise peat disturbance, such as limiting the footprint as much as possible and piling or floating infrastructure.

- An estimate of the volume of peat that will be disturbed by the development broken down into acrotelmic and catotelmic. We would prefer this to be based on collected data rather than earthwork modelling.

- Proposed reuses of disturbed peat. We are pleased to note that the screening report confirms that the material will be used to restore an area of cleared plantation forestry. If designed and implemented well we consider this to be a good use of the material. A plan showing the areas to be restored, a statement of the proposed restoration objectives including peat reuse depths accompanied by a basic calculation to demonstrate that all the peat can used on site as part of site reinstatement and the above habitat improvement works should be provided.

- A map showing any temporary storage areas for disturbed peat, although now that a clear on site use has been identified for the material we would encourage the developer to try and excavate the peat and reuse it for restoration as a single activity.

2.3 We note that a Peat Management Plan was provided for the last application but was not shared with is. It seems very likely that the submission we request above can be a revision of this document, but to avoid doubt it needs to include the background information outlined above and needs to be specific to this development.

## 3. Pollution prevention and environmental management

3.1 A schedule of mitigation should be included which outlines the measures to be taken to limit the impacts on the environment during the construction period. They must include reference to best practice pollution prevention and construction techniques and regulatory requirements, Please refer to the Pollution prevention guidelines.

## 4. Flood risk

4.1 While we do have update predictions for climate change we are content that the previously submitted Flood Risk Assessment is still valid and should be submitted as part of the new application. Presuming that there are no new watercourse crossings the only issue which may need further consideration is groundwater flooding, which we have referred to above.

## 5. Disruption to Groundwater Dependent Terrestrial Ecosystems (GWDTE)

5.1 We are content that the information submitted with the previous application demonstrated that the peatland habitats on the site are not significantly groundwater dependant in that setting and as a result we agree that the new application need not include any habitat information.

## 6. Water abstraction

6.1 Based on previous discussions with the applicant we presume that the development will not result in an increase in water abstraction above that already authorised by SEPA under the Water Environment (Controlled Activities) Regulations. We appreciate that the developer has made contact with our local compliance team in Fort William to discuss this further, which is welcomed. If the proposals will result in a need to increase water abstraction above that already consented then details of the proposed abstraction and impact it could have on the environment should be provided. We would be happy to provide further advice on this aspect once details are known.

## 7. Previous land use

7.1 The site currently has a potentially contaminating land use and this should be taken into consideration by suitable ground investigations. The council's contaminated land team will provide further advice on this.

## 8. Regulatory advice for the applicant

8.1 Details of general regulatory requirements and good practice advice for the applicant can be found on our website at www.sepa.org.uk/planning.aspx.

8.2 You should continue to liaise with our Alastair Whyte regarding varying your Part A PPC permit. It is important that regular communication with SEPA is made regarding the consideration of available techniques and demonstration of BAT.

8.3 The smelter is already an Upper Tier COMAH establishment and any changes in inventory that could have major accident consequences as a result of the expansion should be discussed with the COMAH Competent Authority and the Local Authority. It will be necessary to revise your Safety Report and amend your Hazardous Substances Consent.

8.4 Pollution prevention and management during construction and abstraction issues will be dealt with by our local compliance team in Fort William who can be contacted via AHSH@sepa.org.uk. For the avoidance of any doubt we highlight that noise, odour and air quality issues relating to construction and demolition works will not be regulated by SEPA.

Should you wish to discuss this letter please do not hesitate to contact me on email via planning.north@sepa.org.uk.

Yours sincerely

Susan Haslam
Senior Planning Officer
Planning Service

ECopy to: JLL, steve.black@eu.jll.com;
The Highland Council, Susan.MacMillan@highland.gov.uk

*Disclaimer*
*This advice is given without prejudice to any decision made on elements of the proposal regulated by us, as such a decision may take into account factors not considered at this time. We prefer all the technical information required for any SEPA consents to be submitted at the same time as the planning or similar application. However, we consider it to be at the applicant's commercial risk if any significant changes required during the regulatory stage necessitate a further planning application or similar application and/or neighbour notification or advertising. We have relied on the accuracy and completeness of the information supplied to us in providing the above advice and can take no responsibility for incorrect data or interpretation, or omissions, in such information. If we have not referred to a particular issue in our response, it should not be assumed that there is no impact associated with that issue. Further information on our consultation arrangements generally can be found on our website planning pages.*

**From:** Annie Danskin
**Sent:** 08 February 2021 16:30
**To:** [redacted]
**Subject:** FAO Susan Haslam re Alvance Aluminium Billet Plant - AQIA method statement

Please find attached our proposed method statement to complete the AQIA works to accompany the planning application and permitting application for the proposed new billet production facility at Alvance Aluminium in Fort William.

This is in response to Susan Haslam's letter to Susan MacMillan at The Highland Council copied to Steve Black of JLL on 10 December 2020 SEPA ref: PCS/174125

I trust that this meets with your approval.
Regards
Annie


**Annie Danskin | Associate – Air Quality |** ITPEnergised
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Please note our change of Edinburgh address as of 1st July 2020

**DUE TO COVID 19 ADVICE ITPENERGISED ARE WORKING FROM HOME. PLEASE CALL MOBILE NUMBERS IN THE FIRST INSTANCE**

# Proposed Billet Production Facility at Alvance British Aluminium, Fort William

## Air Quality Impact Assessment Method Statement for The Highland Council and SEPA

| | |
|---|---|
| Client: | Alvance |
| Project Number: | 3539 |
| Version: | 1.0 |
| Date: | 2021-02-08 |

# Document Information

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|---|---|
| Project Name: | Proposed Billet Production Facility at Alvance British Aluminium, Fort William |
| Document Title: | Air Quality Impact Assessment Method Statement for The Highland Council and SEPA |
| Client Name: | Alvance |
| Client Contact: | James Tangney |
| Client Address: | Lochaber Smelter, Fort William, PH33 6TH |
| Document Status: | Final for Issue |
| Author: | Annie Danskin |
| Reviewed: | Ruth Fain |
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## Revision History

| Version | Date | Authored | Reviewed | Approved | Notes |
|---|---|---|---|---|---|
| 1.0 | 2021-02-05 | Annie Danskin | Ruth Fain | Ruth Fain | Issued for inclusion in JLL EIA Scoping statement to THC |
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# Contents

# 1. Introduction

1.1.1 This document forms the method statement by which ITPE propose to undertake the Air Quality Impact Assessment (AQIA) to be submitted with the planning application for the proposed Billet Production Plant at Alvance British Aluminium, Fort William.

1.1.2 The method statement has been prepared to include the advice to the planning authority, The Highland Council (THC), from the SEPA Senior Planning Officer, Susan Haslam in response to the screening request (SEPA ref: PCS/174125 dated 10 December 2020). It includes a copy of direct correspondence between ITPE and Nature Scot which focussed on our approach to the assessment of deposition on sensitive habitats within the Ben Nevis SAC.

1.1.3 The AQIA will consider potential impacts upon both human and designated ecological receptors and include direct and potential for fugitive emissions, including odour.

1.1.4 The AQIA will adopt the same methodology as was used for the previously consented Allow Wheel Facility which is being withdrawn.

1.1.5 The AQIA will assess potential impacts associated with the Proposed Development emissions sources solely and in combination with existing emissions sources within the existing Alvance British Aluminium site ('the wider site') including the smelter and bio-diesel generators.

1.1.6 The AQIA will include:

- Desktop review of the local baseline air quality;
- Qualitative assessment of construction phase dust impacts in accordance with the Institute of Air Quality Management (IAQM) Assessment of Dust from Demolition and Construction Guidance (IAQM, 2014);
- Screening assessment of construction and operational phase traffic in accordance with the IAQM/Environmental Protection UK (EPUK) Guidance on Land-use Planning and Development Control: Planning for Air Quality (EPUK & IAQM, 2017);
- Air quality impact assessment of the Proposed Development upon human receptors in accordance with IAQM/Environmental Protection UK (EPUK) Guidance on Land-use Planning and Development Control: Planning for Air Quality (EPUK & IAQM, 2017); and
- Assessments of Critical Level concentrations, nutrient nitrogen deposition and acid deposition due to emissions from the Proposed Development upon designated ecological receptors in accordance with the Environment Agency (EA) Air Emissions Risk Assessment for Your Environmental Permit webpage (EA, 2020) and Habitats Directive AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air (Air Quality Advisory Group, 2014).

1.1.7 This assessment will be undertaken by air quality and dispersion modelling specialists Annie Danskin CEnv, Associate Consultant at ITPE with over 22 years of experience and Jonas Beaugas, Senior Consultant at ITPE with over 6 years of experience. Annie completed the AQIA for the previously consented Alloy Wheel Facility.

# 2. Legislation, Policy and Guidelines

2.1.1 The following legislation, planning policy and guidance documents will be considered as part of the air quality and odour impact assessments.

## 2.2 Legislation

2.2.1 The UK's legislation and regulatory regime, along with national, regional, and local planning policy play a key role in the prevention, control and minimisation of atmospheric emissions that are potentially harmful to human health and the environment. Air Quality Standards (AQS)[1] are used as assessment criteria for determining the significance of any potential changes in local air quality resulting from development proposals.

### 2.2.2 European Legislation Translate into UK Law

2.2.3 The EU has published a Directive on Ambient Air Quality Assessment and Management which came into force in September 1996 (Council of the European Union, 1996). This Directive was intended as a strategic framework for tackling air quality consistently, through setting European wide air quality limit values in a series of daughter directives, superseding and extending existing European legislation. The first four daughter directives were placed into national legislation. A new EU air quality directive (European Parliament and the Council of the European Union, 2008) came into force in June 2008 and was transposed into The Air Quality Standards Regulations in England, Wales, Scotland and Northern Ireland in June 2010 (HM Government, 2010).The directive merged the four daughter directives and one Council decision into a single directive on air quality.

### 2.2.4 National Legislation and Strategy

2.2.5 The Environment Act 1995 (HM Government, 1995) required the preparation of a national air quality strategy setting Air quality Objectives (AQOs) for specified pollutants and outlining measures to be taken by local authorities through the system of Local Air Quality Management (LAQM) and by others to work in pursuit of the achievement of these objectives. A National Air Quality Strategy (NAQS) was published in 1997 and subsequently reviewed and revised in 2000, and an addendum to the Strategy published in 2002. The current Strategy was published in July 2007 (Welsh Assembly Government, Scottish Executive, Department of the Environment, Department for Environment Food and Rural Affairs, 2007).

2.2.6 The AQOs which are relevant to LAQM have been set into Regulations namely Air Quality (Scotland) Regulations 2000, Air Quality (Scotland) Amendment Regulations 2002 and Air Quality (Scotland) Amendment Regulations 2016 (Scottish Executive, 2016), the latter of which introduces an additional statutory obligation for Scottish Local Authorities to comply with an annual mean standard for $PM_{2.5}$ to align with the World Health Organisation (WHO) guideline value (WHO, 2005).

2.2.7 The AQSs are set for the purpose of protecting human health, vegetation, and ecosystems from certain harmful atmospheric pollutants. The Scottish standards take account of the EU objective values and are either effectively identical, or more stringent.

2.2.8 The standards applicable to this study are presented in **Table 2-1**.

*Table 2-1 – AQS for Scotland Applicable to this Assessment*

| Pollutant | Concentration | Measured as |
|---|---|---|
| **Human Receptors** | | |
| Nitrogen dioxide ($NO_2$) | 200 µg/m$^3$ not to be exceeded more than 18 times a year | 1-hour mean |

[1] Air Quality Standards are concentrations recorded over a given time period, which are considered to be acceptable in terms of what is scientifically known about the effects of each pollutant on health and on the environment. They can also be used as a benchmark to indicate whether air pollution is getting better or worse.

| | | |
|---|---|---|
| | 40 µg/m$^3$ | Annual mean |
| Particulate material ($PM_{10}$) | 50 µg/m$^3$, not to be exceeded more than 7 times a year | 24-hour mean |
| | 18 µg/m$^3$ | Annual mean |
| Sulphur Dioxide ($SO_2$) | 266 µg/m$^3$, not to be exceeded more than 35 times a year | 15-min mean |
| | 350 µg/m$^3$, not to be exceeded more than 24 times a year | 1-hour mean |
| | 125 µg/m$^3$, not to be exceeded more than 3 times a year | 24-hour mean |
| Benzene ($C_6H_6$)* | 3.25 µg/m$^3$ | Running annual mean |
| Carbon Monoxide (CO) | 10 mg/m$^3$ | Running 8-hour mean |
| **Ecological Receptors** | | |
| Nitrogen Oxides ($NO_x$) | 30 µg/m$^3$ | Annual mean |
| Sulphur Dioxide ($SO_2$) | 20 µg/m$^3$ | Annual mean |
| | 20 µg/m$^3$ | Winter average |

**used as a surrogate AQO for total VOCs*

2.2.9 The Department for Environment and Rural affairs LAQM Technical Guidance, LAQM TG(16) (DEFRA, 2018) provides advice on where the AQS for pollutants considered in this study apply. These are summarised in **Table 2-2.**

*Table 2-2 – Examples of where the AQS Apply*

| Averaging Period | Standards Should Apply to | Standards Should Not Apply to |
|---|---|---|
| Annual Mean | All locations where members of the public might be reasonably exposed such as: Building façades of residential properties, schools, hospitals, care homes etc. | Building façades of offices or other places of work where members of the public do not have regular access such as: Hotels, unless people live there as a permanent residence; gardens of residential properties; Kerbside sites (as opposed to locations at the building façade), or any other location where the public exposure is expected to be short-term. |
| 8-hour and 24-hour Means | All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties. | Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term. |
| 1-hour Mean | All locations where the annual mean, 24-hour mean and 8-hour mean apply plus: Kerbside sites of busy shopping streets; Parts of car parks, bus and railway stations, etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more;<br>Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer. | Kerbside sites where the public would not be expected to have regular access. |
| 15-min | All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer. | |

### 2.2.10 The Scottish Government Cleaner air for Scotland Strategy

2.2.11 The Scottish Government Cleaner Air for Scotland (CAFS) strategy – The Road to a Healthier Future (Scottish Government, 2015), is a national strategy that sets out how the Scottish Government will deliver its commitment to further improving air quality to protect human health.

2.2.12 The CAFS strategy aims to help the Scottish Government achieve the ambitious goal "to have the best air quality in Europe". A National Modelling Framework (NMF) and National Low Emission Framework (NLEF) will be developed to provide the tools and mechanism to put in place measures to improve air quality.

### 2.2.13 Environmental Protection Act

2.2.14 Section 79, subsection (1)(d) of the Environmental Protection Act 1990 (UK Parliament, 1990) gives the following definitions of statutory nuisance relevant to odour:

*"Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance"*

2.2.15 Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

2.2.16 If the activity is regulated under the Pollution Prevention and Control (PPC) regulations, Scottish Environment Protection Agency (SEPA) may deal with nuisance issues arising if the nuisance relates to the regulated emissions.

### 2.2.17 Local Air Quality Management

2.2.18 Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of administration under the system LAQM. This review and assessment of air quality involves considering present and likely future air quality against the objectives and reporting to the Scottish Government by means of an Annual Progress Report (Shetland Islands Council, 2020). If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the objectives.

2.2.19 There is currently a single AQMA within the Highland Council (THC) administrative area; Inverness City Centre AQMA declared in 2014 due to the exceedance of $NO_2$ annual mean AQO.

## 2.3 Planning Policy

2.3.1 THC Local Development Plan (THC, 2012) includes three policies which make direct reference to air quality; namely:

- Policy 28 Sustainable Design
- Policy 72 Pollution
- Policy 73 Air Quality

2.3.2 The above planning policies will be considered as part of this assessment.

## 2.4 Guidance

2.4.1 The AQIA will be informed by the following guidance documents:

- IAQM Assessment of Dust from Demolition and Construction Guidance (IAQM, 2014);
- IAQM/EPUK Guidance on Land-use Planning and Development Control: Planning for Air Quality (EPUK & IAQM, 2017);
- EPS/RTPI Delivering Cleaner Air for Scotland: Development Planning & Development Management (EPS & RTPI, 2017);
- EA Air Emissions Risk Assessment for your Environmental Permit (EA, 2020);
- EA H1 Environmental Risk Assessment for Permits - Annex F: Air Emissions[2] (EA et Al, 2010);
- Habitats Directive AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air (Air Quality Advisory Group, 2014);
- DEFRA LAQM Technical Guidance, LAQM TG(16) (DEFRA, 2018);

- For pollutants not included in the NAQS, the assessment will use Environmental Assessment Levels (EALs) from the H1 guidance (EA et Al, 2010). The EALs used in this assessment are provided in Table 2-3.

[2] The H1 guidance has bene withdrawn by the EA but is however still referenced on the SEPA website and can therefore be used in Scotland.

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*Table 2-3 – EALs used in the Assessment*

| Pollutant | Concentration | Measured as |
|---|---|---|
| **Human Receptors** | | |
| Hydrogen Fluoride (HF) | 250 µg/m$^3$ | 1-hour mean |
| Hydrogen Chloride (HCl) | 20 µg/m$^3$ | Annual mean |
| | 800 µg/m$^3$ | 1-hour mean |
| Chlorine (Cl) | 15 µg/m$^3$ | Annual mean |
| | 290 µg/m$^3$ | 1-hour mean |
| **Ecological Receptors** | | |
| Hydrogen Fluoride (HF) | 0.5 µg/m$^3$ | weekly mean |
| | 5 µg/m$^3$ | 24-hour mean |

2.4.2 For Dioxins, the process contribution to concentration will be converted to a toxic equivalent TEQ and added to the background levels. From this, the maximum potential dose due to inhalation will be calculated at the location of maximum impact based on the application of the US EPA Human Health Risk Assessment Protocol (HHRAP) and compared against the Tolerable Daily Intake (TDI) of 2 pg /kg/day (picogramme as the World Health Organisation Toxic Equivalent per kilogram bodyweight per day) specified by the Committee on Toxicity (COT) (COT, 2001).

# 3. Method of Assessment

## 3.1 Choice of model

3.1.1 The assessment of atmospheric emissions from the Proposed Development will be undertaken using the latest version of ADMS-5. ADMS-5 is a new generation dispersion model developed by Cambridge Environmental Research Consultants Limited (CERC) which has been extensively validated using several data sets. The model runs will be repeated using AERMOD for comparison.

## 3.2 Pollutants Included

3.2.1 The following pollutants emitted by the existing emissions sources within the wider site and the emissions sources forming part of the Proposed Development will be considered in the AQIA:

- $NO_x$ – Nitrogen Oxides;
- $NO_2$ – Nitrogen dioxide;
- $SO_2$ – Sulphur Dioxide;
- CO – Carbon Monoxide;
- $PM_{10}$ – Particulate Matter ($\leq 10\mu m$);
- HF – Hydrogen Fluoride;
- HCl – Hydrogen Chloride;
- VOC – Volatile Organic Compound;
- $Cl_2$ – Chlorine; and
- Dioxins.

3.2.2 Fine particulate matter ($PM_{2.5}$), are not included in the assessment as there are no monitoring data available particle size fractions other than $PM_{10}$.

## 3.3 Scenarios

3.3.1 The AQIA will include the following groups of sources in order that individual contributions to total ambient concentrations in the study area can be considered as well as cumulative effects:

- Continuous operation of the Proposed Development;
- Continuous operation of the current Lochaber Smelter; and
- Limited hours of operation of biodiesel generators (as dictated by permit PPC/N/50007 SIMEC Lochaber Hydropower 2 Limited) up to 500 hours per year between 0700-2300 hours by means of a time varying model file to represent worst case; and
- Actual recorded hours of operation of biodiesel generators (as recorded by permit PPC/N/50007 conditions and reported annually to SEPA) typically less than 50 hours per year for testing to represent realistic case.
- In the event that the emissions abatement equipment fails (rupture to bag filter), an alarm would trigger the shut-down of the process. Unabated emissions from the Proposed Development could therefore only occur for 15 minutes. An assessment of peak 15 minute mean unabated emissions will be included considering all meteorological conditions for the worst-case year of Tulloch Bridge meteorological data.
- Fugitive emissions from material storage or transfer on site are not likely.

## 3.4 Study Area

### 3.4.1 Construction & Operational Phases – Traffic Emissions

3.4.2 The study area for traffic emissions has been derived in consultation with the appointed traffic consultant (Systra). The study area considered includes the A82 north and south of the Proposed Development site access (refer to **Figure 1**).

### 3.4.3 Construction Phase - Dust

3.4.4 The study area for the construction phase of this assessment has been defined in accordance with the with the IAQM Assessment of Dust from Demolition and Construction Guidance (IAQM, 2014) which stipulates that "an assessment will normally be required where there is:

*"A 'human receptor' within:*

- *350 m of the boundary of the site; or*

- *50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).*

*A [designated] 'ecological receptor' within:*

- *50 m of the boundary of the site;*
- *50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s)."*

3.4.5 The study area considered as part of the construction phase assessment is shown in **Figure 2**.

### 3.4.6 Operational Phase – Emissions to Air

3.4.7 The study area for the operational phase assessment of the Proposed Development emission to air has been derived based on a review of the local area and professional judgment. The study area includes a 5km$^2$ area centred around the Proposed Development site within which a number of human receptors have been selected (Refer to **Figure 1**). These typically includes the closest receptors to the Proposed Development in all directions.

3.4.8 Ecological receptors considered as part of the deposition study includes specific locations within the Ben Nevis Special Area of Conservation (SAC) as specified by Nature Scot (then Scottish Natural Heritage) following the submission of the 2017 assessment undertaken for the formerly proposed Alloy Wheel Facility (Planning Reference: 17/05202/FUL). These have been confirmed as acceptable for this AQIA in recent correspondence with Nature Scot as included in Appendix A.

3.4.9 Receptors taken forward for the assessment are detailed with the baseline concentrations in **Section 3.5.8**.

## 3.5 Assessment Methodology

### 3.5.1 Construction & Operational Phases – Traffic Emissions Screening

3.5.2 Construction phase and operational phase traffic generations have been screened against the EPUK and IAQM land-Use Planning & Development Control guidance Stage 2 criteria (EPUK & IAQM, 2017) of:

- *"A change of Light Duty Vehicle (LDV) flows of:*
  - *More than 100 Annual Average Daily Traffic (AADT) within or adjacent to an Air Quality Management Area (AQMA);*
  - *More than 500 AADT elsewhere;*
- *A change of Heavy Duty Vehicle (HDV) flows of:*
  - *More than 25 AADT within or adjacent to an AQMA;*
  - *More than 100 AADT elsewhere."*

3.5.3 The Proposed Development construction phase and operational traffic generation is not anticipated to exceed the above criteria, therefore a detailed assessment of traffic emissions is not required.

### 3.5.4 Construction Phase Dust Impact

3.5.5 The IAQM guidance on the assessment of dust from demolition and construction (IAQM, 2014) will be used in this assessment to determine the potential impacts due to dust arising from the construction phase of the Proposed Development upon sensitive receptors.

3.5.6 The site will firstly be allocated a risk category based on the following two factors:

- The scale and nature of the works, which determines the potential dust emission magnitude as small, medium, or large; and

- The sensitivity of the area to dust impacts, which is defined as low, medium, or high sensitivity.

3.5.7 These two factors will then be combined to determine the risk of dust impacts with no mitigation applied.

### 3.5.8 Derivation of Background Concentrations

3.5.9 There are five monitoring sites operated by THC within the study area; one automatic site (FW1) monitoring $NO_2$ and $O_3$, and four roadside passive diffusion tubes (PDT)(FW1A – D) monitoring $NO_2$.

3.5.10 Measured concentrations at FW1 are representative of concentrations in a suburban area and concentrations measured at the PDTs are representative of concentrations along the A82 (Belford Road and North Road).

3.5.11 There are no THC monitoring sites within the study area which monitor concentrations of other pollutants considered in this assessment.

3.5.12 On that basis background concentrations at selected receptors have been derived as follows:

- **$NO_x$ –** Background concentrations for $NO_x$ at ecological receptors have been sourced from the Air Pollution Information System (APIS) (JNCC Et Al., 2016);
- **$NO_2$ –** Measured $NO_2$ concentration at FW1 are higher than the Scottish Air Quality 2018-base background map concentrations (Scottish Air Quality, 2020) across the study area. In a conservative approach, 2019 (latest non covid-19 pandemic impacted data are available) measured concentrations at FW1 for the year 2019 have been used to characterise the background concentrations at all selected receptors away from the A82.

  Averaged measured concentrations at FW1A-D for the year 2019 (latest non covid-19 pandemic impacted data are available) have been used to characterise the background concentrations at selected receptors near the A82.
- **$SO_2$ –** Background concentrations for $SO_2$ at human receptors have been sourced from the Department for Environmental, Food and Rural Affairs (DEFRA) 2001-based background maps for 2001 (DEFRA, 2001).

  Background concentrations for $SO_2$ at ecological receptors have been sourced from the Air Pollution Information System (APIS) (JNCC Et Al., 2016);
- **CO –** Background concentrations for CO have been sourced from the Department for Environmental, Food and Rural Affairs (DEFRA) 2001-based background maps for 2001 (DEFRA, 2001).
- **$PM_{10}$ –** Background concentrations for $PM_{10}$ have been sourced from the Scottish Air Quality 2018-based background maps for 2019 (Scottish Air Quality, 2020).
- **HF –** Background concentrations for HF have been sourced from the Guidelines for Halogens and Hydrogen Halides in Ambient Air for Protecting Human Health against Acute Irritancy Effects report which states that *"A modelling study suggested that the natural background concentration of fluoride was 0.61 x 10-6 ppm (0.5 x 10-6 mg/m$^3$). When anthropogenic emissions were included, the background concentration increased to 3.66 x 10-6 ppm (3 x 10-6 mg/m$^3$)"* (DEFRA, 2002)**.**
- **HCl –** Background concentrations for HCL have been sourced from the last full year of available data (2014) from the UK Centre for Ecology & Hydrology Acid Gases and Aerosols Monitoring Network (UK Centre for Ecology & Hydrology , 2014).
- **VOC –** Background concentrations for VOC have been sourced from the Department for Environmental, Food and Rural Affairs (DEFRA) 2001-based background maps for 2001 (DEFRA, 2001).

- **Cl –** The Human Health against Acute Irritancy Effects report which states that *"There are no reported air quality data for chlorine with which to assess population exposures"* (DEFRA, 2002)**.** Background concentrations for CL have therefore been assumed to be null (0).
- **Dioxins** – a literature review is still taking place to determine background concentrations for Dioxins in the study area

3.5.13 All or part of the existing emissions sources within the wider site are captured in the derived background concentrations and the assessment therefore will in some places double account for the emissions associated with the existing sources within the wider site. The derived background concentrations are therefore deemed conservative as no sector removal has been undertaken.

3.5.14 Derived background concentrations at selected receptors are summarised in Table 3-1 to Table 3-2.

### 3.5.15 Derivation of Baseline Nutrient Nitrogen Deposition and Acid Deposition

3.5.16 Baseline nutrient nitrogen and acid depositions at designated ecological receptors have been derived from the APIS Site Relevant Critical Loads and Source Attribution (JNCC Et Al., 2016).

3.5.17 Baseline nutrient nitrogen and acid depositions at selected ecological receptors are summarised in Table 3-3 APIS Baseline Deposition Levels and Critical Loads at Selected Ecological Receptors – Nutrient Nitrogen Deposition (kgN/ha/yr)and Table 3-4

3.5.18 The contributions of the wider site emissions sources are accounted for in the APIS baseline data.

*Table 3-1Derived Background Concentrations at Selected Human Receptors ($\mu g/m^3$)*

| Receptor ID | Receptor Description | $NO_2$ | $SO_2$ | CO ($mg/m^3$) | $PM_{10}$ | HF | HCl | VOC | CL | Dioxin |
|---|---|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 20.00 | 3.69 | 0.13 | 6.99 | 0.003 | 0.39 | 0.12 | 0 | TBC |
| R2 | Residential Property on Grant Place | 8.10 | 3.69 | 0.13 | 6.99 | 0.003 | 0.39 | 0.12 | 0 | TBC |
| R3 | Residential Property on Telford Place | 8.10 | 3.69 | 0.13 | 6.99 | 0.003 | 0.39 | 0.12 | 0 | TBC |
| R4 | Inverlochy Nursery School | 8.10 | 3.69 | 0.13 | 6.99 | 0.003 | 0.39 | 0.12 | 0 | TBC |
| R5 | Residential Property on Lundy Gardens | 8.10 | 3.69 | 0.13 | 6.99 | 0.003 | 0.39 | 0.12 | 0 | TBC |
| R6 | Lochaber High School | 8.10 | 2.67 | 0.13 | 7.03 | 0.003 | 0.39 | 0.12 | 0 | TBC |
| R7 | Residential property on Glenmhor Terrace | 20.00 | 2.67 | 0.13 | 7.03 | 0.003 | 0.39 | 0.12 | 0 | TBC |
| R8 | Residential Property on Carrs Corner | 8.10 | 2.67 | 0.13 | 7.03 | 0.003 | 0.39 | 0.12 | 0 | TBC |
| ST1 | Fort William Football Pitch | 8.10 | 1.65 | 0.13 | 6.74 | 0.003 | 0.39 | 0.11 | 0 | TBC |
| R9 | Residential Houses on Achintee Road | 8.10 | 1.65 | 0.13 | 6.74 | 0.003 | 0.39 | 0.11 | 0 | TBC |
| R10 | Residential on Kilmallie Road | 8.10 | 1.55 | 0.13 | 6.48 | 0.003 | 0.39 | 0.12 | 0 | TBC |
| THC | THC Monitor | 8.10 | 2.1 | 0.13 | 6.40 | 0.003 | 0.39 | 0.12 | 0 | TBC |
| R11 | North Road Retail Park | 20.00 | 3.69 | 0.13 | 6.99 | 0.003 | 0.39 | 0.12 | 0 | TBC |
| PR1 | PR1 -potential future dwelling | 8.10 | 1.41 | 0.12 | 6.82 | 0.003 | 0.39 | 0.09 | 0 | TBC |
| PR2 | PR2 – potential future dwelling | 8.10 | 1.41 | 0.12 | 6.82 | 0.003 | 0.39 | 0.09 | 0 | TBC |

*Table 3-2 Derived Background Concentrations at Selected Ecological Receptors (μg/m³)*

| Receptor ID | Receptor Description | $NO_x$ | $SO_2$ | HCl |
|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 2.02 | 0.53 | 0.39 |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 2.02 | 0.53 | 0.39 |
| Eco3 | H4060 - Alpine and Boreal heaths | 2.02 | 0.53 | 0.39 |
| Eco4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 2.02 | 0.53 | 0.39 |
| Eco5 | H7130 - Blanket Bogs | 2.02 | 0.53 | 0.39 |
| Eco6 | H91C0 - Caledonian forest | 2.02 | 0.53 | 0.39 |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 2.02 | 0.53 | 0.39 |
| Eco8 | H4030 - European Dry heaths | 2.02 | 0.53 | 0.39 |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 2.02 | 0.53 | 0.39 |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 2.02 | 0.53 | 0.39 |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 2.02 | 0.53 | 0.39 |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 2.02 | 0.53 | 0.39 |
| Eco13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 2.02 | 0.53 | 0.39 |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 2.02 | 0.53 | 0.39 |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 2.02 | 0.53 | 0.39 |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 2.02 | 0.53 | 0.39 |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 2.02 | 0.53 | 0.39 |
| Eco18 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 2.02 | 0.53 | 0.39 |

*Table 3-3 APIS Baseline Deposition Levels and Critical Loads at Selected Ecological Receptors – Nutrient Nitrogen Deposition (kgN/ha/yr)*

| Receptor ID | Receptor Description | Nitrogen Deposition Current Load | Critical Load (min) | Critical Load (max) |
|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 9.9 | 5 | 15 |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 9.9 | 5 | 10 |
| Eco3 | H4060 - Alpine and Boreal heaths | 9.9 | 5 | 15 |
| Eco4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 9.9 | 5 | 15 |
| Eco5 | H7130 - Blanket Bogs | 9.9 | 5 | 10 |
| Eco6 | H91C0 - Caledonian forest | 14.4 | 5 | 15 |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 8.3 | 3 | 10 |
| Eco8 | H4030 - European Dry heaths | 9.9 | 10 | 20 |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 9.9 | 15 | 25 |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 9.9 | 5 | 10 |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 9.9 | 5 | 15 |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 9.9 | 5 | 15 |
| Eco13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 9.9 | 5 | 15 |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 9.9 | 10 | 15 |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 9.9 | 10 | 20 |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 14.4 | 10 | 15 |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 9.9 | 10 | 20 |

*Table 3-4 APIS Baseline Acid Deposition Levels and Critical Loads at Selected Ecological Receptors – Acid Deposition (kg eq/ha/yr)*

| Receptor ID | Receptor Description | Acid Deposition Current Load (N) | Acid Deposition Current Load (S) | Critical Load Min (N) | Critical Load Max (S) | Critical Load Max (N) |
|---|---|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 0.7 | 0.2 | 0.178 | 0.220 | 0.541 |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 0.7 | 0.2 | 0.856 | 4 | 4.856 |
| Eco3 | H4060 - Alpine and Boreal heaths | 0.7 | 0.2 | 0.178 | 0.220 | 0.541 |
| Eco4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 0.7 | 0.2 | 0.178 | 0.220 | 0.541 |
| Eco5 | H7130 - Blanket Bogs | 0.7 | 0.2 | 0.321 | 0.663 | 0.984 |
| Eco6 | H91C0 - Caledonian forest | 1 | 0.3 | 0.142 | 1.534 | 1.819 |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 0.6 | 0.2 | 0 | 0 | 0 |
| Eco8 | H4030 - European Dry heaths | 0.7 | 0.2 | 0.642 | 0.22 | 0.862 |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 0.7 | 0.2 | Habitat not sensitive to acidification in APIS | | |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| Eco13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 0.7 | 0.2 | 0.223 | 0.22 | 0.586 |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 1 | 0.3 | 0.142 | 1.534 | 1.819 |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 0.7 | 0.2 | 0.642 | 0.22 | 0.862 |

### 3.5.19 Operational Phase – Emissions Sources and Emissions Inventory

3.5.20 Existing and proposed emissions sources information were provided by the Applicant's process engineers and used to derive an emission inventory.

3.5.21 A detailed emission inventory of the existing and proposed emissions sources is provided in **Appendix B**.

3.5.22 Emissions concentrations comply with BAT and/or MCPD emission limit values as relevant.

### 3.5.23 Operational Phase - Modelling Methodology

#### 3.5.23.1 Operating Patterns

3.5.24 The operating pattern of each modelled source will be taken into consideration. Operating patterns and how they have been modelled are summarised for each source in **Appendix B**.

#### 3.5.24.1 Building Downwash Effects

3.5.25 Buildings can have a significant effect on the dispersion of pollutants from sources and increase the maximum predicted ground level concentrations. The main potential effect of a building is to entrain pollutants into the cavity region in the immediate leeward side of the building, bringing them rapidly down to ground level. As a consequence, concentrations near the buildings can be increased, with downwind concentrations decreased.

3.5.26 Dimensions for existing and proposed buildings within the wider site have been provided by the Applicant's process engineers.

