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Appendix 1.1 Environmental Impact Assessment Record of Determination

A83 Rest and Be Thankful

Contents

Project Details

This document presents the detailed Environmental Impact Assessment Screening and associated Record Of Determination under Section 55A(1) to (4) of The Roads (Scotland) Act 1984 (as amended by The Roads (Scotland) Act 1984 (Environmental Impact Assessment) Regulations 2017).

Description

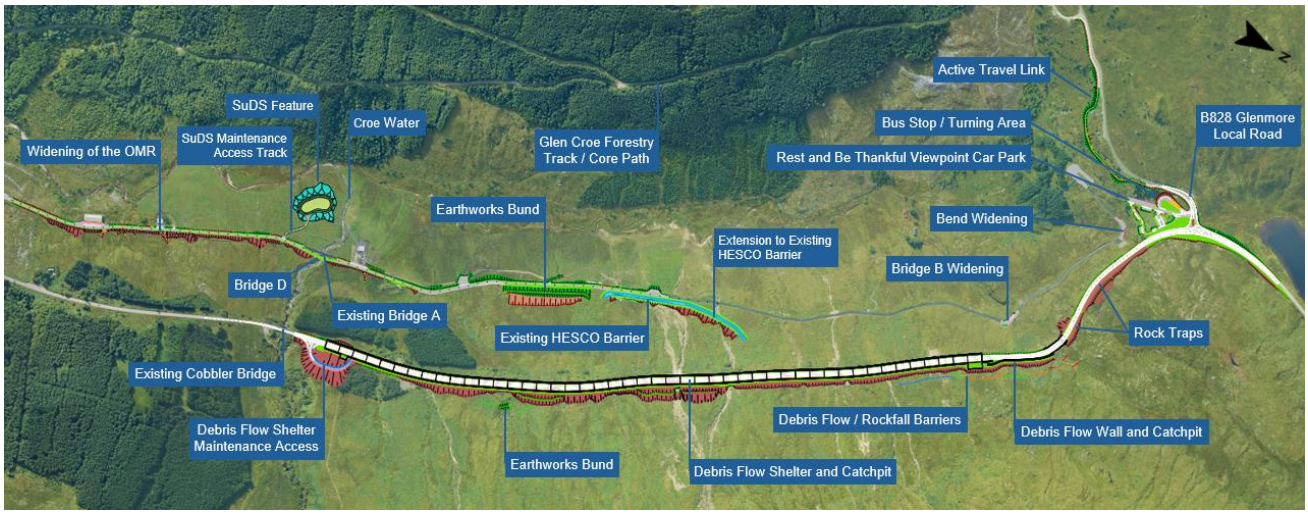
The A83 within Glen Croe (hereafter, referred to as the 'Proposed Scheme') is located in Glen Croe, at the highest point of the A83 trunk road (A83), approximately 265m Above Ordnance Datum (AOD).

The A83 is one of two east-west strategic trunk roads that connects Argyll and Bute to the central belt of Scotland, making it a vital link in the region's transportation infrastructure. The adjacent hillsides have a history of instability resulting in landslides and debris flow hazards, which has increased in recent years due to the frequency of heavy, intense periods of rainfall, leading to frequent road closures and resultant diversion. The Proposed Scheme has been proposed by Transport Scotland as a long-term, resilient, and sustainable solution to the problem of landslides in Glen Croe. The Proposed Scheme location as it passes through Glen Croe is shown in Plate 1, below.

Location

Plate 1 – Proposed Scheme Location (red inset box) & A83 in Glen Croe

Plate 2 – Aerial view of Glen Croe including an overview of the Proposed Scheme layout



The Proposed Scheme (Plate 2) extends for a length of 2.25km, predominately online of the existing A83 and can be split into five sections:

- a southern tie-in to the existing A83 north of the existing bridge (Cobbler Bridge)
- a debris flow shelter and catch pit over a length of 1.35km
- a debris flow protection wall and catch pit extending c145m from the debris flow shelter
- a northern tie-in to the existing A83 and
- a B828 Glen Mhor local road junction and Rest and Be Thankful Viewpoint car park and bus stop / turning area.

In addition to the permanent solution to address the landslide and debris flow risk to the A83, improvements to the Old Military Road (OMR) are proposed to deliver a safe and resilient diversion route to use while the A83 is closed while the long-term solution is delivered.

Following large landslide events in August and September 2020, Transport Scotland commissioned a Strategic Environmental Assessment (SEA) and Preliminary Engineering Services (PES) to investigate a solution to the ongoing issues on the A83 Rest and Be Thankful.

The PES and SEA together were considered equivalent to a Design Manual for Roads and Bridges (DMRB) Stage 1 Assessment, and the outcome was a recommendation of a corridor through Glen Croe as the preferred corridor. A DMRB Stage 2 Assessment was then undertaken to develop and assess route alignment options and to identify a preferred alignment for the Proposed Scheme.

