SCOTGOLD
RESOURCES LIMITED

PLANNING APPLICATION

CONONISH GOLD MINE, TYNDRUM

PLANNING AND ENVIRONMENTAL STATEMENT AUGUST 2017

TOWN AND COUNTRY PLANNING (SCOTLAND) ACT 1997

ENVIRONMENTAL IMPACT ASSESSMENT (SCOTLAND) REGULATIONS 2011

DAL
DALGLEISH
ASSOCIATES
LIMITED

PLANNING & ENVIRONMENTAL STATEMENT

CONONISH GOLD MINE

TYNDRUM

Prepared For:

Scotgold Resources Ltd

Signed...

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9th August 2017

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1 INTRODUCTION

1.1 The Application

This report is a Planning and Environmental Statement (ES) accompanying the planning application by Scotgold Resources Ltd (SGZ Cononish Ltd) for the development and operation of Cononish Gold Mine, Tyndrum, Perthshire (Figures 1.1, 1.1i and 1.1ii Site Location Plans refer).

The application is for the development of an underground gold mine with process plant/accommodation building and tailings stacks, a settlement pond, flow gauging point in the River Cononish, a site drainage system to include piped flows from tailings stacks to settlement pond and settlement pond to the River Cononish as well as a recirculation pipe returning water from the pond to the processing plant, a new bridge over the Crom Allt at the Dalrigh ford, construction of a small car parking area adjacent to the existing public car park at Dalrigh and related track accesses.

The application is for a further revision of the currently permitted operation – ref 2011/0166/MIN, and as subsequently superseded by 2014/0285/DET and 2014/0317/DET. This relates to operating the mine with a phased approach, commencing on completion of Planning and arrangement of finance. It is anticipated this will approximately coincide with the completion of the currently operational Bulk Processing Trial, in 2017 and thus avoid a hiatus in all production activities and employment etc. Initially this will be a 'half scale' phase of operation at 36,000tpa which may be subsequently expanded to 'full production' rate of 72,000tpa (currently permitted under 2014/0285/DET) subject to further investment. This application is therefore for 17 years allowing for the continuation of the initial lower production rate, in the event that funding is not forthcoming for the necessary plant upgrade. It is however envisaged that this can be reduced to around 10 years of mining with the necessary increase in plant throughput.

These project schedules, in each scenario, also make an allowance for an initial 6 month period of construction works and mine establishment, and 6 months for final restoration works. An aftercare period of 5 years from the cessation of mining is also envisaged.

The process plant building will be set into the hillside, below the mine portal. The building will be clad in trapezoidal insulated wall panels, these shall be coloured in a suitable 'recessive' brown. Material excavated will be used to create a landscaped mound, to substantially screen the plant building from views within the glen.

Section 3 describes the construction works and activities which are required to develop, operate and maintain the proposed scheme.

This Environmental Statement (ES) presents the findings of the surveys undertaken in connection with the environmental impact assessment (EIA) of the proposals (Section 1.2).

1.2 Legislative Context

The revised EIA Directive (2014/52/EU) was transposed into the Scottish planning system by the Town Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Transitional measures apply as follows: "***Where a developer who is minded to make an EIA application requests a scoping opinion in respect of the proposed development under Regulation 14(1) of the 2011 Regulations before 16th May 2017, the 2011 Regulations continue to apply to an application for planning permission subsequently submitted for that same proposed development for which the scoping opinion was sought.***"

A scoping request was submitted for this proposal in April 2017 and as such this Environmental Statement has been produced in accordance with the legislative requirements of the European Commission (EC) Directive "on the assessment of the effects of certain public and private projects on the environment" (85/337/EEC) as amended by Directives 97/11/EC and 2003/35/EC and codified by Directive 2011/92/EU. These Directives were initially implemented under UK law in 1988 by a series of Statutory Instruments; in Scotland by The

Environmental Assessment (Scotland) Regulations 1988 (SI No. 1221, 1988) amended in 1999 and 2002 and subsequently by The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011.

The Planning Authority (PA) - Loch Lomond & The Trossachs National Park Authority (LLTNPA), has been consulted on the scope of the Environmental Impact Assessment (EIA). In accordance with The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008, and as this constitutes a major application in the terms of the Regulations, Pre-Application Consultation (PAC) has been undertaken and the EIA informed by consultations with a range of bodies and interested parties (Appendix 1, PAC Report refers). As the proposals are located within the Loch Lomond & The Trossachs National Park (LLTNP) and are in proximity to the River Tay Special Area of Conservation (SAC) there is potential for significant effects on the environment due to the nature of the development.

Compliance with Statutory Requirements has been guided by the Scottish Government Development Department Circular 3/2011, which supersedes guidance in Circular 8/2007, other than Annex E, which continues to apply to the 1999 Regulations.

The statutory requirement is to provide the information specified in Schedule 4 of the Regulations (c.f. Article 5(1) and Annex III of the Directive) and should include a summary in non-technical language of that information. There is however no statutory requirement concerning the form of an ES. The only legal requirements are that the statement shall be prepared by the applicant and comprise a document or series of documents which shall contain the specified information and a summary in non-technical language of that information.

1.3 Objectives of the Environmental Impact Assessment

The EIA process is a means of assessing potential effects of a new development on the environment, and of ways of mitigating those effects through avoidance, minimisation and offsetting, as appropriate. The process may be preceded by both screening and scoping procedures. Screening is the process of deciding which projects require assessment and scoping is identification of the main effects on which the process should focus.

Underground mining falls within Annex II (Schedule 2 of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011). In view of the approach taken historically by the Planning Authority to the development of this site and that the site is within a 'sensitive area' it is the view of the Applicant that EIA is required. Assessment of potential effects may demonstrate that no significant effects are likely however it is not possible to determine that in advance. In this instance, no formal screening opinion was requested, Circular 3, 2011, paragraph 61 makes allowance for such an approach, including the submission of an EIA voluntarily.

Formal scoping of this EIA has established which aspects of the environment required detailed assessment, "the aspects of the environment likely to be significantly affected by the proposed project…" (Schedule 4, EIA Regulations). ES Section 5 refers.

The ES describes these processes and presents the results of the assessment in a form which can be used by the Local Authority in consultation with other bodies, statutory consultees, interest groups and the general public, to aid in the determination of the application. The ES should be a concise analysis which deals with all potentially significant areas of impact, highlighting the key issues relevant to the decision-making process.

The requirement for the Planning Authority to consider the potential effects on Natura 2000 designations is noted. There is no specific guidance on re-consideration of impacts relating to an amended scheme, simply that the competent authority may need to revise or update their HRA to take any changes into account.

Although findings are not likely to vary significantly from those of the previous Appropriate Assessment there is a nevertheless a requirement to revisit this process in relation to the current proposal. This requirement falls on the PA; an updated report to inform this process accompanies the application (Appendices 2 and 12 refer).

The objectives of the ES are summarised below:

- to present an impartial assessment of the environmental impacts and benefits of the project;
- to highlight areas where there is scope for the developer to modify the design of the project to eliminate or mitigate adverse effects;
- to enable the PA to take account of environmental factors in determining the application; and
- to bring the project to the attention of all interested parties for consultation and discussion.

1.4 Approach to the Study

1.4.1 The Project Team

This ES accompanies the Planning Application submitted to the PA in July 2017. The exploration programme has been undertaken by Scotgold Resources Ltd, who has detailed the operation of the mine. The project team has been led by Dalgleish Associates Ltd, Mineral Planning Consultants (DAL), which has undertaken the EIA and the preparation of the ES, including 3D visualisations and photomontages.

Additional specialist input to ES sections has been provided by:

- Knight Piésold Ltd (KP): design of the tailings stacks
- Land Use Consultants (LUC): landscape and visual impact assessment
- Vibrock Ltd: noise and blast vibration

Reference is made throughout this document to the 2011 ES which was also informed by specialist work undertaken by:

- AMEC Earth and Environmental
- Ecological Restoration Consultants: restoration techniques
- Rathmell Archaeology Ltd: archaeology

- Professor David Bell, MA MSc PhD FRSE; socio-environmental and economic issues
- Orbit Communications: Economic and industry liaison

1.4.2 Information Sources

Various sources of information have been accessed to inform the EIA. These include:

- Ordnance Survey mapping
- site topographical surveys and aerial photography
- technical drawings and plans prepared by KP and other members of the project team
- data provided by other organisations and statutory bodies
- information provided by all parties consulted on the proposals
- specialist surveys of the site and environs
- the Development Plan
- previous planning documents relating to the site

Where specialist sources and reports have been used, these are referenced in the relevant sections of the ES or in the associated Appendices.

1.4.3 Consultations

In addition to the mine site landowner, the Strathfillan Community Development Trust (owner of woodland at Dalrigh), and the Strathfillan Community Council, the following bodies were served with a Proposal of Application Notice:

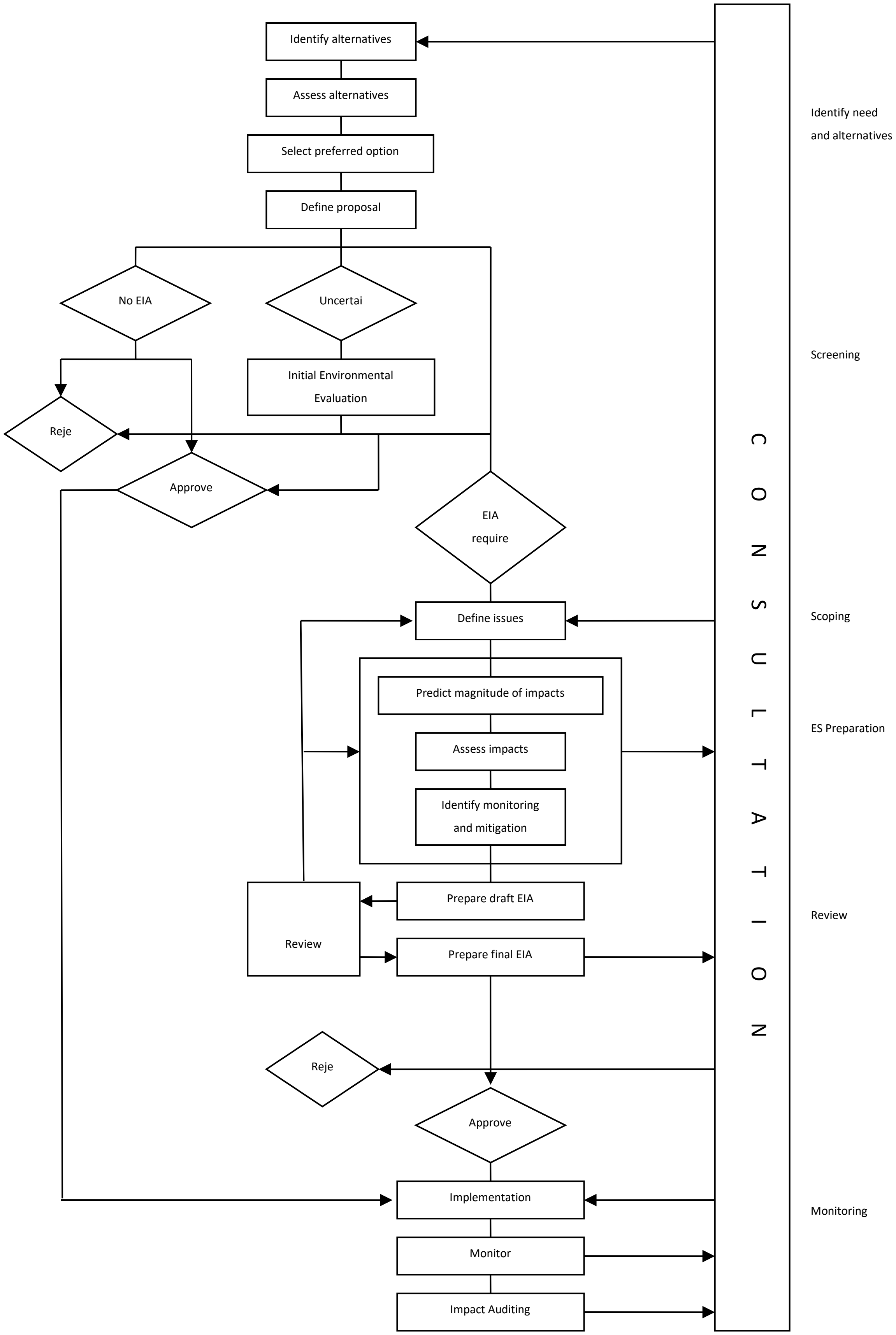
- Scottish Environment Protection Agency (SEPA)
- Scottish Natural Heritage (SNH)
- Environmental Health, Stirling Council.
- Building Control, Stirling Council.
- Roads Authority, Stirling Council
- Trunk Roads Authority, Transport Scotland
- Scottish Water
- Crown Estate
- Network Rail

- Forestry Commission, Cowal and Trossachs Forest District
- Forestry Commission Scotland, Perth and Argyll Conservancy
- The Mountaineering Council of Scotland
- Friends of Loch Lomond and Trossachs National Park
- Scottish Campaign for National Parks
- Woodland Trust Scotland
- Scottish Environment LINK

A Scoping request was submitted to the PA and the following bodies were consulted:

- Stirling Council Environmental Health
- Stirling Council Roads
- Transport Scotland
- Scottish Water
- WOSAS
- RSPB
- SNH
- SEPA
- Historic Environment Scotland
- Stirling Council Flood Protection
- Strathfillan Community Council
- Tay District Salmon Fisheries Board

The EIA Process



Flow diagram of the main components of the EA process

(Based on Walthern 1988)

The responses assisted in identifying key issues for the EIA, whether constraints or opportunities, and may be found in ES Appendix 2. The scoping process and outcomes is detailed at ES Section 5.

PAC with the local community and other interested parties took place at two public events, where information was displayed for comment. These comments and the responses to them where relevant, are provided in ES Appendix 1.

1.5 Structure of the Environmental Statement

1.5.1 Requirements of Schedule 4, Parts I and II of the Environmental Impact Assessment (Scotland) Regulations 2011

These requirements are as follows:

1. Description of the development, including in particular—

(a) a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases;

(b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used; and

(c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the development.

2. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for the choice made, taking into account the environmental effects.

3. A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.

4. A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect,

secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:

(a) the existence of the development;

(b) the use of natural resources;

(c) the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant or appellant of the forecasting methods used to assess the effects on the environment.

5. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.

6. A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.

7. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant or appellant in compiling the required information.

PART 2

1. A description of the development comprising information on the site, design and size of the development.

2. A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.

3. The data required to identify and assess the main effects which the development is likely to have on the environment.

4. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for the choice made, taking into account the environmental effects.

5. A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.

1.5.2 ES Structure – Sections and Appendices

1.5.2.1 ES Sections

The structure of the ES endeavours to present information relating to the development in a straightforward, easily accessed format, which is indicated below:

Section 2 sets the background to the project, describes the area of the proposals with regards to site history, site location, topography, land use and geology, and outlines the mine reserve, summarises alternative options and outlines the potential benefits arising from the proposal.

Section 3 describes the proposed development, construction works and operation, as well as restoration and ES Appendix 3 KP Tailings Management Feasibility Study, also refers. Construction of the necessary external mine operating structures is a temporary activity. These activities have been evaluated within the different topic sections. Operational impacts over the production period of the mine are then considered, including progressive restoration of the tailings stacks, followed by a further short period when final restoration activities take place including the decommissioning of the process plant building and overall mine site.

Section 4 considers the planning and development framework relevant to the application.

Section 5 describes how the scoping process identified key impacts for assessment.

Sections 6 to 12 deal with the key impacts point by point, informed by the specialist reports contained in ES Appendices.

Section 6 Landscape and Visual Impact Assessment
Section 7 Surface and Groundwater
Section 8 Ecology and Nature Conservation

Section 9	Emissions & Blasting

Section 10	Traffic

Section 11	Socio-economic Assessment

Section 12	Recreational Access

Firstly, for each topic requiring assessment, the baseline situation is described (the physical baseline), established through desk review, consultation, and site surveys. In this case, with an extant permission for mining at Cononish, the 'planning baseline' is also considered. Potential environmental impacts which could result from the development, in the absence of mitigation, are established. The development is assessed taking any embedded mitigation into account as this is integral to the proposal. Any such mitigation and its effectiveness is examined, with respect to preventing, reducing or offsetting any impacts, which whether in isolation or in combination with other impacts have the potential to result in significant adverse effects. Any additional requirement for mitigation is considered and finally residual impacts are presented. The level of significance of any residual impact is discussed, taking into account the likely effectiveness of all proposed mitigation measures.

It is often the case that individuals have different views on the acceptability of particular potential effects of a development and on the development as a whole. In order to address such variation in perception of effects and their significance, residual impacts are generally assessed by comparison with accepted quantified and/or societal standards.

The EIA process is iterative. Where potential for significant impacts has been identified, this has led to a modification of the design of the proposals, or introduction of mitigation measures specifically to reduce such impacts to acceptable levels. Where direct mitigation measures or design modifications are unable to satisfactorily reduce impacts to an acceptable level, appropriate compensatory mitigation to offset these impacts is proposed.

Environmental information is presented in a form which enables the reader to compare baseline data with the predicted impacts for each issue.

Section 13 details the management of waste from extractive industries as required by The Management of Extractive Waste (Scotland) Regulations 2010.

Section 14 concludes the ES by summarising the main findings from each of the topics examined and compares the different positive and negative impacts of the proposal. A summary of mitigation measures is also included.

References are presented at Section 15.

A Glossary of terms used within this report is presented at Section 16.

1.5.2.2 ES Appendices

ES Appendix 1 Pre-Application Consultation Report, describes the consultation process undertaken with the Community, summarises the responses received and where appropriate, how concerns have been addressed within the planning application.

ES Appendix 2 Consultee Responses, documents all consultative responses.

ES Appendices 3 – 12 contain the specialist reports and background data listed below:

ES Appendix 3	Tailings Management Feasibility Study 2017
ES Appendix 4	AMEC Appendices 2011
ES Appendix 5	Ecological Data
ES Appendix 6	Construction & Environmental Management Plan
ES Appendix 7	Decommissioning and Restoration Plan
ES Appendix 8	Noise & Blasting Reports
ES Appendix 9	Archaeological Written Scheme of Investigation
ES Appendix 10	Socio-economic Report
ES Appendix 11	Cononish Glen Management Plan
ES Appendix 12	Appropriate Assessment Appraisal

1.5.3 Definition of Effects

There is no definition of ‘significance’ contained within the EIA Regulations, which require ‘significant’ effects to be identified and described. Under each topic professional judgement has been used to determine which effects are material to the environment, whether individually or in association with other identified effects, to inform the decision-making process.

Significance of an effect is the result of its magnitude or scale (areal extent/degree of change/duration, the nature of effect) and the number and potential sensitivity of receptors/resource value (the nature of receptor). Significance is assessed against recognised criteria for each topic, comparing predicted impacts with the significance thresholds set out in the various Scottish Government guidance documents, or drawing on wider project team expertise, consultation responses, discussions with the local community and other interested parties. In this document, the following definitions of effects are applied:

Effect	Description
None	No detectable change to the environment
Minor	A detectable but non-material change to the environment
Moderate	A material but non-fundamental change to the environment
Major	A fundamental change to the environment

Significant effects are considered those which are assessed as being moderate or major.

Effects may be direct or indirect, adverse or beneficial and may be temporary or permanent. Where discrete impacts of a proposal may affect a single receptor the potential cumulative effect should also be considered – intra-project effects. Effects caused by this proposal in combination with any other reasonably foreseeable development(s) in the wider area are considered and assessed as necessary.

2 BACKGROUND TO THE PROJECT

2.1 The Applicant

The applicant, SGZ Cononish Limited (SC569264) is a wholly owned subsidiary of Scotgold Resources Limited (Australia), with registered offices at Upper Tyndrum Station, Tyndrum and is a mineral development and exploration company with mineral interests (substantially through five granted Crown Option Agreements - amounting to some 4100km^2) in central western Scotland. Scotgold Resources Limited is an Australian Company whose Depositary Interests (DIs) are listed on AIM.

2.2 Site History

An extensive stream sediment sampling programme was carried out across Scotland by the British Geological Survey in the late 1960s and early 1970s and the Dalradian sequence was identified as highly prospective for both gold and base metals. The high incidence of gold in these samples attracted various exploration companies to the region and Ennex International plc through its Scottish subsidiary, Fynegold Exploration, commenced prospecting in 1984.