3.5.27 The Applicant is in the process of submitting another planning application for a canning facility which will be located adjacent to the Proposed Development. While the canning facility will not include any emissions sources, its infrastructure (building) has the potential to impact on the dispersion of the proposed sources. The building included as part of the canning facility will therefore been included in the modelling study. The orientation of the canning building is yet to be confirmed, therefore sensitivity analysis will be undertaken to assess the potential impact of each orientation (Refer to **Figure 3**). The AQIA will report on the worst-case scenario.

3.5.28 Some existing and proposed buildings have "saw-tooth" pattern roofs. ADMS does not allow for the modelling of buildings with variable roof heights; therefore, buildings with pitched roofs will be modelled by using the average height between the lowest and highest part of the roof as provided by the architect. This is the same approach as was used in the AQIA for the Alloy Wheel Facility.

3.5.29 Buildings with similar heights will be grouped to simplify buildings geometry within the model.

3.5.30 The building footprint and heights as proposed to be modelled are presented in **Figure 3.**

### 3.5.31 Meteorological Data and Model Inputs

3.5.32 The dispersion model will use meteorological data representative of the local area to calculate atmospheric conditions and therefore the dispersion of emissions from the Proposed Development. The closest world meteorological organisation (WMO) site is Aonach Mor, however the station is located at an altitude of 1,130 m above sea level and is therefore not considered representative of meteorological conditions within the study area. Meteorological data have therefore been sourced from the second nearest station, Tulloch Bridge WMO station located approximately 23 km north-east of the Proposed Development site. This assessment has used five years of synoptic meteorological data (2016 to 2020) for Tulloch Bridge and reports on the maximum concentration across all five years at each selected sensitive receptor . This is the same approach as was used in the AQIA for the Alloy Wheel Facility.

3.5.33 A surface roughness of 0.5 m and modelled calculated Monin-Obukhov length ($L_{MO}$) will be used to characterise conditions within the study area. This is the same approach as was used in the AQIA for the Alloy Wheel Facility.

3.5.34 A surface roughness of 0.1 m and modelled calculated $L_{MO}$ have been to characterise conditions at the meteorological sites. This is the same approach as was used in the AQIA for the Alloy Wheel Facility.

**3.5.34.1 Topographical Effects**

3.5.35 The Proposed Development is located at the foot of the Nevis Range and the area in general can be considered to be complex topographically with steep gradients and defined valleys. The local topography has the potential to change the air flow and hence influence the dispersion of emitted pollutants accounting for recirculating flow and plume impaction, depending on the point source locations.

3.5.36 Terrain effects have therefore been included in the detailed modelling to account for the changing heights in the land around the Proposed Development. The terrain file included in the model covers an area extending approximately 10 km either sides of the Proposed Development site. This is the same approach as was used in the AQIA for the Alloy Wheel Facility.

**3.5.36.1 Modelled Domain**

3.5.37 In addition to predictions at a number of selected receptors, pollutant concentrations across a 5 x 5 km grid using a 25 x 25 m resolution is proposed such that contour plots can be presented. Pollutant concentrations have been predicted at a height of 0 m (ecological receptor) and 1.5 m (human receptors) above ground level.

**3.5.37.1 Nutrient Nitrogen Deposition Modelling**

3.5.38 The modelling of nutrient nitrogen deposition will be undertaken following the approach and using the recommended deposition velocities and conversion factors described in the Habitats Directive AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air (Air Quality Advisory Group, 2014).

3.5.39 The deposition velocity for $NO_2$ used in the assessment will be 0.0015 m/s as recommended in AQTAG06 for Grassland.

3.5.40 The modelled total deposition at each receptor will be converted from $\mu g/m^2/s$ to kg N/ha/yr using the conversion factors from AQTAG06 of 95.9 for $NO_2$.

**3.5.40.1 Hydrogen Fluoride Deposition Modelling**

3.5.41 It is our intention to consult the AQMAU in England to obtain specific guidance on the deposition flux to use for dry deposition and how to model wet deposition. If SEPA are able to offer any specific guidance on this then we request it at your earliest convenience.

**3.5.41.1 Acid Deposition Modelling**

3.5.42 The assessment of acid deposition of $NO_2$, $SO_2$ and HCl will be undertaken as recommended in the Habitats Directive AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air (Air Quality Advisory Group, 2014).

3.5.43 The dry deposition velocities used in the assessment will be 0.0015 m/s, 0.012 m/s and 0.025 m/s for $NO_2$, $SO_2$ and HCl respectively.

3.5.44 The modelled total deposition at each receptor will be converted from $\mu g/m^2/s$ to keq/ha/yr (kg equivalent acid deposition) using the conversion factors from AQTAG06 of 6.84, 9.84 and 8.63 for $NO_2$, $SO_2$ and HCl respectively.

**3.5.44.1 Operational Phase – Modelling Results Processing**

***Treatment of Nitrogen Dioxide***

3.5.45 Emissions of $NO_x$ comprise both $NO_2$ and NO (nitric oxide). Emissions of $NO_x$ will undergo oxidation in the atmosphere to form $NO_2$, however the rate of conversion will depend on a number of factors before equilibrium in the atmosphere is reached.

3.5.46 In line with EA H1 Environmental Risk Assessment for Permits Guidance – Annex F (EA et Al, 2010), the AQIA will consider $NO_x$ emissions as 70% $NO_2$ when considering compliance with the long-term (annual mean) AQS and as 35% $NO_2$ when considering compliance with the short-term (1-hour mean) AQSs. Using these proportions is considered to be a worst-case assessment.

**3.5.46.1 Predicted Environmental Concentration (PEC) Calculations**

3.5.47 The concentrations of emitted pollutants from the Proposed Development and/or existing sources within the wider site (hereafter referred to as the Process Contribution (PC)) will be combined with the contribution from all other sources included in the background concentrations to obtain the total Predicted Environmental Concentration (PEC).

3.5.48 The PECs for long-term concentrations have been calculated as follows:

- PEC for long-term concentrations: PC + the background.

For short-term PECs the EA web-based guidance (EA, 2020) states the following:

"When you calculate background concentration, you can assume that the short-term background concentration of a substance is twice its long-term concentration."

PECs for short-term concentrations have therefore been calculated as follows:

- PEC for short-term concentrations: PC + twice the background

For the calculation of PECs 'short-term' relates to averaging period of up to 1-hour and 'long-term' to averaging period greater than 1-hour.

## 3.6 Assessment of Potential Effect Significance

### 3.6.1 Construction Phase - Dust

3.6.2 The IAQM guidance on the assessment of dust from demolition and construction (IAQM, 2014) will be used in this assessment to determine the potential impacts due to dust arising from the construction phase of the Proposed Development upon sensitive receptors.

3.6.3 The site will be firstly allocated a risk category based on the following two factors:

- The scale and nature of the works, which determines the potential dust emission magnitude as small, medium, or large; and
- The sensitivity of the area to dust impacts, which is defined as low, medium, or high sensitivity.

3.6.4 These two factors were then combined to determine the risk of dust impacts with no mitigation applied.

### 3.6.5 Operational Phase – Emissions to Air

**3.6.5.1 Assessment of Impact upon Human Receptors**

3.6.6 The IAQM/EPUK Guidance on Land-use Planning and Development Control: Planning for Air Quality (EPUK & IAQM, 2017) provides a suggested framework of impact descriptors with respect to assessment of long-term (annual mean) and short-term (1-hour mean or less) air quality objectives. The guidance presents a practical way of assigning a meaningful description to the degree of an impact, by expressing the magnitude of incremental change as a proportion of a relevant assessment level which is summarised below.

3.6.7 The change in pollutant concentrations with respect to baseline concentrations has been assessed at selected representative receptors within the study area. The absolute magnitude of pollutant concentrations in the "with Proposed Development" scenario is also described, and this is used to consider the risk of the AQSs being exceeded in each scenario.

3.6.8 The criteria used to assess the significance of impact at long-term and short-term receptors are summarised in **Table 3-5** and **Table 3-6** respectively.

*Table 3-5 – Impact Descriptors for Long-term Receptors*

| Long Term Average Concentrations at Receptor in Assessment Year | % Change in Concentration Relative to AQAL | | | |
|---|---|---|---|---|
| | 1 | 2-5 | 6-10 | >10 |
| 75% or less of AQAL | Negligible | Negligible | Slight | Moderate |
| 76-94% of AQAL | Negligible | Slight | Moderate | Moderate |
| 95-102% of AQAL | Slight | Moderate | Moderate | Substantial |
| 103-109% of AQAL | Moderate | Moderate | Substantial | Substantial |
| 110% or more of AQAL | Moderate | Substantial | Substantial | Substantial |

Note: A change of less than 0.5% of the AQAL is so small as to be described as Negligible. The EPUK and IAQM refer to the AQSs as AQAL.

3.6.9 The IAQM guidance specifies that when considering short-term concentrations, the study should consider the maximum predicted hourly concentration due to the process in any year and should be assessed "*without the need to reference background or baseline concentrations*".

*Table 3-6 – Impact Descriptors for Short-term Receptors*

| Maximum Process Contribution Relative to AQAL | 11-20% | 21-50% | >51% |
|---|---|---|---|
| **Magnitude** | Small | Medium | Large |
| **Impact Descriptor** | Slight | Moderate | Substantial |

Note: A change of less than 10.5% of the AQAL is to be described as Negligible.

3.6.10 There are no available guidance or methods to assess impacts associated with AQSs with averaging periods between 1 hour and 1 year. For such AQSs the assessment is based on professional judgment and mainly considered the likelihood of achievement of the AQSs at relevant sensitive receptors.

**3.6.10.1 Assessment of Impacts upon Ecological Receptors**

3.6.11 For European sites an assessment is made as to whether the installation is "*likely to have a significant effect*", and whether this could lead to an "*adverse effect on site integrity*" in accordance with AQTAG06.

3.6.12 SEPA's screening criteria for significance of the deposition of emissions from the Horizontal Guidance Note H1 will be applied to the outcome of the deposition dispersion modelling for Ben Nevis SAC habitats.

3.6.13 The AQIA will conclude that that PCs of less than 1% of the Critical load for nutrient nitrogen and acid deposition can be considered to be insignificant, and that PCs greater than 1% may require further assessment, depending upon the context. In these circumstances the judgement of an experienced ecologist will be sought and further consultation with Nature Scot will take place.

3.6.14 The predicted PECs will be compared with the relevant Critical Levels and Critical Loads respectively.

## 3.7 Outputs

3.7.1 The output from the AQIA will be a detailed report including a series of tables with maximum predicted concentrations of pollutants emitted from the proposed development at receptors relevant for human health effects, considering all five tears of meteorological data. The tables will provide a comparison with the relevant AQO/EAL for long and short term exposure for each pollutant.

3.7.2 Additional tables will be presented to demonstrate the predicted concentrations of key pollutants and the resultant calculated nutrient nitrogen and acid deposition at ecological receptors.

3.7.3 A selection of contour maps will be presented to show predicted effects across the entire study area.

3.7.4 The report will be provided as an Appendix to the EIA report chapter. The EIA chapter will provide a summary of the AQIA and discuss the potential significance of residual effects after proposed mitigation measures, including potential cumulative effects with other sources at the site.

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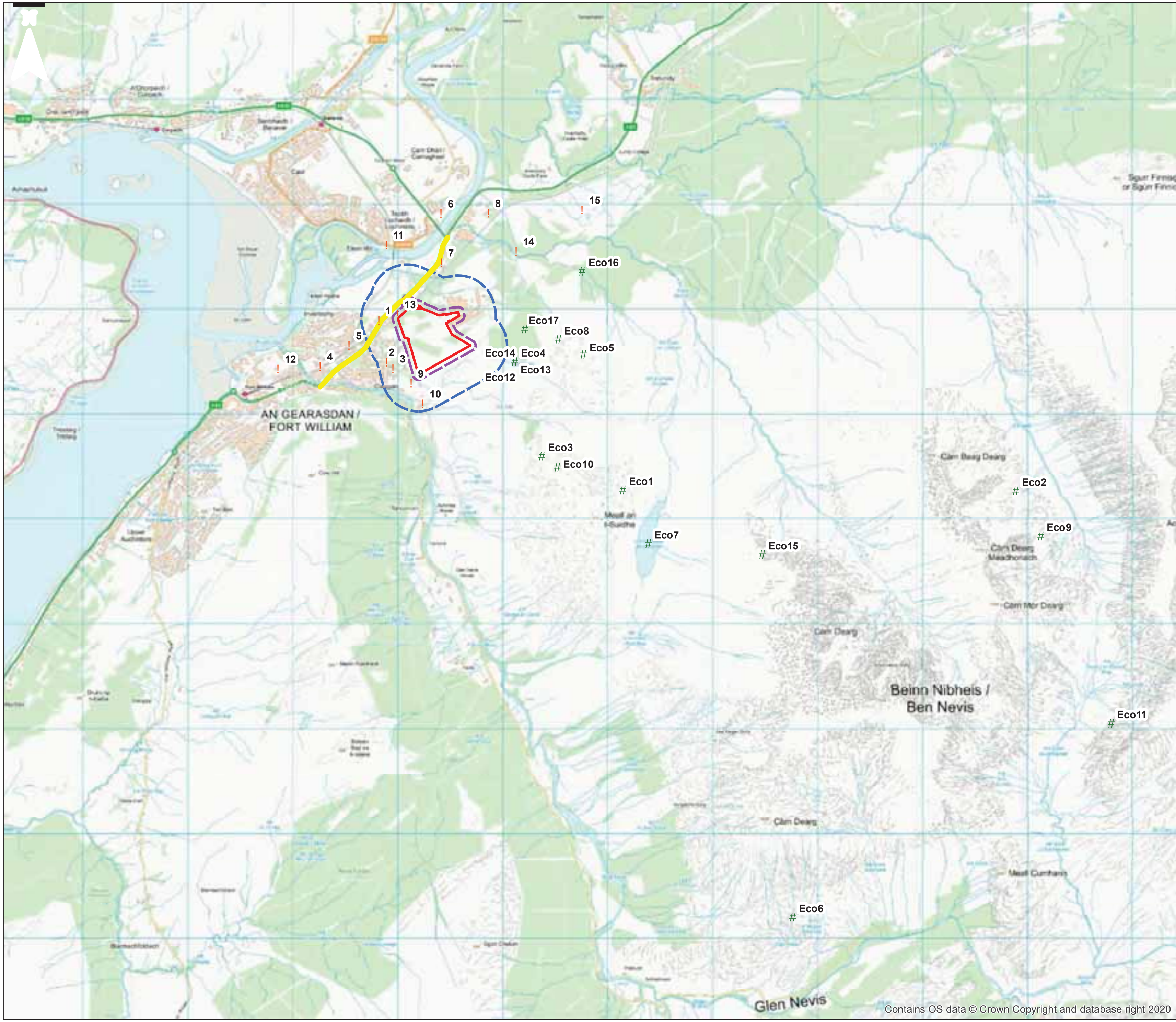
# Figures




**KEY**

- Site Boundary
- Traffic Assessment Study Area
- Construction Phase Dust Assessment Study Area (Human Receptor)
- Construction Phase Dust Assessment Study Area (Ecological Receptor)
- ! Selected Human Receptor
- # Ben Nevis Special Area of Conversation Selected Ecological Receptor

0 1 2 km

Scale 1:35,000 @ A3

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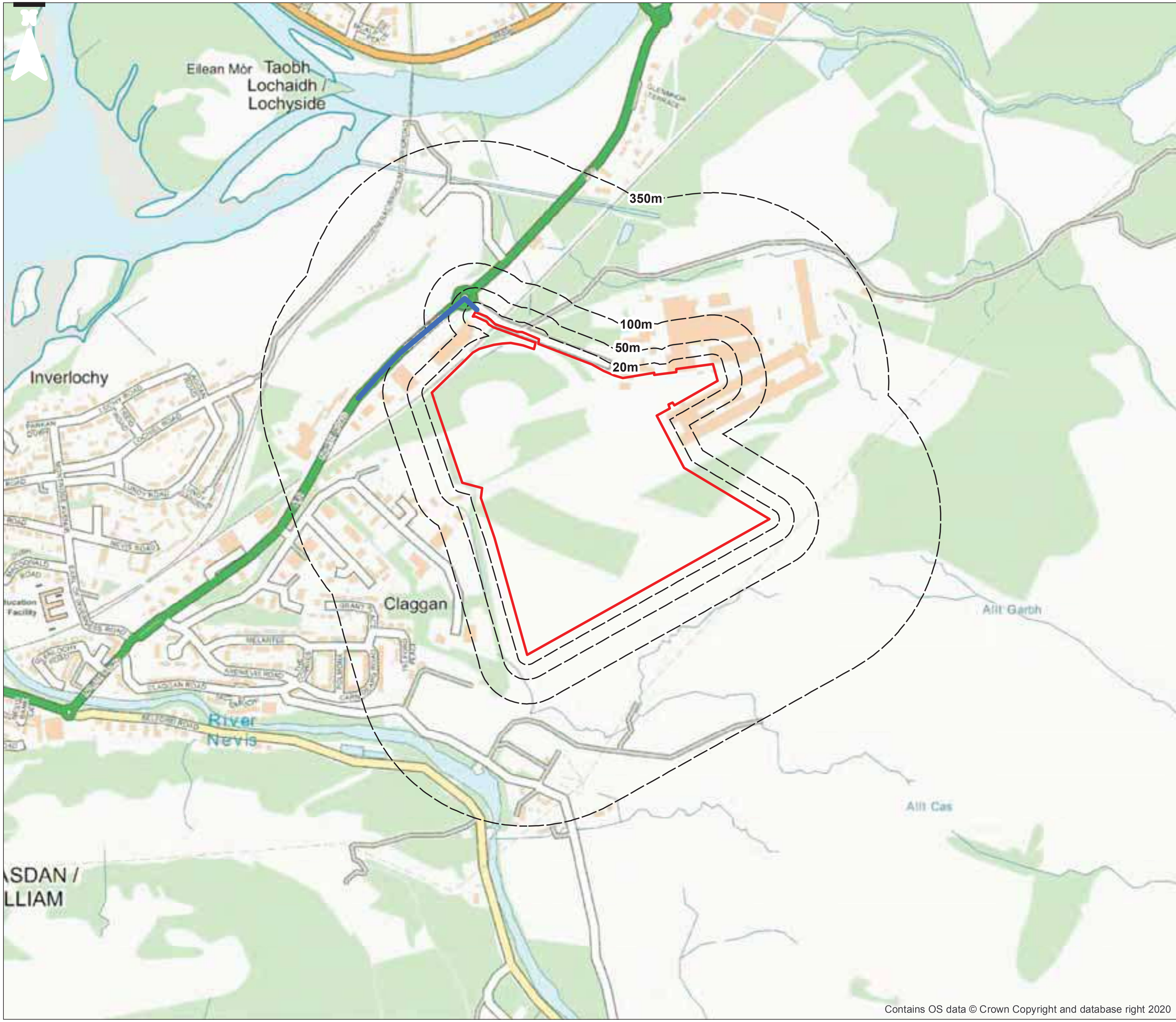
Alvance British Aluminium
Air Quality Method Statement

**Figure 1**

**Study Areas & Selected Receptors**

| Date: 08/02/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




KEY

Site Boundary

Assumed Track-out Route

Construction Phase Dust Assessment Buffers Around Site Boundary

0 200 400 m

Scale 1:7,500 @ A3

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Alvance British Aluminium
Air Quality Method Statement

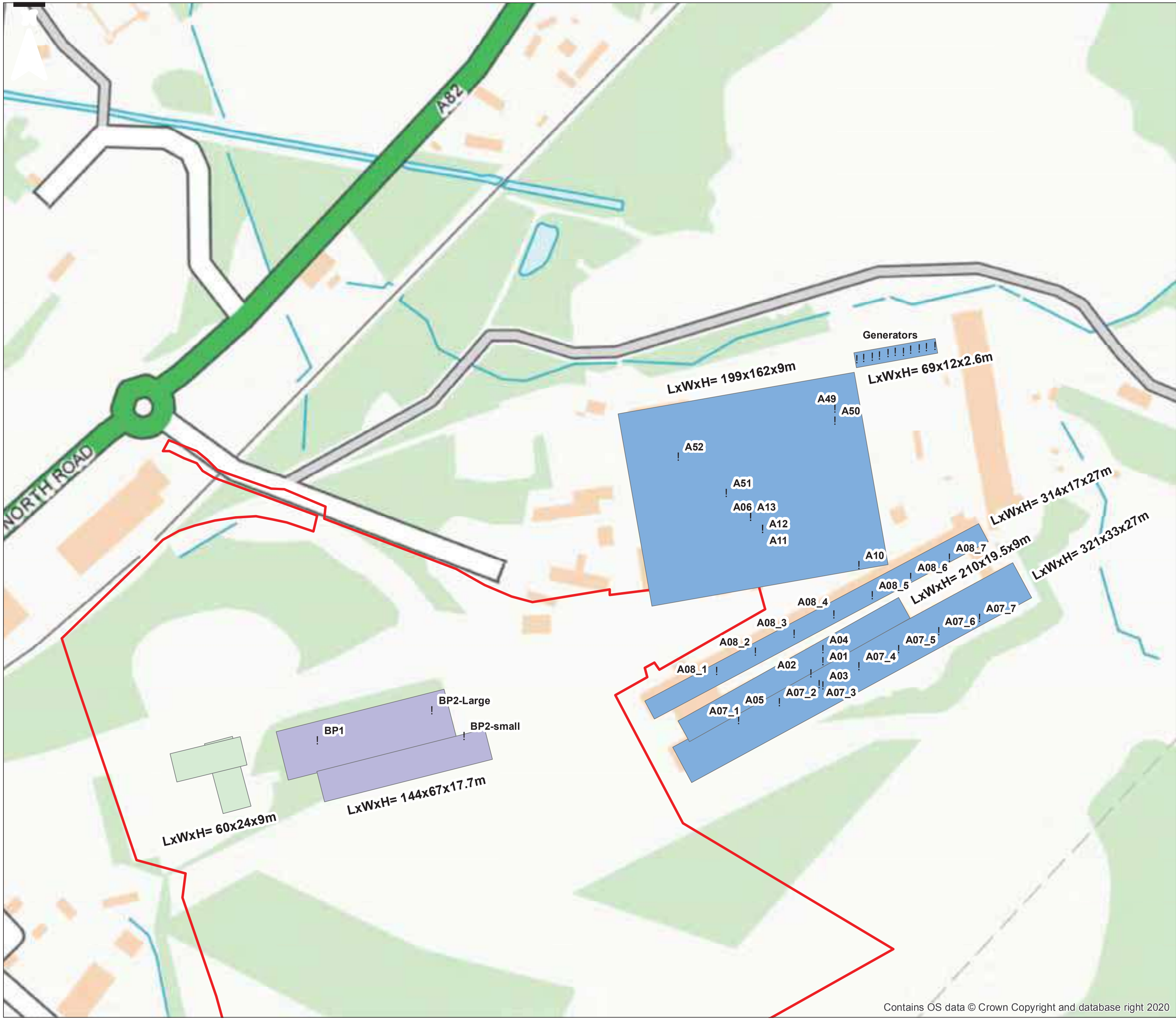
**Figure 2**

**Construction Phase Dust Impact Assessment**



| Date: 08/02/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|

Project Number: 3539




**KEY**

Site Boundary

**Modelled Buildings**

Existing Buildings

Proposed Billet Buildings

Canning Building EW or NS Orientations to be Confirmed (Different Planning Application)

! Modelled Sources

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Air Quality Method Statement

**Figure 3**

**Model Inputs**

| Date: 08/02/2021 | Drawn by: JB | Checked by: AD | Version: V1 |
|---|---|---|---|



Project Number: 3539

# Appendix A – Correspondence with Nature Scot

## Annie Danskin

| | |
|---|---|
| **From:** | Corrina Mertens [redacted] |
| **Sent:** | 27 January 2021 14:46 |
| **To:** | Annie Danskin |
| **Subject:** | RE: Habitats Risk Assessment within Ben Nevis SAC for Alvance Aluminium Billet Plant application |
| **Follow Up Flag:** | Follow up |
| **Due By:** | 29 January 2021 09:00 |
| **Flag Status:** | Flagged |

Annie,

Thank you for requesting our opinion on this assessment and methodology. We agree that your proposed method seems appropriate, however we advise that you confirm the details with SEPA as we would normally defer to them in these types of cases.

Regards

Corrina

I am working from home. You can contact me by email or on my work number above between 8.00am and 4.30pm.
**Corrina Mertens | Area Officer, South Highland**

**NatureScot** | Scottish Natural Heritage | Torlundy | Fort William | Inverness-shire | PH33 6SW| [redacted]
07887 832273

nature.scot | @nature_scot | *Scotland's Nature Agency* | *Buidheann Nàdair na h-Alba*

---

**From:** Annie Danskin
**Sent:** 22 January 2021 17:58
**To:** Ben Ross ; Corrina Mertens
**Cc:** Jonas Beaugas ; Ruth Fain
**Subject:** Habitats Risk Assessment within Ben Nevis SAC for Alvance Aluminium Billet Plant application

Dear Corrina and Ben

I am sending this to both of you as Corrina advised on the requirements for the habitats risk assessment with respect to emissions from the now consented Alloy Wheel Facility at the Alvance Aluminium site in Fort William back in 2017, and in case she is no longer involved, perhaps Ben can advise or direct to the appropriate specialist.

I am working on the air quality assessment for the EIA for the now proposed Billet Plant at the Alvance site in Fort William, the AWF no longer being taken forward.
I attach our previous assessment (submitted via Golder Associates as EIA co-ordinators).

You previously advised us of the habitats and grid references where you required assessment against critical levels for NOx and SOs, critical loads for nutrient nitrogen deposition and critical loads for acid deposition.
We would propose to carry out a repeat assessment using the same methodology (as per AQTAG06), using updated background data and site descriptions taken from a recent review of the APIS website.

The attached table shows the data used in the 2017 assessment and the updated values proposed for the current assessment. Text in red highlights differences between the two.
Can you confirm that you are happy with the assessment being undertaken at the same grid references and with the new proposed values.

As before, we will tabulate results for the Billet Plant only, Biodiesel Generators Only and Cumulative Emissions. The emissions from the existing smelter are not explicitly modelled as their contribution is already accounted for in the background concentrations and deposition at each location.

We will also prepare contour maps to show how critical levels for NOx and SOs, critical loads for nutrient nitrogen deposition and critical loads for acid deposition are distributed over the entire study area.

I would be grateful for your response as quickly as possible in order that we can undertake the dispersion modelling next week.
I look forward to hearing from you
Regards
Annie

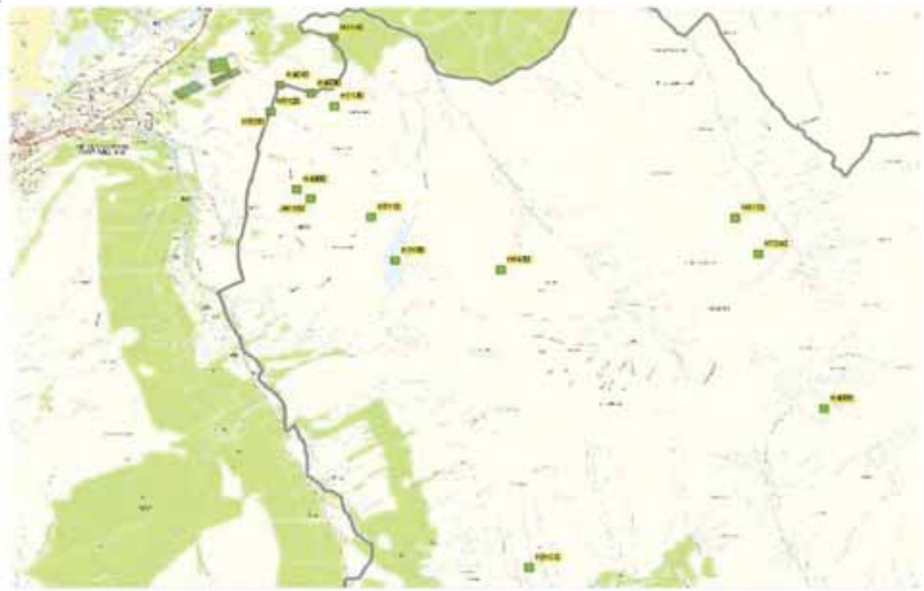
**Annie Danskin | Associate – Air Quality |** ITPEnergised
Office: [redacted]
4th Floor | Centrum House | 108-114 Dundas Street | Edinburgh | EH3 5DQ
www.itpenergised.com

Please note our change of Edinburgh address as of 1st July 2020

**DUE TO COVID 19 ADVICE ITPENERGISED ARE WORKING FROM HOME. PLEASE CALL MOBILE NUMBERS IN THE FIRST INSTANCE**

| Habitat Code | Receptor name - Used in 2017 Alloy Wheel Facility Assessment | Receptor name - As listed in Apis for Habitat Code at Ben Nevis SAC 2021 | X-Coordinate | Y-Coordinate | Average NOx Concentration ug/m3 | Average SO2 Concentration ug/m3 | NITROGEN DEPOSITION – Baseline: Average APIS Nitrogen Deposition Current Load | NITROGEN DEPOSITION – Baseline: Critical load MIN kgN/ha/yr | NITROGEN DEPOSITION – Baseline: Critical load MAX kgN/ha/yr | NITROGEN DEPOSITION – Updated Baseline: Average APIS Nitrogen Deposition Current Load | NITROGEN DEPOSITION – Updated Baseline: Critical load MIN kgN/ha/yr | NITROGEN DEPOSITION – Updated Baseline: Critical load MAX kgN/ha/yr | ACID DEPOSITION – Baseline: Average APIS N Deposition keq/ha/yr | ACID DEPOSITION – Baseline: Average APIS S Deposition keq/ha/yr | ACID DEPOSITION – Baseline: CLminN | ACID DEPOSITION – Baseline: CLMaxS | ACID DEPOSITION – Baseline: CLMaxN | ACID DEPOSITION – Updated Baseline: Average APIS N Deposition keq/ha/yr | ACID DEPOSITION – Updated Baseline: Average APIS S Deposition keq/ha/yr | ACID DEPOSITION – Updated Baseline: CLminN | ACID DEPOSITION – Updated Baseline: CLMaxS | ACID DEPOSITION – Updated Baseline: CLMaxN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H8110 | Acidic scree | Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 214142 | 773275 | 2.02 | 0.53 | 12.2 | 5 | 15 | 9.9 | 5 | 15 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.220 | 0.541 |
| H6170 | Alpine and subalpine calcareous grasslands | Alpine and subalpine calcareous grasslands | 217892 | 773265 | 2.02 | 0.53 | 12.2 | 5 | 10 | 9.9 | 5 | 10 | 0.87 | 0.34 | 1 | 4 | 5 | 0.7 | 0.2 | 0.856 | 4 | 4.856 |
| H4060 | Alpine and subalpine heaths | Alpine and Boreal heaths | 213371 | 773597 | 2.02 | 0.53 | 12.2 | 5 | 15 | 9.9 | 5 | 15 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.220 | 0.541 |
| H8120 | Base-rich scree * | Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundif | 213111 | 774500 | 2.02 | 0.53 | 12.2 | 5 | 15 | 9.9 | 5 | 15 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.220 | 0.541 |
| H7130 | Blanket bog | Blanket Bogs | 213766 | 774568 | 2.02 | 0.53 | 12.2 | 5 | 10 | 9.9 | 5 | 10 | 0.87 | 0.34 | 0.321 | 0.663 | 0.984 | 0.7 | 0.2 | 0.321 | 0.663 | 0.984 |
| H91C0 | Caledonian forest | Caledonian forest | 215764 | 769201 | 2.02 | 0.53 | 18.5 | 5 | 15 | 14.4 | 5 | 15 | 1.32 | 0.46 | 0.142 | 1.534 | 1.819 | 1 | 0.3 | 0.142 | 1.534 | 1.819 |
| H3130 | Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrientlevels | Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 214385 | 772763 | 2.02 | 0.53 | 12.5 | 3 | 10 | 8.3 | 3 | 10 | 0.87 | 0.34 | no information | no information | no information | 0.6 | 0.2 | 0 | 0 | 0 |
| H4030 | Dry heaths | European Dry heaths | 213527 | 774710 | 2.02 | 0.53 | 12.2 | 10 | 20 | 9.9 | 10 | 20 | 0.87 | 0.34 | 0.642 | 0.220 | 0.862 | 0.7 | 0.2 | 0.642 | 0.22 | 0.862 |
| H7240 | High-altitude plant communities associated with areas of water seepage | Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 218129 | 772837 | 2.02 | 0.53 | 12.2 | 15 | 25 | 9.9 | 15 | 25 | no information | no information | not sensitive | not sensitive | not sensitive | 0.7 | 0.2 | Habitat not sensitive to acidification in APIS | | |
| H6150 | Montane acid grasslands | Siliceous alpine and boreal grasslands | 213518 | 773488 | 2.02 | 0.53 | 12.2 | 5 | 10 | 9.9 | 5 | 10 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| H4080 | Mountain willow scrub | Sub-Arctic Salix spp scrub | 218800 | 771050 | 2.02 | 0.53 | 12.2 | 5 | 15 | 9.9 | 5 | 15 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| H8220 | Plants in crevices on acid rocks | Siliceous rocky slopes with chasmophytic vegetation | 213111 | 774500 | 2.02 | 0.53 | 12.2 | 5 | 15 | 9.9 | 5 | 15 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| H8210 | Plants in crevices on base-rich rocks * | Calcareous rocky slopes with chasmophytic vegetation | 213111 | 774500 | 2.02 | 0.53 | 12.2 | 10 | 15 | 9.9 | 5 | 15 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| H6230 | Species-rich grassland with mat-grass in upland areas | Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 213111 | 774500 | 2.02 | 0.53 | 12.2 | 10 | 15 | 9.9 | 10 | 15 | 0.87 | 0.34 | 0.223 | 0.220 | 0.586 | 0.7 | 0.2 | 0.223 | 0.22 | 0.586 |
| H6430 | Tall herb communities | Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 215473 | 772659 | 2.02 | 0.53 | 12.2 | 10 | 20 | 9.9 | 10 | 20 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| H91A0 | Western acidic oak woodland | Old sessile oak woods with Ilex and Blechnum in the British Isles | 213756 | 775360 | 2.02 | 0.53 | 18.5 | 10 | 15 | 14.4 | 10 | 15 | 1.32 | 0.46 | 0.142 | 1.534 | 1.819 | 1 | 0.3 | 0.142 | 1.534 | 1.819 |
| H4010 | Wet heathland with cross-leaved heath | Northern Atlantic wet heaths with Erica tetralix | 213206 | 774811 | 2.02 | 0.53 | 12.2 | 10 | 20 | 9.9 | 10 | 20 | 0.87 | 0.34 | 0.642 | 0.220 | 0.862 | 0.7 | 0.2 | 0.642 | 0.22 | 0.862 |

*** No maps were provided for these Habitats therefore the assessment was made at the SAC boundary co-ordinate of 213111, 774500 and represents the maximum deposition within the SAC.***