In addition to the above assessment for a permanent solution, a Medium term Strategy Options Assessment Report was also completed to outline option development and assessment process for a safe and resilient diversion route when the A83 is closed.

Description of local environment

The sections below provide a brief description of the local environment (study areas referred to vary for each environmental discipline under consideration) of the Proposed Scheme.

Air quality

A review of baseline conditions for the Proposed Scheme has indicated that there are no Air Quality Management Areas (AQMA) likely to be affected and concentrations of relevant pollutants are well below relevant National Air Quality Strategy (AQS) objectives and European Union (EU) Limit Values in the study area.

Some sensitive receptors, both human health and ecological, are located within the Air Quality study area, with the closet designated site, the Beinn an Lochain Site of Special Scientific Interest (SSSI), located immediately west of the northern extent of the Proposed Scheme.

Cultural heritage

There are 67 heritage assets identified within the study area of the Proposed Scheme. These include one Category C listed building, the Rest and Be Thankful stone. Twenty-nine of the assets were identified from the Historic Environment Record (HER), seven through analysis of historic mapping, nine previously unrecorded assets were identified during the walkover surveys and 22 assets were identified from previous archaeological reports.

The Proposed Scheme crosses an undulating landscape which consists of low intensity agriculture, grazing, moorland and dispersed settlement. The earliest recorded site comprises the remains of settlement and / or funerary activity which likely date to the Iron Age or later (Canmore ID 150772). The recorded features include two hut circles, field systems, and two longhouses or burial cairns.

There is also evidence of post-medieval agricultural activity, with sites such as a settlement at High Glen Croe (Canmore ID 150778, WoSAS ID 44648) and Mid Glen Croe (Canmore ID 150772, WoSAS ID 44649), shielings (WoSAS ID 68820) and a structure of uncertain date (WoSAS ID 68819). Quarries and walls are also recorded.

There are a number of assets associated with the OMR as well as the road itself (Canmore ID 126550), referred to as Dumbarton – Tarbet – Inverary Road, associated remains include the Category C listed ‘Rest and Be Thankful’ Stone (LB18816) and bridges.

Evidence of World War II military remains have also been identified, concentrated around the summit of the OMR. These assets relate to the Home Guard Stop Defence post (Canmore ID 293674) and include Nissen huts, structural remains of buildings, mortar mounting locations and evidence of pill boxes. The OMR became a popular venue for ‘hill-climb’ motorsport in the early 1900s.

Landscape and visual effects

The Proposed Scheme is located within the Argyll Forest Park, within the Loch Lomond and The Trossachs National Park (LLTNP) (Northern Area) and is adjacent to the North Argyll Area of Panoramic Quality. Therefore, sensitive landscape receptors are associated with the Proposed Scheme, including the Special Landscape Qualities of the LTTNP.

The Proposed Scheme is centred on Glen Croe within the 'Arrochar Alps' to the west of Loch Lomond. The area is drained by the Croe Water and the Kinglas Water and numerous tributaries. Loch Restil is a notable feature located on the northwestern edge of the Proposed Scheme.

The Landscape Character Type (LCT) of the immediate area is the 'Upland Glens – Loch Lomond and the Trossachs' (LCT 252) (Upland Glens – Loch Lomond and the Trossachs), consisting of narrow glen floor enclosed by steep hill slopes. The mountains surrounding the Proposed Scheme are part of the 'Highland Summits' LCT (LCT 251) (Highland Summits), consisting of high mountains generally lying above 800m.

At the northern extent of the Proposed Scheme there is a viewpoint and car park known as the 'Rest and Be Thankful' viewpoint. This offers a view south across Glen Croe and is the site of a Category C listed structure – 'Rest and Be Thankful' Stone.

There are two residential visual receptor properties within a 3km radius of the Proposed Scheme from which views of the Proposed Scheme may be afforded. There are recreational receptors associated with users of Core Paths, users of the Rest and Be Thankful Car Park viewpoint, users of the B828 Glen Mhor local road, users of the A83 Argyll Coastal Route, users of the OMR, and hikers on hillwalking trails.

Biodiversity

One designated site is located within the Proposed Scheme boundary, Beinn an Lochain Site of Special Scientific Interest (SSSI) which is located partially within the Proposed Scheme boundary. Beinn an Lochain SSSI supports an extensive boulder field which supports a range of vegetation habitats.

Within the wider area, the Glen Etive and Glen Fyne Special Protection Area (SPA) is located 1.8km to the north of the Proposed Scheme and Loch Lomond Woods Special Area of Conservation (SAC) is located approximately 3.1km to the east.

There are no non-statutory designated sites, or local wildlife sites, present within 1km of the Proposed Scheme.

Geology and soils

The Proposed Scheme is underlain by bedrock geology of the Beinn Bheula Schist Formation (BGS GeoIndex). Igneous intrusions within the South of Scotland Granitic

suite are noted between Beinn Luibhean and The Cobbler and extend down to the existing A83. Two faults cross the Proposed Scheme just south of the Rest and Be Thankful car park, both trending northeast to southwest.