In 1985, the programme identified a promising structure at Cononish which was investigated by initial trenching and subsequent diamond drilling. A further phase of diamond drilling in 1987 began to delineate a substantial resource. Further drilling was conducted in 1988 and in 1989; planning permission was obtained to drive an underground adit to examine the grade and continuity of the structure. 1110 metres of level development and 173 metres of vertical development were completed and the results justified the preparation of a feasibility study as a prelude to an application for planning permission to develop Scotland’s first modern underground gold mine. The application was submitted in 1991 and subsequently granted in 1996.

During this period, ownership of the project (through Fynegold Exploration) had passed to Caledonia Mining Corporation whose intention it was to put the mine into production in 1997.

In 2000 the project was put on care and maintenance as a result of a sharp decrease in the availability of funding for junior mining companies combined with a sustained cyclical low in the gold price. The Oak Consortium acquired Fynegold Exploration from Caledonia in 2001 and Fynegold Exploration was purchased by Scotgold Resources in May 2007. The more recent planning history is detailed below.

2.3 Recent Planning History

Planning permission 2011/0166/MIN made provision for the development of an underground gold mine with process plant/accommodation building and tailings management facility (TMF), construction of a diversion channel for the Allt Eas Anie around the TMF, and a gauging station in the River Cononish, upgrading of the wooden bridge over the Crom Allt at Dalrigh, construction of a small employee car parking area adjacent to the public car park at Dalrigh and related track accesses.

A Section 42 application was subsequently permitted in February 2015 (2014/0285/DET); this altered the permitted operational hours of the mine.

In April 2016 permission was granted for a Bulk Processing Trial (BPT ref. 2016/0064/DET) making provision for the installation of processing plant within the existing buildings at Cononish, the operation of a bulk processing trial with the intention of processing 2,400t of ore.

A section 42 application was granted in February 2017 (2016/0366/DET) which extended the BPT operation to March 2018 with the intention of processing the remaining 4,800t of ore. This BPT remains operational.

2.4 Reserve

2.4.1 Gold vein mineralisation

The gold and silver mineralisation at Cononish occurs within a northeast – southwest trending quartz sulphide vein hosted by the psammites and pelites of the Lower and Middle Dalradian stratigraphic sequences, prevalent in the south-western Grampians (Figure 2.2, Site Geology refers).

The quartz vein varies in thickness between a few centimetres and eight metres wide with an average width of just under two metres and dips between 60^{o} to 90^{o} from horizontal. The area currently identified for mining has a strike length of some 600 metres and a dip extent of 300 metres.

2.4.2 Mineable Inventory

Current estimates suggest a mineable inventory of around 530,000 tonnes of ore. The tailings storage capacity is designed to accommodate the entire anticipated tailings volume.

2.4.3 Mining method

The location and aspect of the current inventory, within the southern flanks of Beinn Chuirn, allows the mine to be developed from a horizontal tunnel rather than by shaft. The existing adit will be widened and an internal network of tunnels developed to connect the working levels of the mine for extraction operations. A mining method called 'sub level open stoping' is proposed as the main source of production, this is a highly productive safe 'non entry' (i.e. limited access to the working areas) method practised worldwide.

2.5 Consideration of Alternatives

2.5.1 Requirements of EIA Regulations

The Environmental Impact Assessment (Scotland) Regulations 2011, require the applicant to include an outline of the main alternatives studied, together with an indication of the main reasons for his choice, taking into account the environmental effects. In this instance alternative sites for the mine have not been considered, as discussed below. Alternative locations and construction and operational methods have however been considered for the surface ancillary mine facilities, i.e. the process plant, plant building and the tailings management and these are examined in Section 3, Description of Scheme and in particular in Section 6, Landscape and Visual Impact Assessment

2.5.2 Alternatives

2.5.2.1 Minerals Developments

The subject of alternative sites is better suited to planning matters concerned with building or housing developments for example, rather than schemes which require 'location specific' conditions. In the case of minerals the consideration of alternatives is necessarily restricted, as minerals may only be worked where they occur. They must also occur in quantity and quality such that their exploitation is economically feasible. "Getting the best from our land: A guide to Scotland's first Land Use Strategy" gives guidance on specific locational use.

The critical issue in consideration of the site suitability is that the scheme may proceed without harm to the natural heritage of the site and its environs. This being the case there is no further requirement to consider alternative sites, the EIA process addresses these issues fully.

Unlike bulk minerals, the development of a metalliferous mineral deposit from initial exploration through to production involves several stages of investigation such as to satisfy the due diligence requirements attendant on mining company investor confidence in bringing forward the project. Such drilling investigation is very costly and inevitably occurs in several tranches, over several years, requiring funding at each stage, assuming positive results. The Cononish mine is currently the sole gold mining project at this stage of development, not only in Scotland, but in the mainland UK.

Scotgold has undertaken surface exploration outwith the National Park boundary on a number of promising occurrences which remain at an early stage of exploration.

2.5.2.2 *Strategic Minerals*

The Scottish Government issued a document 'Raw Materials Critical to the Scottish Economy' (Final Report: Project ER27, January 2011) recognising the global economy and the political risk to strategic metals supply. This project brings forward a supply of gold and silver and ancillary minor metals identified in these reports.

Economic factors, including the additional role of gold as a store of value, are discussed in Section 11 and in the report by Professor Bell in ES Appendix 10.

Consideration of alternatives is therefore confined to "design alternatives", which in this instance relate to the surface expression of the mining scheme and attendant necessary works (see Section 2.5.2.3, Section 3 and Section 6).

Taking the option of "no development" eliminates the benefits which are outlined below in Section 2.6. These are also considered in the summary of impacts presented in Section 14.

2.5.2.3 *Consideration of Alternative Construction and Operational Methods*

1996 Scheme

The 'original' scheme was permitted in 1996 and included several large process plant buildings located on the open hillside below the mine portal and a single Tailings Management Facility (TMF) with a footprint necessitating diversion of both the Allt Eas Anie and the burn which rises in Coire na Saobhaidhe (identified in the 1996 permission as the "Forestry Stream"). A later alteration to this scheme, as a modification to that permission and partly in respect of purification of conditions, was approved by Stirling Council subject to the conclusion of a Section 75 agreement. The agreement was not concluded due to the fall in the gold price at that time. This 1997 scheme improved the layout of plant, in terms of its orientation, but still included several separate process buildings. The TMF footprint was adjusted to remove the requirement to divert the Forestry burn.

2010 Revision

The scheme submitted in 2010 significantly reduced the footprint and scale of the process plant.

Improved processing methods, using biodegradable reagents were promoted.

The TMF was slightly reduced in volume from the 1996 permission.

2011 Further Revision

Process Plant Building

The 2010 proposals for the process plant building were taken forward into this revision. All processing operations were contained within a low rise, acoustically clad, building set into the hillside below the mine portal and substantially screened behind a landscaped mound.

The location of the building proximal to the mine is essential, to minimise ore haul distance from the portal. The detailed alternatives studied related to the building elevation Above Ordnance Datum (AOD), to optimise the screening effect of the landscaped mound around it to the east and south. The potential visual impact of the mound was itself considered, but on balance was seen to be beneficial. The building specification was developed to include a recessive brown finish, to further minimise potential visual impact.

Ore Processing

Alternative processing methods are possible but in consideration of best practice in relation to minimising pollution the proposal makes no use of any potentially contaminating reagents. The process proposed extracted gold and gold bearing sulphides from the comminuted ore by gravity separation followed by 'flotation' with **no requirement for cyanide or mercury**.

Further studies resulted in the reduction of reagent requirement. Very small amounts of a biodegradable collector and frother were proposed, with the sulphides being 'floated' off, pressed and dried to form a gold bearing concentrate. (The 'extractive waste' comprising sand and silt size quartz with some accompanying rock fines from the ore bearing vein and is known as tailings. The tailings were to be discharged as a slurry to the TMF).

Tailings Management

The TMF design was reviewed following the PA views on its scale and form.

As an alternative to sourcing materials externally for the construction of the TMF containment, AMEC identified and assessed the suitability of construction materials from the Allt Eas Anie diversion and from within the footprint of the TMF, thus reducing construction vehicle movements within the site itself and negating any potential impact outwith the site, on the transport network, from bulk fill/aggregate vehicles supplying the scheme from quarry sources.

AMEC's report also considered alternative methods of depositing the tailings within the facility and the size of the supernatant pond.

TMF Landscaping

Having reduced the scale of the TMF Scotgold's project team examined options to minimise construction materials requirements and optimise opportunities for early and progressive restoration.

The project team then considered various locations on the slopes below the mine site for the TMF, again balancing the construction materials requirements with least visual intrusion of the structure and best fit in the landscape. The form of the TMF was then adapted as far as possible, within the constraints of the Extractive Waste (Scotland) Regulations 2010 on design, operation and maintenance, to fit with the surrounding topography, carrying through natural features in the shape of the face of the TMF structure.

Finally the detailed treatment to minimise the effect of the regular lines of the structure was decided, liaising with the project team ecologist and restoration specialist.

Current Application

The current proposal retains many of the benefits of the 2011 scheme but reconsiders the treatment of tailings. This evolution of tailings management is summarised at Figure 2.1, Tailings Management - Consideration of Alternatives. The scheme is detailed at ES Section 3.3. Plate 13.2 Consideration of Alternatives – General Location also refers.

2.6 Scheme Benefits

The aims and objectives of the Loch Lomond and Trossachs National Park include fostering an understanding of the natural environment. Scotgold Resources Ltd is committed to providing funding to the local Community in liaison with Loch Lomond and the Trossachs National Park Authority to promote such an understanding, focussing on the geological legacy of the area, its base metal mining history and the more recent discovery of gold. The natural heritage of this area of the Loch Lomond and the Trossachs National Park is intrinsically linked to the underlying geology. The composition of the bedrock, in tandem with the ice sculpted topography, underpins the ecology of the Ben Lui Special Area of Conservation (SAC). The topography of the Cononish valley has resulted from glacial action, with many glacial features evident such as kames, drumlins, corries and hanging valleys.

Support will also be targeted at longer term National Park/Community projects, to ensure that benefits from the gold mine development extend into the future, providing for sustained employment through, for example, spin-off business such as a Scottish gold jewellery enterprise. Scottish gold may attract a premium, as does Welsh gold. There is interest in this opportunity from Scottish goldsmiths. A commitment to funding for landscape and ecological enhancement under a 'Greater Cononish Glen Management Plan' remains in place.

The mine will provide employment for around 60 people, the majority of whom will be sourced from the local area, with the exception of around 14 specialist positions. For every job created in the minerals industry additional jobs are supported with respect to supply/servicing. This represents a potential significant socio-economic benefit within the local area. With rural employment opportunities at a premium, it must be considered that the gold mine would be a significant contributor to the economy of the area. It would also provide training and work experience for entrants to the employment market as well as to those wishing to extend their job skills and longer-term prospects.

2.6.1 Direct Employment

The mine will provide employment for about 60 people. Scotgold has already received approaches from numerous local people seeking work in the mine. It is the intention of the Company to search for employees intensively within the local labour market and it is anticipated that the majority of workers will be sourced from the local area.

For every job created in the minerals industry additional income is generated and jobs are supported in supply/servicing firms. This represents a potential significant socio-economic benefit for the region and the local area. With rural employment opportunities at a premium, it must be considered that the gold mine would be a significant contributor to the economy of the area. It would also provide training and work experience for entrants to the employment market as well as to those wishing to extend their job skills and longer term prospects (see Section 15 and Appendix 11 for further detail on economic issues).

2.6.2 Apprenticeships

Scotgold has liaised with Edutrain in the past, on the opportunities which the mine development could provide for the establishment of apprenticeships. The Company is committed to providing 7-8 apprenticeship places. The skills sets developed would be transferable to other sectors, e.g. the construction industry.

2.6.3 Higher Education

The exploration undertaken by Scotgold follows on from the Government funded geochemical exploration programme of the British Isles undertaken by the British Geological Survey. This led to the identification of the precious metal Cononish vein deposit and the subsequent privately funded exploration studies.

Scotgold's programme has provided valuable work experience for two local graduates (Edinburgh University) and has supported eight MSc and one PhD student projects in recent years, those studies, in conjunction with Scotgold's own research leading to a greater understanding of the Scottish Dalradian sequence as a host to potential metalliferous deposits. Two further PhD places have received funding recently. The revenue streams generated by the mine in production would enable further studies and wider exploration of this metalliferous province to be undertaken.

2.6.4 Long Term Employment Potential

Funding commitment from Scotgold could also be targeted at longer term National Park/Community projects, to ensure that benefits from the gold mine development extend into the future, providing for sustained employment through, for example, spin-off business such as a Scottish gold jewellery enterprise or through the use of expertise gained in the mine in other related ventures. In addition Scottish gold may attract a premium, as does Welsh gold. There is significant interest in this opportunity from Scottish goldsmiths. Production of Scottish Gold from the BPT has attracted considerable interest with a significant premium being generated from the sale of the first commercially produced Scottish gold.

2.6.5 Greater Cononish Glen Management Plan

Scotgold Resources Ltd is committed to providing funding to implement a Management Plan for the Greater Cononish Glen in conjunction with SNH and the Park Authority. This plan will include fencing to manage grazing and to protect proposed planting of native woodland in the lower glen and at the mine site. On the south side of the River Cononish, on the Ben Lui SAC, which is also a National Nature Reserve (NNR), fencing of a part of the lower slope adjacent to the river will encourage habitat enhancement through heath and native woodland regeneration and will complement the neighbouring Coille Coire Chuilc SSSI, designated for its Caledonian Forest native woodland. These proposals are shown on Figure 6.iv Landscape Masterplan.

2.6.6 Supporting the Aims and Objectives of the National Park

The aims and objectives of the Loch Lomond and Trossachs National Park include fostering an understanding of the natural environment. The natural heritage of this area of the Loch Lomond and the Trossachs National Park is intrinsically linked to the underlying geology. The composition of the bedrock, in tandem with the ice sculpted topography, underpins the ecology of the Ben Lui SAC. The topography of the Cononish valley has resulted from glacial action, with many glacial features evident such as kames, drumlins, corries and hanging valleys. There would be benefit from the provision of sensitively placed interpretation, which Scotgold will support.

In conjunction with the local Community Scotgold will provide funding of a feasibility study and possible seed capital for an interpretive facility, most likely located in Tyndrum, focussing on the geological legacy of the area, its base metal mining history and the more recent discovery of gold. This facility would encompass interpretation of the wider natural environment of the National Park. This context for the gold mine development could provide an educational resource highlighting environmental sensitivities and how these should be protected.

2.6.7 Long Term Sustainable Benefits – Tourism related

Consultation with Tourism bodies and Chambers of Commerce indicates that the gold mine proposals are seen as a positive with respect to attracting tourists to the area. The establishment of an interpretive centre with links to the gold mine and associated Scottish gold jewellery enterprise is a further draw (see Appendix 2 for these consultations).

2.6.8 Wider Community Related Benefits

2.6.8.1 Loch Lomond & The Trossachs National Park – Strathfillan Area

Scotgold Resources is committed to providing funding of interpretive support within the National Park. Specific projects have not been identified by the Park Authority and it is recognised that targets for support funding, e.g. training and support of additional Park Rangers for the area, may change over the proposed mine life of 10 years. The suggested Ranger support would benefit visitors to the area, as it may be possible to develop their role to encompass greater tourism linked project activities and workshops with this funding support.

2.6.8.2 Strathfillan Community

As part of the Strathfillan Community since early 2007, Scotgold is committed to providing annual funding into projects identified by Strathfillan Community Development Trust, which are seen as bringing benefits to the community.

2.7 Site Location, Description, Topography, Land Use and Services

2.7.1 Site Location

The site is situated in rural Perthshire within the Stirling Council area and lies within Loch Lomond & The Trossachs National Park (Figure 1.1 Site Location, refers). The National Park Authority is the Planning Authority. The site is located some 3km to the west-south-west of Tyndrum. There are also residential properties at Dalrigh, located some 4km to the east.

The application area extends to a total of 36.77ha, of which 34.55ha is the mine site (including the extent of underground mining), with areas of 0.07ha and 0.04ha for a new bridge over the Crom Allt and an employee car parking area at Dalrigh, respectively. The flow gauging of the River Cononish required in connection with control of discharge volumes from the recirculation pond consists of a stageboard, to be mounted adjacent to the footbridge, to the east of the site and an electronic flow level monitor mounted on the bridge abutment. Associated with this installation is a control box which can be accommodated in an area of 1m x 1m. This is indicated on Figures 1.1 and 1.1i as is the discharge pipeline route to the River Cononish.

Figure 1.1 shows the site in relation to the nearest settlement, Tyndrum and identifies designated areas and recreational routes. The site area is centred at Grid reference NN 2955 2865.

Figure 1.1ii illustrates the location of the proposed bridge and car parking area.

2.7.2 Site Description

The mine complex occupies the lower slopes at the head of the main valley of the River Cononish, at its junction with the Allt Eas Anie. To the immediate west of the mine entrance the ground rises steeply to the southern end of Coire na Saobhaidhe. Surface drainage from Beinn Chuirn, to the north west of the corrie, flows in part over the Eas Anie waterfall some 200m to the south west of the mine entrance.

Currently the site elements from the earlier mine exploration adit permission comprise:

- gated access track from Cononish Farm
- the mine adit entrance
- the mine fill plateau (material from the exploratory adit, including ore – currently being processed as a Bulk Processing Trial, BPT)
- two nissen huts on the mine plateau
- sedi-bags containing dewatered tailings from the BPT
- surface water cut-off ditches
- sumps and silt traps
- three settlement lagoons
- water monitoring facilities

The former core storage and office compound has been cleared and levelled and core rehoused. Peat and moraine bunds associated with the original development works may be seen below the mine plateau adjacent to the track.

The surrounding landscape is open upland with rough grazing. There are a number of watercourses in the wider area, including the River Cononish to the south. The Cononish flows into the River Tay via the River Dochart and boasts the source of the Tay high on Ben Lui in Coire Laoigh. There are farm buildings at Cononish; these together with access tracks, BT plant and fencelines are the only visible built elements in the area. To the east is a significant area of forestry between the site and Tyndrum, this is in the ownership of The Forestry Commission Scotland.

2.7.3 Topography

The site lies on sloping ground with an eastern aspect. The ground is generally hummocky with small scale moraine deposits; a 'basket of eggs' topography formed of glacial till. Rocky outcrops occur and watercourses are cut in bedrock. The Allt Eas Anie flows east from the southern slopes of Beinn Chuirn over a high waterfall, the Eas Anie, and to its confluence with a northern tributary which flows from Coire na Saobhaidhe to the east of Beinn Chuirn. The Allt Eas Anie then flows to its confluence with the River Cononish, at Cononish Farm. At this point the valley widens significantly, continuing east towards Dalrigh. Cononish Glen is flanked to the south by a high ridgeline comprising two Munros; to the west, at the head of the valley, lies Ben Lui, a third Munro and the highest in the area, 'alpine' in character. To the north the valley is enclosed by a ridgeline of lesser hills, between 590m and 880m, the highest of which is Meall Odhar, beyond which, in the valley of the River Fillan, lies the A82 and Tyndrum.

2.7.4 Land Use and Capability

With regards to land capability the Macaulay Institute for Soil Research – Soil Survey of Scotland, Western Scotland identifies the entire site area as lying within 'land capable of use only as rough grazings' - class 6_3 – vegetation dominated by plant communities with low grazing values, particularly heather moor and blanket bog. Soils are of the Strichen Association, parent material is moraine; this soil unit is recognised as having good forestry potential. This potential is being exploited to the east of the site. Above the site on the adjacent hillsides soils are rockier and poorer, sub-alpine and alpine.

Cononish Estate is managed for grazing, sheep and cattle, although in only in small numbers in recent years. The landowner has a management agreement with SNH over the area to the south of the River Cononish, the Ben Lui SAC and National Nature Reserve, designated for its montane vegetation.

The area lying between the southern boundary of the planning application area and the track leading to upper Cononish Glen is currently one of several lower lying seasonal grazing areas. Constraints on land use due to grazing requirements necessary to maintain the Cononish flock are elaborated in the proposed Management Plan (see ES Appendix 11).