# Appendix B – Emissions Inventory

| | | |
|---|---|---|
| | **Notes** | Red Emissions Concentration data derived by Alvance from average of 2019 monitoring reports. |
| Data from PPC Permit | | A05 & A06 - Run 0600 – 1600 – Monday to Friday |
| Alvance Oct 2020 | | A10 - 600 -1600 – Monday to Friday worst case |
| extra lines added by ITPE to check mass emissions calculations | | A11 & A12 - 0800 -1600 – Monday to Friday |
| Informed by Liberty nothing measured from these vents - removed from inventory | | A13 - operates twice a shift = 4 times a day, second task happens 2-5 mins 50 times a day. Modelled as 24/7 as worst case |
| | | A52 - Can operate any hour of the year - modelled as 24/7 |
| X = assumed named pollutant not present for this source | | Generator: Based on 1500hrs/yr/generator = 4 hrs/day/generator. But varies with seasonality and rainfall. Time vary file assumes Gen 1: 0000-0400, Gen 2: 0200-0600, Gen 3: 0400-0800 and so on. There are therefore always 2 units in operation at any one time over all met conditions in a year. |
| | | **Limited to stated hours Monday to Friday, though in reality may only be on 4 days a week. A10 operational from 0800-1800, A11&A12 from 0800-1600 Mon-Fri in Timevary file |

| Source | A01 | A02 | A03 | A04 | A05 | A06 | A07 | A08 | A10 | A11 | A12 | A13 | A52 | A49 | A50 | A51 | Generator (per unit)**** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fume Treatment Plant East Stack | Fume Treatment Plant Centre Stack | Fume Treatment Plant West Stack | Silo Bag Filter, Conveyor and Fill Point Bag Filter | Bath Treatment Plant NO1 Dust Unit Stack | Bath Treatment Plant NO2 Dust Unit Stack | North Cell Room Roof Vents (per vent) | South Cell Room Roof Vents (per vent) | Cast Iron Induction Furnaces | Rodding Room NO1 Dust Unit | Rodding Room NO2 Dust Unit | Crucible Cleaner Stack | Holding furances and Alpur Vent | Material Transfer Building NO1 Dust Unit Stack | Material Transfer Building NO2 Dust Unit Stack | TAC Unit | |
| **Hours of operation per day (24/7 unless stated)** | | | | | 10 | 10 | | | 10 | 8 | 8 | 1.5 | | | | | 0 |
| **Modelled As** | 24/7 | 24/7 | 24/7 | 24/7 | 6am to 4pm Monday to Friday | 6am to 4pm Monday to Friday | 24/7 | 24/7 | 6am to 4pm Monday to Friday (in actual fact likely to be down to 3 days) | 8am to 4pm Monday to Friday (in actual fact likely to be down to 4 days) | 8am to 4pm Monday to Friday (in actual fact likely to be down to 4 days) | 24/7 due to complex operating pattern | 24/7 as can operate any hours of the year | 24/7 | 24/7 | 24/7 as can operate any horu of the year | 7am to 11pm everyday to be very conservative - max of 500hr per generator Allowable but actually <50hr per year use |
| **Gaseous Fluoride (expressed as HF) mg/Nm3** | 0.1 | 1.8 | 0.52 | x | 0.013 | 0.04 | 0.25 | 0.25 | 24 | x | x | 0.06 | 15.7 | 0.01 | 0.02 | 23 | |
| **Total Fluoride (expressed as HF) mg/Nm3** | 0.15 | 1.9 | 0.58 | x | 0.95 | 0.19 | 0.35 | 0.35 | x | x | x | 1.7 | 16 | 0.03 | 0.03 | 23.3 | |
| **Chlorine mg/Nm3** | x | x | x | x | x | x | x | x | x | x | x | x | 12.8 | x | x | x | x |
| **Hydrogen Chloride mg/Nm3** | x | x | x | x | x | x | x | x | x | x | x | x | 65.6 | x | x | x | x |
| **Oxides of Nitrogen (mg/Nm3)** | x | x | x | x | x | x | x | x | x | x | x | x | 177 | x | x | x | x |
| **Nitrogen Dioxide (mg/Nm3)** | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | 400 |
| **Sulphur Dioxide mg/Nm3** | ? | ? | ? | x | x | x | ? | ? | x | x | x | x | 9.9 | x | x | x | 350***** |
| **CO (mg/Nm3)** | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | 650 |
| **Particulates mg/Nm3** | 0.66 | 0.84 | 0.48 | x | 3.4 | 0.55 | 0.4 | 0.4 | <10 | 33 | 0.94 | 8.3 | 0.67 | 0.3 | 0.11 | 0.13 | 130 |
| **$PM_{10}$** | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ |
| **Emission Rate (g/s) - per stack ITPE calc from Red data** | 0.029 | 0.039 | 0.023 | 0.0006 | 0.009 | 0.001 | 0.005 | 0.005 | 0.022 | 0.170 | 0.004 | 0.034 | 0.0004 | 0.003 | 0.001 | 0.0001 | 0.26 |
| **NOx** | | | | | | | | | | | | | √ | | | | √ |
| **Emission Rate (g/s) - per stack ITPE calc from Red data** | x | x | x | x | x | x | x | x | x | x | x | x | 0.101 | x | x | | 0.8 |
| **CO** | | | | | | | | | | | | | | | | | √ |
| **Emission Rate (g/s) - per stack ITPE calc from Red data** | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | 1.29 |
| **Gaseous Fluoride as HF** | √ | √ | √ | | √ | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| **Emission Rate (g/s) - per stack** | 0.0044 | 0.0834 | 0.0250 | x | 0.0000326 | 0.0001 | 0.003 | 0.003 | 0.0524 | x | x | 0.0002 | 0.0089 | 0.0001 | 0.0002 | 0.0184 | x |
| **Total Fluoride as HF** | √ | √ | √ | | √ | √ | √ | √ | | | | √ | √ | √ | √ | | |
| **Emission Rate (g/s) - per stack** | 0.0066 | 0.0880 | 0.0279 | x | 0.0024 | 0.0004 | 0.0048 | 0.0048 | x | x | x | 0.0069 | 0.0091 | 0.0003 | 0.0002 | 0.0187 | x |
| **Chlorine** | | | | | | | | | | | | | √ | | | | |
| **Emission Rate (g/s) - per stack** | x | x | x | x | x | x | x | x | x | x | x | x | 0.0073 | x | x | | x |
| **Hydrogen Chloride HCl** | | | | | | | | | | | | | √ | | | | |
| **Emission Rate (g/s) - per stack** | x | x | x | x | x | x | x | x | x | x | x | x | 0.0373 | x | x | | x |
| **Sulphur Dioxide SO2** | | | | | | | | | | | | | | | | | |
| **Emission Rate (g/s) - per stack** | x | x | x | x | x | x | x | x | x | x | x | x | 0.0056 | x | x | | 0.18 |
| **Supplementary Source Data** | | | | | | | | | | | | | | | | | |
| **Stack Height (m)** | 35 | 35 | 35 | 13.9 | 9 | 9 | 27 | 27 | 11 | 9 | 9 | 9 | 16 | 9 | 9 | | 4.95 |
| **Stack Diameter (m)** | 2.1 | 2.1 | 2.1 | 0.335 | 0.7 | 0.7 | 8.97 | 8.97 | 0.4 | 0.69 | 0.69 | 0.79 | 0.39 | 0.69 | 0.69 | | 0.305 |
| **Stack Area** | 3.46 | 3.46 | 3.46 | 0.09 | 0.38 | 0.38 | 63.10 | 63.10 | 0.13 | 0.37 | 0.37 | 0.49 | 0.12 | 0.37 | 0.37 | | 0.07 |
| **Flue Temperature (C)** | 85.8 | 71.7 | 68.2 | Assumed Ambient Temperature so variable with met data | 26 | 18 | 33 | 33 | 27 | 18 | 13 | Assumed Ambient Temperature so variable with met data | 399 | Assumed Ambient Temperature so variable with met data | Assumed Ambient Temperature so variable with met data | 33.3 | 463 |
| **Flue Temperature (K)** | 358.8 | 344.7 | 341.2 | 288 | 299 | 291 | 306 | 306 | 300 | 291 | 286 | 288 | 672 | 288 | 288 | 306.3 | 736 |
| **Reference Temp (K)** | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 |
| **Ratio Tref/Tact** | 0.76 | 0.79 | 0.80 | 0.95 | 0.91 | 0.94 | 0.89 | 0.89 | 0.91 | 0.94 | 0.95 | 0.95 | 0.41 | 0.95 | 0.95 | 0.89 | 0.37 |
| **Actual Volumetric Flow (m3/s)** | 57.4 | 58.5 | 60.2 | 0.132 | 2.75 | 2.5 | 107.27 | 107.27 | 2.4 | 5.5 | 4.7 | 4.26 | 1.4 | 10.9 | 8.2 | 0.9 | 5.88 |
| **Reference Volume Flow Rate (Nm3/s)** | 43.67 | 46.33 | 48.17 | 0.13 | 2.51 | 2.35 | 95.70 | 95.70 | 2.18 | 5.16 | 4.49 | 4.04 | 0.57 | 10.33 | 7.77 | 0.80 | 1.99 |
| **Efflux Velocity (m/s)** | 16.6 | 16.9 | 17.4 | 1.5 | 7.1 | 6.5 | 1.7 | 1.7 | 19.1 | 14.7 | 12.6 | 8.7 | 11.7 | 29.2 | 21.9 | | 80.5 |
| **Stack Location** | 212630, 774900 | 212620, 774890 | 212630, 774880 | 212630, 774910 | 212560, 774860 | 212570, 775020 | See Below | See Below | 212660, 774980 | 212580, 775010 | 212580, 775010 | 212570, 775020 | 212510, 775070 | 212640, 775110 | 212640, 775100 | 212550, 775040 | See below |

**A07 Stack Locations**

| X | Y |
|---|---|
| 212560 | 774851 |
| 212594 | 774866 |
| 212627 | 774881 |
| 212660 | 774896 |
| 212693 | 774910 |
| 212726 | 774925 |
| 212760 | 774936 |

**A08 Stack Locations**

| X | Y |
|---|---|
| 212542 | 774892 |
| 212574 | 774908 |
| 212606 | 774923 |
| 212639 | 774939 |
| 212671 | 774955 |
| 212703 | 774970 |
| 212735 | 774986 |

**Generators**

| | X | Y |
|---|---|---|
| 1 | 212658 | 775151 |
| 2 | 212664 | 775152 |
| 3 | 212671 | 775153 |
| 4 | 212677 | 775154 |
| 5 | 212684 | 775156 |
| 6 | 212690 | 775157 |
| 7 | 212697 | 775157 |
| 8 | 212703 | 775159 |
| 9 | 212710 | 775160 |
| 10 | 212716 | 775161 |
| 11 | 212723 | 775162 |

Emissions for Proposed new stacks based on
Stack Height modelled as 3.5 m above modelled building height of Xm (TBC) based on the difference between roof eaves and pitch heights
x = assumed pollutant not emitted from source
All sources assumed 24/7 operation
Red emissions limits provided by Alvance from BAT documents -Upper limit used as worst case -need reference
Green emissions-assumed by ITPE/agreed with Alvance based on Medium Combustion Plant Directive for natural gas

| Source | Continuous Homogenizing Furnace Stack | Bag House Fume Stack - Large | Bag House Fume Stack - Small | |
|---|---|---|---|---|
| Hours of operation per day (24/7 unless stated) | BP1 | BP4 | BP4 | |
| Modelled As | 24/7 | 24/7 | 24/7 | |
| Gaseous Fluoride (expressed as HF) (mg/Nm3) | x | x | x | |
| Total Fluoride (expressed as HF) mg/Nm3 | x | 1 | 1 | |
| Chlorine (mg/mN3) | x | 1 | 1 | |
| Hydrogen Chloride mg/Nm3 | x | 10 | 10 | |
| TVOC as Carbon (mg/Nm3) | x | 30 | 30 | |
| Oxides of Nitrogen (mg/Nm3) | 100 | 100 | 100 | |
| Sulphur Dioxide (mg/Nm3) | x | 50 | 50 | |
| CO (mg/Nm3) | x | 150 | 150 | |
| Particulates (mg/m3) | x | 5 | 5 | Assume this is in mg/**N**m3 too |
| Dioxins (PCDD/F) (ng ITEQ/Nm3) | x | 1 | 1 | 1ng = 10^-6 mg |
| Mass Emissions from ref conc x re.f Vol | | | | |
| Total Fluoride g/s | x | 0.0369 | 0.0185 | |
| Chlorine g/s | x | 0.0369 | 0.0185 | |
| HCl g/s | x | 0.3693 | 0.1847 | |
| TVOC g/s | x | 1.1079 | 0.5540 | |
| NOx (g/s) | 0.8578 | 3.6930 | 1.8465 | |
| SO2 g/s | x | 1.8465 | 0.9233 | |
| CO (g/s) | x | 5.5395 | 2.7698 | |
| Particulates (g/s) | x | 0.1847 | 0.0923 | |
| Dioxins (PCDD/F) g/s | x | 0.0000000369 | 0.0000000185 | |
| Stack Height (m) | 3.5 above roof | 3.5 above roof | 3.5 above roof | Assume same as BP1 |
| Stack Diameter (m) | 0.47 | 1.80 | 1.80 | *Assumed* |
| Stack Area (m2) | 0.17 | 2.54 | 2.54 | |
| Actual Temperature (C) | 450.00 | 90 | 90 | *From Alvance ->* |
| Actual Temperature (K) | 723.15 | 363.15 | 363.15 | |
| Reference Temperature (K) | 273.15 | 273.15 | 273.15 | *Assumed to be 0C* |
| Ratio Tref/Tact | 0.38 | 0.75 | 0.75 | |
| Actual Volumetric Flow (m3/s) | 8.58 | 36.93 | 18.47 | *Simplified assumes same density and pressure* |
| Normal Volumetric Flow Rate (Nm3/s) | 3.24 | 27.78 | 13.89 | *From Alvance ->* |
| Modelled Efflux Velocity (m/s) | 49.44 | 14.51 | 7.26 | |
| Stack Location | TBC | TBC | TBC | |

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Property & Urban Regeneration | Infrastructure | Industrial Manufacturing

**From:** Whyte, Alastair [redacted]
**Sent:** 15 March 2021 10:27
**To:** James Tangney [redacted] Annie Danskin
[redacted]
**Subject:** Re: Summary of deposition analysis - Alvance Fort Willliam - Billet Plant

OFFICIAL – BUSINESS

Hi James

Thanks for sending through the attachments regarding the AQIA output for designated habitats.

Could you please provide the emission release rates for the emission points for the existing smelter complex (including biofuel generating plant), alloy wheel plant and the billet plant?  This helps me visualise any changes between the two process. If it helps, it may be easiest if you could send through the tables for alloy wheel plant and the billet plant separately.

As discussed, the critical consideration is whether there has been any increase in impact at any of the designated areas above what was predicted for the Alloy Wheel Plant.  In terms of the specific output, I will have to consult internally and with NatureScot as to the next stage of assessment as that is beyond my area of expertise.

Hope to hear from you soon.

Al

---

**From:** James Tangney [redacted]
**Sent:** 15 March 2021 09:55
**To:** Whyte, Alastair [redacted]
**Subject:** FW: Summary of deposition analysis - Alvance Fort Willliam - Billet Plant



Hello Al,

Please see attachments and commentary below.

Thanks,
**James Tangney**
Process Engineer

[redacted]

E: [redacted]

**Alvance British Aluminium |** A member of the GFG Alliance
**SIMEC Lochaber Hydro Power |** A member of the GFG Alliance

Lochaber Smelter, North Road, Fort William, PH33 6TH, United Kingdom
www.alvancegroup.com

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**From:** Annie Danskin [redacted]
**Sent:** Monday, March 15, 2021 9:47 AM
**To:** James Tangney [redacted]
**Cc:** Ruth Fain [redacted] Jonas Beaugas [redacted]
**Subject:** Summary of deposition analysis - Alvance Fort Willliam - Billet Plant



Hi James
Please find attached material and note below to forward to Al Whyte at SEPA in advance of today's meeting at 2pm.

From ITPE:

In advance of our scheduled group call at 2pm today, please find attached a summary a summary of the predicted deposition impacts at the selected sensitive receptors within the Ben Nevis SAC. These are the same receptors as was used for the Alloy Wheel Facility application. It should be noted that for receptors E4 and E13, grid references were not provided for locations of these habitats and so these have been modelled at the SAC boundary closest to Alvance. From Apis web site, receptor 17 is not sensitive to acidity.

Note that all calculations have been based on **the lowest value** of the acidity critical loads for each habitat e.g. For code H4060 Alpine and Boreal heaths, MinCLminN: 0.178| MaxCLminN: 0.393. the lowest value of 0.178 has been used which provides a worst case assessment.

For nutrient nitrogen deposition we exceed both screening criteria (PC >1% of Critical Load and PEC is >70% of the Critical Load) at one receptor location right on the boundary. The total PEC is still below the CL.

We have prepared 3 contour plots to show the PC as % of the Critical Load where the Critical load is 10, 15 or 20 kgN/ha/yr. Each plot shows the receptors for which that CL applies.

For total acid deposition there are a number of locations where the existing baseline critical load and both screening criteria are exceeded.
We have used the lowest and most frequently occurring CL Max N of 0.541 to calculate the PC as a % of the CL Function in the contour map in Figure 2.

We would appreciate it if you could consider these results at the modelled receptors including the comparison with the predictions for the Alloy Wheel Facility and give your view on the potential for the predicted impacts to cause significant effects in the SAC and advice for further assessment if required.

Regards
Annie

**Annie Danskin | Associate – Air Quality |** ITPEnergised
Office: [redacted]
4th Floor | Centrum House | 108-114 Dundas Street | Edinburgh | EH3 5DQ
www.itpenergised.com

Please note our change of Edinburgh address as of 1st July 2020

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**From:** Whyte, Alastair [redacted]
**Sent:** 16 March 2021 16:37
**To:** James Tangney [redacted]Annie Danskin
[redacted]
**Cc:** Ruth Fain [redacted]Jonas Beaugas [redacted]
**Subject:** Re: Follow up from yesterday's meeting - 15th March 2021

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Afternoon all,

Further to my last email, I have now spoken to our air quality specialist and he has advised that the benzene air quality standard should be used for assessing TVOC impacts unless it can be demonstrated that there are more appropriate AQS/EALs. The use of benzene is considered to cover the worst-case scenario.

Please get in touch once you have considered this advice and indicate how you intend to approach the assessment of TVOC emissions.

Kind regards

Al

**From:** Whyte, Alastair [redacted]
**Sent:** 16 March 2021 15:53
**To:** James Tangney [redacted]Annie Danskin
[redacted]
**Cc:** Ruth Fain <[redacted]Jonas Beaugas [redacted]
Haslam, Susan [redacted]
**Subject:** Follow up from yesterday's meeting - 15th March 2021

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James, Annie

Thanks for yesterday's meeting to discuss the air quality assessment for the billet plant and providing the opportunity for comment prior to the submission of the planning application.

The key points that came from our discussions were:

1. Model output
   The modelling indicates that for acid deposition that the qualifying criteria for triggering "appropriate assessment" may be necessary due to a potentially "significant likely effect" occurring. This could result in a notable delay in the determination of the planning application if this assessment is required to be undertaken by the Local Authority in consultation with Nature Scotland and SEPA. The need for this detailed appropriate assessment could be prevented if the

development could be modified such that it does surpass the criteria where a significant likely effect could occur. It is best to commence looking at the options for reducing emissions from the proposed facility, as such an appraisal of mitigatory measures would need to be undertaken as part of the appropriate assessment. We covered options such as changing the furnace design through the use of low NOx burners (or alternative low NOx furnace technologies) or the installation of selective (or non-selective) catalytic reduction prior to discharge via stack. It would also be worth confirming that the data used for NOx and acid gas emissions is correct.

2. Smelter baseline data

   a) The emission rates should be set using the emission limit values in the smelter permit not the latest sample data.

   b) The sulphur dioxide release rate can be determined from using the anode content specified in the permit and the work the HSE team at the smelter did in establishing its relationship to the associated BAT-AEL in the Non-Ferrous Metals BAT conclusions. This was undertaken as part of last year's permit review.

   c) The biofuel generators will need to be added as specified in the permit and operating using 500 hours annually.

3. TVOC benchmark

   I am consulting with SEPA's air quality specialists regarding the assessment of VOC emissions from the billet plant operations.

4. Nature Scotland contact

   Corrina Mertens contact details are:

   **Corrina Mertens | Area Officer, South Highland**
   **NatureScot** | Scottish Natural Heritage | Torlundy | Fort William | Inverness-shire | PH33 6SW| **t:**01463701644 **m:** 07887 832273

   I have let Corrina know that you will be in touch to discuss obtaining the spatial distribution plots for various species of interest.

Please keep in touch regarding how your further work around developing the AQIA progresses, and it would be worthwhile having a further discussion once the above points have been considered.

Kind regards

Al

## NatureScot

**From:** Annie Danskin
**Sent:** 22 January 2021 17:58
**To:** Ben Ross ; Corrina Mertens
**Cc:** Jonas Beaugas ; Ruth Fain
**Subject:** Habitats Risk Assessment within Ben Nevis SAC for Alvance Aluminium Billet Plant application

Dear Corrina and Ben

I am sending this to both of you as Corrina advised on the requirements for the habitats risk assessment with respect to emissions from the now consented Alloy Wheel Facility at the Alvance Aluminium site in Fort William back in 2017, and in case she is no longer involved, perhaps Ben can advise or direct to the appropriate specialist.

I am working on the air quality assessment for the EIA for the now proposed Billet Plant at the Alvance site in Fort William, the AWF no longer being taken forward.
I attach our previous assessment (submitted via Golder Associates as EIA co-ordinators).

You previously advised us of the habitats and grid references where you required assessment against critical levels for NOx and SOs, critical loads for nutrient nitrogen deposition and critical loads for acid deposition.
We would propose to carry out a repeat assessment using the same methodology (as per AQTAG06), using updated background data and site descriptions taken from a recent review of the APIS website.

The attached table shows the data used in the 2017 assessment and the updated values proposed for the current assessment. Text in red highlights differences between the two.
Can you confirm that you are happy with the assessment being undertaken at the same grid references and with the new proposed values.

As before, we will tabulate results for the Billet Plant only, Biodiesel Generators Only and Cumulative Emissions. The emissions from the existing smelter are not explicitly modelled as their contribution is already accounted for in the background concentrations and deposition at each location.

We will also prepare contour maps to show how critical levels for NOx and SOs, critical loads for nutrient nitrogen deposition and critical loads for acid deposition are distributed over the entire study area.

I would be grateful for your response as quickly as possible in order that we can undertake the dispersion modelling next week.
I look forward to hearing from you
Regards
Annie

**Annie Danskin | Associate – Air Quality |** ITPEnergised
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www.itpenergised.com

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| | | | | | Average NOx Concentration ug/m3 | Average SO2 Concentration ug/m3 | NITROGEN DEPOSITION | | | | | | ACID DEPOSITION | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Baseline | | | Updated Baseline | | | Baseline | | | | | Updated Baseline | | | | |
| Habitat Code | Receptor name - Used in 2017 Alloy Wheel Facility Assessment | Receptor name - As listed in Apis for Habitat Code at Ben Nevis SAC 2021 | X-Coordinate | Y-Coordinate | 5km | 5km | Average APIS Nitrogen Deposition Current Load | Critical load MIN kgN/ha/yr | Critical load MAX kgN/ha/yr | Average APIS Nitrogen Deposition Current Load | Critical load MIN kgN/ha/yr | Critical load MAX kgN/ha/yr | Average APIS N Deposition keq/ha/yr | Average APIS S Deposition keq/ha/yr | CLminN | CLMaxS | CLMaxN | Average APIS N Deposition keq/ha/yr | Average APIS S Deposition keq/ha/yr | CLminN | CLMaxS | CLMaxN |
| H8110 | Acidic scree | Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 214142 | 773275 | 2.02 | 0.53 | 12.2 | 5 | 15 | 9.9 | 5 | 15 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.220 | 0.541 |
| H6170 | Alpine and subalpine calcareous grasslands | Alpine and subalpine calcareous grasslands | 217892 | 773265 | 2.02 | 0.53 | 12.2 | 5 | 10 | 9.9 | 5 | 10 | 0.87 | 0.34 | 1 | 4 | 5 | 0.7 | 0.2 | 0.856 | 4 | 4.856 |
| H4060 | Alpine and subalpine heaths | Alpine and Boreal heaths | 213371 | 773597 | 2.02 | 0.53 | 12.2 | 5 | 15 | 9.9 | 5 | 15 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.220 | 0.541 |
| H8120 | Base-rich scree * | Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 213111 | 774500 | 2.02 | 0.53 | 12.2 | 5 | 15 | 9.9 | 5 | 15 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.220 | 0.541 |
| H7130 | Blanket bog | Blanket Bogs | 213766 | 774568 | 2.02 | 0.53 | 12.2 | 5 | 10 | 9.9 | 5 | 10 | 0.87 | 0.34 | 0.321 | 0.663 | 0.984 | 0.7 | 0.2 | 0.321 | 0.663 | 0.984 |
| H91C0 | Caledonian forest | Caledonian forest | 215764 | 769201 | 2.02 | 0.53 | 18.5 | 5 | 15 | 14.4 | 5 | 15 | 1.32 | 0.46 | 0.142 | 1.534 | 1.819 | 1 | 0.3 | 0.142 | 1.534 | 1.819 |
| H3130 | Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels | Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 214385 | 772763 | 2.02 | 0.53 | 12.5 | 3 | 10 | 8.3 | 3 | 10 | 0.87 | 0.34 | no information | no information | no information | 0.6 | 0.2 | 0 | 0 | 0 |
| H4030 | Dry heaths | European Dry heaths | 213527 | 774710 | 2.02 | 0.53 | 12.2 | 10 | 20 | 9.9 | 10 | 20 | 0.87 | 0.34 | 0.642 | 0.220 | 0.862 | 0.7 | 0.2 | 0.642 | 0.22 | 0.862 |
| H7240 | High-altitude plant communities associated with areas of water seepage | Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 218129 | 772837 | 2.02 | 0.53 | 12.2 | 15 | 25 | 9.9 | 15 | 25 | no information | no information | not sensitive | not sensitive | not sensitive | 0.7 | 0.2 | Habitat not sensitive to acidification in APIS | | |
| H6150 | Montane acid grasslands | Siliceous alpine and boreal grasslands | 213518 | 773488 | 2.02 | 0.53 | 12.2 | 5 | 10 | 9.9 | 5 | 10 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| H4080 | Mountain willow scrub | Sub-Arctic Salix spp scrub | 218800 | 771050 | 2.02 | 0.53 | 12.2 | 5 | 15 | 9.9 | 5 | 15 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| H8220 | Plants in crevices on acid rocks | Siliceous rocky slopes with chasmophytic vegetation | 213111 | 774500 | 2.02 | 0.53 | 12.2 | 5 | 15 | 9.9 | 5 | 15 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| H8210 | Plants in crevices on base-rich rocks * | Calcareous rocky slopes with chasmophytic vegetation | 213111 | 774500 | 2.02 | 0.53 | 12.2 | 10 | 15 | 9.9 | 5 | 15 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| H6230 | Species-rich grassland with mat-grass in upland areas | Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 213111 | 774500 | 2.02 | 0.53 | 12.2 | 10 | 15 | 9.9 | 10 | 15 | 0.87 | 0.34 | 0.223 | 0.220 | 0.586 | 0.7 | 0.2 | 0.223 | 0.22 | 0.586 |
| H6430 | Tall herb communities | Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 215473 | 772659 | 2.02 | 0.53 | 12.2 | 10 | 20 | 9.9 | 10 | 20 | 0.87 | 0.34 | 0.178 | 0.220 | 0.541 | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| H91A0 | Western acidic oak woodland | Old sessile oak woods with Ilex and Blechnum in the British Isles | 213756 | 775360 | 2.02 | 0.53 | 18.5 | 10 | 15 | 14.4 | 10 | 15 | 1.32 | 0.46 | 0.142 | 1.534 | 1.819 | 1 | 0.3 | 0.142 | 1.534 | 1.819 |
| H4010 | Wet heathland with cross-leaved heath | Northern Atlantic wet heaths with Erica tetralix | 213206 | 774811 | 2.02 | 0.53 | 12.2 | 10 | 20 | 9.9 | 10 | 20 | 0.87 | 0.34 | 0.642 | 0.220 | 0.862 | 0.7 | 0.2 | 0.642 | 0.22 | 0.862 |

****No maps were provided for these Habitats therefore the assessment was made at the SAC boundary co-ordinate of 213111, 774500 and represents the maximum deposition within the SAC.***

**From:** Corrina Mertens [redacted]
**Sent:** 27 January 2021 14:46
**To:** Annie Danskin [redacted]
**Subject:** RE: Habitats Risk Assessment within Ben Nevis SAC for Alvance Aluminium Billet Plant application

Annie,

Thank you for requesting our opinion on this assessment and methodology. We agree that your proposed method seems appropriate, however we advise that you confirm the details with SEPA as we would normally defer to them in these types of cases.

Regards

Corrina


I am working from home. You can contact me by email or on my work number above between 8.00am and 4.30pm.

**Corrina Mertens | Area Officer, South Highland**

**NatureScot** | Scottish Natural Heritage | Torlundy | Fort William | Inverness-shire | PH33 6SW| [redacted]

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**From:** Annie Danskin [redacted]
**Sent:** 17 March 2021 17:18
**To:** Corrina Mertens [redacted]
**Cc:** Ruth Fain [redacted]; Jonas Beaugas [redacted]
James Tangney [redacted]
**Subject:** RE: Habitats Risk Assessment within Ben Nevis SAC for Alvance Aluminium Billet Plant application

Hi Corrina

We had a meeting with Al Whyte of SEPA on Monday to discuss some of the predicted deposition effects within the Ben Nevis SAC from the proposed aluminium billet plant at Alvance.

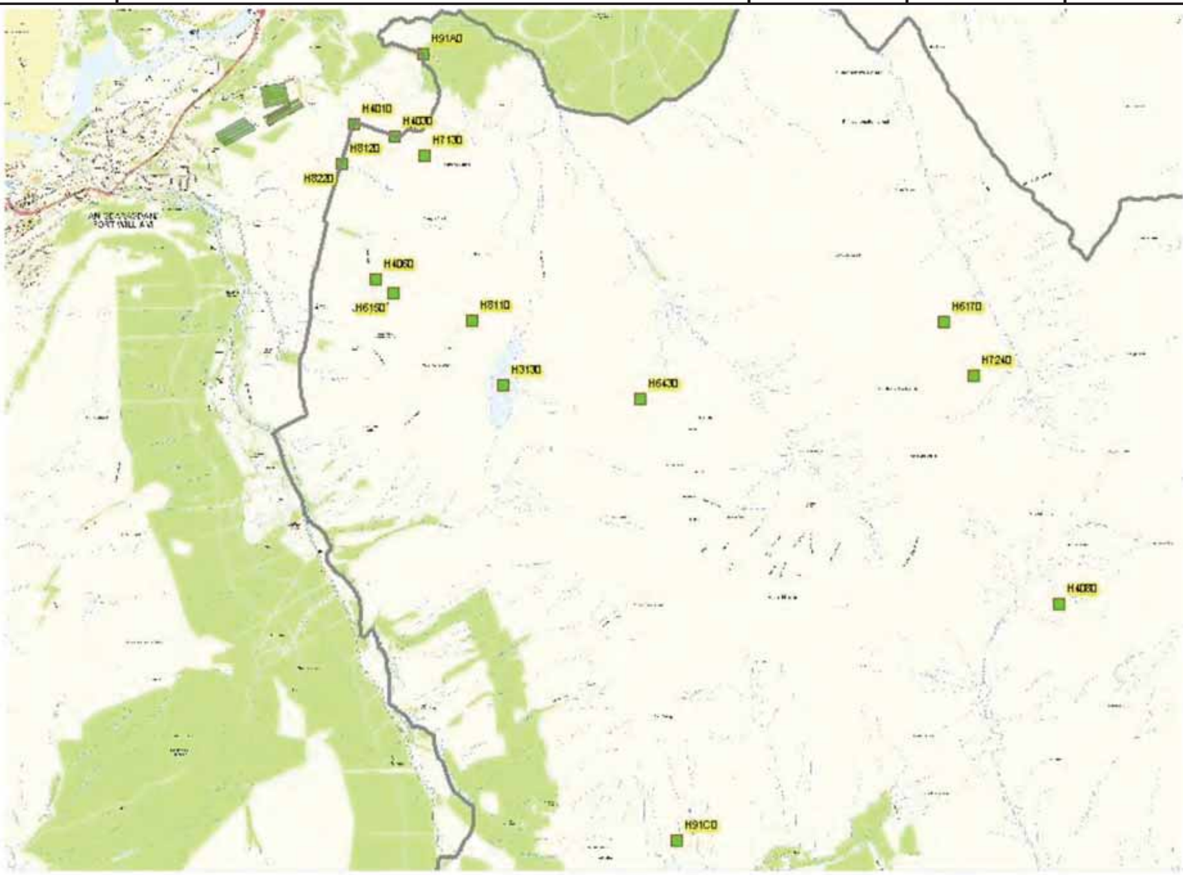
Based on the current plant design under consideration, we have some areas within the SAC where the Acid deposition exceeds the screening criterion of 1% of the Critical Load Function as shown in the attached contour map. This is prior to the consideration of some possible abatement options. The receptor locations Eco 1, Eco 2 etc correspond the qualifying habitats codes as shown in the table and map below. Please note that no grid references were provided for H8120 and H8210 so these have been assessed at the SAC site boundary closest to the proposed development which is presumed to be too conservative.

It would be very helpful for us (and the regulatory bodies) to assess potential deposition impacts of all process design options across areas of qualifying habitats rather than just point locations and determine the area of coverage the >1% CL Function contour relative to the area of the entire resource within the SAC.
Are you therefore able to provide the GIS shape files showing the coverage extent of each qualifying habitat code please?
If the data is not available in layers of each qualifying habitat, NVC data will be a useful alternative. We know the latter exists because the information can be viewed on the Scotland's Environment Map application but we are not able to download it.

We would be grateful for your assistance with this matter at your earliest convenience in order that we can progress the planning application in the planned timescales.
Regards
Annie

| Habitat Code | Receptor name - As listed in Apis for Habitat Code at Ben Nevis SAC 2021 | X-Coordinate | Y-Coordinate | Receptor Name in Contours |
|---|---|---|---|---|
| H8110 | Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 214142 | 773275 | Eco 1 |
| H6170 | Alpine and subalpine calcareous grasslands | 217892 | 773265 | Eco 2 |
| H4060 | Alpine and Boreal heaths | 213371 | 773597 | Eco 3 |
| H8120 | Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 213111 | 774500 | Eco 4 |
| H7130 | Blanket Bogs | 213766 | 774568 | Eco 5 |

| | | | | |
|---|---|---|---|---|
| H91C0 | Caledonian forest | 215764 | 769201 | Eco 6 |
| H3130 | Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 214385 | 772763 | Eco 7 |
| H4030 | European Dry heaths | 213527 | 774710 | Eco 8 |
| H7240 | Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 218129 | 772837 | Eco 9 |
| H6150 | Siliceous alpine and boreal grasslands | 213518 | 773488 | Eco 10 |
| H4080 | Sub-Arctic Salix spp scrub | 218800 | 771050 | Eco 11 |
| H8220 | Siliceous rocky slopes with chasmophytic vegetation | 213111 | 774500 | Eco 12 |
| H8210 | Calcareous rocky slopes with chasmophytic vegetation | 213111 | 774500 | Eco 13 |
| H6230 | Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 213111 | 774500 | Eco 14 |
| H6430 | Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 215473 | 772659 | Eco 15 |
| H91A0 | Old sessile oak woods with Ilex and Blechnum in the British Isles | 213756 | 775360 | Eco 16 |
| H4010 | Northern Atlantic wet heaths with Erica tetralix | 213206 | 774811 | Eco 17 |



**From:** Corrina Mertens [redacted]
**Date:** Monday, 29 March 2021 at 10:23
**To:** Annie Danskin [redacted]
**Cc:** Ruth Fain [redacted] Jonas Beaugas [redacted], James Tangney [redacted]
**Subject:** RE: Habitats Risk Assessment within Ben Nevis SAC for Alvance Aluminium Billet Plant application

Annie, thank you for your email,

I hope you are able to download the datasets for the habitats you listed apart from the two highlighted. We don't have mapped data for H8120 and H8210 as they were included in the datasets for H8110 and H8220 (and similarly with the corresponding NVC types) and were not separated from the datasets. We estimate that around 5-10% of the siliceous features will be made up of calcareous features. Overlaying the habitat dataset with a geological map could help identify where these more base rich areas are.