The BGS Geoindex indicates that the majority of the site is underlain by Glacial Till described as a mix of clay, sand, gravel and boulders. Along the Croe Water the till is overlain by River Terrace Deposits and Alluvium, both of which are described as a mix of clay, silt, sand and gravel. To the north of the Proposed Scheme a small area of Hummocky (Moundy) Glacial Deposits is recorded and described as diamicton, sand and gravel.

The Cobbler (Ben Arthur) Geological Conservation Review (GCR) site is situated to the east and north-east of the A83, with the boundary of the GCR situated approximately 580m to the north at its closest point. The GCR is the only geological designated site, including SSSIs, in the vicinity of the Proposed Scheme.

The Proposed Scheme is entirely underlain by peaty podzol soils, which are described as peaty gleyed podzols with peaty gleys and dystrophic semi-confined peat.

The Proposed Scheme is underlain by poor quality soils (land capability classes 6 and 7) where the soils are of low quality and therefore considered to be of low sensitivity (James Hutton institute (2024). 1:250,000 Land Capability for Agriculture (LCA) map).

Peat was identified during the 2022 ground investigation at 37 locations within Glen Croe between 0.15m and 1.5m in thickness as reported in the Raeburn (2023) Access to Argyll & Bute (A83) Report on Preliminary Ground Investigation. Additionally, the Carbon and Peat 2016 map shows that the Proposed Scheme is underlain by Class 3 and 4 Peat.

The BGS Aquifer productivity map indicates that the River Terrace Deposits and Alluvium, which is located along the Croe Water, could have the potential to form a low productivity superficial aquifer if they predominantly comprise of silts and clays. However, if dominated by granular sands and gravels the deposits have the potential to represent high productivity aquifers with yields of 1l/s to >10l/s. The Hummocky (Moundy) Glacial Deposits and Till across the rest of the Proposed Scheme have both been mapped as insignificant aquifers.

The BGS Hydrogeology map for Scotland shows that the Beinn Bheula Schist bedrock and the unnamed igneous intrusion are categorised as a 2C low productivity aquifer. In addition, the BGS Aquifer Productivity Report suggests the bedrock is expected to have low aquifer productivity yields (0.1l/s – 1.0l/s).

The Scotland's Environment map has identified the bedrock aquifer at the site as the Cowl and Lomond Bedrock aquifer (ID: 150689) with an overall Water Framework Directive classification of good.

The Dochartaigh. B É Ó, Doce. D D, Rutter. H K and MacDonald. A M (2011) BGS groundwater vulnerability report indicates that the groundwater within the bedrock underlying the Proposed Scheme exhibits vulnerability Classes 4 and 5. Class 4 indicates that groundwater is vulnerable to pollutants which are not readily absorbed

or transformed, whereas Class 5 is where groundwater is vulnerable to most pollutants, with rapid impact in many scenarios.

The majority of the Proposed Scheme lies within the Cowl and Lomond Groundwater WFD body (ID 150689), with the groundwater body having an overall status of Good in 2020 (Scottish Environment Protection Agency (SEPA) Water Classification Hub (2015). SEPA Water Classification Hub). The northwest corner of the Proposed Scheme falls within the Oban and Kintyre Groundwater WFD body (ID 150698), which also had an overall classification of Good in 2020 (SEPA Water Classification Hub (2015)).

Groundwater monitoring was carried out as part of the 2022 ground investigation carried out by Raeburn (2023) Access to Argyll & Bute (A83) Report on Preliminary Ground Investigation with shallow groundwater was recorded in both the bedrock and superficial aquifers at depths between 0.2m and 11.1m bgl.

Historical ground investigation data from the BGS showed that groundwater levels in the area are highly variable. Three rounds of groundwater monitoring were carried out between February and March 2009, varying between 3.26m bgl and 9.10m bgl with groundwater levels recorded in February generally higher than in March.

Information provided by SEPA indicates no groundwater dependant public or private water supplies have been identified within the study area.

Areas considered suitable to support GWDTE have been identified within proximity to the Proposed Scheme. However, local characteristics indicate that communities with groundwater dependency are likely to be very limited, with the wet soil conditions on the steep slopes and valley floor of the study area considered to be primarily due to direct precipitation and surface water runoff contribution. A number of GWDTE at the northern extent fall within the Beinn an Lochain SSSI.

One disused quarry and two potential gravel pits are located within 250m of the Proposed Scheme as reported in the Jacobs AECOM (2022), Access to Argyll and Bute (A83) Preliminary Sources Study Report. The disused quarries are not visible on more recent maps and it is therefore likely that they have been infilled. No other potentially contaminative land uses were identified. The potential for contamination associated with made ground from road construction and localised spillages has been identified for the Proposed Scheme.