Grazing on the mine site has been restricted for in recent years and heath vegetation has benefited.

2.7.5 Geology

2.7.5.1 Superficial Deposits

Frequent exposures within stream banks and extensive trial trenching and borehole investigation confirm the superficial deposits over the site area to be locally variable, typically comprising over-consolidated slightly clayey, silty, sandy, gravelly glacial till. The investigations indicate that the glacial till varies between 1m – 7m in depth. Within this moraine there are pockets of peat. A series of peat probe data has been compiled and updated. Depths are variable and although entirely absent from much of the mine site peat is recorded at up to 2m in some areas.

Water levels recorded in borehole installations from November 2009 indicate that the site water table lies within the overburden units or near the top of the bedrock unit.

2.7.5.2 Bedrock Geology

The site lies in a highly metamorphosed zone between the Tyndrum fault to the south and the Ericht-Laidon fault to the north; the principal rock formation is a psammite, a metamorphosed sandstone, with minor pelitic bands (metamorphosed mudstone).

In addition to the surface mapping and borehole investigations carried out in connection with the 1996 planning permission, three further boreholes were sunk in 2009 to recover cores of the bedrock and to investigate the permeability of the bedrock. The results of this drilling exercise confirmed the earlier investigations, i.e. the bedrock is strong – very strong with good rock quality; the predominant discontinuity observed being the foliation associated with the original bedding planes. The bedrock was found to have low permeability values ranging from $1x10^{-6}$m/s – $1x10^{-8}$m/s.

2.7.6 Public Utilities and Rights of Way

2.7.6.1 Public Utilities

There is no gas, electricity, or mains water supply to Cononish Farm. BT has plant which connects the farm to its network; this is a combination of an overhead line on poles and buried cable following the route of the Forestry Access from Tyndrum. The overhead line to the farm runs parallel to the main access track from its junction with the forestry track, then to the southern farm buildings and on northwards to Cononish Farm.

The nearest National Grid apparatus is at the A82(T) at Dalrigh and Tyndrum. A planning permission has been granted previously for an 11kV wooden pole transmission line which links Tyndrum to Cononish through the forestry plantation generally parallel to the existing forestry track (ref. S/97/0367/NST). In conjunction with the installation of 'full' production plant, this power supply shall be extended to the mine.

2.7.6.2 Rights of Way & Core Paths

The West Highland Way passes around 3.5km to the east. Access to Ben Lui can be taken from the A85 to the north-west but also from the east, using the access track from the A82 to Cononish Farm, continuing to the foot of the eastern corries some 2km west of the farm. There is further access on the forestry track from Tyndrum Lower Station; this contours round Sron nan Colan joining the main Cononish access track at the 250m contour. On consultation with Scotways it has been established that these three routes are all catalogued routes, CS320, CS 319 and CS321 respectively; they are also core paths. ES Section 12 and Figure 12.1 refer.

3 THE PROPOSED DEVELOPMENT

3.1 Introduction

This section sets out and describes the construction and operational activities necessary to implement the scheme. The nature of the scheme, which involves the deposition of "extractive waste", requires engineering design plans to be prepared at this stage, as a consequence of the requirements of the Management of Extractive Waste (Scotland) Regulations 2010, which are implemented through the planning regime (ES Section 13 refers). These activities have been the subject of the EIA reported in this ES.

Mitigation measures specific to each environmental topic are included in each relevant section. A list of mitigation measures is given in Section 14.

3.2 Sustainable Development Principles

All schemes of this nature should seek to embody the principles of sustainable development: to minimise effects on the environment by optimising the necessary use of materials; by minimising transport distances on site thus reducing emissions to the atmosphere and the carbon footprint of the development; by adhering to good design of the development and appropriate management of its construction.

In addition the scheme should wherever possible bring sustainable long term benefits including socio-economic benefits, habitat enhancement and recreational opportunities.

3.3 Scheme Details

Section 1.1 includes a general description of the proposals. The key elements of the scheme are listed below. Each element is then described, with the function ascribed to it.

3.3.1 Scheme Elements

- site access at Dalrigh
- off-site car parking at Dalrigh
- bridge over the Crom Allt at Dalrigh
- mine access track (existing)
- mine portal
- mine platform and workshop/core store (existing – to be modified)
- underground mine
- process plant building compound (including associated process plant feed stockpile, four vehicle parking spaces, security booth, tailings stockpile, water tanks and substation) and landscaped screening mound
- tailings stacks
- peat storage and habitat enhancement areas
- site drainage system (cut-off drains, catch ditches, settlement pond and associated pipelines)
- gauging point at River Cononish footbridge
- fencing (security/HSE requirements/stock/deer)
- lighting
- signage

The location of the development is shown on Figure 1.1 and Figure 1.2. Details of the proposals are illustrated in Figures 3.1 – 3.14. Reference may also be made to ES Appendix 3, the Tailings Management Feasibility Study prepared in connection with the design, operation and restoration of the tailings stacks.

3.3.1.1 Site access at Dalrigh

The existing access track to Cononish is an un-metalled road but is in a good state of repair with good visibility splays and a surfaced bellmouth at its exit onto the A82(T). An upgrade to the junction was previously agreed in relation to 2011/0166/MIN (Condition 22) and this work shall be undertaken as approved. An agreement is in place for pre- and post-construction phase inspections to ensure any extraordinary wear and tear is identified. CEMP refers (Appendix 6).

3.3.1.2 Off-site parking at Dalrigh

In order to minimise the number of vehicle movements on the main access track to the mine site, a dedicated car park will be provided for employee vehicles to the south of the existing parking area at Dalrigh. A site minibus will transport employees, both at construction stage and operational stage to the mine site. Consequently, the car park will be one of the initial site construction elements.

The car park, some 20m x 20m, will be constructed within an area of previously disturbed ground, now rough grassland. An existing access gate affords access and egress. Surfacing will be of a sub-base material, similar to the main parking areas. This car parking provision was approved in association with 2011/0166/MIN and additional detail agreed post consent. No change is proposed to these arrangements.

The proposed mine will operate at a reduced level over the weekend when the existing car park is frequently very busy and thus the new parking area will provide a benefit from the outset. In the long term, it may be retained as an integral part of the public car park. This has been identified through consultation as being an issue at present; at peak times, the existing parking facility is overcrowded with vehicles being parked on the roadside affecting safety and the residential amenity of those residing at Dalrigh.

3.3.1.3 Bridge over Crom Allt at Dalrigh

There is currently a 2T weight restriction on the existing bridge at Dalrigh over the Crom Allt. Farm traffic currently makes use of the ford at the confluence immediately upstream from the confluence with the Cononish it is now proposed to install a bailey type bridge at the location of the ford, allowing heavy vehicles to continue to access Cononish Farm and in order to separate mine vehicles from the existing bridge, which is on the West Highland Way, a popular long-distance route. As with the access bellmouth and car park, the bridge works will form part of the initial enabling works.

3.3.1.4 Construction traffic access

Large items of plant, requiring to be delivered by low loader, will be routed via the forestry track from Tyndrum over the railway crossing which joins the main farm access at NGR NN 316 286. This is an established access route historically used by around 20 larger vehicles such as articulated lorries/low loaders per annum.

Road traffic safety issues and timing or construction traffic movements have been discussed and agreed with Trunk Roads Network in connection with previous applications. There is no change to the scheme proposals in this respect.

3.3.1.5 Mine access track

Site access shall continue to be taken from the A82(T) at Dalrigh; this is the existing estate access to Cononish Farm and, subject to the bridge installation noted above, is suitable for all site vehicles.

The mine access track extends for some 1300m from the gate at Cononish Farm to the mine portal. There will be no requirement to widen the track.

3.3.1.6 Mine Portal

The mine portal will be slightly enlarged. All finishes will be either in, or surfaced with natural rock. Where necessary any minor exterior concrete works will be in a concrete coloured to blend with the adjacent rock. This work will be undertaken in conjunction with the process building earthworks and landscaping of the existing mine platform, in accordance with the approved scheme (relating to 2011/0166/MIN and subsequently 2014/0285/DET).

3.3.1.7 Mine platform and workshop/core store

The previously established mine platform has been altered though recent activity at the site. The Bulk Processing Trial (2016/0366/DET) is currently operational and will continue to work through the 7,200 tonnes of ore which formed the northern part of the mine platform. Further landscaping shall be undertaken to reduce the existing landscape and visual impact of this landform. The northern part of the platform having been reduced in this way, shall be graded to merge with the adjacent hillslope. Barren rock from the mine and till/vegetation recovered from other areas of the site shall be placed. These operations shall be undertaken together, and in conjunction with the groundworks for the plant building itself.

3.3.1.8 Underground mine

Underground pre-production development works in the mine will produce 'barren', non-target, rock which will be utilised in the preparation of tailings stacks, forming a basal drainage layer.

Production mining operations will be within the ore vein.

3.3.1.9 Process plant building compound (including associated process plant feed stockpile, four vehicle parking spaces, security booth, tailings stockpile, water tanks and substation) and associated landscaped screening mound

A slightly simplified building is now proposed, reduced in length from that currently approved by 10m.

The platform and bund are remodelled but the principles of design from the 2011 iteration remain the same, minimising visual clutter, restricting the height of the building and maximising screening for visual and noise effects.

The area required for the building and compound will be excavated into the hill slope, which will reduce the part of the building profile visible above the surrounding landscaped screening mound. The mound will be constructed of materials excavated from the footprint of the process plant compound and the first stack area.

The process plant foundations and base will require concrete works.

Figure 3.9 presents an isometric drawing of the building and a layout of the process plant itself.

To minimise potential impacts from process plant operations within the building, it will be clad in trapezoidal insulated wall panels. The external wall panel colouring will be a recessive brown ‘Brown Grey’ as previously agreed (2011/0166/MIN – Condition 16), which is the most suitable shade to minimise visual impact. The roof colour previously agreed is Grey Brown.

All welfare facilities for staff and mine office accommodation will be contained within the plant building. Foul drainage will be to a small sewage treatment works for which a CAR licence will be required. Details of requirements were discussed with SEPA in relation to the currently approved development.

All reagents used in the process will be securely stored within the plant building. In the flotation process the reagents used are potassium amyl xanthate (collector), which is in powder form contained in 120kg drums. The flotation frother is methyl isobutyl carbinol which will be stored as a liquid in 50 gallon drums.

Only small quantities are required to be stored at any time, as only around 100kg of total reagents are used per month.

A small assay laboratory within the plant building will carry minor amounts of chemicals.

Gold recovered from the gravity separation process will be smelted on site. This process will be covered by a Pollution Prevention and Control Permit (PPC Permit), issued and regulated by SEPA.

Oils, lubricants etc. shall be stored in sealed containers.

The site fuel tank will either be bunded or double skinned to comply with The Control of Pollution (Oil Storage) (Scotland) Regulations 2006. It will be located adjacent to the northern end of the building. Spill kits provision will be at appropriate locations within the plant building.

The process plant feed stockpile will be to the southern end of the building. This small stockpile will contain around 1 day's production (at full production rate), some 250 tonnes of ore. It will be fed by mine ore haul vehicle from the mine portal and loaded into the process plant crusher by wheeled shovel.

Similarly, a tailings stockpile will be required to the northern end of the processing building.

Parking for 4 private vehicles will be at the southern end of the building. Loading of concentrate (bulk bags) for daily transport off-site will be from the northern end of the building.

A small security booth will be positioned at the northern entrance to the compound.

3.3.1.10 Grid Connection

The nearest existing national grid cable is adjacent to the A82(T) at Dalrigh and at Tyndrum. Power will be supplied by an on-site generator for the initial production phase. A new high voltage line (11kV) shall connect the mine to the grid for full production rate. This line has been previously permitted. It will follow the route of the existing access track from the mine site as far as the railway crossing and then north-east to the existing cable on the A82(T). The landscape and visual impact assessment concludes that this should be buried for a short length in the vicinity of the West Highland Way at Lochan nan Arm as previously permitted.

3.3.1.11 Tailings Stacks

A series of ten separate stack areas shall be formed, each relating to around one year's production of tailings at the full production rate of 6,000tpm. The stacks shall be prepared by initially stripping the vegetation to till which shall be compacted prior to the placement of a basal drainage layer (of barren mine rock) and a geotextile fabric in order to separate this layer from the tailings. Stripped materials shall be used in progressive restoration at the earliest. In all cases storage times shall be minimised. Any deep, humified peat below the nominal stripping level of 0.4m below existing ground level shall be retained in situ, covered with a geotextile and covered with the mine rock basal drain. There is likely to be a limited volume of peat arising from each stack area which will then be used in habitat enhancement within the site area and/or contained for future use in restoration (see ES Section 3.3.1.12 below).

Tailings will be dewatered at the plant building as part of the process. The dry tailings (up to around 16% water content) will be loaded from the tailings stockpile and hauled using a 25t All-terrain Dump Truck (ADTs). The tailings shall be placed, spread and compacted in 300mm layers (bulldozed and rolled) to form tailings storage stacks mimicking naturalistic moraine features, in keeping with this glacial geomorphology.

Tailings placement is likely to be undertaken throughout the day with spreading and compaction undertaken for around 5-10 minutes, generally twice per day.

3.3.1.12 Peat storage and habitat enhancement areas

Peaty topsoil/turves will be stripped from the tailings stack areas, as well as the lines of site drainage features. This will be undertaken progressively, only disturbing areas of the mine site when necessary. Materials from each stripping exercise will be placed directly for restoration whenever possible, initially on the landscaped screening mound and subsequently on completed areas of each stack in turn. Any humified peat arisings shall be used for habitat enhancement in areas of degraded bog habitat between stacks. Should any temporary storage be required this will be within suitable containment cells where the peat may be kept wet and prevented from mobilising.

A peat depth drawing is included at Appendix 5.

3.3.1.13 Site drainage system (cut-off drains, catch ditches, settlement pond and associated pipelines)

A series of cut-off drains will divert surface run-off around the areas of the site affected by the proposed development. This practice minimises surface water inputs to the site and diverts 'clean' flows around areas subject to engineering operations.

Along the lower edges of each tailings stack, additional catch ditches shall be cut in order that any flow from the basal drains, and indeed surface run off from the stacks, is diverted for settlement, prior to discharge into the water environment. This is to ensure that no suspended solids which may result from engineering works enter the natural water environment. Flows from the catch drains to the north of the Allt Eas Anie shall be directed to a settlement pond via a pipeline. The settlement pond is designed to ensure that there is sufficient capacity for storm flows as well as to contain site water during any periods of low flows in the Cononish. At low flows in the Cononish there shall be no discharge from the site drainage system. This is in accordance with the existing Controlled Activities Regulations (CAR) licence for discharge (Licence reference number CAR/L/1001391) to which no change is currently proposed.

3.3.1.14 Gauging point at River Cononish Footbridge

This will require the erection of a stageboard mounted on the abutment of the footbridge and of the installation of an electronic flow measuring device. The latter requires no intrusive works within the river and only a 1m x 1m adjacent area to contain the control link to the automatic fail-safe shut off to the discharge line from the recirculation pond to the River Cononish.

3.3.1.15 Discharge line to River Cononish

This will comprise a 710mm diameter HDPE pipe discharging directly to the River Cononish below the confluence of the All Eas Anie. Provision has been made for storm flow discharges.

3.3.1.16 Fencing and Mine Portal Security

Areas of stock proof fencing are already present on the site. These will be modified as required in accordance with the development of the site and the proposed fencing plan around the area and in the Greater Cononish Glen (Figure 6.iii and Figure 6.iv, Landscape Restoration Plan and Landscape Masterplan respectively) and will be incorporated in the Greater Cononish Glen Management Plan (Appendix 11) discussed by Scotgold in liaison with SNH and the Park Authority as part of its mitigation measures in association with the currently permitted scheme. No changes are proposed. Both stock proof and deer fencing are proposed, the location of which has considered:

- sheep grazing, gathering and animal welfare requirements
- deer movements – avoid fence configurations which could cause channelling
- collision risk for birds
- the protection of new woodland planting
- potential for visual intrusion
- maintenance of access for walkers
- creation of appropriately sited and designed fence crossing points and gates

Exclusion of grazing sheep and deer will be beneficial to upland heath regeneration over the area.

Around the plant building compound, contained with the landscaped mound and at the base of the hill slope to the rear of the building, 2m high security fencing will be erected. Security gates will be situated at the north and south entrances to the mine site. The security booth will be within this fenced area, at the northern entrance.

The mine portal will be secured in compliance with HSE requirements outwith shift working hours.

3.3.1.17 Lighting

Consideration has been given to light pollution with particular reference given to the Scottish Executive Guidance Note "Controlling Light Pollution and Reducing Lighting Energy Consumption" dated March 2007.

Surface operations such as placement of tailings will not require to be undertaken during night time hours. The process plant building will give rise to no light emissions, provision having been made for its westwards (hillside facing) windows to be shuttered during hours of darkness. Movement of ore from the mine portal to the transfer stockpile at the southern access to the plant buildings will average one load per hour. During hours of darkness only vehicle lighting will be necessary for this short haul distance, which will be partially screened from all but higher elevations by the landscaped screening bund around the building.

Lighting may be required in the event that emergency maintenance is required. In that instance, good practice principles which shall be followed wherever feasible from a technical and health and safety viewpoint include:

- all lighting will have a clear purpose;
- over-lighting will be avoided; and
- all lights will be carefully directed to where they are most needed and will be designed to minimise light pollution.

The security booth will have low level lighting. Its position is shielded from Cononish Glen by the landscaped mound.

3.3.1.18 Signage

Signage in accordance with HSE requirements will be located at the mine access track gate. There is a requirement to identify the mine and its operator and to provide essential contact telephone numbers.

Other information signage, e.g. information for walkers and climbers in relation to mine activities, or educational information about the mine will be amalagamated at this location, to minimise visual intrusion. The only additional signage proposed relates to recreational waymarking; a finger board will be erected the Cononish Glen track beyond the mine site, to indicate the point from which ice climbers may access the Eas Anie. There will be no formal track. Further waymarking will also be erected to indicate the access to the east of the mine site between Coire na Saobhaidhe and Cononish Farm, ES Section 12 refers.

3.4 Construction and Operation

3.4.1 Timescales

The engineering, construction and commissioning works necessary to the operation of the gold mine will be undertaken within a 6 month period prior to the commencement of production underground mining. Initial engineering and construction works will include access improvements, bridge installation, plant platform and bund establishment, processing plant building construction, preparation of the initial stack area, site drainage system for plant area and initial stack, settlement pond, discharge pipeline, power supply, initial peat containment and/or preparation of habitat enhancement areas.

As each stack accommodates around 1 year's production, at the full production rate of 6,000tpm preparation of each stack shall commence around 6 months in advance. As each basal drainage layer is dependent upon barren rock arisings from the mine the preparation of each stack will be progressive. In this way, generally around half of each stack area will be ready for the placement of tailings when the stack becomes active (i.e. tailings placement commences within that stack area). Equally, restoration of each stack will be progressive, commencing once a sufficient area is available for placement of moraine, soils, and vegetation. Wherever possible these processes shall be undertaken concurrently, minimising any requirement for storage of soils and vegetation.

Site decommissioning and restoration works are completed in the final year of the project, likely to continue for around 6 months after the cessation of mining operations. An aftercare period of five years will be applied to each area with final aftercare for the site for five years from the cessation of mining.

3.4.2 Hours of working

All as currently approved under 2014/0285/DET.

3.4.2.1 Construction and Restoration Phase

Construction/decommissioning/restoration working hours at the site:
0600hrs and 2100hrs
Monday to Saturday and not on Sundays or recognised Scottish Public Holidays.

3.4.2.2 Operational Phase

Underground operations:
24hrs

Process plant operations:
24hrs
Monday to Saturday and not on Sundays or recognised Scottish Public Holidays.

Surface working operations (including vehicle movements) to the Tailings Storage Facility (TSF) comprising the stack areas:
0600 - 2100hrs
Monday to Saturday and not on Sundays or recognised Scottish Public Holidays.

Haulage of minerals from the site or acceptance of deliveries to the site along the Cononish Access road from Dalrigh and Station Road Lower:
0800hrs - 1800hrs
Monday to Saturday and not on Sundays or recognised Scottish Public Holidays.

No works or vehicle movements are proposed outwith the time periods listed above, excluding emergencies, unless otherwise agreed in writing, in advance, with the Planning Authority.