We note that you mention that the site boundary is deemed too conservative for H8120 and H8210, therefore we suggest you identify the highest levels of deposition over H8110 and H8220 and select receptor points within these areas.

If you require any further advice or help with the datasets please do not hesitate to get in touch

Corrina

I am working from home. You can contact me by email or on my work number above between 8.00am and 4.30pm.

**Corrina Mertens | Area Officer, South Highland**

**NatureScot** | Scottish Natural Heritage | Torlundy | Fort William | Inverness-shire | PH33 6SW| [redacted]

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NatureScot

**From:** Corrina Mertens [redacted]
**Sent:** 20 April 2021 09:26
**To:** Jonas Beaugas [redacted]
**Cc:** Annie Danskin [redacted] Ruth Fain [redacted]
James Tangney [redacted] Jonas Beaugas
[redacted] Whyte, Alastair [redacted]
**Subject:** FW: Habitats Risk Assessment within Ben Nevis SAC for Alvance Aluminium Billet Plant application

Jonas.

Sorry or the delay getting back to you. Several of the advisors I needed to consult with were on leave over Easter.

I have answered your specific queries in red in your original email below. .

I also advise that you add two further receptors:

- Oceanic heath communities are associated with habitat H4060. The nearest location for a receptor for H4060 with oceanic montane bryophyte is 215573 772808
- Snowbed communities are associated with H6150. The nearest location for a receptor for H6150 with snowbed communities is 217660 772460.

Both these communities are highly sensitive to air pollution and are components of the two described habitats. We do not have the oceanic and snowbed communities data available to download yet, but we are working on it. Once we have it I will send it to you.

I have also attached a map showing the location of H6170 habitat.

Thanks

Corrina

I am working from home. You can contact me by email or on my work number above between 8.00am and 4.30pm.

**Corrina Mertens | Area Officer, South Highland**

**NatureScot** | Scottish Natural Heritage | Torlundy | Fort William | Inverness-shire | PH33 6SW| [redacted]

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**From:** Jonas Beaugas [redacted]
**Sent:** 30 March 2021 14:43
**To:** Corrina Mertens [redacted]
**Cc:** Annie Danskin <annie.danskin@itpenergised.com>; Ruth Fain [redacted]>;
James Tangney <James.Tangney@alvancegroup.com>; Jonas Beaugas
[redacted]
**Subject:** Re: Habitats Risk Assessment within Ben Nevis SAC for Alvance Aluminium Billet Plant application

Good afternoon Corrina –

Many thanks for your email and for providing the link to the HABMOS dataset.

We have prepared the attached figure which shows the ecological receptors as provided at the time of the Alloy Wheel Facility assessment (see table below) over the HABMOS dataset for the habitat of relevance to our study (as per the table below).

| Habitat Code | Receptor name - As listed in Apis for Habitat Code at Ben Nevis SAC 2021 | X-Coordinate | Y-Coordinate | Receptor Name in Contours |
|---|---|---|---|---|
| H8110 | Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 214142 | 773275 | Eco 1 |
| H6170 | Alpine and subalpine calcareous grasslands | 217892 | 773265 | Eco 2 |
| H4060 | Alpine and Boreal heaths | 213371 | 773597 | Eco 3 |
| H8120 | Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 213111 | 774500 | Eco 4 |
| H7130 | Blanket Bogs | 213766 | 774568 | Eco 5 |
| H91C0 | Caledonian forest | 215764 | 769201 | Eco 6 |
| H3130 | Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 214385 | 772763 | Eco 7 |
| H4030 | European Dry heaths | 213527 | 774710 | Eco 8 |
| H7240 | Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 218129 | 772837 | Eco 9 |
| H6150 | Siliceous alpine and boreal grasslands | 213518 | 773488 | Eco 10 |
| H4080 | Sub-Arctic Salix spp scrub | 218800 | 771050 | Eco 11 |
| H8220 | Siliceous rocky slopes with chasmophytic vegetation | 213111 | 774500 | Eco 12 |
| H8210 | Calcareous rocky slopes with chasmophytic vegetation | 213111 | 774500 | Eco 13 |
| H6230 | Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 213111 | 774500 | Eco 14 |
| H6430 | Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 215473 | 772659 | Eco 15 |

| | | | | |
|---|---|---|---|---|
| H91A0 | Old sessile oak woods with Ilex and Blechnum in the British Isles | 213756 | 775360 | Eco 16 |
| H4010 | Northern Atlantic wet heaths with Erica tetralix | 213206 | 774811 | Eco 17 |

The grid reference for Eco16 places this receptor in areas designated for:

- Broadleaved deciduous woodland,
- Woodland forest and other wooded land,
- Woodland not on marshy terrain,
- Sphagnum woods, and
- Carr and fen scrubs.

The location at which Eco16 is designated is not designated for H91A0 - old sessile oak woods (as per the above table). I have marked with a red triangle on the figure attached where the closest location of H91A0 is. Can you please confirm whether Eco 16 should be moved to this location and whether the habitat listed above where Eco 16 is currently located should be considered? Eco16 should remain in the location specified in the table. There is a problem with HabMos mapping of H91A0 but our NVC data confirms that this area of woodland is qualifying habitat.

The HABMOS dataset does not seem to include "H6170 - Alpine and subalpine calcareous grasslands" (Eco2) within the Ben Nevis SAC. Can you please confirm whether we should consider this habitat and if yes its location within the SAC? Eco 2 seems to be located on H8220 – Siliceous rocky slopes. Yes this habitat is present within the SAC and Eco2 is a good location for this receptor.

As per Annie's email below, in a conservative approach some receptors have been placed on the boundary of the SAC, however we would propose that these are moved to the location of the habitat they are designated for (e.g Eco 4, 12 and 13 should be moved approximately 200m to the south). Eco 12 is in the right place as it occurs in this location as a small proportion of the habitat mosaic. Eco 13, however should be moved to 217619 769520 ( this is the closest location of this habitat) . Eco 4 should be moved to 215347 772105.

Thanks again for your guidance.

Kind Regards,

**Jonas Beaugas | Senior Consultant – Advisory Services |** ITPEnergised
[redacted]
4th Floor, Centrum House, 108-114 Dundas Street, Edinburgh EH3 5DQ
www.itpenergised.com

# Ben Nevis SAC habitats and Lochaber Smelter

! Lochaber Smelter

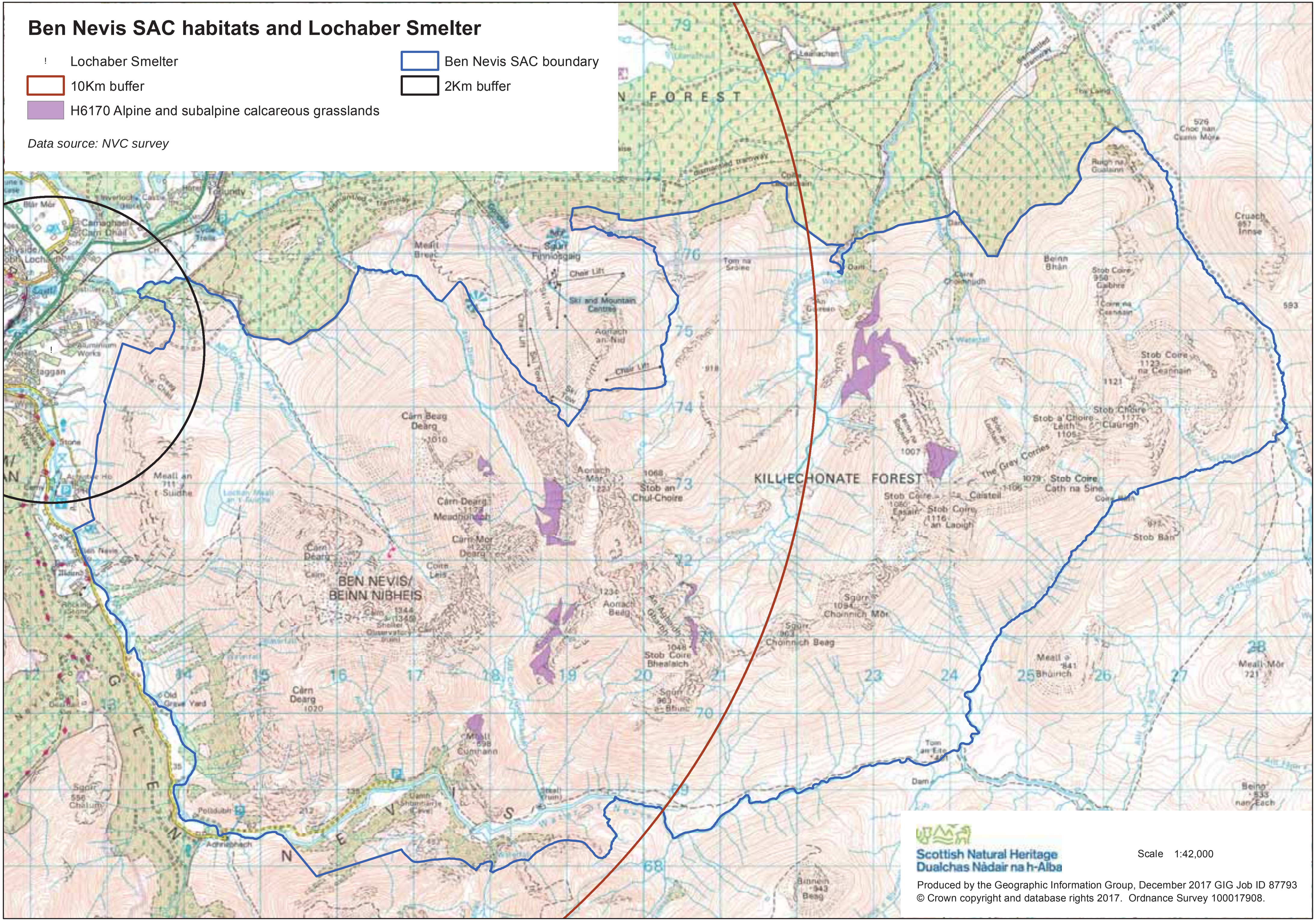
10Km buffer

H6170 Alpine and subalpine calcareous grasslands

Ben Nevis SAC boundary

2Km buffer

*Data source: NVC survey*




Scottish Natural Heritage
Dualchas Nàdair na h-Alba

Scale 1:42,000

Produced by the Geographic Information Group, December 2017 GIG Job ID 87793

# Annex 2 – Emissions Sources Information

## Operating Patterns & Emissions

- **Smelter and Generators** – Sources have been modelled at their permitted emission limit values (ELVs).
- **Proposed Development** – Sources have been modelled at their proposed ELVs including abatement (see below).
- **Smelter $SO_2$ Emissions** – The sulphur dioxide release rate for the Smelter has been calculated based on the permitted maximum production value of 47,500 T per year and $SO_2$ permit limit of 15 kg/t. This resulted in a $SO_2$ emission rate of 4.52 g/s per source.
- **Generators** – It has been assumed that the generators operate continuously between the permitted hours of 7am and 11pm (5840 hours per year). Generators are however only permitted to operate for a total of 500 hours. On that basis long-term generator process contributions at selected receptors have been corrected down from 5840 hours to 500 hours on a pro-rata basis. It should be noted that the generators have historically only been operating for up to 50 hours per year and the assessment is therefore highly conservative.

  As it is not possible to know during which hour of the year the generators will operate, no corrections have been applied to predicted peak 1-hour short-term concentrations.
- **Other Sources** – all other emissions sources have been modelled as operating 24/7.

## Abatement Options for the Proposed Development

The Applicant is working with furnace and flue gas treatment equipment manufacturers to design systems that will deliver the required $NO_x$ and acid gas abatement from the melting furnace emissions while minimising the amount of additional space required by the proposed solutions. The AQIA has included $NO_x$ and HCl emissions at concentrations substantially lower than the BAT ELVS, as shown in the emissions inventory that follows, in order to minimise the effects on sensitive human and ecological receptors. Abatement solutions to achieve these limits are likely to include the following:

- Ductwork to split flue gases from hood extraction air to maintain flue gases above 200°C where $NO_x$ reduction works most efficiently;
- Installation of a short section of reactor ductwork for chemical dosing of flue gases for the main melting/casting furnace group with ammonia for $NO_x$ removal and hydrated lime with a low portion of activated carbon for acid gas reduction;
- Installation of a hose-type filter with ceramic coating for $NO_x$ removal; and
- Standard low temperature bag filter plant for flue gas and hood extraction air from the rotary furnace group.

The emissions from the process have been calculated assuming 100,000 tonnes billet production per annum from 100% recycled material. If the production figure is less than 100,000 tonnes and/or primary aluminium from the existing Smelter is used, the emissions from the melting furnaces will be significantly lower than have been assumed in this AQIA.

# Emissions Inventories

## Billet Plant - Proposed ELVs

| Source | BP1 | BP2 Large | BP2 Small |
|---|---|---|---|
| Hours of operation per day (24/7 unless stated) | | | |
| Modelled As | 24/7 | 24/7 | 24/7 |
| Gaseous Fluoride (expressed as HF) (mg/Nm3) | x | x | x |
| Total Fluoride (expressed as HF) (mg/Nm3) | x | 1 | 1 |
| Chlorine (mg/mN3) | x | x | x |
| Hydrogen Chloride (mg/Nm3) | x | 1 | 1 |
| TVOC (mg/Nm3) | x | 30 | 20 |
| Oxides of Nitrogen (mg/Nm3) | 200 | 18.65 | 20 |
| Sulphur Dioxide (mg/Nm3) | x | 0 | 0 |
| CO (mg/Nm3) | 50 | 100 | 50 |
| Particulates (mg/m3) | x | 5 | 5 |
| Dioxins (PCDD/F) (ng ITEQ/Nm3) | x | 0.1 | 0.1 |
| Amonia (mg/m3) | x | x | x |
| Mass Emissions from ref conc x re.f Vol | | | |
| Total Fluoride g/s | X | 0.0389 | 0.0194 |
| Chlorine g/s | X | x | x |
| HCl g/s | X | 0.0389 | 0.0194 |
| TVOC g/s | X | 1.1667 | 0.3889 |
| NOx (g/s) | 0.3400 | 0.7253 | 0.3889 |
| SO2 g/s | X | 0.0000 | 0.0000 |
| CO (g/s) | 0.1700 | 3.8889 | 0.9722 |
| Particulates (g/s) | X | 0.1944 | 0.0972 |
| Dioxins (PCDD/F) **g/s** | X | 0.0000000039 | 0.0000000019 |
| Amonia (g/s) | X | X | X |
| **Stack Height (m)** | 3.5m above roof valley | 3.5m above roof valley | 3.5m above roof valley |
| **Stack Diameter (m)** | 0.562 | 2.1 | 1.4 |
| **Stack Area (m2)** | 0.248 | 3.46 | 1.54 |
| **Actual Temperature (C)** | 350.00 | 90 | 50 |
| **Actual Temperature (K)** | 623.15 | 363.15 | 323.15 |
| **Reference Temperature (K)** | 273.15 | 273.15 | 273.15 |
| **Ratio Tref/Tact** | 0.44 | 0.75 | 0.85 |
| **Actual Volumetric Flow (m3/s)** | 3.88 | 51.70 | 23.00 |
| **Normal Volumetric Flow Rate (Nm3/s)** | 1.70 | 38.89 | 19.44 |
| **Modelled Efflux Velocity (m/s)** | 15.63 | 14.93 | 14.94 |
| **Stack Location** | E: 212219 N:774834 | E: 212305 N:774859 | E: 212331 N:774838 |

## Billet Plant - BAT ELVs

| Source | BP1 | BP2 Large | BP2 Small |
|---|---|---|---|
| Gaseous Fluoride (expressed as HF) (mg/Nm3) | x | x | x |
| Total Fluoride (expressed as HF) (mg/Nm3) | x | 1 | 1 |
| Chlorine (mg/mN3) | x | x | x |
| Hydrogen Chloride mg/Nm3 | x | 10 | 10 |
| TVOC (mg/Nm3) | x | 30 | 30 |
| Oxides of Nitrogen (mg/Nm3) | 200 | 100 | 100 |
| Sulphur Dioxide (mg/Nm3) | x | x | x |
| CO (mg/Nm3) | 50 | 150 | 150 |
| Particulates (mg/m3) | x | 5 | 5 |
| Dioxins (PCDD/F) (ng ITEQ/Nm3) | x | 0.1 | 0.1 |
| Amonia (mg/m3) | x | x | x |
| Mass Emissions from ref conc x re.f Vol | | | |
| Total Fluoride g/s | X | 0.0389 | 0.0194 |
| Chlorine g/s | X | X | X |
| HCl g/s | X | 0.3889 | 0.1944 |
| TVOC g/s | X | 1.1667 | 0.5833 |
| NOx (g/s) | 0.3400 | 3.8889 | 1.9444 |
| SO2 g/s | X | X | X |
| CO (g/s) | 0.1700 | 5.8333 | 2.9167 |
| Particulates (g/s) | X | 0.1944 | 0.0972 |
| Dioxins (PCDD/F) **g/s** | X | 0.00000000389 | 0.00000000194 |
| Amonia (g/s) | X | X | X |
| **Stack Height (m)** | 3.5m above roof valley | 3.5m above roof valley | 3.5m above roof valley |
| **Stack Diameter (m)** | 0.562 | 2.1 | 1.4 |
| **Stack Area (m2)** | 0.248 | 3.46 | 1.54 |
| **Actual Temperature (C)** | 350.00 | 90 | 50 |
| **Actual Temperature (K)** | 623.15 | 363.15 | 323.15 |
| **Reference Temperature (K)** | 273.15 | 273.15 | 273.15 |
| **Ratio Tref/Tact** | 0.44 | 0.75 | 0.85 |
| **Actual Volumetric Flow (m3/s)** | 3.88 | 51.70 | 23.00 |
| **Normal Volumetric Flow Rate (Nm3/s)** | 1.70 | 38.89 | 19.44 |
| **Modelled Efflux Velocity (m/s)** | 15.63 | 14.93 | 14.94 |
| **Stack Location** | E: 212219 N:774834 | E: 212305 N:774859 | E: 212331 N:774838 |

**Legend**

- Data from PPC Permit
- Data based on average monitoring available for 2019/2020
- Extra lines added by ITPE to ccalculate emissions
- X = assumed named pollutant not present for this source
- Data confirmed by Alvance British Aluminium
- SO2 calculated based on production with permit limit of 15kgSO2/t and based on maximum production of 47,500 t/year
- No Permit limits - based on monitoring

# Smelter and Generators as Permitted

| | A01 | A02 | A03 | A04 | A05 | A06 | A07 | A08 | A10 | A11 | A12 | A13 | A52 | A49 | A50 | A51 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Source | Fume Treatment Plant East Stack | Fume Treatment Plant Centre Stack | Fume Treatment Plant West Stack | Silo Bag Filter, Conveyor and Fill Point Bag Filter | Bath Treatment Plant NO1 Dust Unit Stack | Bath Treatment Plant NO2 Dust Unit Stack | North Cell Room Roof Vents (per vent) | South Cell Room Roof Vents (per vent) | Cast Iron Induction Furnaces | Rodding Room NO1 Dust Unit | Rodding Room NO2 Dust Unit | Crucible Cleaner Stack | Holding furances and Alpur Vent | Material Transfer Building NO1 Dust Unit Stack | Material Transfer Building NO2 Dust Unit Stack | TAC Unit | Generator (per unit) |
| Modelled As | 24/7 | 24/7 | 24/7 | 24/7 | 24/7 | 24/7 | 24/7 | 24/7 | 24/7 | 24/7 | 24/7 | 24/7 | 24/7 | 24/7 | 24/7 | 24/7 | 7am to 11pm everyday to be very conservative - max of 500hr per generator Allowable but actually <50hr per year use |
| Gaseous Fluoride (expressed as HF) mg/Nm3 | 1 | 1 | 1 | x | 0.013 | 0.04 | 0.25 | 0.25 | 24 | x | x | 0.06 | 15.7 | 0.01 | 0.02 | 23 | |
| Total Fluoride (expressed as HF) mg/Nm3 | 1.5 | 1.5 | 1.5 | x | 0.95 | 0.19 | 0.35 | 0.35 | x | x | x | 1.7 | 16 | 0.03 | 0.03 | 23.3 | |
| Chlorine mg/Nm3 | x | x | x | x | x | x | x | x | x | x | x | x | 12.8 | x | x | x | x |
| Hydrogen Chloride mg/Nm3 | x | x | x | x | x | x | x | x | x | x | x | x | 65.6 | x | x | x | x |
| Oxides of Nitrogen (mg/Nm3) | x | x | x | x | x | x | x | x | x | x | x | x | 177 | x | x | x | x |
| Nitrogen Dioxide (mg/Nm3) | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | 400 |
| Sulphur Dioxide mg/Nm3 | Based on tonnage (See below) | | | x | x | x | Based on tonnage (See below) | | x | x | x | x | 9.9 | x | x | x | 350***** |
| CO (mg/Nm3) | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | 650 |
| Particulates mg/Nm3 | 5 | 5 | 5 | 5 | 10 | 10 | 0.4 | 0.4 | 10 | 10 | 10 | 10 | 10 | 0.3 | 0.11 | 10 | 130 |
| $PM_{10}$ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Emission Rate (g/s) - per stack ITPE calc from Red data | 0.218 | 0.232 | 0.241 | 0.0006 | 0.025 | 0.023 | 0.005 | 0.005 | 0.022 | 0.052 | 0.045 | 0.040 | 0.0057 | 0.003 | 0.001 | 0.0080 | 0.26 |
| NOx | | | | | | | | | | | | | √ | | | | √ |
| Emission Rate (g/s) - per stack ITPE calc from Red data | x | x | x | x | x | x | x | x | x | x | x | x | 0.101 | x | x | x | 0.8 |
| CO | | | | | | | | | | | | | | | | | √ |
| Emission Rate (g/s) - per stack ITPE calc from Red data | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | 1.29 |
| Gaseous Fluoride as HF | √ | √ | √ | | √ | √ | √ | √ | √ | | | √ | √ | √ | √ | √ | |
| Emission Rate (g/s) - per stack | 0.0437 | 0.0463 | 0.0482 | x | 0.0000326 | 0.0001 | 0.003 | 0.003 | 0.0524 | x | x | 0.0002 | 0.0089 | 0.0001 | 0.0002 | 0.0184 | x |
| Total Fluoride as HF | √ | √ | √ | | √ | √ | √ | √ | | | | √ | √ | √ | √ | √ | |
| Emission Rate (g/s) - per stack | 0.0655 | 0.0695 | 0.0723 | x | 0.0024 | 0.0004 | 0.0048 | 0.0048 | x | x | x | 0.0069 | 0.0091 | 0.0003 | 0.0002 | 0.0187 | x |
| Chlorine | | | | | | | | | | | | | √ | | | | |
| Emission Rate (g/s) - per stack | x | x | x | x | x | x | x | x | x | x | x | x | 0.0073 | x | x | x | x |
| Hydrogen Chloride HCl | | | | | | | | | | | | | √ | | | | |
| Emission Rate (g/s) - per stack | x | x | x | x | x | x | x | x | x | x | x | x | 0.0373 | x | x | x | x |
| Sulphur Dioxide SO2 | | | | | | | | | | | | | √ | | | | |
| Emission Rate (g/s) - per stack | 4.52 | 4.52 | 4.52 | x | x | x | 0.65 | 0.65 | x | x | x | x | 0.0056 | x | x | x | 0.18 |
| Supplementary Source Data | | | | | | | | | | | | | | | | | |
| Stack Height (m) | 35 | 35 | 35 | 13.9 | 9 | 9 | 27 | 27 | 11 | 9 | 9 | 9 | 16 | 9 | 9 | 13 | 4.95 |
| Stack Diameter (m) | 2.1 | 2.1 | 2.1 | 0.335 | 0.7 | 0.7 | 8.97 | 8.97 | 0.4 | 0.69 | 0.69 | 0.79 | 0.39 | 0.69 | 0.69 | 0.33 | 0.305 |
| Stack Area | 3.46 | 3.46 | 3.46 | 0.09 | 0.38 | 0.38 | 63.10 | 63.10 | 0.13 | 0.37 | 0.37 | 0.49 | 0.12 | 0.37 | 0.37 | 0.09 | 0.07 |
| Flue Temperature (C) | 85.8 | 71.7 | 68.2 | Assumed Ambient Temperature so variable with met data | 26 | 18 | 33 | 33 | 27 | 18 | 13 | Assumed Ambient Temperature so variable with met data | 399 | Assumed Ambient Temperature so variable with met data | Assumed Ambient Temperature so variable with met data | 33.3 | 463 |
| Flue Temperature (K) | 358.8 | 344.7 | 341.2 | 288 | 299 | 291 | 306 | 306 | 300 | 291 | 286 | 288 | 672 | 288 | 288 | 306.3 | 736 |
| Reference Temp (K) | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 | 273 |
| Ratio Tref/Tact | 0.76 | 0.79 | 0.80 | 0.95 | 0.91 | 0.94 | 0.89 | 0.89 | 0.91 | 0.94 | 0.95 | 0.95 | 0.41 | 0.95 | 0.95 | 0.89 | 0.37 |
| Actual Volumetric Flow (m3/s) | 57.4 | 58.5 | 60.2 | 0.132 | 2.75 | 2.5 | 107.27 | 107.27 | 2.4 | 5.5 | 4.7 | 4.26 | 1.4 | 10.9 | 8.2 | 0.9 | 5.88 |
| Reference Volume Flow Rate (Nm3/s) | 43.67 | 46.33 | 48.17 | 0.13 | 2.51 | 2.35 | 95.70 | 95.70 | 2.18 | 5.16 | 4.49 | 4.04 | 0.57 | 10.33 | 7.77 | 0.80 | 1.99 |
| Efflux Velocity (m/s) | 16.6 | 16.9 | 17.4 | 1.5 | 7.1 | 6.5 | 1.7 | 1.7 | 19.1 | 14.7 | 12.6 | 8.7 | 11.7 | 29.2 | 21.9 | 10.5 | 80.5 |
| Stack Location | 212630, 774900 | 212620, 774890 | 212630, 774880 | 212630, 774910 | 212560, 774860 | 212570, 775020 | See Below | See Below | 212660, 774980 | 212580, 775010 | 212580, 775010 | 212570, 775020 | 212510, 775070 | 212640, 775110 | 212640, 775100 | 212550, 775040 | See below |

**A07 Stack Locations**

| X | Y |
|---|---|
| 212560 | 774851 |
| 212594 | 774866 |
| 212627 | 774881 |
| 212660 | 774896 |
| 212693 | 774910 |
| 212726 | 774925 |
| 212760 | 774936 |

**A08 Stack Locations**

| X | Y |
|---|---|
| 212542 | 774892 |
| 212574 | 774908 |
| 212606 | 774923 |
| 212639 | 774939 |
| 212671 | 774955 |
| 212703 | 774970 |
| 212735 | 774986 |

**Generators**

| | X | Y |
|---|---|---|
| 1 | 212658 | 775151 |
| 2 | 212664 | 775152 |
| 3 | 212671 | 775153 |
| 4 | 212677 | 775154 |
| 5 | 212684 | 775156 |
| 6 | 212690 | 775157 |
| 7 | 212697 | 775157 |
| 8 | 212703 | 775159 |
| 9 | 212710 | 775160 |
| 10 | 212716 | 775161 |
| 11 | 212723 | 775162 |

## Further Information Regarding VOC

**From:** Jan Lukaszewski [redacted]
**Sent:** Thursday, March 18, 2021 8:34 AM
**To:** Damian Wilson [redacted]
**Cc:** Margaret Lane [redacted] Will Savage [redacted]
**Subject:** RE: BENZINE AND OTHER EMISSIONS ON ALUMINIUM MELTING



Hi Damian

I confirm that powder coats contain no Volatile Organic Compounds so no benzene. Benzene is classed as a carcinogen.

In any case benzene is a fuel, part of petroleum so during recycling would combust!

I suggest you need to consider PM2.5 particulates in your emissions, they are likely to be included by the time your plant starts up

Particulate matter (PM) is a term used to describe the mixture of solid particles and liquid droplets in the air. It can be either human-made or naturally occurring. Some examples include dust, ash and sea-spray. Particulate matter (including soot) is emitted during the combustion of solid and liquid fuels, such as for power generation, domestic heating and in vehicle engines. Particulate matter varies in size (i.e. the diameter or width of the particle). $PM_{2.5}$ means the mass per cubic metre of air of particles with a size (diameter) generally less than 2.5 micrometres (µm). $PM_{2.5}$ is also known as fine particulate matter (2.5 micrometres is one $400^{th}$ of a millimetre).

Kind regards,
Jan

**Jan Lukaszewski BSc. MBA. C.Eng. FIET. CQP. FCQI**
JLukaszewski@alfed.org.uk
Technical Manager
[redacted]

Suite 9, Alcora Building, Mucklow Hill, Halesowen, West Midlands, B62 8DG
Tel: [redacted] Web: www.alfed.org.uk | Linkedin | Facebook | Twitter
Company Registration Number 723801 (England). VAT Registration Number 111 5314 28



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# AXALTA SAFETY DATA SHEET

# SAFETY DATA SHEET

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Commission Regulation (EU) 2015/830

## SECTION 1: Identification of the substance/mixture and of the company/ undertaking

### 1.1 Product identifier

| | | |
|---|---|---|
| **Product identifier** | : | 2021000240096 |
| **Product name** | : | AE00017049121 JANUARY 1 |
| **Product type** | : | Powder. |
| **Other means of identification** | : | Not available. |
| **Date of issue** | : | 6 March 2021 |
| **Version** | : | 2 |
| **Date of previous issue** | : | 6 March 2020 |

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

| | | |
|---|---|---|
| **Identified uses** | : | Powder coating for industrial use. |
| **Uses advised against** | : | Not for sale to or use by consumers. |

### 1.3 Details of the supplier of the safety data sheet

Axalta Coating Systems Germany GmbH & Co. KG
Christbusch 25
DE 42285 Wuppertal
+49 (0)202 529-0

**e-mail address of person responsible for this SDS** : sds-competence@axalta.com

**National contact**

Axalta Powder Coating Systems UK Ltd.
Whessoe Road
GB Darlington, County Durham. DL3 0XH
+44 (0)1325 355371

### 1.4 Emergency telephone number

**Supplier**

+(44)-870-8200418

# SECTION 2: Hazards identification

## 2.1 Classification of the substance or mixture

**Product definition** : Mixture

**Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]**

Not classified.

The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.

**Ingredients of unknown toxicity** : 1.9 percent of the mixture consists of component(s) of unknown acute dermal toxicity
1.9 percent of the mixture consists of component(s) of unknown acute inhalation toxicity

See Section 11 for more detailed information on health effects and symptoms.

## 2.2 Label elements

**Hazard pictograms** : Not applicable.

**Signal word** : No signal word.

**Hazard statements** : No known significant effects or critical hazards.

**Precautionary statements**

**Prevention** : Not applicable.

**Response** : Not applicable.

**Storage** : Not applicable.

**Disposal** : Not applicable.

**Supplemental label elements** : Safety data sheet available on request.

**Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** : Not applicable.

## 2.3 Other hazards

**Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII** : This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

**Other hazards which do not result in classification** : May form combustible dust concentrations in air.

# SECTION 3: Composition/information on ingredients

**3.2 Mixtures** : Mixture

| Product/ingredient name | Identifiers | % | Regulation (EC) No. 1272/2008 [CLP] | Type |
|---|---|---|---|---|
| Castor oil, hydrogenated | EC: 232-292-2<br>CAS: 8001-78-3 | ≤3 | Aquatic Chronic 4, H413<br>**See Section 16 for the full text of the H statements declared above.** | [1] |

## SECTION 3: Composition/information on ingredients

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section.

Type

[1] Substance classified with a physical, health or environmental hazard
[2] Substance with a workplace exposure limit
[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
[5] Substance of equivalent concern
[6] Additional disclosure due to company policy

Occupational exposure limits, if available, are listed in Section 8.

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

| | |
|---|---|
| **General** | : In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and seek medical advice. |
| **Eye contact** | : Remove contact lenses, irrigate copiously with clean, fresh water, holding the eyelids apart for at least 10 minutes and seek immediate medical advice. |
| **Inhalation** | : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. |
| **Skin contact** | : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Do NOT use solvents or thinners. |
| **Ingestion** | : If swallowed, seek medical advice immediately and show the container or label. Keep person warm and at rest. Do NOT induce vomiting. |
| **Protection of first-aiders** | : No action shall be taken involving any personal risk or without suitable training. |

### 4.2 Most important symptoms and effects, both acute and delayed

There are no data available on the mixture itself. The mixture has been assessed following the conventional method of the CLP Regulation (EC) No 1272/2008 and is classified for toxicological properties accordingly. See Sections 2 and 3 for details.

This takes into account, where known, delayed and immediate effects and also chronic effects of components from short-term and long-term exposure by oral, inhalation and dermal routes of exposure and eye contact.
Coating powders can cause localised skin irritation in folds of the skin or under tight clothing.