Material assets and waste

Preliminary design estimates of the volume of imported materials that are likely to be required for the construction of the Proposed Scheme are presented in Table 1. These estimates are considered appropriate for the level of detail expected at DMRB Stage 3 Scoping.

Table 1 – Estimated quantity (tonnes) of materials to be imported for the Proposed Scheme

Earthworks (Fill)	Concrete	Steel	Pavement	TOTAL

843	203,647	22,862	10,200	237,552

Overall, the current waste generation is deemed minimal within the Proposed Scheme boundary. The operation and maintenance of assets within the boundary generates small volumes of waste from routine maintenance of the existing road infrastructure, such as replacement of signage and reflective road studs (cats' eyes), some of which is anticipated to be sent to landfill. In addition, there are ongoing works for removal of debris, due to landslides and rock falls, from the catch-pits and the road network. The ultimate management and destination of the debris is known and managed by BEAR Scotland on behalf of Transport Scotland.

Noise and vibration

Within the operational study area for noise there are a small number of noise and vibration sensitive receptors including residential properties and walking, cycling and horse-riding routes.

Daily traffic on the A83 is understood to be around 4,500 vehicles per day, of which approximately 10% are Heavy Goods Vehicles (HGV). Current traffic levels on the OMR are negligible in terms of noise generation.

Near to the A83, road traffic noise will be the dominant noise source in Glen Croe. At increasing distances away from the trunk road, sounds from natural sources will become more present.

Population and human health

The following sensitive receptors have been identified within the vicinity of the Proposed Scheme.

- Private Property and Housing – two private residences, both located approximately 270m from the Proposed Scheme;
- Community Land and Assets – including the Rest and Be Thankful car park / viewpoint and bus stop / turning area;
- Agricultural Land Holdings – fields of improved and semi-improved pasture, agricultural outbuildings, small areas of forestry plantation and rough grazing; and
- Walkers, Cyclists and Horse Riders (WCH) – a number of walking routes in the area including the LLTNP Core Path (running immediately adjacent and south of the Croe Water) and a Hill Walking Route (immediately adjacent and north of the Croe Water) where they meet the A83. There are also paths leading to Beinn Luibhean and a local path.

While the immediate locale of the Proposed Scheme is rural with a very low population, the A83 does play a vital role in linking wider communities to the health, social, educational, recreational and economic facilities and opportunities. Communities in Cowal, Dunoon, Kintyre and Mid Argyll rely on the A83 as their main road access to Glasgow and Central Scotland without needing to rely on ferries.

Road drainage and the water environment

There are a small number of private water supplies and a licenced water abstraction identified within 1 km of the Proposed Scheme.

The Croe Water is the main watercourse in the vicinity of the Proposed Scheme, with a catchment draining the surrounding steep mountainous area, including the south and west facing slopes of Beinn Ime, Beinn Luibhean, Ben Arthur, Ben Donich and The Brack. The Croe Water is the watercourse of high importance crossed by the Proposed Scheme. All other watercourses crossed by the Proposed Scheme are tributaries of the Croe Water that drain the steep valley sides – these are of medium importance.

Loch Restil (a standing freshwater waterbody) is a receptor of a high importance, and is located within the Beinn an Lochain SSSI designated site and adjacent to the northern extent of the Proposed Scheme.

Effects on Climate

The UK's total Greenhouse Gas (GHG) emissions for 2023 UK greenhouse gas emissions, provisional figures (last reported year) were 384.2 $MtCO_2e$, 5.4% lower than the 2022 UK Provisional Greenhouse Gas Emissions. The transport sector was the largest emitting sector of UK GHGs in 2022, emitting 29.1% of all emissions.

The Climate Change (Scotland) Act (Climate Change (Emissions Reduction Targets) (Scotland) Act 2019) sets out targets of reducing greenhouse gas emissions by 100% before 2045.

Climate Vulnerability

The Proposed Scheme is situated within the Argyll River Basin. The climate in the Argyll River Basin is one of relatively mild winters and warm summers. The data from the Dunstaffnage met station shows that over the period 1930 to 2022 both the average daily summer maximum temperatures and average daily winter maximum temperatures have been increasing. The Transport Scotland Rest and Be Thankful climate station suggests similar trends to the Dunstaffnage met station over the available years of data (2018-2022), although actual temperatures are approximately 3°C cooler. Long term average daily rainfall for each month (1981-2010) in the Argyll River Basin is in line with the maximum for the UK.

In the study area, effects from extreme weather have been recorded. Winter et al., (2019) discusses the economic effects of landslides and floods on road networks using the A83 as a case study. It highlights the regular occurrence of landslide events associated with monthly average rainfall substantially in excess of the average in Scotland.

Accidents and Disasters

The following factors have been assessed to establish a baseline for major accidents and disasters for the Proposed Scheme:

- features external to the Proposed Scheme that contribute a potential source of hazard to the Proposed Scheme
- sensitive receptors at risk of significant effect and
- current (without the Proposed Scheme) major event risks for the existing locality.