3.4.3 Employment

3.4.3.1 Construction Stage/Decommissioning restoration stage

At construction the numbers of persons employed on site at any time is dependent upon the construction programme. Up to 25 persons are likely to be employed, with the appointed contractor likely to follow normal practice and supplement labour requirements from local sources.

Local contractors will be employed at decommissioning, to remove the process building and undertake minor earthworks prior to final restoration.

3.4.3.2 Mine production

The operation of the underground mine and the process plant requires 62 persons. Note that pre-production underground works will run in tandem with surface construction.

3.4.4 Contractors

Contractors with experience of the nature of the construction works proposed and in this type of environment will be appointed following a rigorous tendering and adjudication process. The operator shall have overall responsibility for supervision of works and for ongoing maintenance of the operational scheme. The Applicant will appoint an Ecological Clerk of Works (ECoW) and Landscape Clerk of Works (LCoW) who will liaise with the Operator's Project Manager and any contractors to ensure that all activities on site comply with site schemes for the protection of the natural heritage interest. The remits for CoWs were submitted in relation to the consented scheme and no changes are proposed (Appendix 6 refers).

All contractors shall attend tool box talks given by the ECoW to further ensure that all sensitivities in the area are highlighted and protective measures understood. Education with regards to natural heritage features is absolutely critical to their protection. Contractors are required to supply detailed method statements under the Construction Quality Assurance and Construction Design Management Regulations 2015 which will incorporate required protection measures. Restoration works will be undertaken by contractors with appropriate experience.

3.4.5 Construction Activities

Primary access for the construction works, for heavy plant and for building and plant components, is from the A82 at Tyndrum over the level crossing and then via the forestry track to Cononish Farm. Heavy plant would be brought in convoy, to fit with railway schedules and outwith peak road usage periods, as agreed with Transport Scotland.

During site construction works, as required for Health & Safety purposes, areas of the site will be temporarily fenced off.

A site construction compound and lay down area will be located within the area formerly occupied by portacabin offices and core storage.

The following plans show the location of the site elements and the phasing of the construction.

The phasing details over the projected life of the mine are set out in Figures 3.2 – 3.7i as well as at ES Appendix 3 (document Appendix F), indicating the proposed site elements, namely the process plant building location, the tailings stacks and settlement pond.

Figure 3.8 sets out the proposed scheme at closure.

Figure 3.9 is an orthographic projection of the process plant building and a general process plant layout.

3.4.6 Restoration of Construction Works

Ground affected by construction works will be reinstated as far a possible as works progress, on a programme of rolling restoration. Through carefully considered construction methods the requirement for restoration of the site area will be minimised. Any areas which are visibly altered by the construction process shall be closely monitored to ensure that natural vegetation becomes re-established and that there is no residual landscape impact.

Construction works will be overseen by an ECoW appointed by the Applicant, with the remit to provide ongoing compliance reports to the Applicant and the Park as Planning Authority. As set out at Section 3.4.4, above, the Contractor will have to adhere to rigorous construction methods to ensure protection of the natural heritage interest.

3.5 Operational Phase

3.5.1 Extraction of Ore

The gold bearing ore will be extracted using standard underground drill and blast methods. The ore will be transported by low profile truck from the mine portal via the access track. A small stockpile of around 250 tonnes of ore will be maintained at the southern end of the plant building. This represents around one day's processing (at full production rate).

3.5.2 Processing

The processing of ore remains the same as the currently approved scheme. The only additional plant relates to tailings management.

Processing plant will be entirely within the plant building and consists of a 'grizzley' screen, jaw crusher, granulator (second jaw crusher), ball mill (wet process) and two separate separation processes, a gravity separation process and a froth flotation process to produce a gold bearing sulphide concentrate. Additionally, there will be a filter-press (dewatering plant) to dewater the residue from this process which is known as tailings. The plant elements are illustrated in Figure 3.9.

Gold extracted by gravity separation will be further processed in the small onsite furnace. The concentrate, once pressed, dried and bagged, will require further off-site processing.

3.5.3 Concentrate Despatch

The concentrate will be transported from the site in 1.5 tonne bulk bags by a 7.5-18 tonne commercial vehicle to a suitable container loading site and shipped in 28 tonne containers either by road or road/sea to Europe to a multi-metal smelting facility.

3.6 Decommissioning and Final Restoration

The anticipated lifetime of the scheme is 10 years (although this may extend to 17 years if finance for additional plant is not forthcoming), by which time the scheme shall be decommissioned and restoration works undertaken. All progressive and final restoration works will be overseen and monitored by a Restoration Group (Appendix 11 refers), comprising representatives from Scotgold, the landowner, the Park Authority, SNH and the Crown Estates.

Decommissioning involves the securing of the mine portal, the removal of the plant building and ancillary structures, regrading and landscaping of the plant building area and mine plateau above utilising the materials in the adjacent landscaped mound. Available vegetated surfaces will be stripped and temporarily stored for replacement over the regraded slopes. The mine access track shall be maintained for estate use.

Tailings stacks having been progressively restored will be subject to any final treatment necessary as part of their aftercare.

When tailings stack construction is completed and the disturbed areas are adequately stabilised and vegetated, the settlement pond will no longer be required. Monitoring of site drainage shall continue during the aftercare period. When monitoring has confirmed that the settlement pond is no longer required the pond outflow shall be decommissioned and maintenance, including dredging, shall cease and the pond left to naturalise. No further after care is likely to be necessary.

Figure 3.8 indicates the vegetation types which have been identified as likely to recolonise over the site area, as a consequence of slope and drainage.

The area affected by the development comprises a mosaic of habitats with species becoming dominant depending on local conditions such as slope and drainage patterns. The site has been subject to intensive grazing in the past although as this is now restricted and more natural habitat is developing. The area is a wet heath acid grassland mosaic with elements of mire and rush-pasture; watercourses add significantly to habitat diversity. There is little exposed peat and very little tree cover, restricted to plantations and a few individual trees along the sheltered banks of the watercourses.

The proposed restoration will see a similar habitat mosaic develop although the detailed balance and distribution is likely to alter as the stack areas may tend to support increased grassland on the potentially drier slopes. The permeability of the stacks will however be similar to that of the existing substrates across the site and wet heath is likely to remain dominant. Flush and bog habitats in lower lying areas between the stacks will also be in keeping with the current diversity of habitat on site.

While the current balance of habitats will not be replicated at restoration the intention is to maintain a naturalistic ecotone across the site, including: wet and dry heath; acid grassland; flush; and blanket mire/bog, this is further considered in ES Section 8. The detail and methods for restoration are included in Appendix 7, Decommissioning and Restoration Plan.

3.7 Health and Safety

The construction site shall be subject to the relevant legislation and guidance, e.g. Construction (Design and Management) Regulations 2015, Health and Safety at Work Act 1974, Management of Health and Safety at Work Regulations 1992, Manual Handling Operations Regulations 1992, Personal Protective Equipment at Work Regulations 1992. Contractors shall also be responsible for the production of, and adherence to, site specific Health and Safety Plans.

3.8 Extractive Waste (Scotland) Regulations 2010 - Waste Management Plan

In compliance with this legislation a Waste Management Plan is required for the site and forms part of the planning application. The waste will comprise tailings from the gold extraction process. The tailings have been characterised as inert and the facility (tailings stacks) is not considered to represent a risk of major accident. It is therefore not considered to be a category A facility, this is a departure from the currently approved scheme. Provision is also made for a storage area within the mine for underground waste.

Section 13 of this ES sets out and explains the processes which have been followed.

Public participation in this process is satisfied, through the planning process, by the inclusion of the design and accompanying supporting studies as part of this ES. Loch Lomond and the Trossachs National Park as Planning Authority will require the lodging of a financial guarantee under the provisions of this legislation.

3.9 Cumulative Impact

Consideration has been given to the possibility of cumulative impact, this being attributable to the operation of two or more developments within influencing distance. The potential for cumulative effects has been scoped out, ES Section 5 refers. There is no cumulative impact anticipated.

Landscape and visual impacts may be considered cumulatively in several ways, *intervisibility* (where one development is visible from another), *simultaneously* (from the same location, in the same view), *successively* (from the same location as the viewer rotates), *sequentially* (from different locations as the viewer moves through the landscape). The remote location of the scheme at Cononish reduces the likelihood that anyone travelling through the landscape would be affected by this scheme, in combination with another scheme, in this way. LLTNP considers however that cumulative landscape and visual effects should be considered in relation to the in-combination effects of separate elements of this proposal (not in this case cumulative with other schemes). ES Section 6 considers this in detail through a sequential visual assessment.

No potential cumulative impacts have been identified.

4 PLANNING AND DEVELOPMENT FRAMEWORK

4.1 Introduction

The planning system guides the future development and use of land in cities, towns and rural areas in the long term public interest. The aim is to ensure that development and changes in land use occur in suitable locations and are sustainable. The planning system must also provide protection from inappropriate development.

In preparing this application consideration has been given to relevant planning guidance at all levels including national guidance in Scottish Planning Policy, Circulars and Planning Advice Notes, and regional and local guidance in the Development Plan. The development plan comprises: The National Park Partnership Plan, 2012-2017; the Draft National Partnership Plan 2018-2023, Loch Lomond & The Trossachs National Park Local Development Plan, 2016 and associated Supplementary Guidance.

4.2 Sustainable Development

'Securing the Future', the UK Government Sustainable Development Strategy, was launched by the Department for Environment, Food and Rural Affairs (DEFRA) in March 2005. The Strategy updates 'A Better Quality of Life: A Strategy for Sustainable Development for the UK' published in 1999 and takes account of developments since the 1999 Strategy, both domestically and internationally; the changed structure of government in the UK with devolution to Scotland, Wales and Northern Ireland; greater emphasis on delivery at regional level and the new relationship between government and local authorities.

The national strategy is based around five principles:

- ***living within environmental limits***
- ***ensuring a strong, healthy and just society***
- ***achieving a sustainable economy***
- ***promoting good governance***
- ***using sound science responsibly***

and contains four agreed priorities:

- ***sustainable consumption and production***
- ***climate change***
- ***natural resource protection***
- ***sustainable communities***

With respect to sustainable consumption and production the strategy for doing this involves:

- ***measures to improve the environmental performance of products and services, including improved product design;***
- ***continued drive to improve resource efficiency and reduce waste and harmful emissions across business sectors;***
- ***a new push to influence consumption patterns, including proposals for new advice for consumers;***
- ***new commitments on sustainable procurement in the public sector;***
- ***support for innovation to bring through new products, materials and services;***
- ***stronger partnerships with key business sectors such as the food, tourism and construction industries, and***
- ***a review of our waste strategy, with increased emphasis on reducing waste at source and making use of it as a resource.***

With respect to protecting our natural resources and enhancing the environment the Strategy acknowledges that natural resources are vital to our existence and to the development of communities and that there is a need for better understanding of environmental limits, a need for environmental enhancement where the environment is most degraded, the need to ensure a decent environment for everyone, and the need for a more integrated policy framework to deliver this. With this in mind the Strategy commits to placing sustainable development at the heart of the land use planning system and at the core of new planning guidance.

‘Choosing our Future: Scotland’s Sustainable Development Strategy’ December 2005 sets out action which Scotland will take to turn the shared priorities set out in the UK Framework for sustainable development into action.

With specific regard to sustainable development the proposal would permit the exploitation of a valuable resource whilst encouraging tourism by promoting more diverse interest in the National Park area. In economic terms the proposal would provide significant economic benefits for the local community through the provision of employment, use of local facilities, funding towards local community based projects and business, contribution towards the landscape management of the greater Cononish Glen. Tourist opportunities are recognised by the Scottish Tourism Forum and the opportunities associated with ethical gold jewellery have attracted interest from goldsmiths. In operational terms, appropriate project design and operational management would ensure that potential impacts are minimised and that the proposal would meet current amenity and environmental standards.

4.3 Getting the Best from our Land – A Land Use Strategy for Scotland 2016-2021

The first Land Use Strategy published in 2011 was a strategic framework bringing together proposals for getting the best from Scotland's land resources, helping us to think more strategically about the potential of our land and the ways in which land is used now and into the future. It set the long-term directions we need to pursue to get the best from Scotland's land and contribute to a more prosperous and successful nation. The Climate Change (Scotland) Act 2009 requires the Land Use Strategy to be reviewed every five years. Published by the Scottish Government in March 2016, the Land Use Strategy follows the 2011 Strategy and takes account of changes over the period and sets out consolidated efforts to move forward into the next phase. The central framework of the second Land Use Strategy remains the same – the Vision, Objectives and Principles for Sustainable Land Use.

The Objectives of the Land Use Strategy are:

- ***Land based businesses working with nature to contribute more to Scotland's prosperity;***
- ***Responsible stewardship of Scotland's natural resources delivering more benefits to Scotland's people; and***
- ***Urban and rural communities better connected to the land, with more people enjoying the land and positively influencing land use.***

The Land Use Strategy sets out Principles of Sustainable Land Use which will be used by public bodies when making plans and taking significant decisions affecting land use. The proposal is considered consistent with the Principles for Sustainable Land Use as noted below:

A. ***Opportunities for land use to deliver multiple benefits should be encouraged.***

The proposal provides multiple benefits with respect to: training and employment which will be a significant socio-economic benefit within the local area; assisting in the implementation of the Greater Cononish Glen Management Plan and supporting the aims and objectives of the National Park. There is also potential for tourism relating to Tyndrum's mining heritage.

B. ***Regulation should continue to protect essential public interests whilst placing as light a burden on businesses as is consistent with achieving its purpose. Incentives should be efficient and cost-effective.***

The approach taken by regulators to previous applications at the site has been consistent with this principle. The planning authority and statutory consultees apply this principle as a matter of course.

C. ***Where land is highly suitable for a primary use (for example food production, flood management, water catchment management and carbon storage) this value should be recognised in decision-making.***

Having regard to the scarcity of gold in the UK, the strategic value of the mineral resource should be recognised, together with the ethical credentials of the precious metals to be mined. If properly managed the proposed operation does not conflict with other uses of the land and the water environment.

D. ***Land use decisions should be informed by an understanding of the functioning of the ecosystems which they affect in order to maintain the benefits of the ecosystem services which they provide.***

The development of the site has been designed to ensure that there are no significant impacts on surrounding eco-systems. The proposed native woodland planting, habitat regeneration proposals to enable improvement of degraded UKBAP habitat will improve the eco-system of a wider area around the mine site. The site area will be fully restored to integrate with the surrounding landscape.

E. ***Landscape change should be managed positively and sympathetically, considering the implications of change at a scale appropriate to the landscape in question, given that all Scotland's landscapes are important to our sense of identity and to our individual and social wellbeing.***

Full consideration has been given to the landscape and mitigation ensures that the implications of change are at an acceptable scale.

F. ***Land-use decisions should be informed by an understanding of the opportunities and threats brought about by the changing climate. Greenhouse gas emissions associated with land use should be reduced and land should continue to contribute to delivering climate change adaptation and mitigation objectives.***

Utilisation of on-site materials minimises carbon emissions and the temporary disturbance of peat is balanced in the medium term by replacement for habitat enhancement with further benefits being derived from native woodland planting.

G. ***Where land has ceased to fulfil a useful function because it is derelict or vacant, this represents a significant loss of economic potential and amenity for the community concerned. It should be a priority to examine options for restoring all such land to economic, social or environmentally productive uses.***

Although the mine site is currently in use, the bulk processing trial is a relatively short term operation, moving into full mining production would see this land fulfil its economic potential prior to final restoration with associated environmental benefits.

H. ***Outdoor recreation opportunities and public access to land should be encouraged, along with the provision of accessible green space close to where people live, given their importance for health and well-being.***

Restriction of outdoor recreational opportunities during the development of the site is negligible. There will be no restriction of outdoor activities other than access to the mine site which would be excluded due to Health & Safety legislation. The presence of the mine may indeed attract more people to the area and to the glen.

I. ***People should have opportunities to contribute to debates and decisions about land use and management decisions which affect their lives and their future.***

The local community have been fully consulted with respect to the proposed development of the mine as it has evolved over the years and continue to be supportive. The planning authority will consider local views in the determination of this application.

J. ***Opportunities to broaden our understanding of the links between land use and daily living should be encouraged.***

Scotgold will continue to support the development of an interpretive facility with a focus on the geological and mining heritage of the National Park.

4.4 Scottish Planning Policy

4.4.1 National Planning Framework for Scotland 3 (NPF 3)

The new National Planning Framework for Scotland 3 (NPF 3) was laid before the Scottish Parliament and adopted in June 2014. The NPF is a long-term strategy for Scotland setting out the Government's development priorities over the next 20-30 years. It is the spatial expression of the Government Economic Strategy, and of its plans for development and investment in infrastructure. The NPF identifies national developments and other strategically important development opportunities in Scotland. It is accompanied by an Action Programme which identifies how the Government expects it to be implemented, by whom, and when. Statutory development plans must have regard to the NPF, and Scottish Ministers expect planning decisions to support its delivery. Whilst acknowledging the need for construction minerals and energy minerals to support the construction and energy sectors, NPF 3 also highlights the need for appropriate restoration.

4.4.2 Scottish Planning Policy

The Scottish Government committed in 2010 to combining all former Scottish Planning Policy (SPP) and National Planning Policy Guideline (NPPG) series' publications into one condensed Scottish Planning Policy document which will provide clearer, more focused and consistent policy messages.

Scottish Planning Policy (SPP) February 2010 provided a single consolidated document of subject policies. This approach placed planning in the wider context of Scottish Government aims and policies and clarified the Government's expectations of the system and planning services. It was a brief statement of policy and did not attempt to provide a comprehensive summary or explanation of the planning system in Scotland or to describe the full and diverse range of objectives to which planning may contribute. The SPP does not restate policy and guidance expressed elsewhere. The policies expressed in this SPP should inform the content of development plans, should be a consideration in decisions on planning applications and should be used to inform development proposals from initial concept to implementation. The SPP superseded and revoked twenty one SPP, NPPG, Circular and PAN documents.

A new SPP was published on 23 June 2014. The purpose of the SPP is to set out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land. The SPP promotes consistency in the application of policy across Scotland whilst allowing sufficient flexibility to reflect local circumstances. It directly relates to:

- the preparation of development plans;
- the design of development, from initial concept through to delivery; and
- the determination of planning applications and appeals.

Environmental Impact Assessment of the development proposals has been carried out in accordance with the provisions of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011, to assess any likely significant potential environmental impacts and, in this event, suggest mitigating measures. An Environmental Statement has been prepared detailing the results of this Environmental Impact Assessment. Detailed proposals have been submitted which make provision for appropriate restoration. The applicant fully accepts that an appropriate restoration guarantee shall be required.

The SPP should be read and applied as a whole. There are nevertheless paragraphs which have particular relevance to this application; these are presented in the following three sections.

The proposed development accords the SPP 2014.

4.4.2.1 Sustainability

The SPP introduces a presumption in favour of development that contributes to sustainable development.

Paragraph 28: ***The planning system should support economically, environmentally and socially sustainable places by enabling development that balances the costs and benefits of a proposal over the longer term. The aim is to achieve the right development in the right place; it is not to allow development at any cost.***

Paragraph 29: ***This means that policies and decisions should be guided by the following principles:***

- ***giving due weight to net economic benefit;***
- ***responding to economic issues, challenges and opportunities, as outlined in local economic strategies;***
- ***supporting good design and the six qualities of successful places;***
- ***making efficient use of existing capacities of land, buildings and infrastructure including supporting town centre and regeneration priorities;***
- ***supporting climate change mitigation and adaptation including taking account of flood risk;***
- ***having regard to the principles for sustainable land use set out in the Land Use Strategy;***
- ***protecting, enhancing and promoting access to cultural heritage, including the historic environment;***
- ***protecting, enhancing and promoting access to natural heritage, including green infrastructure, landscape and the wider environment;***

- ***reducing waste, facilitating its management and promoting resource recovery; and***
- ***avoiding over-development, protecting the amenity of new and existing development and considering the implications of development for water, air and soil quality.***

4.4.2.2 Promoting Rural Development

Paragraph 75: ***The planning system should:***

…

- ***encourage rural development that supports prosperous and sustainable communities and businesses whilst protecting and enhancing environmental quality; …***

ES Section 11, Socio-economics, refers.