### 4.3 Indication of any immediate medical attention and special treatment needed

| | |
|---|---|
| **Notes to physician** | : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. |
| **Specific treatments** | : No specific treatment. |

See toxicological information (Section 11)

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

| | |
|---|---|
| **Suitable extinguishing media** | : Recommended: alcohol-resistant foam, $CO_2$ blanket, water spray or mist. |
| **Unsuitable extinguishing media** | : Do not use water jet.<br>Do not use inert gas under high pressure (e.g. CO2). |

### 5.2 Special hazards arising from the substance or mixture

| | |
|---|---|
| **Hazards from the substance or mixture** | : Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard. |
| **Hazardous combustion products** | : Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen. |

### 5.3 Advice for firefighters

| | |
|---|---|
| **Special protective actions for fire-fighters** | : Cool closed containers exposed to fire with water. Do not release runoff from fire to drains or watercourses. |
| **Special protective equipment for fire-fighters** | : Appropriate breathing apparatus may be required. |

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

| | |
|---|---|
| **For non-emergency personnel** | : Exclude sources of ignition and ventilate the area. Avoid breathing dust. Refer to protective measures listed in sections 7 and 8. |
| **For emergency responders** | : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel". |

| | |
|---|---|
| **6.2 Environmental precautions** | : Do not allow to enter drains or watercourses. If the product contaminates lakes, rivers, or sewers, inform the appropriate authorities in accordance with local regulations. |
| **6.3 Methods and material for containment and cleaning up** | : Contain and collect spillage with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not use a dry brush as dust clouds or static can be created. |
| **6.4 Reference to other sections** | : See Section 1 for emergency contact information.<br>See Section 8 for information on appropriate personal protective equipment.<br>See Section 13 for additional waste treatment information. |

## SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

**Advice should be taken from a competent occupational health practitioner on the assessment of employees with skin or respiratory complaints before the individual is exposed to the uncured product.**

## SECTION 7: Handling and storage

**7.1 Precautions for safe handling** : Precautions should be taken to prevent the formation of dusts in concentrations above flammable, explosive or occupational exposure limits.
Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources.
Mixture may charge electrostatically: always use earthing leads when transferring from one container to another.
Operators should wear antistatic footwear and clothing and floors should be of the conducting type.
Keep away from heat, sparks and flame.
Avoid contact with skin and eyes. Avoid the inhalation of dust, particulates, spray or mist arising from the application of this mixture. Avoid inhalation of dust from sanding.
Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed.
Put on appropriate personal protective equipment (see Section 8).
Always keep in containers made from the same material as the original one.
Comply with the health and safety at work laws.
Do not allow to enter drains or watercourses.

**7.2 Conditions for safe storage, including any incompatibilities**

Store in accordance with local regulations.

**Additional information on storage conditions**

Observe label precautions. Store in a dry, cool and well-ventilated area. Keep away from heat and direct sunlight. Keep container tightly closed.
Keep away from sources of ignition. No smoking. Prevent unauthorised access. Containers that have been opened must be carefully resealed and kept upright to prevent leakage.

**7.3 Specific end use(s)**

**Recommendations** : Not available.

**Industrial sector specific solutions** : Not available.

## SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

**8.1 Control parameters**

**Occupational exposure limits**

No exposure limit value known.

**Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

## SECTION 8: Exposure controls/personal protection

**DNELs/DMELs**

| Product/ingredient name | Type | Exposure | Value | Population | Effects |
|---|---|---|---|---|---|
| Castor oil, hydrogenated | DNEL | Long term Oral | 23.875 mg/kg bw/day | General population | Systemic |
| | DNEL | Long term Dermal | 23.875 mg/kg bw/day | General population | Systemic |
| | DNEL | Long term Dermal | 47.75 mg/kg bw/day | Workers | Systemic |
| | DNEL | Long term Inhalation | 83.045 mg/m³ | General population | Systemic |
| | DNEL | Long term Inhalation | 336.75 mg/m³ | Workers | Systemic |
| | DNEL | Long term Inhalation | 8.638 ppm | Workers | Systemic |

**PNECs**

No PNECs available

### 8.2 Exposure controls

**Appropriate engineering controls** : Avoid breathing dust. Where reasonably practicable, this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain exposure to dusts below the OEL, suitable respiratory protection must be worn.

**Individual protection measures**

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Safety eyewear should be used when there is a likelihood of exposure.

**Skin protection**

**Body protection** : Personnel should wear protective clothing. Care should be taken in the selection of protective clothing to ensure that inflammation and irritation of the skin at the neck and wrists through contact with the powder are avoided.

**Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory protection** : If workers are exposed to concentrations above the exposure limit, they must use appropriate, certified respirators.

Dry sanding, flame cutting and/or welding of the dry paint film will give rise to dust and/or hazardous fumes. Wet sanding/flatting should be used wherever possible. If exposure cannot be avoided by the provision of local exhaust ventilation, suitable respiratory protective equipment should be used.

**Environmental exposure controls** : Do not allow to enter drains or watercourses.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

**Appearance**

| | | |
|---|---|---|
| **Physical state** | : | Solid. |
| **Colour** | : | Not available. |
| **Odour** | : | Not available. |
| **Odour threshold** | : | Not available. |
| **pH** | : | Not applicable. |
| **Melting point/freezing point** | : | Not available. |
| **Initial boiling point and boiling range** | : | Not applicable. |
| **Flash point** | : | Closed cup: Not applicable. [Product does not sustain combustion.] |
| **Evaporation rate** | : | Not available. |
| **Flammability (solid, gas)** | : | Not available. |
| **Lower and upper explosive (flammable) limits** | : | Lower: 40 g/m³ |
| **Vapour pressure** | : | 0 kPa [room temperature] |
| **Vapour density** | : | Not available. |
| **Density** | : | 1.196 g/cm³ |
| **Solubility(ies)** | : | Partially soluble in the following materials: cold water. |
| **Partition coefficient: n-octanol/ water** | : | Not available. |
| **Auto-ignition temperature** | : | 335°C |
| **Decomposition temperature** | : | Not applicable. |
| **Viscosity** | : | Not available. |
| **Explosive properties** | : | Not available. |
| **Oxidising properties** | : | Not available. |
| **Weight volatiles** | : | 0 % (w/w) |
| **VOC content** | : | 0 % (w/w) |

### 9.2 Other information

***room temperature (=20°C)***

## SECTION 10: Stability and reactivity

| | | |
|---|---|---|
| **10.1 Reactivity** | : | No specific test data related to reactivity available for this product or its ingredients. |
| **10.2 Chemical stability** | : | Stable under recommended storage and handling conditions (see Section 7). |
| **10.3 Possibility of hazardous reactions** | : | Under normal conditions of storage and use, hazardous reactions will not occur. |
| **10.4 Conditions to avoid** | : | When exposed to high temperatures may produce hazardous decomposition products. |

## SECTION 10: Stability and reactivity

**10.5 Incompatible materials** : Not applicable.

**10.6 Hazardous decomposition products** : Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.

## SECTION 11: Toxicological information

**11.1 Information on toxicological effects**

There are no data available on the mixture itself. The mixture has been assessed following the conventional method of the CLP Regulation (EC) No 1272/2008 and is classified for toxicological properties accordingly. See Sections 2 and 3 for details.

This takes into account, where known, delayed and immediate effects and also chronic effects of components from short-term and long-term exposure by oral, inhalation and dermal routes of exposure and eye contact.
Coating powders can cause localised skin irritation in folds of the skin or under tight clothing.

**Acute toxicity**

| Product/ingredient name | Result | Species | Dose | Exposure |
|---|---|---|---|---|
| Castor oil, hydrogenated | LD50 Oral | Rat | >10 g/kg | - |

**Conclusion/Summary** : Not available.

**Acute toxicity estimates**

N/A

**Irritation/Corrosion**

**Conclusion/Summary** : Not available.

**Sensitisation**

**Conclusion/Summary** : Not available.

**Mutagenicity**

**Conclusion/Summary** : Not available.

**Carcinogenicity**

**Conclusion/Summary** : Not available.

**Reproductive toxicity**

**Conclusion/Summary** : Not available.

**Teratogenicity**

**Conclusion/Summary** : Not available.

**Specific target organ toxicity (single exposure)**

Not available.

**Specific target organ toxicity (repeated exposure)**

Not available.

**Aspiration hazard**

Not available.

**Other information** : Not available.

## SECTION 12: Ecological information

### 12.1 Toxicity

There are no data available on the mixture itself.
Coating powder residues should not be allowed to enter drains or watercourses or be deposited where they could affect ground or surface waters.

The mixture has been assessed following the summation method of the CLP Regulation (EC) No 1272/2008 and is not classified as hazardous to the environment, but contains substance(s) hazardous to the environment. See section 3 for details.

**Conclusion/Summary** : Not available.

### 12.2 Persistence and degradability

**Conclusion/Summary** : Not available.

### 12.3 Bioaccumulative potential

| Product/ingredient name | $LogP_{ow}$ | BCF | Potential |
|---|---|---|---|
| Castor oil, hydrogenated | 18.75 | - | high |

### 12.4 Mobility in soil

**Soil/water partition coefficient ($K_{OC}$)** : Not available.

**Mobility** : Not available.

### 12.5 Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

**12.6 Other adverse effects** : No known significant effects or critical hazards.

## SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

### 13.1 Waste treatment methods

**Product**

**Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

**Hazardous waste** : Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 2008/98/EC.

**Disposal considerations** : Do not allow to enter drains or watercourses.
Dispose of according to all federal, state and local applicable regulations.
If this product is mixed with other wastes, the original waste product code may no longer apply and the appropriate code should be assigned.
For further information, contact your local waste authority.

**European waste catalogue (EWC)**

## SECTION 13: Disposal considerations

The European Waste Catalogue classification of this product, when disposed of as waste, is:

| Waste code | Waste designation |
|---|---|
| 08 02 01 | waste coating powders |

**Packaging**

**Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

**Disposal considerations** : Using information provided in this safety data sheet, advice should be obtained from the relevant waste authority on the classification of empty containers.
Empty containers must be scrapped or reconditioned.
Dispose of containers contaminated by the product in accordance with local or national legal provisions.

| Type of packaging | European waste catalogue (EWC) | |
|---|---|---|
| CEPE Paint Guidelines | 15 01 10* | packaging containing residues of or contaminated by hazardous substances |

**Special precautions** : This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

## SECTION 14: Transport information

| | ADR/RID | ADN | IMDG | IATA |
|---|---|---|---|---|
| **14.1 UN number** | Not regulated. | Not regulated. | Not regulated. | Not regulated. |
| **14.2 UN proper shipping name** | - | - | - | - |
| **14.3 Transport hazard class(es)** | - | - | - | - |
| **14.4 Packing group** | - | - | - | - |
| **14.5 Environmental hazards** | No. | No. | No. | No. |

**Marine pollutant** Not available.

**14.6 Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**14.7 Transport in bulk according to IMO instruments** : Not applicable.

## SECTION 14: Transport information

The actual shipping description for this product may vary based several factors including, but not limited to, the volume of material, size of the container, mode of transport and use of exemptions or exceptions found in the applicable regulations. The information provided in Section 14 is one possible shipping description for this product. Consult your shipping specialist or supplier for appropriate assignment information.

## SECTION 15: Regulatory information

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

**EU Regulation (EC) No. 1907/2006 (REACH)**

**Annex XIV - List of substances subject to authorisation**

**Annex XIV**

None of the components are listed.

**Substances of very high concern**

None of the components are listed.

**Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** : Not applicable.

**Other EU regulations**

**Seveso Directive**

This product is not controlled under the Seveso Directive.

**National regulations**

**Industrial use** : The information contained in this safety data sheet does not constitute the user’s own assessment of workplace risks, as required by other health and safety legislation. The provisions of the national health and safety at work regulations apply to the use of this product at work.

**15.2 Chemical safety assessment** : No Chemical Safety Assessment has been carried out.

## SECTION 16: Other information

**CEPE code** : 3

Indicates information that has changed from previously issued version.

**Abbreviations and acronyms** : ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
N/A = Not available
PBT = Persistent, Bioaccumulative and Toxic

## SECTION 16: Other information

PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
vPvB = Very Persistent and Very Bioaccumulative

**Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]**

| Classification | Justification |
|---|---|
| Not classified. | |

**Full text of abbreviated H statements**

| | |
|---|---|
| H413 | May cause long lasting harmful effects to aquatic life. |

**Full text of classifications [CLP/GHS]**

| | |
|---|---|
| Aquatic Chronic 4 | LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 4 |

**Date of printing** : 6 March 2021
**Date of issue/ Date of revision** : 6 March 2021
**Date of previous issue** : 6 March 2020
**Version** : 2

**Notice to reader**

**This product is intended for industrial use only.**

**Safety Data Sheet (SDS) content is believed to be accurate as of its issue date, but is subject to change as new information is received by Axalta Coatings Systems, LLC or any of its subsidiaries or affiliates (Axalta). This SDS may incorporate information that has been provided to Axalta by its suppliers. Users should ensure that they are referring to the most current version of the SDS. Users are responsible for following the precautions identified in this SDS. It is the users' responsibility to comply with all laws and regulations applicable to the safe handling, use, and disposal of the product.**

**Users of Axalta products should read all relevant product information prior to use, and make their own determination as to the suitability of the products for their intended use. Except as otherwise required by applicable law, AXALTA MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. The information on this SDS relates only to the specific product identified in Section 1, Identification, and does not relate to its possible use in combination with any other material or in any specific process. If this product is to be used in combination with other products, Axalta encourages you to read and understand the SDS for all products prior to use.**

**TECHNOFORM EC-SAFETY DATA SHEET**

TECHNOFORM

# EC-safety data sheet

Insulating profiles
for windows, doors,
and facades.

TECHNOFORM

# EC-safety data sheet

## 1. Product and company name

### 1.1 Product data
**Subject No.:** 200000-999900
**Designation:** Insulating strips

### 1.2 Data on manufacturer
**Supplier:** Technoform Bautec Kunststoffprodukte GmbH
Ostring 4, D-34277 Fuldabrück
Phone: +49 561/9583-400
Fax: +49 561/9583-521

## 2. Composition / Data on constituents

### 2.1 Chemical properties (individual substance)
PA66
**Additional information:** In addition to PA66, also contains pigments, fillers, additives, stabilizers and glass fibres.

### 2.2 Chemical properties (preparation)
**Description:** Product consists of PA 66, glass-fibre reinforced.
**Hazardous constituents:** None.

## 3. Potential hazards
None.

## 4. First-aid measures
**Upon contact with skin:** Burns caused by molten material require medical care.

## 5. Fire-fighting measures
**Suitable extinguishing agents:**
Water, foam, dry powder and $CO_2$.
Unsuitable extinguishing agents for reasons of safety: None.
**Possibly released at temperatures in excess of 300 °C:**
Toxic gases, $CO_2$, Accompanied by traces of: hydrogen cyanide.
**Further information:** Formation of further breakdown and oxidation products is dependent on the conditions of the fire. Dispose of fire residues and contaminated fire-fighting water in accordance with regionally applicable official directives.
**Special protective equipment:** When fighting fires, it is necessary to wear a gas mask with an independent air supply.

## 6. Measures in case of accidental leakage
No personal or environmental precautionary measures necessary.

## 7. Handling and storage
**Notes on safe handling:** No special measures required.
**Notes on fire and explosion protection:** No special measures required.
**Industrial hygiene:** No special measures required.
**Storage:** Store in a dry place to ensure that handling properties are maintained.

## 8. Exposure limits and personal protective equipment
None.

## 9. Physical and chemical properties

### 9.1 Appearance
**Shape:** Oblong
**Colour:** Black
**Odour:** Odourless

### 9.2 Safety data
**Melting point:** 250–265 °C
**Flash point:** 490 °C
**Ignition point:** 530 °C
**Density:** 1.25–1.35 g/ccm
**Fire-promoting properties:** Incineration or overheating.

### 9.3 Further data
**Combustion rate of PA66:** 1–2 cm/min

## 10. Stability and reactivity
Thermal decomposition at > 300 °C.
**Hazardous decomposition products:** Carbon monoxide, hydrogen cyanide; Depending on fire conditions: Aldehydes, amines, ammonia, ketones, nitriles and traces of nitrogen oxides possible.
**Further data:** No hazardous reactions observed.

## 11. Toxicological data
According to our experience and information, the product does not constitute a health hazard when handled and used correctly.

## 12. Ecological data
**No ecotoxic effects; water hazard class (WHC):** 0 (generally not a water hazard because water-insoluble, non-toxic solid)
**General note:** When handled correctly, no environmental risks expected.

## 13. Notes on disposal
The material in the product can be recycled. The product can be disposed of as household refuse in accordance with local directives or can be fed into a suitable incinerator.

## 14. Transportation data
Does not constitute a hazard in terms of transportation regulations.

## 15. Regulations
Not classified by Dangerous Chemicals Ordinance or relevant EC Guidelines.
When handling dust generated during mechanical processing, e.g. grinding, observe the relevant directives/limiting values for fines (lower toxic limit for fines: 6 $mg/m^3$).

## 16. Other data
The cited data are based on our current knowledge and must not be taken as a warranty of properties.
The recipient of our product assumes responsibility to observe existing laws and provisions.

TBGroup-Do-TB-06_Version_2_01.05.18

# DECLARATION SHEET

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TECHNOFORM

# Declaration sheet

Absence of hazardous substances in Technoform materials

Insulation solutions for windows, doors, and facades

# Declaration sheet

## Absence of hazardous substances in Technoform materials

We hereby confirm, that Technoform Bautec materials does not intentionally contain any of the additives listed below. This applies to our products in PA 66 GF25, dry impact resistant; PA 66 GF40, dry impact resistant; Recycled PA 66 GF25, dry impact resistant and Low Lambda PA 66 GF25, dry impact resistant.

| Living Building Challenge Red List |
|---|
| Asbestos |
| Cadmium |
| Chlorinated Polyethylene and Chlorosulfonated Polyethylene |
| Chlorofluorocarbons (CFCs) |
| Choloroprene (Neoprene) |
| Formaldehyde (added) |
| Halogenated Flame Retardants (PBDE, TBBPA, HBCD, Deca-BDE, TCPP, TCEP and other retardants with bromine or chlorine)“ |
| Hydrochlorofluorocarbons (HCFCs) |
| Lead (added) |
| Mercury |
| Petrochemical Fertilizers and Pesticides |
| Phthalates |
| Polyvinyl Chloride (PVC or CPVC) |
| Wood treatments containing Creosote, Arsenic or Pentachlorophenol |

| Google’s Materials of Concern |
|---|
| Anti-microbial chemicals |
| Coal ash |
| Nanomaterials |

| U.S. EPA Chemicals of Concern |
|---|
| Benzidine Dyes |
| Bisphenol A (BPA) |
| Methylene Diphenyl Diisocyanate (MDI) |
| Nonylphenol and Nonylphenol Ethoxylates |
| Perfluorinated chemicals (PFCs, including PFOA and Teflon) |
| Short chain chlorinated paraffins |
| Toluene Diisocyanate (TDI) |

The absence of hazardous substances was not determined by Technoform through specific testing but it is based upon information provided by our raw material suppliers, who do not exclude that some of the substances mentioned above may possible be present as trace impurities.

This statement is only valid for the material mentioned above. We cannot guarantee that your final product does not contain any additives as these may be result of additional processing at your plant, which is not under our control.

The product information presented above is correct to the best of our knowledge today.

**Insulation solutions for windows, doors, and facades**

TBGroup-Do-TP1-18_Version 4_07.2020

TECHNOFORM

# Declaration sheet

## Absence of hazardous substances in Technoform materials

We hereby confirm, that Technoform Bautec materials does not intentionally contain any of the additives listed below. This applies to our products in PA 66 GF25, dry impact resistant; PA 66 GF40, dry impact resistant; Recycled PA 66 GF25, dry impact resistant and Low Lambda PA 66 GF25, dry impact resistant.

| **State of the Environment Norway :<br>List of Priority Substances (Part1)** |
|---|
| Arsenic |
| Bisphenol A |
| Brominated flame retardants |
| Diethylhexylphthalat |
| Certain surfactants (DTDMAC, DSDMAC, DHTDMAC) |
| 1,2-Dichloroethane (EDC) |
| Dioxins and furans |
| Cadmium |
| Chlorinated alkyl benzenes (CABs) |
| Chromium |
| Hexachlorobenzene |
| Lead |
| Medium-chain chlorinated paraffins |
| Mercury |
| Musk xylenes |
| Nonylphenol and its ethoxylates |
| Octylphenol and its ethoxylates |
| Polycyclic Aromatic Hydrocarbons (PAH) |
| Pentachlorophenol (PCP) |
| Polychlorinated biphenyls (PCBs) |
| PFOA |
| Short-chain chlorinated paraffins |
| Siloxane-D4 |
| Siloxane-D5 |
| TCEP (tris (2-chloroethyl) phosphate) |
| Tetrachloroethene (PER) |

| **State of the Environment Norway :<br>List of Priority Substances (Part2)** |
|---|
| Tributyl tin compounds |
| Trichlorobenzene |
| Trichloroethene (TRI) |
| Triclosan |
| 2,4,6 Tri-tert-buthylphenol |

The absence of hazardous substances was not determined by Technoform through specific testing but it is based upon information provided by our raw material suppliers, who do not exclude that some of the substances mentioned above may possible be present as trace impurities.

This statement is only valid for the material mentioned above. We cannot guarantee that your final product does not contain any additives as these may be result of additional processing at your plant, which is not under our control.

The product information presented above is correct to the best of our knowledge today.

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**Insulation solutions for windows, doors, and facades**

# Annex 3 – Background and Baseline Concentrations

## Human Receptors

*Table 1 - Derived Background Concentrations at Selected Human Receptors ($\mu g/m^3$)*

| Receptor ID | Receptor Description | $NO_2$ | $SO_2$ | CO ($mg/m^3$) | $PM_{10}$ | HF | HCl | VOC | CL | Dioxin Average daily intake (pg ITEQ/kg-BW/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 20.00 | 3.69 | 0.13 | 6.99 | 0.003 | 0.39 | 0.12 | 0 | 0.03 |
| R2 | Residential Property on Grant Place | 8.10 | 3.69 | 0.13 | 6.99 | 0.003 | 0.39 | 0.12 | 0 | 0.03 |
| R3 | Residential Property on Telford Place | 8.10 | 3.69 | 0.13 | 6.99 | 0.003 | 0.39 | 0.12 | 0 | 0.03 |
| R4 | Inverlochy Nursery School | 8.10 | 3.69 | 0.13 | 6.99 | 0.003 | 0.39 | 0.12 | 0 | 0.03 |
| R5 | Residential Property on Lundy Gardens | 8.10 | 3.69 | 0.13 | 6.99 | 0.003 | 0.39 | 0.12 | 0 | 0.03 |
| R6 | Lochaber High School | 8.10 | 2.67 | 0.13 | 7.03 | 0.003 | 0.39 | 0.12 | 0 | 0.03 |
| R7 | Residential property on Glenmhor Terrace | 20.00 | 2.67 | 0.13 | 7.03 | 0.003 | 0.39 | 0.12 | 0 | 0.03 |
| R8 | Residential Property on Carrs Corner | 8.10 | 2.67 | 0.13 | 7.03 | 0.003 | 0.39 | 0.12 | 0 | 0.03 |
| ST1 | Fort William Football Pitch | 8.10 | 1.65 | 0.13 | 6.74 | 0.003 | 0.39 | 0.11 | 0 | 0.03 |
| R9 | Residential Houses on Achintee Road | 8.10 | 1.65 | 0.13 | 6.74 | 0.003 | 0.39 | 0.11 | 0 | 0.03 |

| Receptor ID | Receptor Description | $NO_2$ | $SO_2$ | CO ($mg/m^3$) | $PM_{10}$ | HF | HCl | VOC | CL | Dioxin Average daily intake (pg ITEQ/kg-BW/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| R10 | Residential on Kilmallie Road | 8.10 | 1.55 | 0.13 | 6.48 | 0.003 | 0.39 | 0.12 | 0 | 0.03 |
| THC | THC Monitor | 8.10 | 2.1 | 0.13 | 6.40 | 0.003 | 0.39 | 0.12 | 0 | 0.03 |
| R11 | North Road Retail Park | 20.00 | 3.69 | 0.13 | 6.99 | 0.003 | 0.39 | 0.12 | 0 | 0.03 |
| PR1 | PR1 | 8.10 | 1.41 | 0.12 | 6.82 | 0.003 | 0.39 | 0.09 | 0 | 0.03 |
| PR2 | PR2 | 8.10 | 1.41 | 0.12 | 6.82 | 0.003 | 0.39 | 0.09 | 0 | 0.03 |

## Ecological Receptors

*Table 2 - Derived Background Concentrations at Selected Ecological Receptors ($\mu g/m^3$)*

| Receptor ID | Receptor Description | $NO_x$ | $SO_2$ | HCl |
|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 2.02 | 0.53 | 0.39 |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 2.02 | 0.53 | 0.39 |
| Eco3 | H4060 - Alpine and Boreal heaths | 2.02 | 0.53 | 0.39 |
| RevisedEco4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 2.02 | 0.53 | 0.39 |
| Eco5 | H7130 - Blanket Bogs | 2.02 | 0.53 | 0.39 |

| Receptor ID | Receptor Description | $NO_x$ | $SO_2$ | HCl |
|---|---|---|---|---|
| Eco6 | H91C0 - Caledonian forest | 2.02 | 0.53 | 0.39 |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 2.02 | 0.53 | 0.39 |
| Eco8 | H4030 - European Dry heaths | 2.02 | 0.53 | 0.39 |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 2.02 | 0.53 | 0.39 |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 2.02 | 0.53 | 0.39 |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 2.02 | 0.53 | 0.39 |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 2.02 | 0.53 | 0.39 |
| RevisedEco13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 2.02 | 0.53 | 0.39 |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 2.02 | 0.53 | 0.39 |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 2.02 | 0.53 | 0.39 |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 2.02 | 0.53 | 0.39 |

| Receptor ID | Receptor Description | $NO_X$ | $SO_2$ | HCl |
|---|---|---|---|---|
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 2.02 | 0.53 | 0.39 |
| NewEco18 | H4060 - Oceanic Montane Bryophyte | 2.02 | 0.53 | 0.39 |
| NewEco19 | H6150 - Snowbed Communities | 2.02 | 0.53 | 0.39 |

*Table 3 - APIS Baseline Deposition Levels and Critical Loads at Selected Ecological Receptors – Nutrient Nitrogen Deposition (kgN/ha/yr)*

| Receptor ID | Receptor Description | Nitrogen Deposition Current Load | Critical Load (min) | Critical Load (max) |
|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 9.9 | 5 | 15 |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 9.9 | 5 | 10 |
| Eco3 | H4060 - Alpine and Boreal heaths | 9.9 | 5 | 15 |
| RevisedEco4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 9.9 | 5 | 15 |
| Eco5 | H7130 - Blanket Bogs | 9.9 | 5 | 10 |
| Eco6 | H91C0 - Caledonian forest | 14.4 | 5 | 15 |

| Receptor ID | Receptor Description | Nitrogen Deposition Current Load | Critical Load (min) | Critical Load (max) |
|---|---|---|---|---|
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 8.3 | 3 | 10 |
| Eco8 | H4030 - European Dry heaths | 9.9 | 10 | 20 |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 9.9 | 15 | 25 |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 9.9 | 5 | 10 |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 9.9 | 5 | 15 |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 9.9 | 5 | 15 |
| RevisedEco13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 9.9 | 5 | 15 |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 9.9 | 10 | 15 |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 9.9 | 10 | 20 |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 14.4 | 10 | 15 |

| Receptor ID | Receptor Description | Nitrogen Deposition Current Load | Critical Load (min) | Critical Load (max) |
|---|---|---|---|---|
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 9.9 | 10 | 20 |
| NewEco18 | H4060 - Oceanic Montane Bryophyte | 9.9 | 5 | 15 |
| NewEco19 | H6150 - Snowbed Communities | 9.9 | 5 | 10 |

*Table 4 - APIS Baseline Deposition Levels and Critical Loads at Selected Ecological Receptors – Acid Deposition (kg eq/ha/yr)*

| Receptor ID | Receptor Description | Acid Deposition Current Load (N) | Acid Deposition Current Load (S) | Critical Load Min (N) | Critical Load Max (S) | Critical Load Max (N) |
|---|---|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 0.7 | 0.2 | 0.178 | 0.220 | 0.541 |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 0.7 | 0.2 | 0.856 | 4 | 4.856 |
| Eco3 | H4060 - Alpine and Boreal heaths | 0.7 | 0.2 | 0.178 | 0.220 | 0.541 |
| RevisedEco4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 0.7 | 0.2 | 0.178 | 0.220 | 0.541 |
| Eco5 | H7130 - Blanket Bogs | 0.7 | 0.2 | 0.321 | 0.663 | 0.984 |

| Receptor ID | Receptor Description | Acid Deposition Current Load (N) | Acid Deposition Current Load (S) | Critical Load Min (N) | Critical Load Max (S) | Critical Load Max (N) |
|---|---|---|---|---|---|---|
| Eco6 | H91C0 - Caledonian forest | 1 | 0.3 | 0.142 | 1.534 | 1.819 |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 0.6 | 0.2 | 0 | 0 | 0 |
| Eco8 | H4030 - European Dry heaths | 0.7 | 0.2 | 0.642 | 0.22 | 0.862 |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 0.7 | 0.2 | Habitat not sensitive to acidification in APIS | | |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| RevisedEco13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 0.7 | 0.2 | 0.223 | 0.22 | 0.586 |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |

| Receptor ID | Receptor Description | Acid Deposition Current Load (N) | Acid Deposition Current Load (S) | Critical Load Min (N) | Critical Load Max (S) | Critical Load Max (N) |
|---|---|---|---|---|---|---|
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 1 | 0.3 | 0.142 | 1.534 | 1.819 |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 0.7 | 0.2 | 0.642 | 0.22 | 0.862 |
| NewEco18 | H4060 - Oceanic Montane Bryophyte | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |
| NewEco19 | H6150 - Snowbed Communities | 0.7 | 0.2 | 0.178 | 0.22 | 0.541 |

# Annex 4 – Model Sensitivity Analysis

**Note:**

The sensitivity analysis has been undertaken for the original list of ecological receptors as provided by NS as part of the 2017 AQIA and confirmed on the 27$^{th}$ of January 2021. Receptors taken into consideration in the sensitivity analysis therefore do not include:

- NewEco18;
- NewEco19;
- RevisedEco-13; and
- RevisedEco-4.

# METEOROLOGICAL STATION SENSITIVITY - ALL SOURCES

**Pollutant:** NOx **Averaging Period:** LT

| ID | Receptors | 2016-TB | 2017-TB | 2018-TB | 2019-TB | 2020-TB | MAX | Difference |
|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 0.83 | 0.68 | 0.79 | 0.96 | 0.68 | 0.96 | 0.28 |
| R2 | Residential Property on Grant Place | 1.42 | 0.85 | 1.01 | 1.19 | 1.02 | 1.42 | 0.57 |
| R3 | Residential Property on Telford Place | 1.59 | 0.90 | 1.11 | 1.34 | 1.17 | 1.59 | 0.69 |
| R4 | Inverlochy Nursery School | 0.62 | 0.48 | 0.54 | 0.72 | 0.52 | 0.72 | 0.24 |
| R5 | Residential Property on Lundy Gardens | 0.59 | 0.44 | 0.49 | 0.68 | 0.49 | 0.68 | 0.24 |
| R6 | Lochaber High School | 1.55 | 1.50 | 1.95 | 1.52 | 1.52 | 1.95 | 0.44 |
| R7 | Residential property on Glenmhor Terrace | 3.42 | 3.73 | 4.10 | 3.91 | 3.35 | 4.10 | 0.75 |
| R8 | Residential Property on Carrs Corner | 4.73 | 4.69 | 4.94 | 4.48 | 4.92 | 4.94 | 0.46 |
| ST1 | Fort William Football Pitch | 1.64 | 0.89 | 1.18 | 1.52 | 1.32 | 1.64 | 0.75 |
| R9 | Residential Houses on Achintee Road | 1.13 | 0.72 | 0.84 | 1.17 | 1.02 | 1.17 | 0.44 |
| R10 | Residential on Kilmallie Road | 0.65 | 0.73 | 0.82 | 0.90 | 0.62 | 0.90 | 0.27 |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 0.45 | 0.36 | 0.42 | 0.56 | 0.41 | 0.56 | 0.20 |
| R11 | North Road Retail Park | 1.23 | 1.11 | 1.25 | 1.46 | 1.01 | 1.46 | 0.44 |
| PR1 | Representative of land allocated for housing within THC LDP | 7.98 | 9.05 | 8.16 | 7.25 | 8.58 | 9.05 | 1.79 |
| PR2 | Representative of land allocated for housing within THC LDP | 2.67 | 3.40 | 2.88 | 2.66 | 3.15 | 3.40 | 0.74 |
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.00 |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 0.08 | 0.10 | 0.08 | 0.08 | 0.09 | 0.10 | 0.02 |
| Eco3 | H4060 - Alpine and Boreal heaths | 0.41 | 0.35 | 0.32 | 0.32 | 0.37 | 0.41 | 0.09 |
| Eco4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 5.65 | 5.32 | 4.43 | 5.28 | 5.58 | 5.65 | 1.22 |
| Eco5 | H7130 - Blanket Bogs | 1.23 | 1.67 | 1.54 | 1.20 | 1.68 | 1.68 | 0.48 |
| Eco6 | H91C0 - Caledonian forest | 0.15 | 0.11 | 0.12 | 0.11 | 0.13 | 0.15 | 0.04 |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 0.05 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.01 |
| Eco8 | H4030 - European Dry heaths | 2.15 | 2.49 | 2.23 | 1.65 | 2.10 | 2.49 | 0.84 |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 0.08 | 0.09 | 0.08 | 0.08 | 0.10 | 0.10 | 0.02 |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 0.20 | 0.18 | 0.18 | 0.16 | 0.19 | 0.20 | 0.04 |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 0.03 | 0.04 | 0.03 | 0.03 | 0.04 | 0.04 | 0.01 |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 5.65 | 5.32 | 4.43 | 5.28 | 5.58 | 5.65 | 1.22 |
| Eco13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 5.65 | 5.32 | 4.43 | 5.28 | 5.58 | 5.65 | 1.22 |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 5.65 | 5.32 | 4.43 | 5.28 | 5.58 | 5.65 | 1.22 |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 0.07 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 | 0.01 |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 7.24 | 9.40 | 6.56 | 5.42 | 7.05 | 9.40 | 3.98 |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 6.80 | 8.18 | 6.57 | 5.59 | 7.39 | 8.18 | 2.59 |

**Pollutant:** NOx **Averaging Period:** ST-99.79

| ID | Receptors | 2016-TB | 2017-TB | 2018-TB | 2019-TB | 2020-TB | MAX | Difference |
|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 39.73 | 35.00 | 36.66 | 47.57 | 43.14 | 47.57 | 12.57 |
| R2 | Residential Property on Grant Place | 53.20 | 44.00 | 46.48 | 45.24 | 44.81 | 53.20 | 9.20 |
| R3 | Residential Property on Telford Place | 52.74 | 43.63 | 46.06 | 45.96 | 40.14 | 52.74 | 12.59 |
| R4 | Inverlochy Nursery School | 36.33 | 30.86 | 36.89 | 38.80 | 37.24 | 38.80 | 7.94 |
| R5 | Residential Property on Lundy Gardens | 27.77 | 28.17 | 27.82 | 37.27 | 31.73 | 37.27 | 9.50 |
| R6 | Lochaber High School | 42.46 | 41.56 | 43.86 | 40.16 | 41.00 | 43.86 | 3.70 |
| R7 | Residential property on Glenmhor Terrace | 87.52 | 88.63 | 93.65 | 89.70 | 85.60 | 93.65 | 8.05 |
| R8 | Residential Property on Carrs Corner | 66.71 | 68.23 | 62.23 | 62.09 | 64.27 | 68.23 | 6.14 |
| ST1 | Fort William Football Pitch | 60.14 | 41.46 | 48.13 | 49.99 | 45.69 | 60.14 | 18.68 |
| R9 | Residential Houses on Achintee Road | 48.13 | 35.04 | 46.05 | 49.32 | 47.40 | 49.32 | 14.28 |
| R10 | Residential on Kilmallie Road | 32.80 | 30.58 | 32.97 | 34.87 | 33.26 | 34.87 | 4.29 |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 25.52 | 22.80 | 25.36 | 25.37 | 22.54 | 25.52 | 2.98 |
| R11 | North Road Retail Park | 52.45 | 47.86 | 48.96 | 56.27 | 57.26 | 57.26 | 9.40 |
| PR1 | Representative of land allocated for housing within THC LDP | 109.58 | 109.64 | 111.48 | 101.39 | 104.55 | 111.48 | 10.09 |
| PR2 | Representative of land allocated for housing within THC LDP | 107.84 | 116.22 | 118.45 | 122.39 | 131.22 | 131.22 | 23.38 |