Baseline features which were identified and considered most significant to the Proposed Scheme are as follows:

- Beinn Luibhean – source of landslide risk, adjacent to the east of the A83
- The Cobbler – source of landslide risk, adjacent to the east of the A83
- Croe Water – source and potential receptor of flooding, which passes under the A83 and
- OMR – potential receptor to landslide risk and flooding, within the Proposed Scheme.

Policies and plans

This Record of Determination has been undertaken in accordance with all relevant regulations, guidance, policies and plans, notably including the Environment and Sustainability Discipline of the Design Manual for Roads and Bridges (Design Manual for Roads and Bridges (DMRB)) and Transport Scotland's Environmental Impact Assessment Guidance (Guidance - Environmental Impact Assessments for road projects (transport.gov.scot)).

Description of main environmental impacts and proposed mitigation

The following section provides an overview of the main anticipated environmental impacts based on the outcome of the DMRB Stage 2 assessment.

Air quality

Potential construction impacts include:

- adverse effects on sensitive receptors from dust generation and
- changes in traffic flows and speeds during construction from temporary traffic management measures and / or additional vehicles travelling to and from the construction site.

Any adverse air quality effects due to construction would be temporary and will be minimised by the application of appropriate mitigation measures, such as damping down of surfaces prior to their being worked and storing dusty materials away from site boundaries and in appropriate containment (e.g. sheeting, sacks, barrels etc.).

During operation, it is considered unlikely that impacts would have a significant effect on local air quality as no changes in speed, composition or volume of traffic on the A83 is anticipated. Additionally, no material change in road alignment is anticipated.

Cultural heritage

Potential impacts during the construction and operation:

- permanent loss, truncation and/or disturbance to known or previously unrecorded heritage assets due to construction activities (such as road construction activity, topsoil stripping, access roads, construction compounds etc.) as well as landscaping and planting (where applicable)
- temporary impacts to the setting of heritage assets during construction (e.g. from noise or traffic movement) and
- permanent changes to the setting of heritage assets within the vicinity of the Proposed Scheme.

Mitigation will be inbuilt in the design of the Proposed Scheme to minimise impacts to heritage assets and their setting as far as possible.

The mitigation strategy identified for the Proposed Scheme will be devised in consultation with the West of Scotland Archaeology Service (WoSAS) and, where appropriate, Historic Environment Scotland.

Landscape and visual effects

Potential impacts to the landscape and visual amenity of the area surrounding the Proposed Scheme include changes to the character of the landscape within Glen Croe and a loss of existing landscape features. There is the potential for significant temporary and permanent impacts to occur to landscape and visual receptors. Potential impacts during construction include:

- vegetation clearance to facilitate construction during the initial mobilisation phase
- activity associated with the construction of the Proposed Scheme, for example the design flow shelter
- changes to embankments and / or rock outcrops
- disturbance caused by blasting related to rock cuts being reformed
- temporary spoil heaps, material storage, and site compounds throughout the construction phase
- lighting associated with working in winter hours of darkness
- plant, machinery and traffic management in view
- temporary realignments and diversions and traffic management resulting in a broader footprint
- temporary stabilisation measures for protection of workforce and
- formation of drainage features.

Potential operational effects include but are not limited to:

- alteration of the local landscape character due to loss of existing landscape elements such as established woodland, changes to rock faces due to rock cuts and changes to existing views
- changed appearance of landform due to new earthworks such as embankments and cuttings
- changed appearance of rock faces due to new rock cuts
- the addition of the debris flow shelter and maintenance access, retaining walls, and bridge structures across rivers and small watercourses, changes to the Rest and Be Thankful car park and addition of the new non-motorised users link
- introduction of new infrastructure elements such as signage, and attenuation pond and associated access track
- the introduction of lighting associated with the debris flow shelter to previously unlit areas and
- the ‘opening up’ of the views due to vegetation removal.

Development of the design will be an iterative process which will include regular design meetings between the structures team and the landscape team to consider embedded mitigation at the early stages of design. Embedded mitigation for features / measures that may potentially lead to significant effects could include the Debris

Flow Shelter being designed to include a green roof and bund slope gradients designed to be varied, and to make the SuDS features as natural as possible.

Biodiversity

There is the potential for significant impacts to occur as a result of habitat loss and fragmentation, injury / mortality of protected species, and pollution of watercourses within Glen Croe. The potential significant impacts during construction include:

- adverse impacts on Glen Etive and Glen Fyne SPA and Loch Lomond Woods SAC through construction works and increased vehicular use along the OMR
- adverse impacts on the designated site Beinn an Lochain SSSI i.e. a small area of permanent habitat loss (<0.5 ha) and temporary habitat loss (<0.5 ha). This relatively small area of habitat loss will be compensated for, and mitigation measures will be adopted to protect potential impacts to the rest of this site
- potential indirect impacts such as pollution, habitat damage / degradation
- changes to local hydrology, hydro-morphology and flow pathways which could affect overall availability, distribution and quality of aquatic habitat
- deterioration in aquatic habitat quality as a result of altered flow character and water quality (due to sediment and drainage run-off during construction)
- displacement and injury / mortality of protected or priority species and
- disturbance to protected or priority species, including disturbance caused by noise and vibration.