4.4.2.3 Valuing the Natural Environment

Due the potential sensitivities of the environs of the application area the following paragraphs are directly relevant to the application.

Paragraph 203: ***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.***

Paragraph 205: ***Where peat and other carbon rich soils are present, applicants should assess the likely effects of development on carbon dioxide (CO2) emissions. Where peatland is drained or otherwise disturbed, there is liable to be a release of CO2 to the atmosphere. Developments should aim to minimise this release.***

Paragraph 207: ***Sites designated as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) make up the Natura 2000 network of protected***

areas. Any development plan or proposal likely to have a significant effect on these sites which is not directly connected with or necessary to their conservation management must be subject to an "appropriate assessment" of the implications for the conservation objectives. Such plans or proposals may only be approved if the competent authority has ascertained by means of an "appropriate assessment" that there will be no adverse effect on the integrity of the site.

ES Section 8, Ecology and Nature Conservation, refers.

Paragraph 212: ***Development that affects a National Park, National Scenic Area, Site of Special Scientific Interest or a National Nature Reserve should only be permitted where:***

- ***the objectives of designation and the overall integrity of the area will not be compromised; or***
- ***any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance.***

Paragraph 213: ***Planning decisions for development within National Parks must be consistent with paragraphs 84-85 (which notes the application of the National Park Aims).***

Paragraph 214: ***The presence (or potential presence) of a legally protected species is an important consideration in decisions on planning applications. If there is evidence to suggest that a protected species is present on site or may be affected by a proposed development, steps must be taken to establish their presence. The level of protection afforded by legislation must be factored into the planning and design of the development and any impacts must be fully considered prior to the determination of the application. Certain activities – for example those involving European Protected Species as specified in the Conservation (Natural Habitats, &c.) Regulations 1994 and wild birds, protected animals and plants under the Wildlife and Countryside Act 1981 – may only be undertaken under licence. Following the introduction of the Wildlife and***

Natural Environment (Scotland) Act 2011, Scottish Natural Heritage is now responsible for the majority of wildlife licensing in Scotland.

ES Section 8, Ecology and Nature Conservation, refers.

Paragraph 215: ***In areas of wild land (see paragraph 200), development may be appropriate in some circumstances. Further consideration will be required to demonstrate that any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation.***

ES Section 6, LVIA refers.

Paragraph 217: ***Where appropriate, planning authorities should seek opportunities to create new woodland and plant native trees in association with development. If a development would result in the severing or impairment of connectivity between important woodland habitats, workable mitigation measures should be identified and implemented, preferably linked to a wider green network (see also the section on green infrastructure).***

Appendix 12 GCGMP refers.

4.4.2.4 Responsible Extraction of Resources

The following paragraphs in relation to responsible mineral extraction are directly relevant to the application.

Paragraph 234: ***Minerals make an important contribution to the economy, providing materials for construction, energy supply and other uses, and supporting employment. … Planning should safeguard mineral resources and facilitate their responsible use. ...***

Paragraph 235: ***The planning system should:***

- ***…***

- ***safeguard workable resources and ensure that an adequate and steady supply is available to meet the needs of the construction, energy and other sectors;***
- ***minimise the impacts of extraction on local communities, the environment and the built and natural heritage; and***
- ***secure the sustainable restoration of sites to beneficial afteruse after working has ceased.***

The ES considers all potential impacts and demonstrates that the potential negative impacts of the proposed mineral extraction on the local community and on the environment are minimised and within acceptable parameters. Provision has been made for restoration and aftercare. In the long term the proposed development makes a positive contribution to the glen as a whole, in both ecological and landscape terms.

Paragraph 237: ***Local development plans should safeguard all workable mineral resources which are of economic or conservation value and ensure that these are not sterilised by other development. Plans should set out the factors that specific proposals will need to address, including:***

- ***disturbance, disruption and noise, blasting and vibration, and potential pollution of land, air and water;***
- ***impacts on local communities, individual houses, sensitive receptors and economic sectors important to the local economy;***
- ***benefits to the local and national economy;***
- ***cumulative impact with other mineral and landfill sites in the area;***
- ***effects on natural heritage, habitats and the historic environment;***
- ***landscape and visual impacts, including cumulative effects;***
- ***transport impacts; and***
- ***restoration and aftercare (including any benefits in terms of the remediation of existing areas of dereliction or instability).***

The ES addresses all relevant issues identified in Paragraph 237.

Paragraph 242: ***Operators should provide sufficient information to enable a full assessment to be made of the likely effects of development together with appropriate control, mitigation and monitoring measures. This should include the provision of an adequate buffer zone between sites and settlements, taking account of the specific circumstances of individual proposals, including size, duration, location, method of working, topography, the characteristics of the various environmental effects likely to arise and the mitigation that can be provided.***

The site design and the provision of a detailed ES, which addresses the potential issues specified in the LLTNP Scoping Response, accord with the requirements of Paragraph 242.

Paragraph 247: ***The Scottish Government is currently exploring a range of options relating to the effective regulation of surface coal mining. This is likely to result in further guidance on effective restoration measures in due course. In the meantime, planning authorities should, through planning conditions and legal agreements, continue to ensure that a high standard of restoration and aftercare is managed effectively and that such work is undertaken at the earliest opportunity. A range of financial guarantee options is currently available and planning authorities should consider the most effective solution on a site-by-site basis. All solutions should provide assurance and clarity over the amount and period of the guarantee and in particular, where it is a bond, the risks covered (including operator failure) and the triggers for calling in a bond, including payment terms. In the aggregates sector, an operator may be able to demonstrate adequate provision under an industry-funded guarantee scheme.***

Appropriate proposals for restoration and aftercare have been provided. A restoration guarantee had been agreed in relation to the current planning permission for the mine; a revised guarantee will be agreed in relation to the proposed changes.

Paragraph 248: ***Planning authorities should ensure that rigorous procedures are in place to monitor consents, including restoration arrangements, at appropriate intervals, and ensure that appropriate action is taken when necessary. …***

The currently consented planning permissions make appropriate provision for the monitoring and review of site operations. It is envisaged that existing conditions will be updated, as appropriate, to ensure that control is maintained. Clerk of Works roles are proposed, as previously agreed.

4.5 Planning Advice Notes

There is no Planning Advice Note which relates directly to the underground working of industrial minerals. The advice contained within PANs 50, 51, 60, 64, 75, 81, 1/2011 and 2/2011 has however been followed in the conception of this scheme and is referenced within the relevant sections of the ES.

4.5.1 PAN 50 Controlling the Environmental Effects of Surface Mineral Workings

In October 1996 the Scottish Office Development Department issued Planning Advice Note 50 (PAN 50) - Controlling the Environmental Effects of Surface Mineral Workings.

Initial operations and landscaping works involve materials handling with excavation and infill. The guidance in PAN 50 is considered to be relevant to the proposal. The aim of PAN 50 is to provide advice on the more significant environmental effects arising from mineral working operations. The Government considers this advice will be relevant in the framing of policies in development plans and in considering planning applications.

PAN 50 deals generally with the environmental effects of surface mineral working and provides the framework for detailed advice in a series of annexes on particular aspects. The first of the series of annexes ***"The Control of Noise at Surface Mineral Workings"*** was published along with ***PAN 50*** as ***Annex A*** and ***provides specific guidance on noise emissions from surface mineral workings***

within environmentally acceptable limits without imposing unreasonable burdens on mineral operators.

Annex A recommends a procedure for the setting of noise limits, but recognises that each case should be treated on its merits, having regard to the particular circumstances of the potential site and its surrounding area.

PAN 50 Annex B "The Control of Dust at Surface Mineral Workings" was published in March 1998 and "provides advice on how the planning system can be used to keep dust emissions from surface mineral workings within environmentally acceptable limits without imposing unreasonable burdens on mineral operators".

The Government is concerned to ensure that, in the interests of employees in the industry and the population at large, dust levels are kept to the minimum practicable level consistent with sound working practices.

PAN 50 Annex C "The Control of Traffic at Surface Mineral Workings" was published in December 1998 and provides advice on how the planning system can be used to manage traffic associated with surface mineral workings, both on-site and off-site, within environmentally acceptable limits.

The Scottish Executive Development Department ***PAN 50 Annex D "The Control of Blasting at Surface Mineral Workings"*** was published in February 2000 and provides advice on how the planning system can be used to keep blasting from surface mineral workings within environmentally acceptable limits.

The applicant endorses the advice on good working practice set out in PAN 50 and has taken this into account in the proposed design and operation of the mine and processing area. PAN 50 Annexes A to D have been considered under the relevant section headings within the ES.

4.5.2 PAN 51 Planning and Environmental Protection

PAN 51 “Planning and Environmental Protection” was published in March 1997 and “gives advice on the role of the planning system in controlling pollution and its relationship to a number of environmental protection regimes. The applicant has given consideration to the advice set out within PAN 51; all potential sources of pollution have been identified and addressed.

4.5.3 PAN 60 Planning for Natural Heritage

PAN 60 “Planning for Natural Heritage” was published in August 2000 and fulfils a commitment given in the National Planning Policy Guideline on Natural Heritage (NPPG14) to provide good advice on planning practice in relation to the conservation and enhancement of Scotland’s natural heritage. Paragraph 53 states that ***“siting, built form, choice of materials and detailing are all important considerations in achieving developments which are in harmony with the existing landscape and build on its existing character”.*** Careful consideration has been given to these matters. The import of PAN 60 has been taken into account in the preparation of this application and in the development of the site restoration, Appendix 7 Decommissioning and Restoration Plan refers.

4.5.4 PAN 75 Planning for Transport

PAN 75 “Planning for Transport” was published in August 2005. The PAN provides good practice guidance which planning authorities, developers and others should carry out in their policy development, proposal assessment and project delivery. The document aims to create greater awareness of how linkages between planning and transport can be managed. It highlights the roles of different bodies and professions in the process and points to other sources of information. Where a proposed development generates significant travel a Transport Assessment may be required. The Transport Assessment is to be distinguished from an Environmental Assessment, but where a formal Environmental Assessment is required, may form part of it. The scope and content of the Transport Assessment will be determined by the scale, travel intensity and travel characteristics of the proposal. The import of PAN 75 has been taken into account in the preparation of this application (ES Section 11 refers).

4.5.5 PAN 81 Community Engagement: Planning with People

PAN 81 "Community Engagement: Planning with People" was published in March 2007. The PAN provides advice to planning authorities and developers on how communities should be properly engaged in the planning process.

Paragraph 52 advises that "***Applicants should view pre-application consultation as an opportunity to consult with people to develop proposals which have minimal adverse impacts on communities. Planning authorities will expect applicants to submit good quality, accurate planning applications with all the supporting information identified at the pre-application stage so that processing can commence without delay"***.

Paragraph 54 advises that a report on how the developer has consulted the community will have to be submitted alongside the planning application. A report on community engagement is provided, Appendix 1.

4.5.6 PAN 1/2011 Planning and Noise

PAN 1/2011 was issued in March 2011 and supersedes PAN 56. The PAN promotes the principles of good acoustic design and a sensitive approach to the location of new development. It promotes the appropriate location of new potentially noisy development, and a pragmatic approach to the location of new development within the vicinity of existing noise generating uses, to ensure that quality of life is not unreasonably affected and that new development continues to support sustainable economic growth.

An assessment of baseline conditions and predicted noise from all aspects of the development has been undertaken to inform operational practices and hours of working at the proposed development. ES Section 10 refers.

4.5.7 PAN 2/2011 Planning and Archaeology

PAN 2/2011 was issued in July 2011 and supersedes PAN 42. It sits alongside Scottish Planning Policy (SPP), Scottish Historic Environment Policy Dec 2011 (SHEP) and the Managing Change in the Historic Environment Guidance Notes, which together set out the Scottish Ministers' policies for planning and the historic environment. Previous archaeological assessment informs this application.

4.6 Regional and Local Planning Policies

As part of the preparation of this application the applicants have considered their proposals in the context of the current planning framework. Consideration has been given to:

- National Parks Partnership Plan 2012-2017;
- The Loch Lomond & The Trossachs National Park Local Development Plan, Adopted 2016; and
- Supplementary Guidance – Design and Placemaking.

4.6.1 National Park Partnership Plan (2012-2017)

The National Park Partnership Plan (2012-2017) was approved by Scottish Ministers in 2012. Success for our National Parks relies on close and effective partnership working by Government, national agencies, local authorities, private businesses, charities, land managers and community organisations. The new National Park Partnership Plans set out in detail how the National Parks, and what they offer to the people of Scotland and visitors, will be enhanced over the next few years.

The Plan seeks a conservation outcome of: ***"An internationally-renowned landscape where the natural beauty, ecology and the cultural heritage are positively managed and enhanced for future generations"***.

The proposed tailings stacks have a positive landscape and visual impact compared to the permitted tailings dam. The key policies to enhance conservation and set out within the policies contained in the LLTNP Local Development Plan 2017-2021 and are addressed in that section; the proposal is considered to be policy compliant. The proposal will not lead to any significant change in terms of ecology or cultural heritage compared to the current consent. The proposal does not conflict with the aims of the National Park

The Plan seeks a visitor experience outcome of: ***"A high quality, authentic experience for visitors, with many opportunities to appreciate and enjoy the natural and cultural heritage, within an internationally renowned landscape that compares to the best on offer around the world"***.

Compared to the currently consented operations, the proposal will impact positively on the special qualities of the Glen. For most visitors, any detraction is likely to be short-term and transient as they pass along recognised routes and the priority given to protecting the Park for quiet enjoyment would not be compromised to any significant extent. Whilst there is an initial loss of the quality of outdoor recreation experience this would not be permanent and in the longer term planting proposals would deliver a net improvement to the experience of the Glen. The development of a goldmine is likely to generate widespread interest and there is potential for greater visitor interest/opportunities as a result of the proposal. The proposal has been considered in relation to the Park's third aim and is considered to be supportive in the longer term.

The Plan seeks a rural development outcome of: ***"In the National Park businesses and communities thrive and people live and work sustainably in a high quality environment"***.

It has been demonstrated that the proposal will make an economic contribution to the area and the wider Scottish economy. The proposal will support tourist development in Tyndrum. The proposal is considered to support the fourth National Park aim which seeks to promote sustainable economic and social development of the area's communities.

The proposal is considered to be consistent with the aims of the Partnership Plan.

The **National Park Partnership Plan: A View to 2018-2023** has been published as a consultative draft. Over the next five years the draft Plan seeks to build on the progress made between 2012 and 2017. The long term visions with respect to Conservation, visitor experience and rural development are similar to the 2012-2017 Plan; there are no proposed changes that would result in conflict with the proposed development. Accordingly, the proposal is considered to be consistent with the aims of the Draft Plan.

4.6.2 Loch Lomond & The Trossachs National Park Local Development Plan 2017-2021

LIVE Park, The Loch Lomond & The Trossachs National Park Local Development Plan 2017-2021 was adopted in 2016. The Local Development Plan (LDP) is focused on updating the key policy areas needed to support the delivery of the vision for development in the National Park, including increasing the supply of rural housing for people living and working in the Park, supporting the sustainable growth and diversification of the rural economy; raising the quality of the Park as a visitor destination, as well as addressing infrastructure limitations at key locations to support future development. Underpinning this strategy are core crosscutting themes of sustainability, climate change, design and placemaking that are central to achieving the Plan's vision.

This Plan shows development for the next 10 years and an indication of development for the subsequent 10 year period. The Plan covers the period 2017 to 2026 and will be updated regularly (every 5 years) so it is kept up to date and is responsive to change.

A number of Supplementary Guidance and Planning Guidance documents accompany this Plan; these explain in more detail how the policy or strategy requirements of the Plan can be met. Adopted Supplementary Guidance and this Plan form the development plan, and hold that status. Planning Guidance does not form part of the development plan, but it still supports this Plan and forms a material consideration on a range of topics which may be expanded in the future.

Supplementary Planning Guidance directly relevant to the proposals includes 'Design and Placemaking'.

The National Parks (Scotland) Act 2000 sets out the Planning Authority's responsibilities including statutory planning and access functions. The Act also requires the Authority to produce a Management Plan

This Plan must adhere to the National Park Partnership Plan and contribute to achieving the f***our aims of National Parks:***

- ***to conserve and enhance the natural and cultural heritage of the area***
- ***to promote sustainable use of the natural resources of the area***
- ***to promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public***
- ***to promote sustainable economic and social development of the area's communities***

These aims are to be pursued together. However, if it appears that there is conflict between the first aim, the conservation and enhancement of the natural and cultural heritage, and any of the others, the Planning Authority must give greater weight to the first aim (Section 9(6) of the National Parks (Scotland) Act 2000); this is often referred to as the 'Sandford Principle'.

The proposal is considered against the National Park aims below.

- ***To conserve and enhance the natural and cultural heritage of the area***

Natural Heritage: The development proposal will not have significant adverse impacts on important habitats and species and will not adversely impact on designated sites; proposed mitigation and restoration techniques must be carried out to the highest standard. The proposal mitigates the main adverse impact on natural heritage from the existing permission which was associated with the landscape and visual impact of the tailings dam. The benefits to natural heritage interests that will be secured by the new tailings stacks proposal support the Park's first aim.

The wider area has a cultural heritage associated with past mining activity. In the future the Cononish Goldmine will form part of the area's heritage and tourism industry and can assist in focussing greater attention on the area's more historic mining heritage. The proposal supports the Park's first aim with respect to cultural heritage.

- ***to promote sustainable use of the natural resources of the area***

The project relates to the exploitation of the natural resources of gold and silver. Other than ready-mix concrete, no construction materials require to be imported to the site; rock from the mine will be utilised for the processing building bund, tracks and drainage layers. The reinstatement proposals involve the re-use of recovered turfs and soils. Any foreseeable risks of pollution have been mitigated. The proposal is considered to be consistent with the Park's second aim.

- ***to promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public***

The proposal represents a beneficial landscape and visual impact compared to the currently consented tailings dam. With regard to this planning baseline, the proposal will impact positively on the special qualities of the Glen. The implications of the project for members of the public will continue to be varied and the recreational experience currently enjoyed by visitors to the Glen will change for a period of at least 10 years. However, for most visitors, any detraction is likely to be short-term and transient as they pass along recognised routes and the priority given to protecting the Park for quiet enjoyment would not be compromised to any significant extent. A mitigation plan is in place to ensure that ice-climbing on the Eas Anie can continue as normal, when in condition. In general, all other access interests are safeguarded.

The development of a goldmine is likely to generate widespread interest and there is potential for increased footfall within the Glen as visitors coming specifically to see the goldmine. An indirect benefit from the development would be to give greater prominence to the mining heritage and geological interests in the area and there is potential for education opportunities associated with interpreting these topics. If appropriate interpretation is provided, this, and the goldmine itself, may attract more visitors to the wider Strathfillan area.

Whilst there is an initial loss of the quality of outdoor recreation experience this would not be permanent and in the longer term planting proposals would deliver a net improvement to the experience of the Glen. The proposal is considered to support the Park's third aim in the longer term.

- ***to promote sustainable economic and social development of the area's communities.***

It has been demonstrated that the proposal will make an economic contribution to the area and the wider Scottish economy. As identified in relation to the third aim, the presence of the goldmine may attract more visitors to the wider area and may lead to other economic development occurring in this part of the Park which may deliver tourism and community benefits. The proposal is considered to support the fourth National Park aim.

Section 4 of the LDP outlines the Plan's policies that will be used to guide and determine planning applications; these are considered below.