**Pollutant:** NOx **Averaging Period:** ST-100

| ID | Receptors | 2016-TB | 2017-TB | 2018-TB | 2019-TB | 2020-TB | MAX | Difference |
|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 218.11 | 242.88 | 98.36 | 154.12 | 224.74 | 242.88 | 144.52 |
| R2 | Residential Property on Grant Place | 215.46 | 84.53 | 78.99 | 59.52 | 94.40 | 215.46 | 155.94 |
| R3 | Residential Property on Telford Place | 226.71 | 92.39 | 75.41 | 65.33 | 70.62 | 226.71 | 161.37 |
| R4 | Inverlochy Nursery School | 147.71 | 77.25 | 81.63 | 81.17 | 90.23 | 147.71 | 70.46 |
| R5 | Residential Property on Lundy Gardens | 166.09 | 77.47 | 77.13 | 165.04 | 103.07 | 166.09 | 88.96 |
| R6 | Lochaber High School | 70.73 | 71.31 | 161.05 | 106.32 | 78.84 | 161.05 | 90.33 |
| R7 | Residential property on Glenmhor Terrace | 209.74 | 185.83 | 143.98 | 229.09 | 132.28 | 229.09 | 96.81 |
| R8 | Residential Property on Carrs Corner | 194.55 | 171.13 | 120.70 | 105.85 | 178.92 | 194.55 | 88.70 |
| ST1 | Fort William Football Pitch | 263.48 | 71.47 | 144.10 | 210.24 | 132.20 | 263.48 | 192.01 |
| R9 | Residential Houses on Achintee Road | 74.45 | 310.44 | 109.32 | 95.39 | 114.23 | 310.44 | 235.99 |
| R10 | Residential on Kilmallie Road | 41.01 | 50.51 | 43.05 | 55.74 | 50.68 | 55.74 | 14.73 |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 119.27 | 47.92 | 47.65 | 52.07 | 122.70 | 122.70 | 75.04 |
| R11 | North Road Retail Park | 259.20 | 420.35 | 123.81 | 127.40 | 229.11 | 420.35 | 296.54 |
| PR1 | Representative of land allocated for housing within THC LDP | 338.64 | 276.38 | 384.44 | 154.81 | 208.65 | 384.44 | 229.63 |
| PR2 | Representative of land allocated for housing within THC LDP | 171.64 | 180.52 | 191.20 | 182.33 | 192.34 | 192.34 | 20.70 |

# METEOROLOGICAL STATION SENSITIVITY - BILLET SOURCES

**Pollutant:** NOx **Averaging Period:** LT

| ID | Receptors | 2016-TB | 2017-TB | 2018-TB | 2019-TB | 2020-TB | MAX | Difference |
|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 0.20 | 0.20 | 0.25 | 0.25 | 0.17 | 0.25 | 0.09 |
| R2 | Residential Property on Grant Place | 0.38 | 0.22 | 0.29 | 0.31 | 0.28 | 0.38 | 0.16 |
| R3 | Residential Property on Telford Place | 0.43 | 0.24 | 0.30 | 0.36 | 0.33 | 0.43 | 0.19 |
| R4 | Inverlochy Nursery School | 0.10 | 0.07 | 0.09 | 0.11 | 0.09 | 0.11 | 0.03 |
| R5 | Residential Property on Lundy Gardens | 0.11 | 0.08 | 0.11 | 0.12 | 0.10 | 0.12 | 0.04 |
| R6 | Lochaber High School | 0.39 | 0.38 | 0.42 | 0.38 | 0.39 | 0.42 | 0.05 |
| R7 | Residential property on Glenmhor Terrace | 1.21 | 1.17 | 1.26 | 1.15 | 1.23 | 1.26 | 0.11 |
| R8 | Residential Property on Carrs Corner | 0.59 | 0.58 | 0.61 | 0.54 | 0.65 | 0.65 | 0.10 |
| ST1 | Fort William Football Pitch | 0.30 | 0.19 | 0.20 | 0.29 | 0.27 | 0.30 | 0.11 |
| R9 | Residential Houses on Achintee Road | 0.17 | 0.13 | 0.12 | 0.17 | 0.16 | 0.17 | 0.05 |
| R10 | Residential on Kilmallie Road | 0.17 | 0.18 | 0.22 | 0.18 | 0.17 | 0.22 | 0.05 |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 0.06 | 0.05 | 0.07 | 0.08 | 0.06 | 0.08 | 0.02 |
| R11 | North Road Retail Park | 0.41 | 0.46 | 0.54 | 0.57 | 0.38 | 0.57 | 0.19 |
| PR1 | Representative of land allocated for housing within THC LDP | 0.37 | 0.45 | 0.37 | 0.36 | 0.43 | 0.45 | 0.09 |
| PR2 | Representative of land allocated for housing within THC LDP | 0.24 | 0.30 | 0.24 | 0.24 | 0.28 | 0.30 | 0.06 |
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 0.04 | 0.04 | 0.03 | 0.03 | 0.04 | 0.04 | 0.01 |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 0.03 | 0.04 | 0.02 | 0.03 | 0.03 | 0.04 | 0.01 |
| Eco3 | H4060 - Alpine and Boreal heaths | 0.11 | 0.12 | 0.09 | 0.10 | 0.12 | 0.12 | 0.02 |
| Eco4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 0.86 | 1.11 | 0.75 | 0.97 | 0.96 | 1.11 | 0.36 |
| Eco5 | H7130 - Blanket Bogs | 0.20 | 0.26 | 0.18 | 0.21 | 0.21 | 0.26 | 0.08 |
| Eco6 | H91C0 - Caledonian forest | 0.03 | 0.03 | 0.02 | 0.03 | 0.03 | 0.03 | 0.01 |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 0.01 | 0.02 | 0.01 | 0.02 | 0.02 | 0.02 | 0.01 |
| Eco8 | H4030 - European Dry heaths | 0.16 | 0.18 | 0.15 | 0.15 | 0.17 | 0.18 | 0.03 |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 0.03 | 0.04 | 0.03 | 0.03 | 0.03 | 0.04 | 0.01 |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 0.06 | 0.07 | 0.06 | 0.06 | 0.07 | 0.07 | 0.02 |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 0.86 | 1.11 | 0.75 | 0.97 | 0.96 | 1.11 | 0.36 |
| Eco13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 0.86 | 1.11 | 0.75 | 0.97 | 0.96 | 1.11 | 0.36 |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 0.86 | 1.11 | 0.75 | 0.97 | 0.96 | 1.11 | 0.36 |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 0.03 | 0.03 | 0.02 | 0.02 | 0.03 | 0.03 | 0.01 |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 1.03 | 1.32 | 0.93 | 0.87 | 1.11 | 1.32 | 0.45 |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 0.87 | 1.05 | 0.72 | 0.76 | 0.94 | 1.05 | 0.33 |

**Pollutant:** NOx **Averaging Period:** ST-99.79

| ID | Receptors | 2016-TB | 2017-TB | 2018-TB | 2019-TB | 2020-TB | MAX | Difference |
|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 9.79 | 10.06 | 11.87 | 11.28 | 9.55 | 11.87 | 2.32 |
| R2 | Residential Property on Grant Place | 11.59 | 9.83 | 12.84 | 10.59 | 10.28 | 12.84 | 3.01 |
| R3 | Residential Property on Telford Place | 11.85 | 11.23 | 10.86 | 10.10 | 11.52 | 11.85 | 1.75 |
| R4 | Inverlochy Nursery School | 4.26 | 4.03 | 4.12 | 4.81 | 4.55 | 4.81 | 0.77 |
| R5 | Residential Property on Lundy Gardens | 5.23 | 4.89 | 5.77 | 6.09 | 6.43 | 6.43 | 1.54 |
| R6 | Lochaber High School | 4.74 | 4.82 | 4.96 | 5.37 | 4.88 | 5.37 | 0.63 |
| R7 | Residential property on Glenmhor Terrace | 9.42 | 9.25 | 9.14 | 9.09 | 8.99 | 9.42 | 0.42 |
| R8 | Residential Property on Carrs Corner | 5.04 | 5.11 | 5.27 | 5.08 | 5.50 | 5.50 | 0.46 |
| ST1 | Fort William Football Pitch | 8.77 | 8.07 | 7.46 | 8.40 | 8.63 | 8.77 | 1.31 |
| R9 | Residential Houses on Achintee Road | 5.64 | 5.83 | 5.65 | 5.71 | 6.42 | 6.42 | 0.79 |
| R10 | Residential on Kilmallie Road | 4.62 | 4.47 | 4.58 | 4.74 | 4.54 | 4.74 | 0.27 |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 2.77 | 2.52 | 2.97 | 3.09 | 2.93 | 3.09 | 0.57 |
| R11 | North Road Retail Park | 15.72 | 15.73 | 17.66 | 16.81 | 16.35 | 17.66 | 1.94 |
| PR1 | Representative of land allocated for housing within THC LDP | 8.17 | 8.32 | 8.34 | 7.97 | 8.91 | 8.91 | 0.94 |
| PR2 | Representative of land allocated for housing within THC LDP | 8.14 | 9.32 | 10.00 | 9.24 | 11.15 | 11.15 | 3.01 |

**Pollutant:** NOx **Averaging Period:** ST-100

| ID | Receptors | 2016-TB | 2017-TB | 2018-TB | 2019-TB | 2020-TB | MAX | Difference |
|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 14.28 | 15.54 | 19.79 | 19.20 | 21.60 | 21.60 | 7.33 |
| R2 | Residential Property on Grant Place | 37.55 | 19.61 | 30.88 | 26.84 | 34.43 | 37.55 | 17.95 |
| R3 | Residential Property on Telford Place | 44.48 | 30.61 | 29.95 | 38.87 | 31.70 | 44.48 | 14.53 |
| R4 | Inverlochy Nursery School | 9.78 | 7.07 | 9.21 | 9.98 | 12.09 | 12.09 | 5.02 |
| R5 | Residential Property on Lundy Gardens | 9.40 | 10.36 | 24.17 | 12.72 | 17.46 | 24.17 | 14.77 |
| R6 | Lochaber High School | 13.80 | 10.58 | 17.14 | 14.41 | 13.24 | 17.14 | 6.56 |
| R7 | Residential property on Glenmhor Terrace | 25.55 | 24.82 | 29.85 | 17.72 | 25.29 | 29.85 | 12.13 |
| R8 | Residential Property on Carrs Corner | 8.17 | 11.95 | 11.25 | 7.01 | 14.95 | 14.95 | 7.94 |
| ST1 | Fort William Football Pitch | 36.94 | 40.84 | 23.15 | 39.57 | 26.70 | 40.84 | 17.68 |
| R9 | Residential Houses on Achintee Road | 13.94 | 16.91 | 13.86 | 12.03 | 17.05 | 17.05 | 5.02 |
| R10 | Residential on Kilmallie Road | 8.50 | 6.72 | 6.57 | 9.17 | 9.18 | 9.18 | 2.61 |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 7.02 | 4.53 | 18.83 | 9.61 | 9.84 | 18.83 | 14.30 |
| R11 | North Road Retail Park | 29.00 | 37.34 | 32.98 | 24.88 | 28.07 | 37.34 | 12.46 |
| PR1 | Representative of land allocated for housing within THC LDP | 10.69 | 10.72 | 17.19 | 13.37 | 22.26 | 22.26 | 11.56 |
| PR2 | Representative of land allocated for housing within THC LDP | 15.84 | 14.73 | 16.01 | 14.71 | 14.96 | 16.01 | 1.30 |

# TULLOCH BRIDGE (TB) vs AONACH MOR (AM) METEOROLOGICAL STATION SENSITIVITY AT ECOLOGICAL SITES - BILET SOURCES

**Pollutant:** NOx **Averaging Period:** LT

| ID | Receptors | 2016-TB | 2016-AM | 2017-TB | 2017-AM | 2018-TB | 2018-AM | 2019-TB | 2019-AM | 2020-TB | 2020-AM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 0.04 | 0.01 | 0.04 | 0.01 | 0.03 | 0.02 | 0.03 | 0.02 | 0.04 | 0.01 |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 0.03 | 0.00 | 0.04 | 0.00 | 0.02 | 0.00 | 0.03 | 0.01 | 0.03 | 0.00 |
| Eco3 | H4060 - Alpine and Boreal heaths | 0.11 | 0.02 | 0.12 | 0.03 | 0.09 | 0.04 | 0.10 | 0.05 | 0.12 | 0.02 |
| Eco4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 0.86 | 0.14 | 1.11 | 0.15 | 0.75 | 0.20 | 0.97 | 0.23 | 0.96 | 0.11 |
| Eco5 | H7130 - Blanket Bogs | 0.20 | 0.04 | 0.26 | 0.03 | 0.18 | 0.06 | 0.21 | 0.04 | 0.21 | 0.03 |
| Eco6 | H91C0 - Caledonian forest | 0.03 | 0.00 | 0.03 | 0.00 | 0.02 | 0.00 | 0.03 | 0.00 | 0.03 | 0.00 |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.00 |
| Eco8 | H4030 - European Dry heaths | 0.16 | 0.04 | 0.18 | 0.03 | 0.15 | 0.08 | 0.15 | 0.04 | 0.17 | 0.04 |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 0.03 | 0.00 | 0.04 | 0.00 | 0.03 | 0.00 | 0.03 | 0.01 | 0.03 | 0.00 |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 0.06 | 0.01 | 0.07 | 0.02 | 0.06 | 0.02 | 0.06 | 0.03 | 0.07 | 0.01 |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 0.86 | 0.14 | 1.11 | 0.15 | 0.75 | 0.20 | 0.97 | 0.23 | 0.96 | 0.11 |
| Eco13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 0.86 | 0.14 | 1.11 | 0.15 | 0.75 | 0.20 | 0.97 | 0.23 | 0.96 | 0.11 |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 0.86 | 0.14 | 1.11 | 0.15 | 0.75 | 0.20 | 0.97 | 0.23 | 0.96 | 0.11 |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 0.03 | 0.00 | 0.03 | 0.00 | 0.02 | 0.01 | 0.02 | 0.01 | 0.03 | 0.00 |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 1.03 | 0.31 | 1.32 | 0.40 | 0.93 | 0.38 | 0.87 | 0.42 | 1.11 | 0.31 |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 0.87 | 0.16 | 1.05 | 0.19 | 0.72 | 0.29 | 0.76 | 0.27 | 0.94 | 0.18 |

# CANNING BUILDING SENSITIVITY

**Pollutant:** NOx  **Averaging Period:** LT

| ID | Receptors | No Canning | N-S | E-W | MAX | Difference |
|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 0.26 | 0.25 | 0.26 | 0.26 | 0.01 |
| R2 | Residential Property on Grant Place | 0.31 | 0.31 | 0.31 | 0.31 | 0.00 |
| R3 | Residential Property on Telford Place | 0.36 | 0.36 | 0.36 | 0.36 | 0.00 |
| R4 | Inverlochy Nursery School | 0.11 | 0.11 | 0.11 | 0.11 | 0.00 |
| R5 | Residential Property on Lundy Gardens | 0.12 | 0.12 | 0.12 | 0.12 | 0.00 |
| R6 | Lochaber High School | 0.38 | 0.38 | 0.38 | 0.38 | 0.00 |
| R7 | Residential property on Glenmhor Terrace | 1.16 | 1.15 | 1.16 | 1.16 | 0.00 |
| R8 | Residential Property on Carrs Corner | 0.54 | 0.54 | 0.54 | 0.54 | 0.00 |
| ST1 | Fort William Football Pitch | 0.29 | 0.29 | 0.29 | 0.29 | 0.00 |
| R9 | Residential Houses on Achintee Road | 0.17 | 0.17 | 0.17 | 0.17 | 0.00 |
| R10 | Residential on Kilmallie Road | 0.18 | 0.18 | 0.18 | 0.18 | 0.00 |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 |
| R11 | North Road Retail Park | 0.57 | 0.57 | 0.57 | 0.57 | 0.00 |
| PR1 | Representative of land allocated for housing within THC LDP | 0.36 | 0.36 | 0.36 | 0.36 | 0.01 |
| PR2 | Representative of land allocated for housing within THC LDP | 0.24 | 0.24 | 0.24 | 0.24 | 0.00 |
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 0.04 | 0.04 | 0.04 | 0.04 | 0.00 |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 0.04 | 0.04 | 0.04 | 0.04 | 0.00 |
| Eco3 | H4060 - Alpine and Boreal heaths | 0.12 | 0.12 | 0.12 | 0.12 | 0.00 |
| Eco4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 1.11 | 1.11 | 1.11 | 1.11 | 0.00 |
| Eco5 | H7130 - Blanket Bogs | 0.26 | 0.26 | 0.26 | 0.26 | 0.00 |
| Eco6 | H91C0 - Caledonian forest | 0.03 | 0.03 | 0.03 | 0.03 | 0.00 |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 0.02 | 0.02 | 0.02 | 0.02 | 0.00 |
| Eco8 | H4030 - European Dry heaths | 0.18 | 0.18 | 0.18 | 0.18 | 0.00 |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 0.04 | 0.04 | 0.04 | 0.04 | 0.00 |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 0.07 | 0.07 | 0.07 | 0.07 | 0.00 |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 1.11 | 1.11 | 1.11 | 1.11 | 0.00 |
| Eco13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 1.11 | 1.11 | 1.11 | 1.11 | 0.00 |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 1.11 | 1.11 | 1.11 | 1.11 | 0.00 |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 0.03 | 0.03 | 0.03 | 0.03 | 0.00 |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 1.31 | 1.32 | 1.31 | 1.32 | 0.00 |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 1.05 | 1.05 | 1.05 | 1.05 | 0.00 |

**Note:**
Based on findings of Met Sensitivity Worst Case Year is:
LT: Eco 2017 / Human 2019 and was therefore used for this comparison

**Pollutant:** NOx  **Averaging Period:** ST-99.79  **AQS:** N/A

| ID | Receptors | No Canning | N-S | E-W | MAX | Difference |
|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 9.63 | 9.55 | 9.55 | 9.63 | 0.08 |
| R2 | Residential Property on Grant Place | 10.09 | 10.28 | 10.09 | 10.28 | 0.19 |
| R3 | Residential Property on Telford Place | 11.52 | 11.52 | 11.52 | 11.52 | - |
| R4 | Inverlochy Nursery School | 4.60 | 4.55 | 4.54 | 4.60 | 0.06 |
| R5 | Residential Property on Lundy Gardens | 6.43 | 6.43 | 6.43 | 6.43 | - |
| R6 | Lochaber High School | 4.88 | 4.88 | 4.88 | 4.88 | - |
| R7 | Residential property on Glenmhor Terrace | 8.99 | 8.99 | 8.99 | 8.99 | - |
| R8 | Residential Property on Carrs Corner | 5.50 | 5.50 | 5.50 | 5.50 | 0.00 |
| ST1 | Fort William Football Pitch | 8.63 | 8.63 | 8.63 | 8.63 | 0.00 |
| R9 | Residential Houses on Achintee Road | 6.42 | 6.42 | 6.42 | 6.42 | - |
| R10 | Residential on Kilmallie Road | 4.54 | 4.54 | 4.54 | 4.54 | - |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 2.93 | 2.93 | 2.93 | 2.93 | - |
| R11 | North Road Retail Park | 16.35 | 16.35 | 16.35 | 16.35 | - |
| PR1 | Representative of land allocated for housing within THC LDP | 7.52 | 8.91 | 7.52 | 8.91 | 1.39 |
| PR2 | Representative of land allocated for housing within THC LDP | 10.68 | 11.15 | 10.68 | 11.15 | 0.47 |

**Note:**
Based on findings of Met Sensitivity Worst Case Year is:
ST: Human: 2020 and was therefore used for this comparison

**Pollutant:** NOx  **Averaging Period:** ST-100  **AQS:** N/A

| ID | Receptors | No Canning | N-S | E-W | MAX | Difference |
|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 21.60 | 21.60 | 21.60 | 21.60 | - |
| R2 | Residential Property on Grant Place | 34.43 | 34.43 | 34.43 | 34.43 | - |
| R3 | Residential Property on Telford Place | 31.70 | 31.70 | 31.70 | 31.70 | 0.00 |
| R4 | Inverlochy Nursery School | 12.09 | 12.09 | 12.09 | 12.09 | - |
| R5 | Residential Property on Lundy Gardens | 17.46 | 17.46 | 17.46 | 17.46 | - |
| R6 | Lochaber High School | 13.24 | 13.24 | 13.24 | 13.24 | - |
| R7 | Residential property on Glenmhor Terrace | 25.29 | 25.29 | 25.29 | 25.29 | - |
| R8 | Residential Property on Carrs Corner | 14.95 | 14.95 | 14.95 | 14.95 | - |
| ST1 | Fort William Football Pitch | 26.70 | 26.70 | 26.70 | 26.70 | - |
| R9 | Residential Houses on Achintee Road | 17.05 | 17.05 | 17.05 | 17.05 | - |
| R10 | Residential on Kilmallie Road | 9.18 | 9.18 | 9.18 | 9.18 | 0.00 |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 9.84 | 9.84 | 9.84 | 9.84 | 0.00 |
| R11 | North Road Retail Park | 28.07 | 28.07 | 28.07 | 28.07 | - |
| PR1 | Representative of land allocated for housing within THC LDP | 22.26 | 22.26 | 22.26 | 22.26 | - |
| PR2 | Representative of land allocated for housing within THC LDP | 14.18 | 14.96 | 14.18 | 14.96 | 0.79 |

**Note:**
Based on findings of Met Sensitivity Worst Case Year is:
ST: Human: 2020 and was therefore used for this comparison

# ABNORMAL OPERATION ANALYSIS

## Nitrogen Dioxide ($NO_2$)

| ID | Receptors | Proposed Development PC (NOX) (µg/m3) | Proposed Development PC (NO2) (µg/m$^3$) | Environmental Assessment Level (EAL) (µg/m$^3$) | Proposed Development PC as % of the AQAL | Impact Descriptor |
|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 89.9 | 31.45 | 200 | 15.7% | Slight |
| R2 | Residential Property on Grant Place | 150.3 | 52.62 | 200 | 26.3% | Moderate |
| R3 | Residential Property on Telford Place | 141.8 | 49.64 | 200 | 24.8% | Moderate |
| R4 | Inverlochy Nursery School | 62.3 | 21.79 | 200 | 10.9% | Negligible |
| R5 | Residential Property on Lundy Gardens | 73.5 | 25.71 | 200 | 12.9% | Slight |
| R6 | Lochaber High School | 58.3 | 20.39 | 200 | 10.2% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 119.5 | 41.82 | 200 | 20.9% | Moderate |
| R8 | Residential Property on Carrs Corner | 47.5 | 16.63 | 200 | 8.3% | Negligible |
| ST1 | Fort William Football Pitch | 138.8 | 48.59 | 200 | 24.3% | Moderate |
| R9 | Residential Houses on Achintee Road | 76.9 | 26.90 | 200 | 13.4% | Slight |
| R10 | Residential on Kilmallie Road | 38.0 | 13.30 | 200 | 6.7% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 43.4 | 15.17 | 200 | 7.6% | Negligible |
| R11 | North Road Retail Park | 112.0 | 39.20 | 200 | 19.6% | Slight |
| PR1 | Representative of land allocated for housing within THC LDP | 103.5 | 36.23 | 200 | 18.1% | Slight |
| PR2 | Representative of land allocated for housing within THC LDP | 78.7 | 27.55 | 200 | 13.8% | Slight |

## Particulate Matter ($PM_{10}$)

| ID | Receptors | Proposed Development PC (µg/m3) | Environmental Assessment Level (EAL) (µg/m$^3$) | Proposed Development PC as % of the AQAL | Impact Descriptor |
|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 4.2 | 50 | 8.5% | Negligible |
| R2 | Residential Property on Grant Place | 7.2 | 50 | 14.5% | Slight |
| R3 | Residential Property on Telford Place | 7.1 | 50 | 14.2% | Slight |
| R4 | Inverlochy Nursery School | 3.1 | 50 | 6.2% | Negligible |
| R5 | Residential Property on Lundy Gardens | 3.4 | 50 | 6.9% | Negligible |
| R6 | Lochaber High School | 2.8 | 50 | 5.5% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 5.8 | 50 | 11.6% | Slight |
| R8 | Residential Property on Carrs Corner | 2.3 | 50 | 4.7% | Negligible |
| ST1 | Fort William Football Pitch | 6.9 | 50 | 13.8% | Slight |
| R9 | Residential Houses on Achintee Road | 3.7 | 50 | 7.3% | Negligible |
| R10 | Residential on Kilmallie Road | 1.8 | 50 | 3.5% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 2.1 | 50 | 4.3% | Negligible |
| R11 | North Road Retail Park | 5.2 | 50 | 10.3% | Negligible |
| PR1 | Representative of land allocated for housing within THC LDP | 5.0 | 50 | 10.1% | Negligible |
| PR2 | Representative of land allocated for housing within THC LDP | 3.4 | 50 | 6.8% | Negligible |

## Hydrogen Chloride (HCl)

| ID | Receptors | Proposed Development PC (µg/m3) | Environmental Assessment Level (EAL) (µg/m$^3$) | Proposed Development PC as % of the AQAL | Impact Descriptor |
|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 8.5 | 800 | 1.1% | Negligible |
| R2 | Residential Property on Grant Place | 14.5 | 800 | 1.8% | Negligible |
| R3 | Residential Property on Telford Place | 14.2 | 800 | 1.8% | Negligible |
| R4 | Inverlochy Nursery School | 6.2 | 800 | 0.8% | Negligible |
| R5 | Residential Property on Lundy Gardens | 6.9 | 800 | 0.9% | Negligible |
| R6 | Lochaber High School | 5.5 | 800 | 0.7% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 11.6 | 800 | 1.5% | Negligible |
| R8 | Residential Property on Carrs Corner | 4.7 | 800 | 0.6% | Negligible |
| ST1 | Fort William Football Pitch | 13.8 | 800 | 1.7% | Negligible |
| R9 | Residential Houses on Achintee Road | 7.3 | 800 | 0.9% | Negligible |
| R10 | Residential on Kilmallie Road | 3.5 | 800 | 0.4% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 4.3 | 800 | 0.5% | Negligible |
| R11 | North Road Retail Park | 10.4 | 800 | 1.3% | Negligible |
| PR1 | Representative of land allocated for housing within THC LDP | 10.1 | 800 | 1.3% | Negligible |
| PR2 | Representative of land allocated for housing within THC LDP | 6.8 | 800 | 0.9% | Negligible |

## VOC as Benzene

**Using Benzene EAL**

| ID | Receptors | Proposed Development PC (µg/m3) | Environmental Assessment Level (EAL) (µg/m$^3$) | Proposed Development PC as % of the AQAL | Impact Descriptor |
|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 25.5 | 208 | 12.2% | Slight |
| R2 | Residential Property on Grant Place | 43.5 | 208 | 20.9% | Moderate |
| R3 | Residential Property on Telford Place | 42.5 | 208 | 20.4% | Slight |
| R4 | Inverlochy Nursery School | 18.7 | 208 | 9.0% | Negligible |
| R5 | Residential Property on Lundy Gardens | 20.6 | 208 | 9.9% | Negligible |
| R6 | Lochaber High School | 16.6 | 208 | 8.0% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 34.9 | 208 | 16.8% | Slight |
| R8 | Residential Property on Carrs Corner | 14.0 | 208 | 6.8% | Negligible |
| ST1 | Fort William Football Pitch | 41.5 | 208 | 19.9% | Slight |
| R9 | Residential Houses on Achintee Road | 22.0 | 208 | 10.6% | Negligible |
| R10 | Residential on Kilmallie Road | 10.6 | 208 | 5.1% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 12.8 | 208 | 6.2% | Negligible |
| R11 | North Road Retail Park | 31.1 | 208 | 14.9% | Slight |
| PR1 | Representative of land allocated for housing within THC LDP | 30.2 | 208 | 14.5% | Slight |
| PR2 | Representative of land allocated for housing within THC LDP | 20.5 | 208 | 9.8% | Negligible |

**Using "Low Level of Concern" limit of 0.3mg/m$^3$**

| ID | Receptors | Proposed Development PC (µg/m3) | Environmental Assessment Level (EAL) (µg/m$^3$) | Proposed Development PC as % of the AQAL | Impact Descriptor |
|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 25.5 | 300 | 8.5% | Negligible |
| R2 | Residential Property on Grant Place | 43.5 | 300 | 14.5% | Slight |
| R3 | Residential Property on Telford Place | 42.5 | 300 | 14.2% | Slight |
| R4 | Inverlochy Nursery School | 18.7 | 300 | 6.2% | Negligible |
| R5 | Residential Property on Lundy Gardens | 20.6 | 300 | 6.9% | Negligible |
| R6 | Lochaber High School | 16.6 | 300 | 5.5% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 34.9 | 300 | 11.6% | Slight |
| R8 | Residential Property on Carrs Corner | 14.0 | 300 | 4.7% | Negligible |
| ST1 | Fort William Football Pitch | 41.5 | 300 | 13.8% | Slight |
| R9 | Residential Houses on Achintee Road | 22.0 | 300 | 7.3% | Negligible |
| R10 | Residential on Kilmallie Road | 10.6 | 300 | 3.5% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 12.8 | 300 | 4.3% | Negligible |
| R11 | North Road Retail Park | 31.1 | 300 | 10.4% | Negligible |
| PR1 | Representative of land allocated for housing within THC LDP | 30.2 | 300 | 10.1% | Negligible |
| PR2 | Representative of land allocated for housing within THC LDP | 20.5 | 300 | 6.8% | Negligible |

**Using "High Level of Concern" limit of 3mg/m$^3$**

| ID | Receptors | Proposed Development PC (µg/m3) | Environmental Assessment Level (EAL) (µg/m$^3$) | Proposed Development PC as % of the AQAL | Impact Descriptor |
|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 25.5 | 3,000 | 0.8% | Negligible |
| R2 | Residential Property on Grant Place | 43.5 | 3,000 | 1.4% | Negligible |
| R3 | Residential Property on Telford Place | 42.5 | 3,000 | 1.4% | Negligible |
| R4 | Inverlochy Nursery School | 18.7 | 3,000 | 0.6% | Negligible |
| R5 | Residential Property on Lundy Gardens | 20.6 | 3,000 | 0.7% | Negligible |
| R6 | Lochaber High School | 16.6 | 3,000 | 0.6% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 34.9 | 3,000 | 1.2% | Negligible |
| R8 | Residential Property on Carrs Corner | 14.0 | 3,000 | 0.5% | Negligible |
| ST1 | Fort William Football Pitch | 41.5 | 3,000 | 1.4% | Negligible |
| R9 | Residential Houses on Achintee Road | 22.0 | 3,000 | 0.7% | Negligible |
| R10 | Residential on Kilmallie Road | 10.6 | 3,000 | 0.4% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 12.8 | 3,000 | 0.4% | Negligible |
| R11 | North Road Retail Park | 31.1 | 3,000 | 1.0% | Negligible |
| PR1 | Representative of land allocated for housing within THC LDP | 30.2 | 3,000 | 1.0% | Negligible |
| PR2 | Representative of land allocated for housing within THC LDP | 20.5 | 3,000 | 0.7% | Negligible |

## Hydrogen Fluoride (HF)

| ID | Receptors | Proposed Development PC (µg/m3) | Environmental Assessment Level (EAL) (µg/m$^3$) | Proposed Development PC as % of the AQAL | Impact Descriptor |
|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 0.8 | 250 | 0.3% | Negligible |
| R2 | Residential Property on Grant Place | 1.4 | 250 | 0.6% | Negligible |
| R3 | Residential Property on Telford Place | 1.4 | 250 | 0.6% | Negligible |
| R4 | Inverlochy Nursery School | 0.6 | 250 | 0.2% | Negligible |
| R5 | Residential Property on Lundy Gardens | 0.7 | 250 | 0.3% | Negligible |
| R6 | Lochaber High School | 0.6 | 250 | 0.2% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 1.2 | 250 | 0.5% | Negligible |
| R8 | Residential Property on Carrs Corner | 0.5 | 250 | 0.2% | Negligible |
| ST1 | Fort William Football Pitch | 1.4 | 250 | 0.6% | Negligible |
| R9 | Residential Houses on Achintee Road | 0.7 | 250 | 0.3% | Negligible |
| R10 | Residential on Kilmallie Road | 0.4 | 250 | 0.1% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 0.4 | 250 | 0.2% | Negligible |
| R11 | North Road Retail Park | 1.0 | 250 | 0.4% | Negligible |
| PR1 | Representative of land allocated for housing within THC LDP | 1.0 | 250 | 0.4% | Negligible |
| PR2 | Representative of land allocated for housing within THC LDP | 0.7 | 250 | 0.3% | Negligible |

# Annex 5 – Assessment Results

**Nitrogen Dioxide - Annual Mean**

| Receptor ID | Receptor Name | Background (µg/m$^3$) | Proposed Development PC (µg/m$^3$) | Proposed Development PC as % of AQS | Smelter PC (µg/m$^3$) | Generator PC (500hours) (µg/m$^3$) | PEC (µg/m$^3$) | PEC as % of AQS | Impact Descriptor |
|---|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 20.0 | 0.18 | - | 0.01 | 0.04 | 20.23 | - | - |
| R2 | Residential Property on Grant Place | 8.1 | 0.26 | 0.7% | 0.02 | 0.06 | 8.44 | 21.1% | Negligible |
| R3 | Residential Property on Telford Place | 8.1 | 0.30 | 0.8% | 0.02 | 0.07 | 8.49 | 21.2% | Negligible |
| R4 | Inverlochy Nursery School | 8.1 | 0.08 | 0.2% | 0.01 | 0.04 | 8.22 | 20.6% | Negligible |
| R5 | Residential Property on Lundy Gardens | 8.1 | 0.08 | 0.2% | 0.01 | 0.03 | 8.23 | 20.6% | Negligible |
| R6 | Lochaber High School | 8.1 | 0.30 | 0.7% | 0.03 | 0.09 | 8.51 | 21.3% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 20.0 | 0.88 | 2.2% | 0.08 | 0.16 | 21.12 | 52.8% | Negligible |
| R8 | Residential Property on Carrs Corner | 8.1 | 0.45 | 1.1% | 0.06 | 0.25 | 8.84 | 22.1% | Negligible |
| ST1 | Fort William Football Pitch | 8.1 | 0.21 | - | 0.02 | 0.08 | 8.41 | - | - |
| R9 | Residential Houses on Achintee Road | 8.1 | 0.12 | 0.3% | 0.01 | 0.06 | 8.29 | 20.7% | Negligible |
| R10 | Residential on Kilmallie Road | 8.1 | 0.16 | 0.4% | 0.02 | 0.04 | 8.28 | 20.7% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 8.1 | 0.05 | 0.1% | 0.01 | 0.03 | 8.19 | 20.5% | Negligible |
| R11 | North Road Retail Park | 20.0 | 0.40 | - | 0.02 | 0.05 | 20.47 | - | - |
| PR1 | Representative of land allocated for housing within THC LDP | 8.1 | 0.32 | 0.8% | 0.06 | 0.51 | 8.99 | 22.5% | Negligible |
| PR2 | Representative of land allocated for housing within THC LDP | 8.1 | 0.21 | 0.5% | 0.06 | 0.18 | 8.55 | 21.4% | Negligible |