Potential for significant impacts during the operation of the Proposed Scheme include:

- habitat fragmentation as a result of new culverts and bridge works
- habitat fragmentation and / or change in habitat connectivity affecting movements of protected and priority species (between / across the A83, OMR and wider area)
- injury or mortality to protected and priority species
- disturbance to protected and priority species from noise, light or other visual stimuli and
- localised changes to water quality as a result of sediment and drainage run-off.

The Proposed Scheme has been optimised to consider ecological habitats and avoid adverse ecological impacts where possible through incorporation of embedded mitigation measures such as, installation of mammal ledges and / or tunnels, the possible implementation of wildlife exclusion zones and the Contractors Construction Environmental Management Plan (CEMP).

Geology and soils

There is the potential for significant impacts to occur as a result of the land-take required for the Proposed Scheme as well as the requirement for rock cuts and earthworks cut / fill. Potential impacts during construction and operation include:

- direct loss of soils and peatland under the temporary and permanent footprint of the Proposed Scheme, some of which are within the Beinn an Lochain SSSI
- direct loss of class 3 and class 4 peat or peatland environments
- loss of peatlands in vicinity to the Proposed Scheme due to the lowering of groundwater caused by road cuttings
- an indirect loss or change to groundwater levels from excavation of road cuttings leading to a change in groundwater levels which could result in a negative effect on groundwater dependant receptors
- potential for some groundwater dependant receptors (including GWDTEs) to be lost and
- potential contamination associated with Made Ground from road construction and localised spillages.

Measures for mitigation could include minimising both the land take required and cuttings into the hillside, hence reducing the potential impact on soils, and the use of Sustainable Drainage system (SuDS) detention basin.

Material assets and waste

An estimate of material requirements for the Proposed Scheme was provided within the DMRB Stage 2 Report which included for structures (including the debris flow shelter), culverts and bridges. Potentially significant impacts include:

- impacts from consumption on primary resources
- site preparation and remediation, incorporating ground works, excavation and site clearance, generating site arisings (topsoil, planings, other earthworks) and
- impacts associated with disposing of waste when diverting site arisings from landfill is not possible (e.g. used off-site on other schemes).

Mitigation measures could include procuring aggregates from sources local to the Proposed Scheme, such as authorised quarries, and a Site Waste Management Plan (SWMP).

Noise and vibration

The potential for significant impacts to occur during the construction of the Proposed Scheme include:

- potential effects on sensitive receptors from the OMR informal walking, cycling and horse-riding route.

Construction noise impacts will be appropriately controlled through the adoption of best practice mitigation techniques, secured through the CEMP.

Construction vibration is unlikely to be significant as the two permanent residential receptors lie outside the standard DMRB LA 111 vibration study area, 100m from construction activities with the potential to generate vibration.

Construction traffic noise beyond the study area is unlikely to be significant. All traffic (both normal and construction vehicles) will use the A83 beyond the study area, the additional construction vehicles are not expected to notably increase road traffic levels. Appropriate management of heavy vehicle movements will appropriately control construction impacts.

Operational noise is not considered significant as the Proposed Scheme will not alter the road alignment and is not predicted to change vehicle flow, composition of vehicle types (e.g. cars and heavy vehicles), and vehicle speeds.

Operational vibration is not considered significant as a maintained road surface will be free of irregularities, so operational vibration would not have the potential to lead to significant adverse effects.

Population and human health

The Proposed Scheme has the potential to significantly affect private assets including agricultural land through land-take and severance, as well as the use of some walking, cycling and horse-riding routes which are located within the study area. Potential impacts during construction include:

- potential disruption or changes to access of community land and assets
- impacts on local agricultural activities, including loss of land, loss or disruption to access (including to agricultural outbuildings), severance, loss of access to grazing areas or water supply
- impacts from construction activities on human health including but not limited to visual disturbance and impacts on air quality and
- potential impact on local housing/rental market, health/welfare facilities and essential services from specialist operatives travelling from further afield.

Mitigation measures could include a convoy through the OMR during construction, CEMP, Traffic Management Plan (TMP) and Community Engagement Plan.

During operation robust and safe connections through the region would be anticipated, reducing severance and allowing people to access the health,

educational, economic and leisure facilities and opportunities that they require. It is not anticipated that access to properties would be worsened, and any community facility/bus stop provisions would be reinstated to an equivalent standard.