OVERARCHING POLICY 1:

All development should contribute to the National Park being:

A successful, sustainable place by:

- ***Contributing to the collective achievement of the 4 aims of the National Parks (Scotland) Act, and giving greater weight to the first aim of the National Park if it appears to be in conflict with the other National Park aims,***
- ***Contributing to sustainable development,***

- ***Supporting the implementation of the National Park Partnership Plan; it's Outcomes, Policies and Priorities,***
- ***Ensuring areas of open space are of high quality, appropriate to the needs of the local community, integrated to the development and provide links to the wider green network; and,***
- ***Being Distinctive, Safe and Pleasant, Easy to move around, Welcoming, Adaptable, and Resource efficient.***

A low carbon place by:

- ***Reusing brownfield land or vacant property where possible,***
- ***Reducing greenhouse gas emissions through sustainable design; use of energy efficient materials, passive solar design, landscaping and micro renewables, connecting or creating opportunities to a shared heating scheme;***
- ***Supporting the provision of waste reduction and waste hierarchy principles including prevention, reuse (e.g. composting) or recycling; and,***
- ***Connecting well to public transport and safe pedestrian/cycle access where possible.***

A natural, resilient place by:

- ***Minimising adverse impacts on water, air and soil quality,***
- ***Addressing the impacts of climate change,***
- ***Avoiding significant flood risk,***
- ***Relating well to the landscape context and setting, be sympathetic to local built forms and materials including historic street pattern, scale, massing and design,***
- ***Respect the important physical/historical/ landscape/cultural features of the site and surrounding area; and,***
- ***Incorporating appropriate soft and hard landscaping, a planting scheme, and measures to protect existing trees and other landscape features.***

A more connected place by:

- ***Increasing and improving connections to nearby places, paths, piers, streets, bus stops, train stations and open space;***
- ***Designing streets to consider place – how it looks and feels - before movement; and,***

- ***Encouraging developers to explore opportunities for the provision of digital infrastructure to new homes and business premises as an integral part of development.***

The goldmine has previously been assessed as generally contributing to the achievement of the four aims of the Park; as the current proposal reduces the landscape and visual impacts when considered against the planning baseline of the currently permitted mine, it steers the development closer to the aims of the Park.

The proposal maximises the reuse of aggregate waste arising on site thereby minimising the requirement to utilise primary aggregates for infrastructure works.

The ES provides a full appraisal of environmental impacts and demonstrates that there are no significant impacts on water air or soil quality. The proposal represents and improvement compared to the planning baseline as it removes the requirement to divert the Allt Eas Anie.

There is no flood risk associated with the proposal.

The proposal has no significant impact on the surrounding landscape/cultural features.

The proposal incorporates measures that protect and enhance planting in the surrounding area.

OVERARCHING POLICY 2:

Development proposals should not conflict with nearby land uses and where relevant, must address the following requirements:

- ***Landscape & Visual Amenity: safeguard visual amenity and important views, protect and/or enhance rich landscape character, and features and areas specifically designated for their landscape values at any level;***

- ***Amenity and Environmental Effects: avoid any significant adverse impacts of; flooding, noise/vibration, air emissions/odour/fumes/ dust, light pollution, loss of privacy/sunlight/daylight;***
- ***Historic Environment: protect and/or enhance the character, appearance and setting of the historic environment;***
- ***Natural Environment: protect and/or enhance the biodiversity, geodiversity, water environment, sites and species designated at any level (international, national or local) including ancient and semi-natural woodland, green infrastructure and habitat networks;***
- ***Sustainable Travel: support Active Travel choices where possible (prioritise walking, cycling and public transport use over car use) and transport infrastructure;***
- ***Safe Access and Parking: provide safe road access and appropriate parking provision;***
- ***Visitor and Recreational Experience: promote understanding and enjoyment (including recreation) of the special qualities of the area by the public including safeguarding access rights;***
- ***Design & Placemaking: achieve a high quality design and layout, provide a positive sense of place, and compliment local distinctiveness;***
- ***Social Wellbeing and Economic Vitality: adaptable for the changing needs of future users, designing for extreme weather, fulfil disabled requirements, support new businesses, training/jobs for local people and a mix of uses/tenures, and***
- ***Climate Friendly Design: demonstrate how proposed buildings will meet a reduction in greenhouse gas emissions through;***

a) Minimising overall energy requirements through conservation measures, and

b) Incorporating on-site low and zero carbon generating technologies to meet 10% of the overall energy requirements of the building rising to 20% by December 2021.

Supplementary Guidance
(Design and Placemaking) supports the above policy by providing further details on how best to integrate new development within the National Park landscape.

This includes advice on design principles, design process, site analysis, climate change adaption and reducing greenhouse gas emissions.

The larger gold mine development has previously been assessed by the Parks Authority in relation to the land uses designated within Overarching Policy 2 and impacts have been found to be acceptable. As identified within the relevant sections, the proposal will reduce impacts compared to the currently approved development in relation to landscape and visual amenity as the proposed tailings mounds will less intrusive compared to the approved tailing dam. There shall be less impact on the water environment as there is no requirement to divert the Allt Eas Anie under the new proposal.

No change is proposed from the current permission in relation to: sustainable travel; safe access and parking; visitor and recreational experience; design and placemaking; or social wellbeing and economic vitality.

Supplementary Guidance Draft Design and Placemaking relates to site and area appraisal and is concerned not only about how a building looks but also how it fits into the landscape and integrates with the wider landscape setting. The mine buildings have previously been accessed by the Parks Authority and deemed to be acceptable. The proposed buildings do not vary significantly in relation to the consented buildings and are considered to be of appropriate design and colour and, having regard to the necessity for buildings in relation to the overall development, to sit appropriately in the landscape. The proposal accords with the Supplementary Guidance Draft Design and Placemaking.

OVERARCHING POLICY 3:

Developer contributions may be required for public infrastructure, public services or to address adverse environmental impacts. Where an identified need has been demonstrated development proposals will help contribute towards:

- ***Affordable housing;***
- ***Education provision;***
- ***Transport infrastructure and services (where appropriate);***

- ***Water and sewage infrastructure (including Sustainable Drainage System);***
- ***Open space (including landscaping and public access);***
- ***Community facilities (including health, leisure, sport and recreation);***
- ***Waste management facilities (including recycling); and***
- ***Natural and historic heritage.***

Where planning obligations are used to secure developer contributions, these will be sought in line with the requirements of Circular 3/2012 Planning Obligations and Good Neighbour Agreements'.

Financial guarantees have previously been agreed in relation a Restoration Guarantee and the Greater Cononish Glen Management Plan (GCGMP). Whilst the quantum of the Restoration Guarantee will have to be reviewed to reflect the new proposals; contributions will be maintained in relation to the GCGMP.

ECONOMIC DEVELOPMENT POLICY 2:

Economic Development in the countryside and small Rural communities

Development proposals in the countryside for new or expanded businesses uses which support economic activity shall be supported, provided proposals can demonstrate that there is reasonable justification why they cannot be located within Economic Development Sites as shown within town and village maps; and where the proposal;

(a) Involves home-working or live-work units from an existing residential property, or

(b) Is located within an identified Rural Activity Area or supports priorities identified within the Buchanan South or West Loch Lomondside Rural Development Frameworks, or

(c) Utilises redundant structurally sound traditional buildings, or

(d) Forms part of a building group where it can be demonstrated that there is a justification for the business to be located in a countryside location and there are no available sites within towns and villages, or

(e) Redevelops land which has been identified as vacant or derelict within the associated land audit.

Economic Development may be supported in some instances where this forms part of a long term farm or estate-wide business management plan. This policy is supported by Design and Placemaking Supplementary Guidance which provides further information on siting in Building Groups.

The proposal has been demonstrated to support economic activity. It is an accepted fact that minerals can only be worked where they occur. In this instance the location of the gold deposit dictates the development location.

TRANSPORT POLICY 2:

Promoting sustainable Travel and Improved active Travel options

All development proposals will make a positive contribution towards encouraging safe, sustainable travel and improving active travel options throughout the Park by enabling opportunities for:

(a) Sustainable transport modes, based on a hierarchy of walking, cycling, public transport and motorised transport; for freight, a shift from road to rail and water-based transport where possible,

(b) Access and opportunities for water transport on the sea lochs and on some inland lochs,

(c) Modal change from private car to more sustainable transport modes within settlements including the provision of integrated new or improved transport infrastructure,

(d) New and improved links to existing and proposed walking and cycling routes, as described in the Core Path Plan and included in the National Walking and Cycling Network (NWCN). Former railway lines should be safeguarded to provide walking, cycling and bridleway opportunities.

Due to the location of the mineral deposit, the hierarchy in relation to sustainable transport modes is limited. However, provision has been made for the group transportation of employees from the A82 to the mine site. Where feasible, the operator shall encourage employees to car share when travelling to and from the A82 parking facility.

The development has previously been assessed and confirmed to meet the requirements of ***TRANSPORT POLICY 3: Impact assessment and Design standards of new Development, Policies 1) Assessment of Impact, and 2) Design Specification and Standards.***

NATURAL ENVIRONMENT POLICY 1:

National Park Landscapes, Seascape and Visual Impact

Development will protect the special landscape qualities of the National Park in accordance with The Special Landscape Qualities of Loch Lomond & The Trossachs National Park (SNH 2010). Development proposals will be required to be sympathetic to their setting and minimise visual impact, including areas of wild land character (1) and wild land areas.

Note: The special landscapes of the National Park include a range of character types and are covered by various designations.

The currently permitted development was subject to landscape and visual assessment which confirmed to the satisfaction of the LLTNP Planning Authority that the proposal could be undertaken without unacceptable impacts. The proposal relates to a revised storage plan for mine waste which will reduce landscape and visual impacts compared to the currently permitted development. A landscape and visual assessment has been undertaken (ES Section 6 refers) which confirms that impacts are acceptable in relation to the existing baseline and an improvement on those associated with the planning baseline.

NATURAL ENVIRONMENT POLICY 2:

European sites - Special Areas of Conservation and Special Protection Areas

Development that is likely to have a significant effect on a European Site, which is not directly connected with or necessary to their conservation management, will be subject to an assessment (known as an Appropriate Assessment) of the implications for the site's conservation objectives. Where the assessment concludes that proposed development will affect the integrity of the site, either individually or in combination with other development, the proposal will only be permitted

where:

(a) There are no alternative solutions; and

(b) There are imperative reasons of overriding public interest, including those of a social or economic nature. Where the site concerned hosts a priority natural habitat type these reasons must relate to human health or public

safety, beneficial consequences of primary importance for the environment, or further to an opinion from the European Commission (through Scottish Ministers) or other imperative reasons of overriding public interest.

The European site may be designated or proposed, and the significant effect can be either alone or in combination with other plans or projects. In exceptional circumstances and where the above points have been fully investigated; the proposal will only be permitted where compensatory measures are provided to ensure that the overall coherence of the network of European Sites is protected, with prior consultation with the European Commission via Scottish Ministers.

While the proposal does not lie within an SAC boundary, due to its proximity to designated sites (Ben Lui SAC and River Tay SAC), and the interconnected nature of the areas, via the flows of the Allt Eas Anie, impact assessment has been undertaken to demonstrate that there shall be no significant impact on the designated areas. Information is presented in the Appropriate Assessment Appraisal, Appendix 12, in order to assist the competent authority with a Habitat Regulations Appraisal, and Appropriate Assessment, as necessary.

NATURAL ENVIRONMENT POLICY 3:

Sites of Special Scientific Interest, National Nature Reserves and RAMSAR Sites

Development that affects a Site of Special Scientific Interest, National Nature Reserve or RAMSAR site will only be permitted where it is demonstrated that:

(a) There is an overall enhancement of the site for the reasons it was designated, or

(b) There is no adverse effect on the site that would compromise the objectives and overall integrity of the designated area; or

(c) Any adverse effects on the qualities for which the area has been designated are clearly outweighed by social or economic benefits of national importance.

The parts of the Ben Lui designations which lie within Cononish Glen are also covered by the SAC designation. The potential for any effects is therefore addressed above at Natural Environment Policy 2.

NATURAL ENVIRONMENT POLICY 4:

Legally Protected species

Development will not be permitted where it would have an adverse impact on any protected species under schedules 2, 3 and 4 of the Conservation (Natural Habitats &c.) Regulations 1994, wherever they occur unless it is demonstrated that:

(a) ***It would not be detrimental to the maintenance of the United Kingdom population or conservation status of the species concerned; and***

(b) ***There is no alternative; and***

(c) ***The applicant can demonstrate public health, public safety or other imperative reasons of overriding public interest, including those of a social or economic nature, and that there are beneficial consequences of primary importance for the environment.***

In addition full consideration will be given to the protection of species protected under schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended), species listed in Annex 1 of the Birds Directive and badgers under the Protection of Badgers Act 1992 (as amended).

Where there is good reason to believe that a protected species may be present on a proposed development site, an ecological survey will be required to determine whether the species is present, the likely impacts on the species or habitat, and any mitigation and compensation measures that will be undertaken.

Appropriate ecological surveys have been undertaken and mitigation proposed as appropriate; the proposal shall have no significant impact on Legally Protected Species (Policy ENV4).

NATURAL ENVIRONMENT POLICY 5:

Species and Habitats

Development that would have an adverse impact (including cumulative impact) on habitats or species identified in the National Park Biodiversity Action Plan which occur in the National Park will only be permitted where:

(a) ***It is demonstrated that the need and justification for the development outweighs the local, national or international contribution of the area of habitat or populations of species; and***

(b) Significant harm or disturbance to the ecological functions, continuity and integrity of the habitats or species populations is avoided, or minimised where harm is unavoidable, and appropriate compensatory or management measures are included either within or outside of the site; and

(c) The extent and functions (for carbon sequestration and/or Ground Water Dependant Terrestrial Ecosystems) of woodlands, peat and bog lands will not be impaired in the medium to long-term.

The ecological assessment (ES Section 8 refers) demonstrates that there shall be no significant impact on species or habitats.

NATURAL ENVIRONMENT POLICY 6:

Enhancing Biodiversity

Developments will be required to enhance biodiversity by:

(a) Securing the protection, management and enhancement of natural landscape, wildlife, wildlife habitat, habitat networks and green corridors, and where possible the creation of new wildlife habitats; and

(b) Aiming to have native species planted and preventing the planting or spread of invasive non-native species including those listed in Schedule 9 of The Wildlife and Countryside Act 1981.

The proposal relates to the modification of a currently permitted mine development. Existing habits shall be managed; native species shall be utilised for restoration planting.

NATURAL ENVIRONMENT POLICY 7:

Protecting Geological Conservation Review Sites

Development that affects a Geological Conservation Review Site will only be permitted where it is demonstrated that:

(a) There is an overall enhancement of the site for the reasons it was identified, or

(b) There is no adverse effect on the site that would compromise the objectives and overall integrity of the identified area; or

(c) Any adverse effects on the qualities for which the area has been identified are clearly outweighed by social or economic benefits of national importance.

Sites of geological importance in the National Park identified through future research and audit will be recognised and appropriately protected from any significant adverse effects.

The site is not currently a designated site. The proposal offers significant potential with respect to the geological interpretation of the area.

NATURAL ENVIRONMENT POLICY 10:

Protecting Peatlands

Development should avoid the unnecessary disturbance of peat and carbon-rich soils. Best practice must be adopted in the movement, storage, management and reinstatement of peat and carbon-rich soils. Development on undisturbed areas of peat or carbon-rich soils will not normally be permitted, unless;

(a) The economic and social benefits of the development clearly outweigh any potential detrimental effect on the environment; and

(b) It has been clearly demonstrated that there is no viable alternative.

Where development is permitted, a depth survey must be undertaken which demonstrates that the areas of deepest peat have been avoided.

Where required, a peat management plan and where appropriate mitigation measures must also be submitted which demonstrates that the unnecessary disturbance, degradation or erosion of peat is avoided.

A peat survey has been undertaken and the disturbance of peat has been avoided where possible. The proposal reduces the volume of peat to be excavated compared to the current consent. In areas where peat will be excavated, appropriate handling measures will be in place and all peat will be used in restoration works for habitat enhancement.

NATURAL ENVIRONMENT POLICY 11:

Protecting the Water Environment

Development will be required to ensure no significant adverse impact on the water environment by:

a) Protecting and enhancing the ecological status and riparian habitat, natural heritage, landscape values and physical characteristics of water bodies (including biodiversity and geodiversity);

b) Demonstrating that there would be no significant adverse impact on protected species or their habitats in the water body or its catchment area;

(c) Ensuring that development has no adverse impact on the quantity of water available for drinking water and other uses;

(d) Protecting and enhancing existing flood plains; protecting opportunities for public access to and recreation and enjoyment on and around lochs, rivers, burns, wetlands and the coastal marine area; and

(e) Having regard to any designated Bathing Waters in the Park. Where engineering works are required in or near water bodies, that may have a significant adverse effect on points (a) to (e), either up or downstream from the works, they will not be supported.

1. There will be a presumption in favour of soft engineering techniques and against the culverting of watercourses, unless there is no suitable alternative. Proposals for culverting of watercourses for land gain may only be justified if the applicant can demonstrate that:

(f) No other practical option exists that would allow the watercourse to remain open; and

(g) The proposed development is of over-riding public interest.

Under the revised proposal there will be no requirement to divert the Allt Eas Anie. Accordingly the proposal is beneficial in terms of protecting the water environment. ES Section 7 addresses issues relating to hydrology and hydrogeology. Appropriate consideration has been taken of all relevant guidance; no significant impacts are anticipated.

With respect to ***Natural Environmental Policy 11, Protecting the Water Environment***, the treatment of sewerage shall be by a private treatment system to be agreed with the PA in liaison with SEPA. Water shall be sourced from the site drainage system and recycled, the site water management system ensures the protection of water quality including drinking water supply.

The proposal is not located within the Flood Risk Area as designated by SEPA. ***Natural Environment Policy 16, Flood Risk*** is not applicable.

NATURAL ENVIRONMENT POLICY 16:

Land contamination

Where development is proposed on or close to known or suspected land contamination, applicants will be required to provide a risk assessment which demonstrates that:

(a) ***Potential impacts on human health and the wider environment, including all aspects of the water environment, arising from land contamination have been investigated and addressed. Where appropriate, consideration should be given to both radioactive and non-radioactive sources of contamination; and***

(b) ***The site has been remediated or the development proposal provides for remediation of the site in a manner consistent with the requirements of PAN 33 to ensure that the site is made suitable for use and is not causing unacceptable risk.***

The proposal relates to an established mine site. There is no contaminated land.

The proposal shall have no impact with respect to ***Historic Environment Policy 1, Listed Buildings; Historic Environment Policy 2, Conservation Areas; Historic Environment Policy 3, Wider Built Environment and Cultural Heritage; Historic Environment Policy 4: Gardens and Designed Landscapes; or Historic Environment Policy 6, Scheduled Monuments and Other Nationally Important Archaeological Sites.***

HISTORIC ENVIRONMENT POLICY 7:

Other Archaeological Resources

Other archaeological resources will be expected to be retained, protected and preserved in-situ and in an appropriate setting wherever feasible. Where it can be demonstrated that preservation in-situ is not feasible, planning approval will be conditional upon the developer making appropriate provision for the archaeological excavation, recording, and analysis of the resources, and for publication of the results where appropriate, all to the satisfaction of the National Park Authority.

An archaeological assessment was undertaken in relation to the current planning permission which was assessed as having an impact of low magnitude on the remnants of buildings associated with the former lead mine at Eas Anie. Where possible, development has been positioned to avoid these features. Mitigation is proposed by the recording of the features prior to removal and analyses and publication thereafter. No significant archaeological impacts have been identified. There will be on change from the current permission.

HISTORIC ENVIRONMENT POLICY 8:
Sites with Unknown Archaeological Potential
Where sites are considered to have significant archaeological potential the developer will be required to submit details of the results of an archaeological evaluation of the site with the application, or before its determination. Where significant archaeological remains are found during evaluation, and where they cannot be preserved in-situ, planning permission may be refused or made conditional on compliance with an agreed programme of archaeological mitigation as required by the National Park Authority.

An archaeological assessment has previously been undertaken. Given the marginal character of the ground, and historical disturbance, the potential for the presence of previously unidentified archaeological features has been assessed to be low. An archaeological watching brief shall be maintained during the ground disturbance elements of the construction programme where these are assessed by the survey to have the potential to expose remains from the historic lead mine. These works shall ensure that any currently unknown buried features can be identified and recorded as appropriate.

MINERAL EXTRACTION POLICY 1:
Support will be given to proposals provided that:

(a) ***There will be no adverse effect on the National Park's special qualities, communities, traffic generation or flooding by virtue of the quarry or support infrastructure; and***

(b) ***The site will be subsequently restored and enhanced to provide benefits for the local community, biodiversity and the landscape; and***

(c) ***There is provision to facilitate the recycling and re-use of waste resulting from mineral extraction and processing.***

More flexibility will exist and be given in the case of a proposed extension to existing facilities if there are significant economic development benefits providing the proposals meet the criteria (a), (b) and (c) above.