**Nitrogen Dioxide - Hourly Mean 99.79th Percentile**

| Receptor ID | Receptor Name | Background (µg/m$^3$) | Proposed Development PC (µg/m$^3$) | Proposed Development PC as % of AQS | Smelter & Generators PC (µg/m$^3$) | Proposed Development + Smelter & Generators PC (µg/m$^3$) | PEC (µg/m$^3$) | PEC as % of AQS |
|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 20.0 | 4.2 | 2.1% | 16.4 | 16.6 | 56.6 | 28.3% |
| R2 | Residential Property on Grant Place | 8.1 | 4.5 | 2.2% | 15.3 | 18.6 | 34.8 | 17.4% |
| R3 | Residential Property on Telford Place | 8.1 | 4.1 | 2.1% | 15.9 | 18.5 | 34.7 | 17.3% |
| R4 | Inverlochy Nursery School | 8.1 | 1.7 | 0.8% | 12.0 | 13.6 | 29.8 | 14.9% |
| R5 | Residential Property on Lundy Gardens | 8.1 | 2.3 | 1.1% | 11.6 | 13.0 | 29.2 | 14.6% |
| R6 | Lochaber High School | 8.1 | 1.9 | 0.9% | 15.4 | 15.4 | 31.6 | 15.8% |
| R7 | Residential property on Glenmhor Terrace | 20.0 | 3.3 | 1.6% | 31.8 | 32.8 | 72.8 | 36.4% |
| R8 | Residential Property on Carrs Corner | 8.1 | 1.9 | 1.0% | 22.7 | 23.9 | 40.1 | 20.0% |
| ST1 | Fort William Football Pitch | 8.1 | 3.1 | 1.5% | 18.8 | 21.1 | 37.3 | 18.6% |
| R9 | Residential Houses on Achintee Road | 8.1 | 2.2 | 1.1% | 16.2 | 17.3 | 33.5 | 16.7% |
| R10 | Residential on Kilmallie Road | 8.1 | 1.7 | 0.8% | 12.1 | 12.2 | 28.4 | 14.2% |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 8.1 | 1.1 | 0.5% | 8.4 | 8.9 | 25.1 | 12.6% |
| R11 | North Road Retail Park | 20.0 | 6.2 | 3.1% | 19.4 | 20.0 | 60.0 | 30.0% |
| PR1 | Representative of land allocated for housing within THC LDP | 8.1 | 3.1 | 1.6% | 37.3 | 39.0 | 55.2 | 27.6% |
| PR2 | Representative of land allocated for housing within THC LDP | 8.1 | 3.9 | 2.0% | 42.3 | 45.9 | 62.1 | 31.1% |

**Nitrogen Dioxide - Hourly Mean 100th Percentile**

| Receptor ID | Receptor Name | Background (µg/m$^3$) | Proposed Development PC (µg/m$^3$) | Proposed Development PC as % of AQS | Smelter & Generators PC (µg/m$^3$) | Proposed Development + Smelter & Generators PC (µg/m$^3$) | PEC (µg/m$^3$) | PEC as % of AQS | Impact Descriptor |
|---|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 20.0 | 7.6 | 3.8% | 85.0 | 85.0 | 125.0 | 62.5% | Negligible |
| R2 | Residential Property on Grant Place | 8.1 | 13.1 | 6.6% | 62.3 | 75.4 | 91.6 | 45.8% | Negligible |
| R3 | Residential Property on Telford Place | 8.1 | 15.6 | 7.8% | 63.8 | 79.3 | 95.5 | 47.8% | Negligible |
| R4 | Inverlochy Nursery School | 8.1 | 4.2 | 2.1% | 51.7 | 51.7 | 67.9 | 33.9% | Negligible |
| R5 | Residential Property on Lundy Gardens | 8.1 | 8.5 | 4.2% | 58.1 | 58.1 | 74.3 | 37.2% | Negligible |
| R6 | Lochaber High School | 8.1 | 6.0 | 3.0% | 56.4 | 56.4 | 72.6 | 36.3% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 20.0 | 10.4 | 5.2% | 79.8 | 80.2 | 120.2 | 60.1% | Negligible |
| R8 | Residential Property on Carrs Corner | 8.1 | 5.2 | 2.6% | 66.7 | 68.1 | 84.3 | 42.1% | Negligible |
| ST1 | Fort William Football Pitch | 8.1 | 14.3 | 7.1% | 91.3 | 92.2 | 108.4 | 54.2% | Negligible |
| R9 | Residential Houses on Achintee Road | 8.1 | 6.0 | 3.0% | 108.7 | 108.7 | 124.9 | 62.4% | Negligible |
| R10 | Residential on Kilmallie Road | 8.1 | 3.2 | 1.6% | 18.8 | 19.5 | 35.7 | 17.9% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 8.1 | 6.6 | 3.3% | 40.8 | 42.9 | 59.1 | 29.6% | Negligible |
| R11 | North Road Retail Park | 20.0 | 13.1 | 6.5% | 147.1 | 147.1 | 187.1 | 93.6% | Negligible |
| PR1 | Representative of land allocated for housing within THC LDP | 8.1 | 7.8 | 3.9% | 134.6 | 134.6 | 150.8 | 75.4% | Negligible |
| PR2 | Representative of land allocated for housing within THC LDP | 8.1 | 5.6 | 2.8% | 62.2 | 67.3 | 83.5 | 41.8% | Negligible |

Maximum

**Bold:** Exceed Relevant AQS

**Carbon Monoxide - Running 8-hr Mean**

| Receptor ID | Receptor Name | Background ($mg/m^3$) | Proposed Development PC ($mg/m^3$) | Proposed Development PC as % of AQS | Smelter & Generators PC ($mg/m^3$) | PEC ($mg/m^3$) | PEC as % of AQS |
|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 0.128 | 0.0006 | 0.006% | 0.0011 | 0.1297 | 1.3% |
| R2 | Residential Property on Grant Place | 0.128 | 0.0010 | 0.010% | 0.0017 | 0.1307 | 1.3% |
| R3 | Residential Property on Telford Place | 0.128 | 0.0012 | 0.012% | 0.0019 | 0.1311 | 1.3% |
| R4 | Inverlochy Nursery School | 0.128 | 0.0003 | 0.003% | 0.0010 | 0.1293 | 1.3% |
| R5 | Residential Property on Lundy Gardens | 0.128 | 0.0003 | 0.003% | 0.0009 | 0.1292 | 1.3% |
| R6 | Lochaber High School | 0.129 | 0.0012 | 0.012% | 0.0023 | 0.1325 | 1.3% |
| R7 | Residential property on Glenmhor Terrace | 0.129 | 0.0036 | 0.036% | 0.0041 | 0.1367 | 1.4% |
| R8 | Residential Property on Carrs Corner | 0.129 | 0.0019 | 0.019% | 0.0064 | 0.1372 | 1.4% |
| ST1 | Fort William Football Pitch | 0.127 | 0.0009 | 0.009% | 0.0022 | 0.1301 | 1.3% |
| R9 | Residential Houses on Achintee Road | 0.127 | 0.0005 | 0.005% | 0.0017 | 0.1292 | 1.3% |
| R10 | Residential on Kilmallie Road | 0.129 | 0.0006 | 0.006% | 0.0011 | 0.1305 | 1.3% |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 0.130 | 0.0002 | 0.002% | 0.0008 | 0.1310 | 1.3% |
| R11 | North Road Retail Park | 0.128 | 0.0012 | 0.012% | 0.0014 | 0.1305 | 1.3% |
| PR1 | Representative of land allocated for housing within THC LDP | 0.122 | 0.0013 | 0.013% | 0.0130 | 0.1363 | 1.4% |
| PR2 | Representative of land allocated for housing within THC LDP | 0.122 | 0.0008 | 0.008% | 0.0047 | 0.1275 | 1.3% |

Maximum

**Bold:** Exceed Relevant AQS

**Particulate Matter (PM10) - Annual Mean**

| Receptor ID | Receptor Name | Background (µg/m$^3$) | Proposed Development PC (µg/m$^3$) | Proposed Development PC as % of AQS | Smelter PC (µg/m$^3$) | Generator PC (500hours) (µg/m$^3$) | PEC (µg/m$^3$) | PEC as % of AQS | Impact Descriptor |
|---|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 7.0 | 0.0 | - | 0.2 | 0.3 | 7.3 | - | - |
| R2 | Residential Property on Grant Place | 7.0 | 0.1 | 0.3% | 0.2 | 0.3 | 7.3 | 40.3% | Negligible |
| R3 | Residential Property on Telford Place | 7.0 | 0.1 | 0.4% | 0.2 | 0.3 | 7.3 | 40.5% | Negligible |
| R4 | Inverlochy Nursery School | 7.0 | 0.0 | 0.1% | 0.1 | 0.2 | 7.1 | 39.7% | Negligible |
| R5 | Residential Property on Lundy Gardens | 7.0 | 0.0 | 0.1% | 0.1 | 0.2 | 7.1 | 39.7% | Negligible |
| R6 | Lochaber High School | 7.0 | 0.1 | 0.4% | 0.2 | 0.4 | 7.4 | 41.1% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 7.0 | 0.2 | 1.2% | 0.5 | 0.8 | 7.9 | 43.7% | Negligible |
| R8 | Residential Property on Carrs Corner | 7.0 | 0.1 | 0.7% | 0.5 | 0.7 | 7.8 | 43.1% | Negligible |
| ST1 | Fort William Football Pitch | 6.7 | 0.1 | - | 0.2 | 0.3 | 7.1 | - | - |
| R9 | Residential Houses on Achintee Road | 6.7 | 0.0 | 0.2% | 0.2 | 0.3 | 7.0 | 38.9% | Negligible |
| R10 | Residential on Kilmallie Road | 6.5 | 0.0 | 0.2% | 0.2 | 0.2 | 6.7 | 37.2% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 6.4 | 0.0 | 0.1% | 0.1 | 0.1 | 6.5 | 36.2% | Negligible |
| R11 | North Road Retail Park | 7.0 | 0.1 | - | 0.3 | 0.4 | 7.4 | - | - |
| PR1 | Representative of land allocated for housing within THC LDP | 6.8 | 0.1 | 0.5% | 1.0 | 1.3 | 8.1 | 45.0% | Negligible |
| PR2 | Representative of land allocated for housing within THC LDP | 6.8 | 0.1 | 0.3% | 0.4 | 0.5 | 7.3 | 40.6% | Negligible |

**Particulate Matter (PM10) - Daily Mean 98.08th%ile**

| Receptor ID | Receptor Name | Background (µg/m$^3$) | Proposed Development PC (µg/m$^3$) | Proposed Development PC as % of AQS | Smelter & Generators PC (µg/m$^3$) | Proposed Development + Smelter & Generators PC (µg/m$^3$) | PEC (µg/m$^3$) | PEC as % of AQS |
|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 7.0 | 0.3 | 0.6% | 3.0 | 3.1 | 10.1 | 20.3% |
| R2 | Residential Property on Grant Place | 7.0 | 0.5 | 1.0% | 3.7 | 4.2 | 11.2 | 22.4% |
| R3 | Residential Property on Telford Place | 7.0 | 0.6 | 1.3% | 4.0 | 4.7 | 11.7 | 23.4% |
| R4 | Inverlochy Nursery School | 7.0 | 0.1 | 0.3% | 2.3 | 2.4 | 9.3 | 18.7% |
| R5 | Residential Property on Lundy Gardens | 7.0 | 0.2 | 0.4% | 1.9 | 2.1 | 9.1 | 18.1% |
| R6 | Lochaber High School | 7.0 | 0.3 | 0.6% | 3.9 | 4.0 | 11.0 | 22.1% |
| R7 | Residential property on Glenmhor Terrace | 7.0 | 0.8 | 1.6% | 9.3 | 9.4 | 16.4 | 32.8% |
| R8 | Residential Property on Carrs Corner | 7.0 | 0.4 | 0.7% | 6.7 | 6.9 | 14.0 | 27.9% |
| ST1 | Fort William Football Pitch | 6.7 | 0.4 | - | 4.6 | 5.1 | 11.8 | - |
| R9 | Residential Houses on Achintee Road | 6.7 | 0.3 | 0.5% | 3.5 | 3.6 | 10.3 | 20.7% |
| R10 | Residential on Kilmallie Road | 6.5 | 0.3 | 0.6% | 3.1 | 3.2 | 9.7 | 19.4% |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 6.4 | 0.1 | 0.2% | 1.7 | 1.8 | 8.2 | 16.4% |
| R11 | North Road Retail Park | 7.0 | 0.6 | - | 3.3 | 3.6 | 10.6 | - |
| PR1 | Representative of land allocated for housing within THC LDP | 6.8 | 0.3 | 0.6% | 10.3 | 10.6 | 17.4 | 34.8% |
| PR2 | Representative of land allocated for housing within THC LDP | 6.8 | 0.2 | 0.4% | 4.9 | 5.1 | 11.9 | 23.8% |

Maximum

**Bold:** Exceed Relevant AQS

**Hydrogen Fluoride - Hourly Mean**

| Receptor ID | Receptor Name | Background ($\mu g/m^3$) | Proposed Development PC ($\mu g/m^3$) | Proposed Development PC as % of AQS | Smelter & Generators PC ($\mu g/m^3$) | Proposed Development + Smelter & Generators PC ($\mu g/m^3$) | PEC ($\mu g/m^3$) | PEC as % of AQS | Impact Descriptor |
|---|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 0.003 | 0.8 | 0.3% | 2.3 | 2.9 | 2.9 | 1.2% | Negligible |
| R2 | Residential Property on Grant Place | 0.003 | 1.5 | 0.6% | 6.4 | 6.5 | 6.5 | 2.6% | Negligible |
| R3 | Residential Property on Telford Place | 0.003 | 1.8 | 0.7% | 6.1 | 6.9 | 6.9 | 2.8% | Negligible |
| R4 | Inverlochy Nursery School | 0.003 | 0.6 | 0.2% | 3.9 | 3.9 | 3.9 | 1.6% | Negligible |
| R5 | Residential Property on Lundy Gardens | 0.003 | 1.0 | 0.4% | 4.1 | 5.1 | 5.1 | 2.0% | Negligible |
| R6 | Lochaber High School | 0.003 | 0.7 | 0.3% | 3.6 | 3.7 | 3.7 | 1.5% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 0.003 | 1.4 | 0.6% | 5.2 | 5.2 | 5.2 | 2.1% | Negligible |
| R8 | Residential Property on Carrs Corner | 0.003 | 0.5 | 0.2% | 3.5 | 3.5 | 3.5 | 1.4% | Negligible |
| ST1 | Fort William Football Pitch | 0.003 | 2.2 | 0.9% | 6.6 | 7.9 | 7.9 | 3.2% | Negligible |
| R9 | Residential Houses on Achintee Road | 0.003 | 0.7 | 0.3% | 4.4 | 5.2 | 5.2 | 2.1% | Negligible |
| R10 | Residential on Kilmallie Road | 0.003 | 0.4 | 0.1% | 3.9 | 4.2 | 4.2 | 1.7% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 0.003 | 0.5 | 0.2% | 2.3 | 2.3 | 2.3 | 0.9% | Negligible |
| R11 | North Road Retail Park | 0.003 | 1.4 | 0.5% | 2.9 | 3.4 | 3.4 | 1.4% | Negligible |
| PR1 | Representative of land allocated for housing within THC LDP | 0.003 | 1.0 | 0.4% | 3.2 | 3.4 | 3.4 | 1.3% | Negligible |
| PR2 | Representative of land allocated for housing within THC LDP | 0.003 | 0.5 | 0.2% | 2.8 | 2.8 | 2.8 | 1.1% | Negligible |

Maximum

**Bold:** Exceed Relevant AQS

**Hydrogen Chloride - Annual Mean**

| Receptor ID | Receptor Name | Background (µg/m$^3$) | Proposed Development PC (µg/m$^3$) | Proposed Development PC as % of AQS | Smelter & Generators PC (µg/m$^3$) | Proposed Development + Smelter & Generators PC (µg/m$^3$) | PEC (µg/m$^3$) | PEC as % of AQS | Impact Descriptor |
|---|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 0.392 | 0.007 | - | 0.007 | 0.014 | 0.406 | - | - |
| R2 | Residential Property on Grant Place | 0.392 | 0.012 | 0.06% | 0.009 | 0.021 | 0.412 | 2.1% | Negligible |
| R3 | Residential Property on Telford Place | 0.392 | 0.014 | 0.07% | 0.009 | 0.024 | 0.416 | 2.1% | Negligible |
| R4 | Inverlochy Nursery School | 0.392 | 0.003 | 0.02% | 0.007 | 0.010 | 0.402 | 2.0% | Negligible |
| R5 | Residential Property on Lundy Gardens | 0.392 | 0.004 | 0.02% | 0.005 | 0.009 | 0.401 | 2.0% | Negligible |
| R6 | Lochaber High School | 0.392 | 0.015 | 0.08% | 0.014 | 0.029 | 0.421 | 2.1% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 0.392 | 0.045 | 0.22% | 0.040 | 0.085 | 0.477 | 2.4% | Negligible |
| R8 | Residential Property on Carrs Corner | 0.392 | 0.024 | 0.12% | 0.035 | 0.059 | 0.451 | 2.3% | Negligible |
| ST1 | Fort William Football Pitch | 0.392 | 0.011 | - | 0.010 | 0.021 | 0.412 | - | - |
| R9 | Residential Houses on Achintee Road | 0.392 | 0.006 | 0.03% | 0.008 | 0.014 | 0.406 | 2.0% | Negligible |
| R10 | Residential on Kilmallie Road | 0.392 | 0.007 | 0.04% | 0.008 | 0.015 | 0.406 | 2.0% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 0.392 | 0.002 | 0.01% | 0.006 | 0.008 | 0.400 | 2.0% | Negligible |
| R11 | North Road Retail Park | 0.392 | 0.014 | - | 0.009 | 0.023 | 0.415 | - | - |
| PR1 | Representative of land allocated for housing within THC LDP | 0.392 | 0.017 | 0.08% | 0.033 | 0.050 | 0.441 | 2.2% | Negligible |
| PR2 | Representative of land allocated for housing within THC LDP | 0.392 | 0.010 | 0.05% | 0.031 | 0.042 | 0.433 | 2.2% | Negligible |

**Hydrogen Chloride - Hourly Mean**

| Receptor ID | Receptor Name | Background (µg/m$^3$) | Proposed Development PC (µg/m$^3$) | Proposed Development PC as % of AQS | Smelter & Generators PC (µg/m$^3$) | Proposed Development + Smelter & Generators PC (µg/m$^3$) | PEC (µg/m$^3$) | PEC as % of AQS | Impact Descriptor |
|---|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 0.392 | 0.8 | 0.1% | 4.3 | 4.3 | 5.0 | 0.6% | Negligible |
| R2 | Residential Property on Grant Place | 0.392 | 1.5 | 0.2% | 3.7 | 3.8 | 4.6 | 0.6% | Negligible |
| R3 | Residential Property on Telford Place | 0.392 | 1.8 | 0.2% | 2.7 | 2.7 | 3.5 | 0.4% | Negligible |
| R4 | Inverlochy Nursery School | 0.392 | 0.6 | 0.1% | 0.7 | 0.7 | 1.5 | 0.2% | Negligible |
| R5 | Residential Property on Lundy Gardens | 0.392 | 1.0 | 0.1% | 0.7 | 1.0 | 1.8 | 0.2% | Negligible |
| R6 | Lochaber High School | 0.392 | 0.7 | 0.1% | 1.3 | 1.8 | 2.6 | 0.3% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 0.392 | 1.4 | 0.2% | 5.3 | 5.3 | 6.1 | 0.8% | Negligible |
| R8 | Residential Property on Carrs Corner | 0.392 | 0.5 | 0.1% | 1.9 | 1.9 | 2.7 | 0.3% | Negligible |
| ST1 | Fort William Football Pitch | 0.392 | 2.2 | 0.3% | 1.4 | 2.2 | 3.0 | 0.4% | Negligible |
| R9 | Residential Houses on Achintee Road | 0.392 | 0.7 | 0.1% | 0.8 | 1.1 | 1.9 | 0.2% | Negligible |
| R10 | Residential on Kilmallie Road | 0.392 | 0.4 | 0.0% | 0.4 | 0.6 | 1.4 | 0.2% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 0.392 | 0.5 | 0.1% | 0.6 | 0.6 | 1.4 | 0.2% | Negligible |
| R11 | North Road Retail Park | 0.392 | 1.4 | 0.2% | 7.0 | 7.0 | 7.8 | 1.0% | Negligible |
| PR1 | Representative of land allocated for housing within THC LDP | 0.392 | 1.0 | 0.1% | 2.6 | 3.0 | 3.8 | 0.5% | Negligible |
| PR2 | Representative of land allocated for housing within THC LDP | 0.392 | 0.5 | 0.1% | 1.5 | 1.5 | 2.2 | 0.3% | Negligible |

Maximum

**Bold:** Exceed Relevant AQS

**Volatile Organic Compound - Running Annual Mean - Using Benzene AQS**

| Receptor ID | Receptor Name | Background (µg/m$^3$) | Proposed Development PC (µg/m$^3$) | Proposed Development PC as % of AQS | Smelter & Generators PC (µg/m$^3$) | Proposed Development + Smelter & Generators PC (µg/m$^3$) | PEC (µg/m$^3$) | PEC as % of AQS | Impact Descriptor |
|---|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 0.117 | 0.2 | - | 0.0 | 0.2 | 0.3 | - | - |
| R2 | Residential Property on Grant Place | 0.117 | 0.3 | 9.5% | 0.0 | 0.3 | 0.4 | 13.1% | Slight |
| R3 | Residential Property on Telford Place | 0.117 | 0.4 | 11.5% | 0.0 | 0.4 | 0.5 | 15.1% | Moderate |
| R4 | Inverlochy Nursery School | 0.117 | 0.1 | 2.6% | 0.0 | 0.1 | 0.2 | 6.2% | Negligible |
| R5 | Residential Property on Lundy Gardens | 0.117 | 0.1 | 2.9% | 0.0 | 0.1 | 0.2 | 6.5% | Negligible |
| R6 | Lochaber High School | 0.119 | 0.4 | 12.1% | 0.0 | 0.4 | 0.5 | 15.7% | Moderate |
| R7 | Residential property on Glenmhor Terrace | 0.119 | 1.2 | 36.1% | 0.0 | 1.2 | 1.3 | 39.8% | Moderate |
| R8 | Residential Property on Carrs Corner | 0.119 | 0.6 | 19.2% | 0.0 | 0.6 | 0.7 | 22.8% | Moderate |
| ST1 | Fort William Football Pitch | 0.107 | 0.3 | - | 0.0 | 0.3 | 0.4 | - | - |
| R9 | Residential Houses on Achintee Road | 0.107 | 0.2 | 4.9% | 0.0 | 0.2 | 0.3 | 8.2% | Negligible |
| R10 | Residential on Kilmallie Road | 0.118 | 0.2 | 5.9% | 0.0 | 0.2 | 0.3 | 9.5% | Slight |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 0.119 | 0.1 | 1.9% | 1.0 | 0.1 | 0.2 | 5.5% | Negligible |
| R11 | North Road Retail Park | 0.117 | 0.3 | - | 0.0 | 0.3 | 0.5 | - | - |
| PR1 | Representative of land allocated for housing within THC LDP | 0.090 | 0.4 | 13.0% | 0.0 | 0.4 | 0.5 | 15.7% | Moderate |
| PR2 | Representative of land allocated for housing within THC LDP | 0.090 | 0.3 | 7.9% | 0.0 | 0.3 | 0.3 | 10.7% | Slight |

**Volatile Organic Compound - Running Annual Mean - Using 0.3mg/m$^3$**

| Receptor ID | Receptor Name | Background (µg/m$^3$) | Proposed Development PC (µg/m$^3$) | Proposed Development PC as % of AQS | Smelter & Generators PC (µg/m$^3$) | Proposed Development + Smelter & Generators PC (µg/m$^3$) | PEC (µg/m$^3$) | PEC as % of AQS | Impact Descriptor |
|---|---|---|---|---|---|---|---|---|---|
| R1 | Hotel near to the A82 | 0.117 | 0.2 | - | 0.0 | 0.2 | 0.3 | - | - |
| R2 | Residential Property on Grant Place | 0.117 | 0.3 | 0.10% | 0.0 | 0.3 | 0.4 | 0.1% | Negligible |
| R3 | Residential Property on Telford Place | 0.117 | 0.4 | 0.12% | 0.0 | 0.4 | 0.5 | 0.2% | Negligible |
| R4 | Inverlochy Nursery School | 0.117 | 0.1 | 0.03% | 0.0 | 0.1 | 0.2 | 0.1% | Negligible |
| R5 | Residential Property on Lundy Gardens | 0.117 | 0.1 | 0.03% | 0.0 | 0.1 | 0.2 | 0.1% | Negligible |
| R6 | Lochaber High School | 0.119 | 0.4 | 0.13% | 0.0 | 0.4 | 0.5 | 0.2% | Negligible |
| R7 | Residential property on Glenmhor Terrace | 0.119 | 1.2 | 0.39% | 0.0 | 1.2 | 1.3 | 0.4% | Negligible |
| R8 | Residential Property on Carrs Corner | 0.119 | 0.6 | 0.21% | 0.0 | 0.6 | 0.7 | 0.2% | Negligible |
| ST1 | Fort William Football Pitch | 0.107 | 0.3 | - | 0.0 | 0.3 | 0.4 | - | - |
| R9 | Residential Houses on Achintee Road | 0.107 | 0.2 | 0.05% | 0.0 | 0.2 | 0.3 | 0.1% | Negligible |
| R10 | Residential on Kilmallie Road | 0.118 | 0.2 | 0.06% | 0.0 | 0.2 | 0.3 | 0.1% | Negligible |
| THC | THC Monitor representative of sensitive receptors near Camanachd Crescent | 0.119 | 0.1 | 0.02% | 1.0 | 0.1 | 0.2 | 0.1% | Negligible |
| R11 | North Road Retail Park | 0.117 | 0.3 | - | 0.0 | 0.3 | 0.5 | - | - |
| PR1 | Representative of land allocated for housing within THC LDP | 0.090 | 0.4 | 0.14% | 0.0 | 0.4 | 0.5 | 0.2% | Negligible |
| PR2 | Representative of land allocated for housing within THC LDP | 0.090 | 0.3 | 0.09% | 0.0 | 0.3 | 0.3 | 0.1% | Negligible |

Maximum

**Bold:** Exceed Relevant AQS

**Dioxins**

**Calculation of Daily Dioxins Exposure by Inhalation using USEPA method - ADULT**

| ID | Receptors | Background Intake per day (pg I-TEQ/kg-BW/day)* | Proposed Development PC (ug/m3) | Proposed Development PC (pg/m3) | Concentration in air (Ca) pg/m3 | Daily inhalation Rate (IR) m3/hour | Exposure Time (hours/day) | Exposure Frequency (EF) days/year | Exposure Duration (ED) years | Average Weight Adult (kg) | Averaging Time to determine TDI (AT) days | Process Daily Dose by Inhalation per adult (pg I-TEQ/kg-BW/day) | Process Daily Intake by Inhalation as percentage of TDI | Total Daily Dose by Inhalation per adult (pg I-TEQ/kg-BW/day) | Total Daily Intake by Inhalation as percentage of Tolerable Daily Intake (TDI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R1 Hotel near to the | 0.03 | 7.26E-10 | 7.26E-04 | 7.26E-04 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 1.98E-04 | 0.010% | 0.0302 | 0.0151 |
| 2 | R2 Residential Prope | 0.03 | 1.20E-09 | 1.20E-03 | 1.20E-03 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 3.27E-04 | 0.016% | 0.0303 | 0.0152 |
| 3 | R3 Residential Prope | 0.03 | 1.45E-09 | 1.45E-03 | 1.45E-03 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 3.96E-04 | 0.020% | 0.0304 | 0.0152 |
| 4 | R4 Inverlochy Nurse | 0.03 | 3.35E-10 | 3.35E-04 | 3.35E-04 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 9.13E-05 | 0.005% | 0.0301 | 0.0150 |
| 5 | R5 Residential Prope | 0.03 | 3.72E-10 | 3.72E-04 | 3.72E-04 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 1.01E-04 | 0.005% | 0.0301 | 0.0151 |
| 6 | R6 Lochaber High Sc | 0.03 | 1.50E-09 | 1.50E-03 | 1.50E-03 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 4.10E-04 | 0.021% | 0.0304 | 0.0152 |
| 7 | R7 Residential prope | 0.03 | 4.50E-09 | 4.50E-03 | 4.50E-03 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 1.23E-03 | 0.061% | 0.0312 | 0.0156 |
| 8 | R8 Residential Prope | 0.03 | 2.41E-09 | 2.41E-03 | 2.41E-03 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 6.57E-04 | 0.033% | 0.0307 | 0.0153 |
| 9 | ST1 Fort William Foo | 0.03 | 1.12E-09 | 1.12E-03 | 1.12E-03 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 3.07E-04 | 0.015% | 0.0303 | 0.0152 |
| 10 | R9 Residential House | 0.03 | 6.29E-10 | 6.29E-04 | 6.29E-04 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 1.72E-04 | 0.009% | 0.0302 | 0.0151 |
| 11 | R10 Residential on K | 0.03 | 7.39E-10 | 7.39E-04 | 7.39E-04 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 2.02E-04 | 0.010% | 0.0302 | 0.0151 |
| 12 | THC Monitor | 0.03 | 2.43E-10 | 2.43E-04 | 2.43E-04 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 6.62E-05 | 0.003% | 0.0301 | 0.0150 |
| 13 | R11 North Road Retai | 0.03 | 1.37E-09 | 1.37E-03 | 1.37E-03 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 3.74E-04 | 0.019% | 0.0304 | 0.0152 |
| 14 | PR1 | 0.03 | 1.67E-09 | 1.67E-03 | 1.67E-03 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 4.56E-04 | 0.023% | 0.0305 | 0.0152 |
| 15 | PR2 | 0.03 | 1.03E-09 | 1.03E-03 | 1.03E-03 | 0.83 | 24 | 350 | 70 | 70 | 25550 | 2.81E-04 | 0.014% | 0.0303 | 0.0151 |

* Average UK Daily intake for adults by inhalation = 2pg/day divided by average adult weight of 70kg (Defra/Environment Agency 2003)
Defra/Environment Agency, 2003 *Contaminants in Soil: Collation of Toxicological Data and Intake Values for Humans - Dioxins, Furans and Dioxin Like PCB"*

**Calculation of Daily Dioxins Exposure by Inhalation using USEPA method - CHILD**

| ID | Receptors | Background Intake per day (pg I-TEQ/kg-BW/day)* | Proposed Development PC (ug/m3) | Proposed Development PC (pg/m3) | Concentration in air (Ca) pg/m3 | Daily inhalation Rate (IR) m3/hour | Exposure Time (hours/day) | Exposure Frequency (EF) days/year | Exposure Duration (ED) years | Average Weight Child (kg) | Averaging Time to determine TDI (AT) days | Process Daily Dose by Inhalation per adult (pg I-TEQ/kg-BW/day) | Process Daily Intake by Inhalation as percentage of TDI | Total Daily Dose by Inhalation per child (pg I-TEQ/kg-BW/day) | Total Daily Intake by Inhalation as percentage of Tolerable Daily Intake (TDI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R1 Hotel near to the | 0.13 | 7.26E-10 | 7.26E-04 | 7.26E-04 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 3.34E-04 | 0.017% | 0.1303 | 0.0652 |
| 2 | R2 Residential Prope | 0.13 | 1.20E-09 | 1.20E-03 | 1.20E-03 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 5.51E-04 | 0.028% | 0.1306 | 0.0653 |
| 3 | R3 Residential Prope | 0.13 | 1.45E-09 | 1.45E-03 | 1.45E-03 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 6.67E-04 | 0.033% | 0.1307 | 0.0653 |
| 4 | R4 Inverlochy Nurse | 0.13 | 3.35E-10 | 3.35E-04 | 3.35E-04 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 1.54E-04 | 0.008% | 0.1302 | 0.0651 |
| 5 | R5 Residential Prope | 0.13 | 3.72E-10 | 3.72E-04 | 3.72E-04 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 1.71E-04 | 0.009% | 0.1302 | 0.0651 |
| 6 | R6 Lochaber High Sc | 0.13 | 1.50E-09 | 1.50E-03 | 1.50E-03 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 6.92E-04 | 0.035% | 0.1307 | 0.0653 |
| 7 | R7 Residential prope | 0.13 | 4.50E-09 | 4.50E-03 | 4.50E-03 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 2.07E-03 | 0.103% | 0.1321 | 0.0660 |
| 8 | R8 Residential Prope | 0.13 | 2.41E-09 | 2.41E-03 | 2.41E-03 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 1.11E-03 | 0.055% | 0.1311 | 0.0656 |
| 9 | ST1 Fort William Foo | 0.13 | 1.12E-09 | 1.12E-03 | 1.12E-03 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 5.18E-04 | 0.026% | 0.1305 | 0.0653 |
| 10 | R9 Residential House | 0.13 | 6.29E-10 | 6.29E-04 | 6.29E-04 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 2.89E-04 | 0.014% | 0.1303 | 0.0651 |
| 11 | R10 Residential on K | 0.13 | 7.39E-10 | 7.39E-04 | 7.39E-04 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 3.40E-04 | 0.017% | 0.1303 | 0.0652 |
| 12 | THC Monitor | 0.13 | 2.43E-10 | 2.43E-04 | 2.43E-04 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 1.12E-04 | 0.006% | 0.1301 | 0.0651 |
| 13 | R11 North Road Retai | 0.13 | 1.37E-09 | 1.37E-03 | 1.37E-03 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 6.31E-04 | 0.032% | 0.1306 | 0.0653 |
| 14 | PR1 | 0.13 | 1.67E-09 | 1.67E-03 | 1.67E-03 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 7.69E-04 | 0.038% | 0.1308 | 0.0654 |
| 15 | PR2 | 0.13 | 1.03E-09 | 1.03E-03 | 1.03E-03 | 0.3 | 24 | 350 | 70 | 15 | 25550 | 4.73E-04 | 0.024% | 0.1305 | 0.0652 |

* Average UK Daily intake for adults by inhalation = 2pg/day divided by average adult weight of 15kg (Defra/Environment Agency 2003)
Defra/Environment Agency, 2003 *Contaminants in Soil: Collation of Toxicological Data and Intake Values for Humans - Dioxins, Furans and Dioxin Like PCB"*