Road drainage and the water environment

Potential significant impacts on the water environment during construction and operation of the Proposed Scheme include:

- Sedimentation: Silt and sedimentation runoff into nearby waterbodies generated by construction activities such as excavation and earthmoving. During operation, sediment will be entrained in highway runoff, particularly during first flush events following dry periods.
- Chemical contamination: Construction materials, fuels, cement and sewage, for example, can pose a risk of accidental spills or leaks. Dissolved heavy metals, rubber particulates and other debris are generated during routine operation by vehicles, with incidents leading to accidental spillages of contaminants such as fuel or liquid materials being transported by road. These substances can contaminate surface waterbodies if proper containment and preventative measures are not in place.
- Altered hydrology: The introduction of impervious surfaces may affect the natural hydrological processes. Increased runoff and altered flow patterns may disrupt the balance of local water bodies, potentially causing flooding or water scarcity downstream. The alteration / redirection of natural watercourses may lead to the fragmentation of aquatic habitats.
- Water supplies can be adversely affected by sedimentation, chemical contamination, altered hydrology; or a combination of each.
- Hydromorphology: During construction there would be severe disruption to the watercourse flows and sediment supply and transfer downstream. Diversions and convergence of watercourses and overland flow will be required. Careful consideration of how to mitigate and monitor throughout the construction phase will be essential.
- Watercourses along the Proposed Scheme would require substantial, permanent, modification in the form of catchpits, culverts and flow baffles, and will require ongoing maintenance during the operational phase. It is noted that some of these modifications already exist to some degree at several crossings. Flows and sediment supply and transport processes would be altered.
- Flood Risk: The potential effects identified for flood risk during construction and operational phases of the Proposed Scheme comprise increased flood risk within the floodplain of the Croe Water, increased surface water runoff, and the potential for groundwater flooding. Watercourse diversions and interactions with the Croe Water floodplain are expected throughout the construction phase. Operationally, the Proposed Scheme is expected to briefly interact with the floodplain as it is routed over the current A83 alignment and over the Croe Water floodplain and would cross 24 watercourses, classified as Minor A and B.

Mitigation measures could include SuDS for the treatment of surface runoff from the carriageway, a flood response plan and catch pits upstream of OMR crossings.

Effects on Climate

During construction there is a potential for a negative effect on climate from generation of emissions that would not occur otherwise. However, it is likely that these would contribute only a small percentage of Scotland's overall carbon budgets and therefore the Proposed Scheme is unlikely to generate a significant effect on climate. This is in line with the policy position set out in the Section 3.19 Note 1 of DMRB LA 114 Climate: It is very unlikely that the impact of a road project will, in isolation, affect the ability of the Government to meet its carbon reduction plan targets.

During operation, there is the potential for a positive or negative effect on climate, depending on the balance between additional vehicles which may be added to the road network compared with improvements in traffic flow. However, with reference to DMRB LA 114, it is considered unlikely that any effects from the operation would be of a sufficient magnitude to constitute a significant effect.

Emissions are mitigated by applying the carbon reduction hierarchy.

Climate Vulnerability

Significant impacts on construction activities could occur during extreme weather, these include: the frequency, duration and intensity of extreme weather events that can be linked to climate change. If construction coincides with one or more extreme weather events, there may potentially be construction related effects.

Potential operational effects on asset receptors (including their operation, maintenance and refurbishment) and end users (e.g., members of the public, commercial operators etc.):

- hotter summers could damage materials (rutting, shrinkage and expansion), could reduce the asset lives of structures (over expansion and buckling) and increase vehicle breakdowns increasing maintenance requirements and associated traffic disruption
- drier summers could damage landscaping. More regular maintenance may cause traffic disruption
- drier summers and wetter winters could cause soil instability (intensify and extend soil moisture deficits and impact groundwater levels and earth pressures) affecting structures and embankments and potentially increasing maintenance requirements and associated traffic disruption
- extreme weather (snow and ice) could create a hazard during operation, particularly at the entrance and exit of the flow debris shelter and

- wetter winters and extreme weather could increase landslide risk in the future impacting maintenance work, may cause damage to Proposed Scheme assets, and could affect end users.

Climate vulnerability mitigation will primarily include design modifications (embedded mitigation), for example using SuDS to manage water quality from surface water runoff generated by extreme weather.

Vulnerability of the project to risks

A review of major event categories and types has been undertaken which has concluded that the Proposed Scheme will be potentially vulnerable to major accidents and / or disasters associated with landslides, fluvial flooding and pluvial flooding during both the construction and operational phases.

Relevant design, mitigation and enhancement measures include, but are not limited to good engineering practice, Environmental, Health & Safety Management systems and risk management systems.

- supplier management environmental, health and safety standards (e.g. Construction Skills Certification Scheme)
- risk management systems and
- a Code of Construction Practice (CoCP).

Assessment cumulative effects

In terms of cumulative effects with other development or projects, the only other project in the area are the works ongoing by Transport Scotland's operating company on the A83. The on-going work to provide resilience measures for the A83 combined with the rock fall and retentions measures as part of the Proposed Scheme, are not considered to result in significant cumulative effects.