New mineral extraction sites shall only be supported where the material to be extracted is required to facilitate the enhancement and maintenance of the National Park's built environment or, where it can be demonstrated that there is an overriding national interest and there is no reasonable alternative source outwith the National Park. An Environmental Impact Assessment will normally be required for all new workings, to consider, amongst other things, the impact on the water environment.

Development proposals for the exploration or the development of wellhead and transmission infrastructure for unconventional gas extraction (coal bed methane, shale gas and other forms of onshore oil and gas) are generally not supported. Planning proposals of this nature shall be assessed with particular focus on criteria (a) above and the overarching policies

A bond will be required in most instances for restoration, enhancement and aftercare of ground conditions.

This application is for a revision of the extraction and processing operations permitted in February 2015. The proposal will reduce the potential landscape and visual impacts attributable to the tailing dam.

The proposal has been subject to appropriate Environmental Impact Assessment. As the diversion of the Allt Eas Anie would no longer be required, the proposal will reduce the potential for impacts on the water environment. With mitigation there is no potential for any impact on the River Tay SAC. No significant impacts are anticipated with respect to infrastructure.

The proposal shall create some 50 - 60 local jobs directly associated with the mine operations. Local employment shall further support local businesses with additional employment generated through the operation of a visitor facility, to be set up with funding from the applicant. The proposal shall have a positive economic impact on the local area.

There shall be no change in terms of traffic generation.

The proposal will re-use mineral waste associated with the mine development to minimise the requirement to import and use primary aggregates on site.

It is considered that the proposal is consistent with the requirements of ***Mineral Extraction Policy 1***. The proposal will make use of an identified resource, will have a positive sustainable economic impact and is considered to support the four statutory aims of the National Park.

4.7 Assessing the Proposal in Terms of Planning Control

National guidance makes provision for the working of minerals within appropriate environmental constraints and advises that, to protect the physical and natural environment, a hierarchy of policies should be adopted within development plans that tailor the degree of protection to the importance of the area.

The National Park Partnership Plan seeks to ensure that businesses and communities thrive and people live and work sustainably in a high quality environment. The rural development outcomes shall be a key consideration in the determination of any proposal, in tandem with sustainability of development and protection of the special qualities of the Park.

The Loch Lomond and The Trossachs National Park Local Development Plan highlights the necessity for sustainability of development to be a priority. While encouraging economic activity the environmental sensitivities of the park, designated and otherwise are emphasised. This includes the conservation of geological interests.

Whilst the Plan will only support new mineral extraction in exceptional circumstances, the Plan also acknowledges the gold resource at Cononish recognising that this is an exceptional resource.

The EIA process gives full consideration to all potential impacts, environmental, social and community. Residential properties in the vicinity are located at such a distance that the potential for disturbance from many aspects of the proposal is low/negligible.

The ES addresses all potential environmental impacts, both positive and negative, on the landscape and natural environment by virtue of the scale, type, location and the quality and extent of mitigation and restoration proposed. The proposal shall have no significant negative impacts in terms of ecology, hydrology, hydrogeology, noise, dust, traffic and archaeology and no impact on the qualifying features of the Tay River SAC. With regards to interaction with other projects in the environs no significant cumulative impacts are envisaged. Cultural heritage within the area includes significant historical mining activity at Tyndrum. The proposed development is assessed as being consistent with, and indeed enhancing, the cultural heritage of the area. Significant local economic benefits have been identified with respect to direct employment at the mine, the use of local services, and a boost for tourism through the provision of funding towards the creation of a visitor and interpretation facility. The proposal is considered to be consistent with the four aims of the National Park.

Taking cognisance of the application's compliance with Scottish Planning Policy and with Development Plan policies it is considered that there are no planning considerations which would merit refusal.

5 SCOPING THE ASSESSMENT

5.1 Identification of Potential Impacts

An Environmental Impact Assessment must identify the potentially significant impacts which may arise from the proposed development at all stages of the project, including effects caused in association with other existing or proposed developments.

The aspects which may require assessment include (consolidation of EC Directives 2011/92/EU and 2014/52/EU):

- human beings (population and human health)
- fauna
- flora
- biodiversity, with particular attention to species and habitats protected
- under Directive 92/43/EEC and Directive 2009/147/EC
- land
- soil
- water
- air
- climate
- landscape
- material assets
- cultural heritage
- the interactions between any of the foregoing

Following identification of the main elements of the development, and an initial assessment of how these are likely to affect the main environmental headings, the potential impacts, <u>in the absence of mitigation measures</u>, were identified. The applicant submitted a proposed scope for EIA as a formal scoping request in April 2017. Responses are attached, Appendix 2 refers.

Details of restoration and aftercare, as well as a summary of any other mitigation measures were included in the proposed scope. The key issues identified for assessment are presented below together with comment from consultees and the final scope of the EIA in relation to each of the issues.

5.2 Identification of the Key Issues

Following the assessment of potential effects of the development, matters and concerns raised by the consultees previously, and using client and consultant experience, including the previous assessments for development of the mine, the scoping process identified the key issues, requiring full assessment as the potential effects on:

- the water environment;
- landscape and visual amenity;
- access;

and to a lesser degree:

- flora and fauna (requiring an update protected species survey and data to inform an updated Habitat Regulations Appraisal).

Other potential effects which had previously been scoped in and assessed were found to be acceptable previously and are not considered likely to alter under the new proposal. Further guidance on these issues is however taken from a formal scoping exercise and the responses received by consultees and compiled by the PA.

No changes are now proposed which are thought likely to alter previous conclusions in relation to the specific areas of noise, dust, blasting and traffic. The revised tailings management will lead to a reduction in these effects relating to construction phase as no TMF embankment will now be constructed and no diversion to the Allt Eas Anie is proposed. Operational effects will be unaltered, except for on-site traffic movements. A full assessment of these vehicle movements in relation to potential noise and dust effects is included as part of the consideration of hydrology, landscape and visual amenity, access and recreation, and flora and fauna. An updated noise assessment and full consideration of the effects of dust on specific receptors is provided, these findings are summarised in ES 9 Emissions.

The scoping response from Stirling Council Roads reiterated their previous position, noting that conditions should be attached to any grant of consent to require roads condition surveys to be undertaken. The PA has however requested an updated traffic assessment; ES Section 10 refers.

An Archaeological report was prepared in relation to the permitted scheme and the changes proposed have no potential to alter its conclusions. The scoping response from WOSAS states that it is unlikely to be necessary to undertake further assessment of the impact of the revised proposal on the historic environment as part of any new EIA. It goes on however to note that the previously agreed programme of mitigation work would still remain to be completed; this remains Scotgold's intention and Appendix 9 refers.

5.2.1 Hydrology

A full assessment of the existing and proposed site hydrology is provided. This considers the detail of site water management and the infrastructure and operational methods which shall require to be implemented in order to avoid adverse effects on the water environment. Although the mining and processing of ore remains essentially unaltered, the implications of dewatering as part of the process and the handling of dry tailings, their placement, landscaping and restoration are all now considered. This assessment informs the Competent Authority in relation to the requirement to update the Habitat Regulations Appraisal and if necessary Appropriate Assessment relating to the River Tay SAC (Appendix 12 also refers).

5.2.2 Landscape and Visual Amenity

Previous assessment has demonstrated that the effects of mining at this location could be accommodated within this landscape setting. Although it is likely that the revised proposal represents an overall reduction in landscape and visual impact, a further assessment was proposed to fully explore the potential effects and to establish that this is indeed the case. A complete review of potential effects has been undertaken. The potential implications of the proposal on wild land are also considered.

5.2.3 Flora and Fauna

Scoping responses highlighted a number of aspects which the assessment should consider. The establishment of sufficient baseline data was recommended, in order to enable consideration of any minor alterations to the scheme during its lifetime. It was suggested that the exact position and size of tailings stacks, tracks, and working corridors may need to evolve in the light of practical experience (during the project). This is certainly the case and an element of micro-siting is anticipated. Nevertheless, the EIA process seeks to establish the acceptability of the principles of the proposal, within parameters which ensure that any potential for significant effects is addressed, avoiding, minimising, and offsetting effects through appropriate mitigation measures, including restoration.

Monitoring of protected species shall continue throughout the life of the mine and update surveys have been undertaken in relation to habitat and otter activity to inform the PA's decision; potential effects are assessed and mitigation presented, as necessary. The habitat survey, using National Vegetation Classification standards (NVC) has also considered the classification of habitat under the Functional Wetland Typology for Scotland, relating to Groundwater Dependent Terrestrial Ecosystems (GDTEs).

The impact assessment presented considers the potential impacts on habitat including the effects of the progressive restoration of disturbed areas, the decommissioning of the scheme and the potential impacts associated with the final restoration of the site area. Impacts on wet heath, dry heath, blanket bog plant communities, areas of peat (a surface organic layer >0.5m deep) and GDTEs are all considered at ES Section 8.

Restoration details including what habitats will be restored and how this will be achieved successfully are set out in Appendix 7 Decommissioning and Restoration Plan.

In order to enable the competent authority (the PA) to undertake an updated Habitat Regulations Appraisal (HRA), a revision of baseline information and likely effects on qualifying features is presented. This relates to the River Tay SAC and Ben Lui SAC. An updated Appropriate Assessment Appraisal is submitted, Appendix 12 refers. This includes a consideration of: water and silt management associated with the development (ES Section 7 also refers); the construction of the new bridge in relation to fish, particularly salmon as a qualifying feature of the River Tay SAC (ES Section 8 Ecology and Nature Conservation also refers); the potential for dust generation (ES Section 9 Emissions also refers); effects associated with the Greater Cononish Glen Management Plan (ES section 8 also refers).

5.2.4 Access and Recreation

The revised proposal does not introduce any restriction on the ability of visitors to access the glen. However the proposed scheme was considered likely to have potential effects on visitors which have not previously been assessed. This relates to the introduction of tailings delivery vehicles which will operate throughout the life of the mine. The potential for impacts associated with the noise, dust and visual disturbance which may be caused by these vehicles will be the focus of this assessment. There is also an alternative bridge crossing proposed, over the Crom Allt.

5.3 Other Environmental Effects

5.3.1 Human Beings

5.3.1.1 Benefits of the development

An analysis of the economic/socio-economic effects of the development is presented in the report at Section 11. Employment opportunities associated with the proposals during the life of the development are discussed, together with the longer term sustainable employment resulting from the gold mine. Indirect and induced benefits are considered, locally, regionally and nationally.

5.3.1.2 *Potential Impacts*

Consideration under this heading relates to direct impacts on members of the public; site contractors are not considered here. The members of the public potentially affected are those using Cononish Glen and the surrounding hills for recreational access. Potential impacts on walkers in Cononish Glen related to road traffic are not considered to be significant due to the small numbers of vehicles involved and equally so in relation to the capacity of the existing highway network. Recreational access is assessed at ES Section 12. Potential impacts on human beings are dealt with in each topic section and impacts and mitigation are summarised in Section 14 of the ES.

5.3.2 Climate

5.3.2.1 *Energy consumption and fuel emissions to the atmosphere*

The extractive and processing operations require energy and as such there is a carbon footprint associated with the development. Through the use of efficient, modern plant this is minimised. There are further elements of the design which minimise the use of energy/fuel, the site layout reduces the haul distances between the mine and the processing plant and the use of site sourced materials removes a requirement for the importation of suitable bulk fill and aggregates from quarries in the region, with attendant road vehicle miles, fuel consumption and emissions. Housing the process plant and management accommodation within a single insulated and acoustically clad building also has benefits.

5.3.2.2 *Peat Disturbance*

The area of the development is generally covered by a thin but locally variable peaty topsoil, in some areas this overlies peat (>0.5m deep). The small area directly impacted by the proposals will give rise to short term loss of this resource, as a carbon sink. During progressive and at final restoration the peaty topsoil will be replaced and a habitat supporting peat development created.

Disturbance of peat is limited; any potentially deeper peat will be retained in situ (disturbance is limited to <0.4m below existing ground level); release of greenhouse gases from these areas is negligible. Volumes of peat removed from stack footprints, from those areas where the surface organic layer is deeper than 0.5m (and therefore defined as peat) have been calculated on the basis of peat probe data, and provision made for use in restoration and/or habitat enhancement where possible. This will not only reduce the potential for release of CO_2 from disturbed peat but also limit this potential release from degraded peat habitat currently on site.

The contribution to climate effects from this scheme are minimised and are assessed as being insignificant. Any more detailed assessment of carbon balance is scoped out.

5.3.3 Material Assets

The quality of the natural resource present is critical to the success of the operation. Permitting this application allows the economic value of the resource to be realised and provides wider economic benefits to the estate in maintaining its viability in the long term as well as to the economy of the local area, the wider region and nationally (see Section 11 and ES Appendix 10).

6 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

LUC

www.landuse.co.uk

Cononish Gold Mine: Landscape and Visual Impact Assessment

Prepared by LUC on behalf of Scotgold Resources Ltd.
July 2017

6.1 Introduction

6.1.1 Purpose and Scope

A landscape and visual impact assessment (LVIA) was submitted in support of the original planning application in July 2011 ('the 2011 LVIA'). Planning consent for the Cononish Gold Mine (the Permitted Development) was granted in 2012, but has not been implemented.

A number of changes to the permitted scheme are now proposed, as described in ES Section 3. The purpose of this updated LVIA is to re-evaluate the potential for effects on landscape character and visual amenity, arising from these changes to the Permitted Development.

This 2017 LVIA provides a reassessment of landscape and visual effects, focusing on the key changes between the Permitted Development and the amended proposal (the Proposed Development), as described below. To that end, it considers potential effects against the 'physical baseline', i.e. the prevailing conditions on site, and also makes reference to the 'planning baseline', i.e. the situation including the Permitted Development.

6.1.2 Assessment Process and Objectives

Landscape and visual assessments are separate, although linked, processes. This chapter considers the potential effects of the proposal on:

- the landscape as a resource in its own right (caused by changes to the constituent elements of the landscape, its specific aesthetic or perceptual qualities and the character of the landscape);
- views and visual amenity as experienced by people (caused by changes in the appearance of the landscape).

This chapter deals with landscape and visual effects separately. The assessment has been undertaken by chartered Landscape Architects at LUC.

The assessment process which was undertaken, and key objectives, are set out below.

- **Establish current baseline:** Any changes in the landscape character or visual amenity of the area since 2011 will be identified and described where relevant. The policy context relating to landscape has also changed, and updated policy and guidance has been identified.
- **Identify potential effects:** The potential effects of the amended project on landscape resources, character and visual amenity have been assessed in line with currently available good practice guidance.
- **Identify mitigation measures**: The changes in the design of the proposal have been developed with a view to reduce reducing the potential for landscape and visual effects, as described in ES Sections 2.5 and 3.3, and represent mitigation by design (embedded mitigation). Based on the assessment of potential effects, further measures for avoiding or reducing the significance of effects have been identified.
- **Describe residual effects and their significance:** Any residual effects that cannot be mitigated are described, including cumulative effects, and their significance is determined.

6.1.3 Study Area

This LVIA adopts the same study area as was used in the 2011 LVIA, based on a 10km radius from the mine. The study area is also determined by the zone of theoretical visibility (ZTV) of the Proposed Development, which is shown in Figure 6i and described in Section 6.4.3.1. The shaded areas of the ZTV indicate the predicted maximum extent of the area from which any part of the developed mine site may be seen, and therefore enable the study area to be focussed upon those locations within a 10km radius which will potentially be affected.

6.1.4 The Proposed Development

The Proposed Development is described in detail in ES Section 3. The key changes from the Permitted Development include the removal of the tailings management facility, which comprised a large dam, and the associated diversion of the Allt Eas Anie. Instead, dried tailings will be stacked in discrete units across a similar area. A new bridge over the Crom Allt is now proposed, rather than upgrading the existing bridge. The key features of the development will be:

- Site access, including a new car park, new bridge over the Crom Allt, and use of the existing access road;
- New Process Plant Building to be located adjacent to the existing mine portal;
- Phased establishment of 10 discrete tailings mounds (dry-stack areas), with associated drainage features;
- Phased restoration of mounds as they are completed; and
- Final restoration of the site, including decommissioning and removal of the Process Plant Building.

6.1.5 Potential Effects

The following potential types of effect are considered in the assessment:

- direct and indirect effects on landscape resources and character, including the perceptual qualities of the landscape;
- visibility of the development and effects on views and visual amenity;
- short term and temporary effects during the construction period of the development;
- medium term effects during the operational working lifetime of the mine (either ten years or 16 years);
- intermittent effects associated with operation, such as vehicular and pedestrian activity, movement and lighting;
- in-combination effects resulting from the various elements of the Proposed Development being experienced in the landscape together, including sequential effects on routes; and
- short and medium term effects during the decommissioning and restoration period, post closure of the mine.

6.1.5.1 Effects Scoped Out

The following effects have been scoped out of this assessment:

- effects on receptors outside the ZTV of the Proposed Development and/or beyond 10km from the location of the site, where it is judged that significant effects are unlikely to occur; and
- cumulative effects, resulting from the mine working in combination with other ongoing, planned and proposed development in the area.

6.1.6 Consultation

A Scoping Report was prepared by Dalgleish Associates Ltd (DAL) in April 2017, and Loch Lomond and the Trossachs National Park Authority (LLTNPA) provided a scoping opinion on 16 May 2017. This included detailed comments from the LLTNPA landscape advisor. Comments from Scottish Natural Heritage were largely confined to ecology matters, though with some relevance to site restoration proposals. Subsequent correspondence between DAL and LLTNPA clarified matters including viewpoint selection, presentation of visualisations, and the baseline for assessment.

6.2 Assessment Methodology

6.2.1 Overview

The key steps in the methodology for assessing landscape and visual effects were as follows:

- the landscape of the study area was analysed and landscape receptors identified;
- the area over which the development will be visible was established through creation of a Zone of Theoretical Visibility (ZTV);
- the visual baseline was recorded in terms of the different groups of people who may experience views of the development and the nature of their existing views and visual amenity;

- viewpoints were selected (including representative viewpoints, specific viewpoints and illustrative viewpoints), in consultation with LLTNPA;
- likely significant effects on landscape and visual resources were identified; and
- the level (and significance) of landscape and visual effects were judged with reference to the sensitivity of the resource/receptor (its susceptibility and value) and magnitude of effect (a combination of the scale of effect, geographical extent, duration and reversibility).

6.2.2 Data Sources

The following data sources have informed the assessment:

- Scottish Planning Policy;
- Loch Lomond and the Trossachs National Park Local Development Plan and supplementary guidance;
- Loch Lomond and the Trossachs National Park Partnership Plan;
- Scottish Natural Heritage (2009) Loch Lomond and The Trossachs National Park landscape character review. SNH Review no. 140;
- Scottish Natural Heritage (2010) The Special Landscape Qualities of the Loch Lomond and The Trossachs National Park. Commissioned Report No. 376;
- Descriptions of Wild Land Areas published by Scottish Natural Heritage;
- Ordnance Survey (OS) Maps at 1:25,000 and 1:50,000 scale; and
- Aerial and ground level photography available on-line.

6.2.3 Surveys

Since field work was carried out in 2010-2011 for the original LVIA, further post-application visits to the site and study area were carried out on several occasions. In particular, site visits were undertaken in February 2017 to discuss the dry-stack approach. During this site visit the likely scale and locations of the tailings stacks were considered, and approaches to mitigating the key effects were discussed. Updated viewpoint photography (see Figures 6.1i to 6.13i) was undertaken by DAL during April and May 2017, and has been assessed as part of this LVIA.

6.2.4 Approaches and Principles

The following section describes the methodology used to prepare this update LVIA. It is based on current good practice guidance described in the third edition of Guidelines for Landscape and Visual Impact Assessment (GLVIA3).

Annex 6.1 sets out the full methodology used for the LVIA. The methodology describes how the overall significance of both landscape and visual effects was judged, drawing on assessments of:

- sensitivity (nature of receptor), based on considering both susceptibility of the receptor and value of the resource; and
- the magnitude of effect (nature of the effect), based on considering size/scale, geographical extent, duration and reversibility of the predicted changes.

With respect to terminology, GLVIA3 generally distinguishes between “the 'impact', defined as the action being taken, and the 'effect', defined as the change resulting from that action” and recommends that the terms should be used consistently in this way. The terms are used in this way within the assessment.

Assessment of potential effects on landscape, which deals with changes to the landscape as a resource, and visual effects, which addresses changes in views and visual amenity, are related but distinct components of LVIA. The methodologies used to assess potential landscape and visual effects are broadly similar, but do include some differences.