**Oxide of Nitrogen - Annual Mean**

| Receptor ID | Receptor Name | Background ($\mu g/m^3$) | Proposed Development PC ($\mu g/m^3$) | Proposed Development PC as % of AQS | Generators PC ($\mu g/m^3$) | Proposed Development + Generators PC ($\mu g/m^3$) | Proposed Development + Generators PC as % of AQS | PEC ($\mu g/m^3$) | PEC as % of AQS |
|---|---|---|---|---|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 2.02 | 0.0434 | 0.14% | 0.0051 | 0.0485 | 0.16% | 2.0685 | 6.9% |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 2.02 | 0.0359 | 0.12% | 0.0055 | 0.0414 | 0.14% | 2.0614 | 6.9% |
| Eco3 | H4060 - Alpine and Boreal heaths | 2.02 | 0.1187 | 0.40% | 0.0251 | 0.1438 | 0.48% | 2.1638 | 7.2% |
| RevisedEco-4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 2.02 | 0.0087 | 0.03% | 0.0029 | 0.0117 | 0.04% | 2.0317 | 6.8% |
| Eco5 | H7130 - Blanket Bogs | 2.02 | 0.2578 | 0.86% | 0.1245 | 0.3823 | **1.27%** | 2.4023 | 8.0% |
| Eco6 | H91C0 - Caledonian forest | 2.02 | 0.0335 | 0.11% | 0.0098 | 0.0433 | 0.14% | 2.0633 | 6.9% |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 2.02 | 0.0213 | 0.07% | 0.0042 | 0.0255 | 0.08% | 2.0455 | 6.8% |
| Eco8 | H4030 - European Dry heaths | 2.02 | 0.1773 | 0.59% | 0.1960 | 0.3733 | **1.24%** | 2.3933 | 8.0% |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 2.02 | 0.0384 | 0.13% | 0.0053 | 0.0436 | 0.15% | 2.0636 | 6.9% |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 2.02 | 0.0708 | 0.24% | 0.0115 | 0.0823 | 0.27% | 2.1023 | 7.0% |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 2.02 | 0.0134 | 0.04% | 0.0025 | 0.0159 | 0.05% | 2.0359 | 6.8% |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 2.02 | 1.1139 | **3.71%** | 0.4007 | 1.5146 | **5.05%** | 3.5346 | 11.8% |
| RevisedEco-13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 2.02 | 0.0061 | 0.02% | 0.0024 | 0.0084 | 0.03% | 2.0284 | 6.8% |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 2.02 | 1.1139 | **3.71%** | 0.4007 | 1.5146 | **5.05%** | 3.5346 | 11.8% |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 2.02 | 0.0299 | 0.10% | 0.0041 | 0.0340 | 0.11% | 2.0540 | 6.8% |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 2.02 | 1.3175 | **4.39%** | 0.6851 | 2.0026 | **6.68%** | 4.0226 | 13.4% |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 2.02 | 1.0508 | **3.50%** | 0.6023 | 1.6531 | **5.51%** | 3.6731 | 12.2% |
| NewEco18 | H4060 - Oceanic Montane Bryophyte | 2.02 | 0.0469 | 0.16% | 0.0052 | 0.0521 | 0.17% | 2.0721 | 6.9% |
| NewEco19 | H6150 - Snowbed Communities | 2.02 | 0.0619 | 0.21% | 0.0072 | 0.0690 | 0.23% | 2.0890 | 7.0% |

Maximum

**Bold:** PC >1% or PEC > 70% of long-term benchmark; critical level

**Hydrogen Fluoride - Weekly Mean**

| Receptor ID | Receptor Name | Background (µg/m$^3$) | Proposed Development PC (µg/m$^3$) | Proposed Development PC as % of AQS | Generators PC (µg/m$^3$) | Proposed Development + Generators PC (µg/m$^3$) | Proposed Development + Generators PC as % of AQS | PEC (µg/m$^3$) | PEC as % of AQS |
|---|---|---|---|---|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 0.003 | 0.002 | 0.4% | 0.0 | 0.002 | 0.36% | 0.005 | 1.0% |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 0.003 | 0.001 | 0.3% | 0.0 | 0.001 | 0.29% | 0.004 | 0.9% |
| Eco3 | H4060 - Alpine and Boreal heaths | 0.003 | 0.005 | 1.0% | 0.0 | 0.005 | 0.98% | 0.008 | 1.6% |
| RevisedEco-4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 0.003 | 0.000 | 0.1% | 0.0 | 0.000 | 0.07% | 0.003 | 0.7% |
| Eco5 | H7130 - Blanket Bogs | 0.003 | 0.011 | 2.2% | 0.0 | 0.011 | 2.19% | 0.014 | 2.8% |
| Eco6 | H91C0 - Caledonian forest | 0.003 | 0.001 | 0.3% | 0.0 | 0.001 | 0.29% | 0.004 | 0.9% |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 0.003 | 0.001 | 0.2% | 0.0 | 0.001 | 0.18% | 0.004 | 0.8% |
| Eco8 | H4030 - European Dry heaths | 0.003 | 0.008 | 1.6% | 0.0 | 0.008 | 1.57% | 0.011 | 2.2% |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 0.003 | 0.002 | 0.3% | 0.0 | 0.002 | 0.31% | 0.005 | 0.9% |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 0.003 | 0.003 | 0.6% | 0.0 | 0.003 | 0.60% | 0.006 | 1.2% |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 0.003 | 0.001 | 0.1% | 0.0 | 0.001 | 0.11% | 0.004 | 0.7% |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 0.003 | 0.043 | 8.6% | 0.0 | 0.043 | 8.63% | 0.046 | 9.2% |
| RevisedEco-13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 0.003 | 0.000 | 0.1% | 0.0 | 0.000 | 0.05% | 0.003 | 0.7% |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 0.003 | 0.043 | 8.6% | 0.0 | 0.043 | 8.63% | 0.046 | 9.2% |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 0.003 | 0.001 | 0.2% | 0.0 | 0.001 | 0.25% | 0.004 | 0.8% |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 0.003 | 0.049 | 9.8% | 0.0 | 0.049 | 9.84% | 0.052 | 10.4% |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 0.003 | 0.040 | 8.0% | 0.0 | 0.040 | 7.99% | 0.043 | 8.6% |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 0.003 | 0.049 | 0.98% | 0.0 | 0.049 | 0.98% | 0.052 | 1.0% |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 0.003 | 0.040 | 0.79% | 0.0 | 0.040 | 0.79% | 0.043 | 0.9% |
| NewEco18 | H4060 - Oceanic Montane Bryophyte | 0.003 | 0.002 | 0.04% | 0.0 | 0.002 | 0.04% | 0.005 | 0.1% |
| NewEco19 | H6150 - Snowbed Communities | 0.003 | 0.003 | 0.05% | 0.0 | 0.003 | 0.05% | 0.006 | 0.1% |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NewEco18 | H4060 - Oceanic Montane Bryophyte | 0.003 | 0.002 | 0.4% | 0.0 | 0.002 | 0.39% | 0.005 | 1.0% |
| NewEco19 | H6150 - Snowbed Communities | 0.003 | 0.003 | 0.5% | 0.0 | 0.003 | 0.50% | 0.006 | 1.1% |

**Hydrogen Fluoride - Daily Mean**

| Receptor ID | Receptor Name | Background ($\mu g/m^3$) | Proposed Development PC ($\mu g/m^3$) | Proposed Development PC as % of AQS | Generators PC ($\mu g/m^3$) | Proposed Development + Generators PC ($\mu g/m^3$) | Proposed Development + Generators PC as % of AQS | PEC ($\mu g/m^3$) | PEC as % of AQS |
|---|---|---|---|---|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 0.003 | 0.002 | 0.04% | 0.0 | 0.002 | 0.04% | 0.005 | 0.1% |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 0.003 | 0.002 | 0.03% | 0.0 | 0.002 | 0.03% | 0.005 | 0.1% |
| Eco3 | H4060 - Alpine and Boreal heaths | 0.003 | 0.005 | 0.10% | 0.0 | 0.005 | 0.10% | 0.008 | 0.2% |
| RevisedEco-4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 0.003 | 0.000 | 0.01% | 0.0 | 0.000 | 0.01% | 0.003 | 0.1% |
| Eco5 | H7130 - Blanket Bogs | 0.003 | 0.011 | 0.22% | 0.0 | 0.011 | 0.22% | 0.014 | 0.3% |
| Eco6 | H91C0 - Caledonian forest | 0.003 | 0.002 | 0.03% | 0.0 | 0.002 | 0.03% | 0.005 | 0.1% |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 0.003 | 0.001 | 0.02% | 0.0 | 0.001 | 0.02% | 0.004 | 0.1% |
| Eco8 | H4030 - European Dry heaths | 0.003 | 0.008 | 0.16% | 0.0 | 0.008 | 0.16% | 0.011 | 0.2% |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 0.003 | 0.002 | 0.03% | 0.0 | 0.002 | 0.03% | 0.005 | 0.1% |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 0.003 | 0.003 | 0.06% | 0.0 | 0.003 | 0.06% | 0.006 | 0.1% |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 0.003 | 0.001 | 0.01% | 0.0 | 0.001 | 0.01% | 0.004 | 0.1% |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 0.003 | 0.044 | 0.88% | 0.0 | 0.044 | 0.88% | 0.047 | 0.9% |
| RevisedEco-13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 0.003 | 0.000 | 0.01% | 0.0 | 0.000 | 0.01% | 0.003 | 0.1% |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 0.003 | 0.044 | 0.88% | 0.0 | 0.044 | 0.88% | 0.047 | 0.9% |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 0.003 | 0.001 | 0.03% | 0.0 | 0.001 | 0.03% | 0.004 | 0.1% |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NewEco18 | H4060 - Oceanic Montane Bryophyte | 0.003 | 0.002 | 0.4% | 0.0 | 0.002 | 0.39% | 0.005 | 1.0% |
| NewEco19 | H6150 - Snowbed Communities | 0.003 | 0.003 | 0.5% | 0.0 | 0.003 | 0.50% | 0.006 | 1.1% |

**Hydrogen Fluoride - Daily Mean**

| Receptor ID | Receptor Name | Background (µg/m$^3$) | Proposed Development PC (µg/m$^3$) | Proposed Development PC as % of AQS | Generators PC (µg/m$^3$) | Proposed Development + Generators PC (µg/m$^3$) | Proposed Development + Generators PC as % of AQS | PEC (µg/m$^3$) | PEC as % of AQS |
|---|---|---|---|---|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 0.003 | 0.002 | 0.04% | 0.0 | 0.002 | 0.04% | 0.005 | 0.1% |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 0.003 | 0.002 | 0.03% | 0.0 | 0.002 | 0.03% | 0.005 | 0.1% |
| Eco3 | H4060 - Alpine and Boreal heaths | 0.003 | 0.005 | 0.10% | 0.0 | 0.005 | 0.10% | 0.008 | 0.2% |
| RevisedEco-4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 0.003 | 0.000 | 0.01% | 0.0 | 0.000 | 0.01% | 0.003 | 0.1% |
| Eco5 | H7130 - Blanket Bogs | 0.003 | 0.011 | 0.22% | 0.0 | 0.011 | 0.22% | 0.014 | 0.3% |
| Eco6 | H91C0 - Caledonian forest | 0.003 | 0.002 | 0.03% | 0.0 | 0.002 | 0.03% | 0.005 | 0.1% |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 0.003 | 0.001 | 0.02% | 0.0 | 0.001 | 0.02% | 0.004 | 0.1% |
| Eco8 | H4030 - European Dry heaths | 0.003 | 0.008 | 0.16% | 0.0 | 0.008 | 0.16% | 0.011 | 0.2% |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 0.003 | 0.002 | 0.03% | 0.0 | 0.002 | 0.03% | 0.005 | 0.1% |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 0.003 | 0.003 | 0.06% | 0.0 | 0.003 | 0.06% | 0.006 | 0.1% |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 0.003 | 0.001 | 0.01% | 0.0 | 0.001 | 0.01% | 0.004 | 0.1% |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 0.003 | 0.044 | 0.88% | 0.0 | 0.044 | 0.88% | 0.047 | 0.9% |
| RevisedEco-13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 0.003 | 0.000 | 0.01% | 0.0 | 0.000 | 0.01% | 0.003 | 0.1% |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 0.003 | 0.044 | 0.88% | 0.0 | 0.044 | 0.88% | 0.047 | 0.9% |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 0.003 | 0.001 | 0.03% | 0.0 | 0.001 | 0.03% | 0.004 | 0.1% |

**Nitrogen Nutrient Deposition**

| Receptor ID | Receptor Name | Current Load (kg N/ha/year) | Current Load as % of Critical Load | Proposed Development Dry Deposition Flux Nitrogen Nutrient (kg N/ha/year) | Proposed Development PC as % of Critical Load Max | Generators Dry Deposition Flux Nitrogen Nutrient (kg N/ha/year) | Proposed Development + Generators Dry Deposition Flux Nitrogen Nutrient (kg N/ha/year) | Proposed Development + Generators PC as % of Critical Load Max | PEC (kg N/ha/year) | PEC as % of Critical Load Max |
|---|---|---|---|---|---|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 9.9 | 66.0% | 0.004 | 0.03% | 0.001 | 0.005 | 0.03% | 9.905 | 66.0% |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 9.9 | **99.0%** | 0.004 | 0.04% | 0.001 | 0.004 | 0.04% | 9.904 | **99.0%** |
| Eco3 | H4060 - Alpine and Boreal heaths | 9.9 | 66.0% | 0.012 | 0.08% | 0.003 | 0.014 | 0.10% | 9.914 | 66.1% |
| RevisedEco-4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 9.9 | 66.0% | 0.001 | 0.01% | 0.000 | 0.001 | 0.01% | 9.901 | 66.0% |
| Eco5 | H7130 - Blanket Bogs | 9.9 | **99.0%** | 0.026 | 0.26% | 0.013 | 0.038 | 0.38% | 9.938 | **99.4%** |
| Eco6 | H91C0 - Caledonian forest | 14.4 | **96.0%** | 0.003 | 0.02% | 0.001 | 0.004 | 0.03% | 14.404 | **96.0%** |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 8.3 | **83.0%** | 0.002 | 0.02% | 0.000 | 0.003 | 0.03% | 8.303 | **83.0%** |
| Eco8 | H4030 - European Dry heaths | 9.9 | 49.5% | 0.018 | 0.09% | 0.020 | 0.038 | 0.19% | 9.938 | 49.7% |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | 9.9 | 39.6% | 0.004 | 0.02% | 0.001 | 0.004 | 0.02% | 9.904 | 39.6% |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 9.9 | **99.0%** | 0.007 | 0.07% | 0.001 | 0.008 | 0.08% | 9.908 | **99.1%** |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 9.9 | 66.0% | 0.001 | 0.01% | 0.000 | 0.002 | 0.01% | 9.902 | 66.0% |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 9.9 | 66.0% | 0.112 | 0.75% | 0.040 | 0.153 | **1.02%** | 10.053 | 67.0% |
| RevisedEco-13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 9.9 | 66.0% | 0.001 | 0.00% | 0.000 | 0.001 | 0.01% | 9.901 | 66.0% |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 9.9 | 66.0% | 0.112 | 0.75% | 0.040 | 0.153 | **1.02%** | 10.053 | 67.0% |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 9.9 | 49.5% | 0.003 | 0.02% | 0.000 | 0.003 | 0.02% | 9.903 | 49.5% |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 14.4 | **96.0%** | 0.133 | 0.88% | 0.069 | 0.202 | **1.34%** | 14.602 | **97.3%** |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 9.9 | 49.5% | 0.106 | 0.53% | 0.061 | 0.166 | 0.83% | 10.066 | 50.3% |
| NewEco18 | H4060 - Oceanic Montane Bryophyte | 9.9 | 66.0% | 0.005 | 0.03% | 0.001 | 0.005 | 0.03% | 9.905 | 66.0% |
| NewEco19 | H6150 - Snowbed Communities | 9.9 | **99.0%** | 0.006 | 0.06% | 0.001 | 0.007 | 0.07% | 9.907 | **99.1%** |

Maximum

**Bold:** PC >1% or PEC > 70% of long-term benchmark; critical load

**Acid Deposition**

| Receptor ID | Receptor Name | Current Load Nitrogen (keq/ha/year) | Current Load Sulphur (keq/ha/year) | Current Load as % of Critical Load Function | Proposed Development Acid Deposition (N) (keq/ha/year) | Proposed Development Acid Deposition (S) (keq/ha/year) | Proposed Development Acid Deposition (Total) (keq/ha/year) | Proposed Development PC as % of Critical Load Function | Generators Acid Deposition (N) (keq/ha/year) | Generators Acid Deposition (S) (keq/ha/year) | Generators Acid Deposition (Total) (keq/ha/year) | Proposed Development + Generators Acid Deposition (Total) (keq/ha/year) | Proposed Development + Generators PC as % of Critical Load Function) | PEC (keq/ha/year) | PEC as % of Critical Load Function |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | 0.7 | 0.2000 | **166.4%** | 0.0003 | 0.0004 | 0.0007 | 0.14% | 0.0000 | 0.0001 | 0.0002 | 0.0009 | 0.17% | 0.9009 | **166.5%** |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | 0.7 | 0.2000 | 5.0% | 0.0003 | 0.0003 | 0.0006 | 0.01% | 0.0000 | 0.0001 | 0.0002 | 0.0008 | 0.01% | 0.9008 | 5.0% |
| Eco3 | H4060 - Alpine and Boreal heaths | 0.7 | 0.2000 | **166.4%** | 0.0009 | 0.0011 | 0.0020 | 0.37% | 0.0002 | 0.0007 | 0.0008 | 0.0028 | 0.52% | 0.9028 | **166.9%** |
| RevisedEco-4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | 0.7 | 0.2000 | **166.4%** | 0.0001 | 0.0001 | 0.0002 | 0.03% | 0.0000 | 0.0001 | 0.0001 | 0.0003 | 0.05% | 0.9003 | **166.4%** |
| Eco5 | H7130 - Blanket Bogs | 0.7 | 0.2000 | **91.5%** | 0.0019 | 0.0025 | 0.0044 | 0.45% | 0.0009 | 0.0033 | 0.0042 | 0.0086 | 0.87% | 0.9086 | **92.3%** |
| Eco6 | H91C0 - Caledonian forest | 1.0 | 0.3000 | **71.5%** | 0.0002 | 0.0003 | 0.0006 | 0.03% | 0.0001 | 0.0003 | 0.0003 | 0.0009 | 0.05% | 1.3009 | **71.5%** |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | 0.6 | 0.2000 | -* | 0.0002 | 0.0002 | 0.0004 | -* | 0.0000 | 0.0001 | 0.0001 | 0.0005 | -* | 0.8005 | -* |
| Eco8 | H4030 - European Dry heaths | 0.7 | 0.2000 | **104.4%** | 0.0013 | 0.0019 | 0.0032 | 0.37% | 0.0014 | 0.0052 | 0.0066 | 0.0098 | **1.13%** | 0.9098 | **105.5%** |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | 0.7 | 0.2000 | **166.4%** | 0.0005 | 0.0007 | 0.0012 | 0.22% | 0.0001 | 0.0003 | 0.0004 | 0.0016 | 0.30% | 0.9016 | **166.7%** |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | 0.7 | 0.2000 | **166.4%** | 0.0001 | 0.0001 | 0.0002 | 0.04% | 0.0000 | 0.0001 | 0.0001 | 0.0003 | 0.06% | 0.9003 | **166.4%** |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | 0.7 | 0.2000 | **166.4%** | 0.0080 | 0.0099 | 0.0179 | **3.32%** | 0.0029 | 0.0106 | 0.0135 | 0.0315 | **5.82%** | 0.9315 | **172.2%** |
| RevisedEco-13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | 0.7 | 0.2000 | **166.4%** | 0.0000 | 0.0001 | 0.0001 | 0.02% | 0.0000 | 0.0001 | 0.0001 | 0.0002 | 0.04% | 0.9002 | **166.4%** |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | 0.7 | 0.2000 | **153.6%** | 0.0080 | 0.0099 | 0.0179 | **3.06%** | 0.0029 | 0.0106 | 0.0135 | 0.0315 | **5.37%** | 0.9315 | **159.0%** |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | 0.7 | 0.2000 | **166.4%** | 0.0002 | 0.0003 | 0.0005 | 0.09% | 0.0000 | 0.0001 | 0.0001 | 0.0006 | 0.12% | 0.9006 | **166.5%** |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | 1.0 | 0.3000 | **71.5%** | 0.0095 | 0.0113 | 0.0208 | **1.14%** | 0.0049 | 0.0182 | 0.0231 | 0.0439 | **2.41%** | 1.3439 | **73.9%** |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | 0.7 | 0.2000 | **104.4%** | 0.0075 | 0.0094 | 0.0170 | **1.97%** | 0.0043 | 0.0160 | 0.0203 | 0.0373 | **4.33%** | 0.9373 | **108.7%** |
| NewEco18 | H4060 - Oceanic Montane Bryophyte | 0.7 | 0.2000 | **166.4%** | 0.0003 | 0.0004 | 0.0008 | 0.15% | 0.0000 | 0.0001 | 0.0002 | 0.0010 | 0.18% | 0.9010 | **166.5%** |
| NewEco19 | H6150 - Snowbed Communities | 0.7 | 0.2000 | **166.4%** | 0.0004 | 0.0006 | 0.0010 | 0.19% | 0.0001 | 0.0002 | 0.0002 | 0.0013 | 0.23% | 0.9013 | **166.6%** |

Maximum

**Bold:** PC >1% or PEC > 70% of long-term benchmark; critical load

Note: *No critical load information available

**Likely Significance of Effects at Ecological Receptors - Long-term**

| Receptor ID | Receptor Name | Long-term | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PC < 1% long-term benchmark; critical level and load | | | PC > 1% long-term benchmark; critical level and/or load | Statement of likely Significance | PEC < 70% long-term benchmark; critical level and load | | | > 70% long-term benchmark; critical level and/or load | Statement of likely Significance |
| | | Critical Level (NOx) | Critical Load (Nitrogen Nutrient) | Critical Load (Acidification) | | | Critical Level (NOx) | Critical Load (Nitrogen Nutrient) | Critical Load (Acidification) | | |
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |
| Eco3 | H4060 - Alpine and Boreal heaths | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |
| RevisedEco-4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |
| Eco5 | H7130 - Blanket Bogs | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |
| Eco6 | H91C0 - Caledonian forest | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | YES | YES | - | - | No likely significant effec | | | | | No likely significant effect |
| Eco8 | H4030 - European Dry heaths | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | YES | YES | - | - | No likely significant effec | | | | | No likely significant effect |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | NO | YES | NO | YES | PEC to be considered | YES | YES | NO | YES | Likely significant effect |
| RevisedEco-13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | NO | YES | NO | YES | PEC to be considered | YES | YES | NO | YES | Likely significant effect |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | NO | YES | NO | YES | PEC to be considered | YES | NO | NO | YES | Likely significant effect |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | NO | YES | NO | YES | PEC to be considered | YES | YES | NO | YES | Likely significant effect |
| NewEco18 | H4060 - Oceanic Montane Bryophyte | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |
| NewEco19 | H6150 - Snowbed Communities | YES | YES | YES | NO | No likely significant effect | | | | | No likely significant effect |

**Likely Significance of Effects at Ecological Receptors -Short-term**

| Receptor ID | Receptor Name | Short-term | |
|---|---|---|---|
| | | < 10% short-term benchmark; critical level (HF) | > 10% short-term benchmark; critical level (HF) |
| Eco1 | H8110 - Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) | YES | No likely significant effect |
| Eco2 | H6170 - Alpine and subalpine calcareous grasslands | YES | No likely significant effect |
| Eco3 | H4060 - Alpine and Boreal heaths | YES | No likely significant effect |
| RevisedEco-4 | H8120 - Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) | YES | No likely significant effect |
| Eco5 | H7130 - Blanket Bogs | YES | No likely significant effect |
| Eco6 | H91C0 - Caledonian forest | YES | No likely significant effect |
| Eco7 | H3130 - Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea | YES | No likely significant effect |
| Eco8 | H4030 - European Dry heaths | YES | No likely significant effect |
| Eco9 | H7240 - Alpine pioneer formations of the Caricion bicoloris-atrofuscae | YES | No likely significant effect |
| Eco10 | H6150 - Siliceous alpine and boreal grasslands | YES | No likely significant effect |
| Eco11 | H4080 - Sub-Arctic Salix spp scrub | YES | No likely significant effect |
| Eco12 | H8220 - Siliceous rocky slopes with chasmophytic vegetation | YES | No likely significant effect |
| RevisedEco-13 | H8210 - Calcareous rocky slopes with chasmophytic vegetation | YES | No likely significant effect |
| Eco14 | H6230 - Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe) | YES | No likely significant effect |
| Eco15 | H6430 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels | YES | No likely significant effect |
| Eco16 | H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles | YES | No likely significant effect |
| Eco17 | H4010 - Northern Atlantic wet heaths with Erica tetralix | YES | No likely significant effect |
| NewEco18 | H4060 - Oceanic Montane Bryophyte | YES | No likely significant effect |
| NewEco19 | H6150 - Snowbed Communities | YES | No likely significant effect |

# Abnormal Operation Assessment Results

# Annex 6 – Construction Dust Impact Assessment and Good Practice & Site-Specific Mitigation Measures

## Construction Phase Dust Risk Assessment

The dust risk assessment below has been carried out using the criteria in the IAQM Guidance on the assessment of dust from demolition and construction (IAQM, 2014) to determine the impact magnitude and sensitivity of the area around the construction activities associated with the Proposed Development. This assessment should be read with reference to **Drawing 2**.

The focus area for the construction phase dust risk assessment is the 350 m buffer zone around the Proposed Development site boundary.

There are no designated ecological receptors with specific sensitivity to dust within 50 m of any construction activities. The potential effects of construction dust on ecological sites are therefore not considered further.

Assessment covers the four phases of Demolition, Earthworks, Construction and Trackout (as relevant).

In a conservative approach it has been assumed that (if required) Demolition, Earthworks and construction activities would take place across the area encompassed by the site boundary. In reality it is highly likely that construction phase activities will be limited to the location of the Proposed Development.

### *Demolition*

There are no demolition activities proposed as part of the Proposed Development construction phase and therefore no impacts.

### *Earthworks*

Site clearance works, the digging of trenches for foundations and utilities and temporary stockpiling of material represent the principal activities that may generate emissions of particulate material. The potential for stockpiles of materials to generate dust depends on the nature of the material. The grounds of the site includes a mix of soft, friable earth and hardcore concrete.

#### Dust Emission Magnitude

- The total area of earthworks is estimated to be > 10,000 $m^2$. In accordance with the IAQM guidance, the potential dust emission magnitude for earthworks is assessed as **Large**.

#### Sensitivity and Risk of Impacts

- There are >1 medium sensitivity receptors and >100 high sensitivity receptors within 50 m and 350 m of the site boundary respectively. Sensitivity of the area to dust soiling due to earthworks is therefore assessed as **Low**.

  The large magnitude with low sensitivity results in the risk of dust soiling impacts due to earthworks being assessed as **Low.**

- Annual mean $PM_{10}$ background concentrations within 350 m of the site boundary are below the IAQM criterion of 14 µg/$m^3$. Sensitivity of residents to human health impacts due to earthworks is therefore assessed as **Low**.

  The large magnitude with low sensitivity results in the risk of dust impacts on human health due to earthworks being assessed as **Low**.

*Construction Phase*

Dust emissions during construction can give rise to elevated dust deposition and $PM_{10}$ concentrations. These are generally short-lived changes over a few hours or days, which occur over a limited time period of several weeks or months and are usually in defined phases.

### Dust Emission Magnitude

- The total new building volume associated with the Proposed Development is estimated to be 25,000 and 100,000 $m^3$. The potential dust emission magnitude for construction is therefore assessed as **Medium**.

### Sensitivity and Risk of Impacts

- There are >1 medium sensitivity receptor and >100 high sensitivity receptors within 50 m and 350 m of the site boundary respectively. Sensitivity of the area to dust soiling due to construction is therefore assessed as **Low**.

  The medium magnitude with low sensitivity results in the risk of dust soiling impacts due to construction being assessed as **Low**.

- Annual mean $PM_{10}$ background concentrations within 350 m of the site boundary are below the IAQM criterion of 14 µg/$m^3$. Sensitivity of residents to human health impacts due to construction is therefore assessed as **Low**.

  The medium magnitude with the low sensitivity results in the risk of dust impacts on human health due to construction being assessed as **Low.**

*Track-out Material*

Without site-specific mitigation, the IAQM guidance states that track-out can occur from roads up to 200m from the site exit of a medium construction site. The impact declines with distance from the roads and therefore, it is only necessary to consider track-out up to 50m from the edge of the road.

For the purpose of this assessment, it has been assumed that construction phase traffic would travel through Fort William on the A82 south of the site access.

### Dust Emission Magnitude

- It is anticipated that peak daily HDV traffic during construction will not exceed 50. The potential dust emission magnitude for track-out is therefore assessed as **Medium**.

### Sensitivity and Risk of Impacts

- There are >1 medium sensitivity receptor within 50 m of the track-out route. Sensitivity of the area to dust soiling due to track-out is therefore assessed as **Low**.

  The medium magnitude with low sensitivity results in the risk of dust soiling impacts due to track-out being assessed as **Low**.

- Annual mean $PM_{10}$ background concentrations within 50 m of the site boundary are below the IAQM criterion of 14 µg/$m^3$. Sensitivity of residents to human health impacts due to track-out is therefore assessed as **Low**.

  The medium magnitude with the low sensitivity results in the risk of dust impacts on human health due to track-out being assessed as **Low.**

*Summary of Results*

### Overall Dust Emission Magnitude

The overall dust emission magnitude is summarised in **Table 1**.

*Table 1 - Overall Dust Emission Magnitude*

| Activities | Dust Emission Magnitude |
|---|---|
| Demolition | N/A |
| Earthworks | Large |
| Construction | Medium |
| Track-out | Medium |

### Overall Sensitivity of the Surrounding Area

**Table 2** below summarises the sensitivity of the surrounding area.

*Table 2 - Overall Sensitivity of the Surrounding Area*

| Potential Impact | Sensitivity of the Surrounding Area | | | |
|---|---|---|---|---|
| | Demolition | Earthworks | Construction | Track-out |
| Dust Soiling | N/A | Low | Low | Low |
| Human Health | N/A | Low | Low | Low |

### Overall Risk of Dust Impacts

**Table 3** below summarises the dust risk to define site-specific mitigation.

*Table 3 – Summary of Dust Risk to Define Site-Specific Mitigation*

| Potential Impact | Risk of Dust Impact | | | |
|---|---|---|---|---|
| | Demolition | Earthworks | Construction | Track-out |
| Dust Soiling | N/A | Low | Low | Low |
| Human Health | N/A | Low | Low | Low |

### Conclusion

The construction dust risk assessment detailed in above concludes that without specific site mitigation there are human receptors with medium to high sensitivities subject to a low risk of dust soiling and low risk to human health during the earthworks, construction and track-out phases.

Experience in the UK is that good construction management is capable of mitigating the impact of fugitive emissions of particulate matter effectively. In all but the most exceptional circumstances, risk of dust impacts at receptors can be controlled to ensure that they are negligible or low at worst.

The good practice and site-specific mitigation measures to be implemented during construction are detailed below and will be included in a Construction Environmental Management Plan (CEMP).

Risk of dust impacts associated with the Proposed Development construction activities will therefore be negligible and therefore **not significant** once good practice and site-specific mitigation measures are implemented.

## Good Practice and Site-Specific Mitigation Measures

Outlined below are recommendations for mitigation measures to be included in a CEMP, based on the overall risk of dust impacts as assessed above. These are measures that are listed as Desirable or Highly Recommended in the IAQM guidance (IAQM, 2014).

***Proposed mitigation for communications:***

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary; and
- Display the head or regional office contact information.

***Proposed mitigation for dust management:***

- Develop and implement a Dust Management Plan (DMP). This may include measures to control other emissions, approved by the Local Authority.

***Proposed mitigation for site management:***

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the local authority when asked; and
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook.

***Proposed mitigation for monitoring:***

- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Local Authority when asked;
- Increase frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions; and
- Agree dust deposition, dust flux, or real-time $PM_{10}$ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences.

***Proposed mitigation for preparing and maintaining the site:***

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible;

- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site; and
- Cover, seed or fence stockpiles to prevent wind whipping.

***Proposed mitigation for site operations:***

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes and conveyors and covered skips;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event, using wet cleaning methods.

***Proposed mitigation for waste management:***

- Avoid bonfires and burning of waste materials.

***Operating vehicle/machinery and sustainable travel:***

- Ensure all vehicles switch off engines when stationary;
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable;
- Impose and signpost a maximum speed limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas; and
- Issue all suppliers and contractors with delivery routes and access times/restrictions.

***Proposed mitigation specific to earthworks:***

- Re-vegetate earthworks and exposed areas/soils stockpiles to stabilise surfaces as soon as practicable;
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable; and
- Only remove the cover in small areas during work and not all at once.

***Proposed mitigation specific to construction:***

- Avoid scabbling (roughening of concrete surfaces) if possible;
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate control measures are in place;
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.

***Proposed mitigation specific to track-out:***

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. this may require a sweeper being continuously in use;
- Avoid dry sweeping of large areas;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; and
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- Record all inspections of haul routes and any subsequent action in a site logbook; and
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

# Appendix 12.1 Assumptions used to calculate GHG Values

# APPENDIX 12.1 ASSUMPTIONS USED TO CALCULATE GHG VALUES

| Parameter | Value | Unit |
|---|---|---|
| **Construction GHG estimates based on the following:** | | |
| Concrete slab footprint | 12,260 | $m^2$ |
| Slab thickness | 0.25 | m |
| Wall area | 9400 | $m^2$ |
| Roof area | 8750 | $m^2$ |
| Cladding steel profile | 0.0005 | m |
| Cladding insulation profile | 0.11 (wall) 0.08 (roof) | m |
| Concrete mass | 7050 | t |
| Structural steel mass based on 50kg/$m^2$ | 620 | 1 |
| Cladding steel mass | 71 | 1 |
| Insulation mass | 4 | 1 |
| Concrete carbon factor | 0.138 | kgCO2e/kg |
| Structural steel carbon factor | 2.46 | kgCO2e/kg |
| Cladding steel insulation factor | 1.55 | kgCO2e/kg |
| Insulation carbon Factor | 4.26 | kgCO2e/kg |

| Parameter | Value | Unit |
|---|---|---|
| **Operational GHG estimates based on the following:** | | |
| Assumed non zero rated grid electricity imported | 16 | % |
| Year 1 grid factor | 0.127 | $gCO_2e/kWh$ |
| Year 2 grid factor | 0.119 | $gCO_2e/kWh$ |
| Year 3 grid factor | 0.128 | $gCO_2e/kWh$ |
| Year 1-3 SNG factor | 0.2303 | $gCO_2e/kWh$ |
| Year 1 electricity usage | 11.1 | GWh |
| Year 2 electricity usage | 14.8 | GWh |
| Year 3 electricity usage | 18.5 | GWh |
| Year 1 gas usage | 49.8 | GWh |
| Year 2 gas usage | 66.4 | GWh |
| Year 3 gas usage | 83 | GWh |
| Year 1 production | 60,000 | t |
| Year 2 production | 80,000 | t |
| Year 3 production | 100,000 | t |

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