Assessments of the environmental effects

Route options were developed and assessed as part of the A83 Access to Argyll and Bute DMRB Stage 2 Report. An EIA Scoping Report was produced for the Proposed Scheme which considered the potential for significant impacts to occur in the context of The Roads (Scotland) Act 1984 (Environmental Impact Assessment) Regulations 2017. The EIA Scoping Report was issued to the A83 Environmental Steering Group (ESG) for their review and comment.

Consultation

The A83 ESG has been set up for the Proposed Scheme and the following have contributed to the various proposals discussed as part of this:

- NatureScot

- Historic Environment Scotland
- LLTNP Authority
- Scottish Forestry
- Argyll and Bute Council and
- SEPA.

A series of virtual and in-person public exhibitions and public engagement events have been held during the DMRB Stage 1, Stage 2 and Stage 3 assessment work. Consultation was as follows:

- online consultation in September 2020 on the eleven route corridor options considered as part of the Strategic Environmental Assessment (SEA) and Preliminary Engineering Support Services (PESS)
- online and virtual consultation in March 2021 on the five possible route options under consideration within the preferred corridor of Glen Croe
- public exhibitions (both in-person and virtually) to present the Preferred Route Option were held between Monday 12 June and Thursday 15 June 2023 at Arrochar and Lochgilphead and
- public engagement events (both in-person and virtually) presenting an update to the Proposed Scheme design were held between Monday 18 March and Thursday 21 March 2024 at Campbelltown, Lochgilphead, Lochgoilhead and Arrochar.

Statement of case in support of a Determination that a statutory EIA is required

This is a relevant Proposed Scheme in terms of [section 55A(16)] of the Roads (Scotland) Act 1984 as it is a project for the improvement of a road, and the completed works (together with any area occupied by apparatus, equipment, machinery, materials, plant, spoil heaps, or other such facilities or stores required during the period of construction) exceed 1 hectare in area. The works are also situated in whole within the LLTNP, which is a sensitive area within the meaning of regulation 2(1) of the Environmental Impact Assessment (Scotland) Regulations 1999.

The Proposed Scheme has been subject to screening using the Annex III criteria to determine whether a formal EIA is required under the Roads (Scotland) Act 1984 (as amended by The Roads (Scotland) Act 1984 (Environmental Impact Assessment) Regulations 2017). Screening using Annex III criteria, reference to consultations undertaken and review of available information has identified the need for a statutory EIA.

The project will have significant effects on the environment by virtue of factors such as:

Characteristics of the scheme:

The total area required for the Proposed Scheme exceeds 1ha for an Annex 2 development and will involve significant engineering works both on and offline from the existing trunk road network. As detailed in the Description of Main Environmental Impacts and Proposed Mitigation section, there is the potential for significant effects to occur for certain environmental receptors as a result of the Proposed Scheme by virtue of factors such as the characteristics of the Proposed Scheme:

- Construction of a debris flow shelter and catchpit over a length of 1.35km. Commencing approximately 70m north-to-northwest of the existing A83 Cobbler Bridge.
- The catchpit and a debris flow protection wall extend for a further 170m past the debris flow shelter towards the existing junction with the B828 Glen Mhor local road.
- Verge widening in the southbound verge of the Proposed Scheme at the northern tie-in, opposite the junction with the B828.
- The B828 junction with the A83 will be upgraded from a simple priority junction to a ghost island junction.

Location of the scheme:

The Proposed Scheme is located within the boundaries of the Loch Lomond and The Trossachs National Park as well as being located within the boundaries of the Beinn an Lochain Site of Special Scientific Interest, both of which as classed as Sensitive Areas (refer to Annex A for further information).

Characteristics of potential impacts of the scheme:

The screening assessments undertaken have identified the potential for significant effects to occur during both the construction and operation of the Proposed Scheme across a number of the environmental topics included in the Record of Determination.

Given the nature and scale of the works to construct and operate the Proposed Scheme it has been determined that a statutory EIA is required.

References of supporting documentation

References and supporting information are included as hyperlinks throughout this report.

Annex A

The term “sensitive area” means any of the following:

- land notified under sections 3(1) or 5(1) (sites of special scientific interest) of the Nature Conservation (Scotland) Act 2004
- land in respect of which an order has been made under section 23 (nature conservation orders) of the Nature Conservation (Scotland) Act 2004

- a European site within the meaning of regulation 10 of the Conservation (Natural Habitats, &c.) Regulations 1994
- a property appearing in the World Heritage List kept under article 11(2) of the 1972 UNESCO Convention for the Protection of the World Cultural and Natural Heritage
- a scheduled monument within the meaning of the Ancient Monuments and Archaeological Areas Act 1979
- a National Scenic Area as designated by a direction made by the Scottish Ministers under section 263A of the Town and Country Planning (Scotland) Act 1997
- an area designated as a National Park by a designation order made by the Scottish Ministers under section 6(1) of the National Parks (Scotland) Act 2000.

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