The LVIA considers the potential landscape and visual effects arising from the addition of the Proposed Development to the existing landscape. In addition, it gives some consideration to the potential effects against a baseline that includes the Permitted Development, as discussed in Section 6.4 of this LVIA.

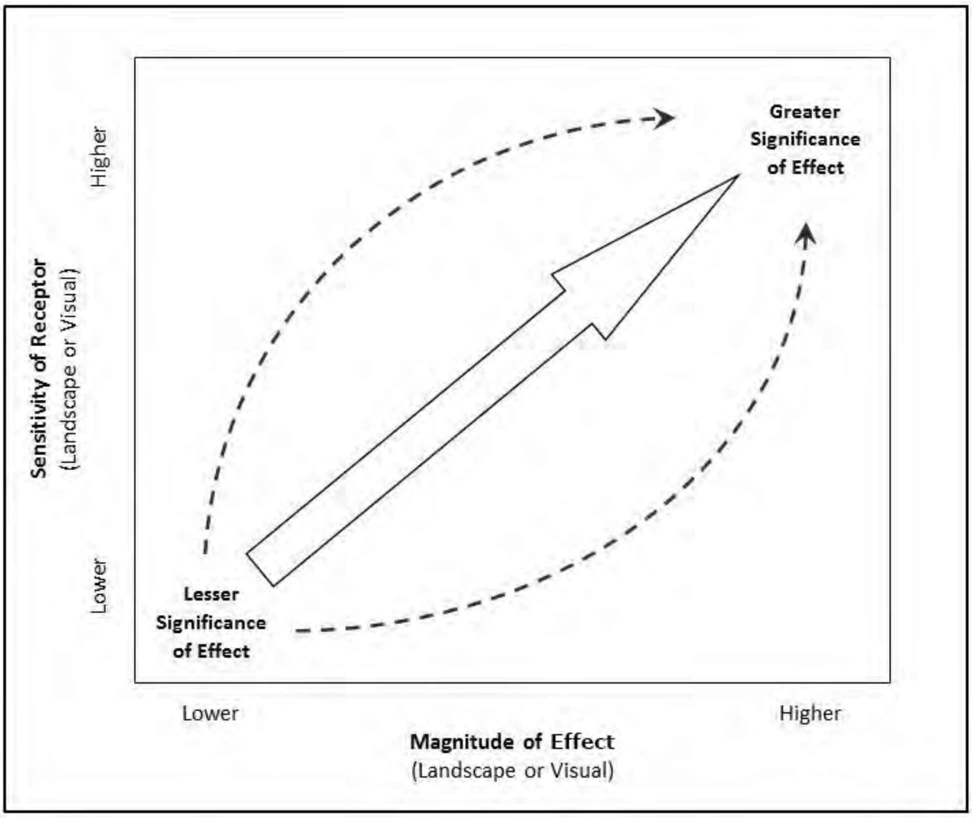
In order that the differences are clear, the methodology and means of assessing significance for landscape and visual effects are set out separately

6.2.5 Assessment of Effects

The assessment of both landscape and visual effects requires consideration of the sensitivity or nature of receptors (taking account of their susceptibility to change and the value placed on the resource) and the magnitude or nature of the effect (taking account of scale and extent, duration and reversibility). Each variable is examined, and professional judgements made, based on the use of a consistent set of standard terms.

The assessment of landscape and visual effects is based on the weighing up and evaluation of the various contributory aspects, resulting in the presentation of a reasoned judgement as to how each has been assessed, and their contribution to the overall level and significance of the identified resultant landscape and visual effects. A numerical or formal weighting system, or rigid matrix-type approach, whereby the level and significance of effect is defined by the direct correlation between the level of sensitivity and the magnitude of effect, is not appropriate for the assessment of landscape and visual effects.

Plate 6.1 Determining Significance of Effects



Consideration is therefore given to the relative importance of each criterion, to inform the overall judgement, which is accompanied by detailed narrative text providing justification for the judgements. Each effect can be evaluated with reference to Plate 6.1 which is shown above as a guide.

6.2.5.1 Assessing Significance of Landscape Effects

The approach to assessing significance is presented in Annex 6.2. Table 6.1 defines the levels of effect used, informed by Plate 6.1.

Table 6.1 Levels of Landscape Effect

Levels of Landscape Effect	
Major	Changes substantially affecting the character of the landscape or the elements therein. For example a major impact is likely when a receptor of high sensitivity is affected by a high magnitude of landscape impact.
Moderate	Change affecting, to a lesser degree, the character of the landscape or the elements therein. For example a moderate impact is likely when a receptor of medium sensitivity is affected by a moderate magnitude of landscape impact.
Minor	Slight change affecting the character of the landscape or specific elements therein. For example a minor impact is likely when a receptor of low sensitivity is affected by a low magnitude of landscape impact.
Negligible	No or minimal perceptible change, affecting the character of the landscape or specific elements therein. Note that this includes locations where there will be no landscape impacts.

Landscape effects are described as either not significant or significant, whereby major and moderate landscape effects are considered significant, as outlined in Table 6.2 below. Note that there is a gradual, blurred transition between levels.

Table 6.2 Significance of Landscape Effects

Significance of Landscape Effects		
Not Significant Landscape effects may be reversible and/or of short duration, and/or over a restricted area, affecting elements and/or characteristics (including aesthetic and perceptual aspects) that contribute to but are not key to the character of landscapes.		**Significant** Landscape effects may be long-term and/or irreversible, and/or over an extensive area, affecting elements and/or characteristics (including aesthetic and perceptual aspects) that are key to the character of nationally valued landscapes.

6.2.5.2 *Assessing Significance of Visual Effects*

The approach to assessing significance is presented in Annex 6.1. Table 6.3 defines the levels of effect used, informed by Plate 6.1.

Table 6.3 Significance of Visual Effects

Levels of Visual Effect	
Major	Changes substantially affecting views and visual amenity. For example a major impact is likely when a receptor of high sensitivity is affected by a high magnitude of visual impact.
Moderate	Change affecting, to a lesser degree, views and visual amenity. For example a moderate impact is likely when a receptor of medium sensitivity is affected by a moderate magnitude of visual impact.
Minor	Slight change affecting views and visual amenity. For example a minor impact is likely when a receptor of low sensitivity is affected by a small magnitude of visual impact.
Negligible	No or minimal perceptible change, affecting views and visual amenity. Note that this includes locations where there will be no impacts.

Visual effects are described as either **not significant** or **significant**, as outlined in Table 6.4 below. Effects assessed as **moderate** and **major** are considered significant in the context of the EIA Regulations.

Table 6.4 Significance of Visual Effects

Significance of Visual Effects		
Not Significant Visual effects on people who are generally less sensitive to changes in views/ visual amenity. Small changes and/or changes which are well integrated into the view, often involving features already present in the view. These may be reversible effects/ or of short duration.	⇨	**Significant** Visual effects on people who may be particularly sensitive to changes in views/ visual amenity, and/or at recognised viewpoints or recognised scenic routes. Large scale changes which introduce new, non-characteristic or discordant or intrusive elements into the view. These may be long-term/ irreversible effects.

6.2.6 Assessment Limitations

No information gaps have been identified which will affect the outcome of the assessment. It is considered that there is sufficient information to enable an informed decision to be taken in relation to the identification and assessment of likely significant landscape and visual effects.

6.2.7 Key Terminology

The key terminology used in the assessment of both landscape and visual effects is set out in Table 6.5 below. These terms are defined in Annex 6.1.

Table 6.5 Significance of Landscape Effects

<table>
<tr><th colspan="5">Key Considerations and Terms</th></tr>
<tr><th>Consideration</th><th colspan="4">Terminology</th></tr>
<tr><td>Sensitivity</td><td>Low</td><td>Medium</td><td colspan="2">High</td></tr>
<tr><td>Susceptibility</td><td>Low</td><td>Medium</td><td colspan="2">High</td></tr>
<tr><td>Value</td><td>Low</td><td>Medium</td><td colspan="2">High</td></tr>
<tr><td>Magnitude</td><td>Barely perceptible</td><td>Low</td><td>Medium</td><td>High</td></tr>
<tr><td>Scale of effect</td><td>Small</td><td>Medium</td><td colspan="2">Large</td></tr>
<tr><td>Geographical Extent</td><td>Small (localised)</td><td>Medium</td><td colspan="2">Large (widespread)</td></tr>
<tr><td>Duration</td><td>Short-term (0-2 yrs.)</td><td>Medium–term (3-16 yrs.)</td><td colspan="2">Long-term (>16 yrs.)</td></tr>
<tr><td>Reversibility</td><td>Reversible</td><td>Partly reversible</td><td colspan="2">Permanent</td></tr>
<tr><td>Level of effect and significance</td><td>Negligible</td><td>Minor</td><td>Moderate</td><td>Major</td></tr>
<tr><td>Direction</td><td>Positive</td><td>Mixed/Neutral</td><td colspan="2">Adverse</td></tr>
</table>

6.3 Policy Context

6.3.1 Introduction

This section provides a summary of the planning policies of relevance to landscape and visual amenity. ES Section 4 details the overall national and local planning policy context and explains compliance with this.

SNH guidance on Minerals and the Natural Heritage in Scotland's Midland Valley, 2000, updated February 2011 was referred to in Loch Lomond and Trossachs National Park scoping opinion, and, although place specific, provides some background and guidance.

6.3.2 Scottish Planning Policy

Paragraph 84 of Scottish Planning Policy (2014) sets out the four aims of National Parks, as defined in the National Parks (Scotland) Act 2000:

- ***"conserve and enhance the natural and cultural heritage of the area;***
- ***promote sustainable use of the natural resources of the area;***
- ***promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public; and***
- ***promote sustainable economic and social development of the area's communities."***

Paragraph 85 highlights that the first aim takes precedence where there is a conflict.

Paragraph 212 of SPP states that: ***"Development that affects a National Park, National Scenic Area, Site of Special Scientific Interest or a National Nature Reserve should only be permitted where:***

- ***the objectives of designation and the overall integrity of the area will not be compromised; or***
- ***any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance."***

Paragraphs 200 notes that: ***"Wild land character is displayed in some of Scotland's remoter upland, mountain and coastal areas, which are very sensitive to any form of intrusive human activity and have little or no capacity to accept new development. Plans should identify and safeguard the character of areas of wild land as identified on the 2014 SNH map of wild land areas."***

Paragraph 215 expands: ***"In areas of wild land (see paragraph 200), development may be appropriate in some circumstances. Further consideration will be required to demonstrate that any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation."***

SPP sets out measures to promote the responsible extraction of mineral resources, including minimising effects on communities and the environment, and ensuring sustainable restoration of extraction sites (paragraph 234ff.).

6.3.3 Local Development Plan

The development plan for Loch Lomond and the Trossachs National Park (LLTNP) is the adopted Local Development Plan 2017-2026 (hereafter referred to as the LDP 2017-2026). Within the LDP 2017-2026, the sections of greatest relevance are:

- Section 1: Introduction and in particular Planning in the National Park on page 7, and Main Changes on page 8;
- Section 2: Vision;
- Section 3: Place, particularly Environment on page 36; and
- Section 4: Policies

Section 3 of the LDP 2017-2026 notes on page 36 that:
"The geodiversity of the Park has led to a significant heritage of quarrying for building materials which has contributed to the distinct character of the area's built heritage. Mineral resources, including gold, also exist near Tyndrum."

Section 4 of the LDP 2017-2026 outlines overarching and detailed policies that will be used by the LLTNP to guide and determine planning applications. Relevant planning policies are set out below.

6.3.3.1 Overarching Policies

These set out the expectations and requirements on all new development. With respect to landscape and visual matters all Overarching Policies (Policies 1 to 3) are relevant to the development. Highlighted below are points within these policies of particular relevance to the assessment of landscape and visual effects.

Overarching Policy 1

This policy states that all development should contribute to the National Park being a natural, resilient place by:

- ***"Relating well to the landscape context and setting, be sympathetic to local built forms and materials including historic street pattern, scale, massing and design,***
- ***Respect the important physical/historical/ landscape/cultural features of the site and surrounding area; and,***
- ***Incorporating appropriate soft and hard landscaping, a planting scheme, and measures to protect existing trees and other landscape features."***

Overarching Policy 2

This policy states that development proposals should not conflict with nearby land uses and, where relevant, must address the following requirements:

- Landscape & Visual Amenity: ***"safeguard visual amenity and important views, protect and/or enhance rich landscape character, and features and areas specifically designated for their landscape values at any level".***

6.3.3.2 Detailed Policies

These set out topic specific requirements for new developments within the LLTNP: relevant details are noted below.

Natural Environment Policy 1

National Park Landscapes, Seascape and Visual Impact – ***"Development will protect the special landscape qualities of the National Park in accordance with***

The Special Landscape Qualities of Loch Lomond & The Trossachs National Park (SNH 2010). Development proposals will be required to be sympathetic to their setting and minimise visual impact, including areas of wild land character and wild land areas."

Natural Environment Policy 6

Enhancing Biodiversity – ***"Developments will be required to enhance biodiversity by:***

(a) Securing the protection, management and enhancement of natural landscape, wildlife, wildlife habitat, habitat networks and green corridors, and where possible the creation of new wildlife habitats; and

(b) Aiming to have native species planted and preventing the planting or spread of invasive non-native species including those listed in Schedule 9 of The Wildlife and Countryside Act 1981."

Mineral Extraction Policy 1

"Support will be given to proposals provided that:

(a) There will be no adverse effect on the National Park's special qualities, communities, traffic generation or flooding by virtue of the quarry or support infrastructure; and

(b) The site will be subsequently restored and enhanced to provide benefits for the local community, biodiversity and the landscape; and

(c) There is provision to facilitate the recycling and re-use of waste resulting from mineral extraction and processing.

More flexibility will exist and be given in the case of a proposed extension to existing facilities if there are significant economic development benefits providing the proposals meet the criteria (a), (b) and (c) above.

New mineral extraction sites shall only be supported where the material to be extracted is required to facilitate the enhancement and maintenance of the National Park's built environment or, where it can be demonstrated that there

is an overriding national interest and there is no reasonable alternative source outwith the National Park. An Environmental Impact Assessment will normally be required for all new workings, to consider, amongst other things, the impact on the water environment.

Development proposals for the exploration or the development of wellhead and transmission infrastructure for unconventional gas extraction (coal bed methane, shale gas and other forms of onshore oil and gas) are generally not supported. Planning proposals of this nature shall be assessed with particular focus on criteria (a) above and the overarching policies

A bond will be required in most instances for restoration, enhancement and aftercare of ground conditions."

6.3.3.3 Draft Design and Placemaking Supplementary Guidance

This document provides additional guidance in support of Overarching Policy 2 and provides further details on how to best integrate new development within the National Park Landscape. The supplementary guidance is also relevant to Natural Environment Policy 1: National Park Landscapes, Seascape and Visual Impact.

6.4 Baseline Conditions

6.4.1 Physical Baseline and Planning Baseline

This section presents the 'physical baseline', i.e. the currently prevailing conditions on site. However, this LVIA also gives consideration to the Proposed Development against the 'planning baseline', i.e. including the Permitted Development. The Permitted Development is described in detail in the relevant planning application documents (reference 2011/0166/MIN and 2014/0285/DET). Had this Permitted Development been implemented, the baseline for the assessment would include the enlarged mine and associated buildings, large tailings management facility, diverted Allt Eas Anie, upgraded Crom Allt bridge and new car park. In considering the Proposed Development against this notional planning baseline, the assessment takes note of the fact that this level of change has previously been considered acceptable.

6.4.2 Landscape Baseline

The baseline landscape is described in relation to landscape character, as defined at regional and local scales, and in relation to applicable landscape designations and their special qualities.

6.4.2.1 Regional landscape character

The landscape of the National Park is described in the Landscape Character Assessment (LCA) published by Scottish Natural Heritage (SNH) in 2009. This document describes the evolution of the landscape as well as its current character. The section on Historic Features notes that *"From the 18th century, deposits of silver, gold and lead were exploited around Tyndrum where the remains of a lead crushing mill can still be seen." (page 60)*.

The section on Minerals Extraction states: "An exploratory gold mine was opened in the 1980s on the lower slopes of Ben Lui at the head of Glen Cononish. This is not currently operational due to low gold prices, but the mine workings, which have not been restored and which extend over the open upland glen and open hill LCT context, are extensive and highly visible. Similarly, the excavations and spoil from the old lead and silver mines on the high ground immediately west of Tyndrum are still very visible, although it can be argued that these now form part of the cultural and industrial archaeological heritage of the area." (page 62).

The LCA places the site and its access track in the Open Upland Glen landscape character type (LCT), and the mine site is immediately adjacent to the Open Hills LCT, as shown on Figure 6ii. Although shown as a distinct line on the map, in reality the transition between these two LCTs is a gradual continuum, and so a landscape which lies close to an LCT boundary will display some of the characteristics of both LCTs.

The landscape characteristics, opportunities and sensitivities for both these LCTs have therefore been considered in the assessment. Extracts from the LCA setting out this information are presented in Annex 6.2.

6.4.2.2 Local landscape character

The LCA provides high level background information about the landscape character of the area, much of which is generic rather than geographically specific. As part of the 2011 LVIA, a more detailed assessment of landscape character was undertaken at a local level, leading to the definition of five local landscape character areas. These are listed in Table 6.6 below, and their descriptions are presented in Annex 6.2, which is extracted from the 2011 LVIA.

Table 6.6 Local Landscape Character Areas

Local Landscape Character Areas
Strath Fillan and Dalrigh (SNH *Upland Glen* type)
River Cononish and Coille Coire Chuilc (SNH *Upland Glen* type)
Cononish Farm Upland Glen (SNH *Upland Glen* type)
Existing Exploratory Mine (SNH *Upland Glen* type)
Cononish and Strath Fillan Hills (SNH *Hills* type)

Since 2011, no substantive changes in the landscape have been noted. There has been some further activity at the existing mine site, including the current Bulk Processing Trial (BPT), but this does not alter the character of this area from what was assessed in 2011.

6.4.2.3 Special qualities of the National Park

Special qualities of the Loch Lomond and The Trossachs National Park are described in a document published by SNH in 2010. The Summary of Special Qualities is noted as:

General Qualities

- "A world-renowned landscape famed for its rural beauty;
- Wild and rugged highlands contrasting with pastoral lowlands;

- Water in its many forms;
- The rich variety of woodlands;
- Settlements nestled within a vast natural backdrop;
- Famous through-routes;
- Tranquillity; and
- The easily accessible landscape splendour."

Breadalbane (within which the site falls)

- "Steep mountains and long glens;
- Crossroads within remote mountain ranges;
- A landscape of distinctive glens and straths;
- The narrow Strathyre and Loch Lubnaig ribbon;
- Beautiful Balquhidder;
- Wide and straight Loch Earn;
- The rocky pass of Glen Ogle;
- Killin and the Falls of Dochart;
- Expansive Glen Dochart;
- Wide Strath Fillan; and
- Sinuous Glen Falloch."

There is one reference to Glen Cononish within the context of 'Wide Strath Fillan' as follows: "Common to all routes through the strath, whether modern road, railway or path, or older military road, drove road or pilgrimage way, are distinctive views to the high summits of Beinn More and Stob Binnein to the south. Glimpses are also obtained of Ben Lui at the head of the Glen Cononish, with its spectacular eastern cliffs retaining their snows until well into the summer. The flat-bottomed Glen Cononish leads into the heart of high mountains and at its eastern end is found the ancient Caledonian pinewood of Coille Coire Chuilc, a dark canopy of rounded crowns and orange bark." (Page 30).

6.4.2.4 Characteristics of Wild Land Area

Wild Land Areas (WLA) are not statutory designations but are afforded significant protection under Scottish Planning Policy. The site is located partly within WLA

06 Ben Lui. The boundary of this WLA crosses the mine site, including the existing mine entrance but excluding Cononish Farm.

The western half of this WLA lies within Argyll and Bute and the eastern half is in Stirling. It has an area of 145km^2 and is roughly rectangular in shape, extending some 23km from east to west.

The description of the WLA identified in the SNH Descriptions of Wild Land (2017) includes the following qualities:

- "Contrast between the more massive and remote hills in the south-west and the arresting, more visible and popular hills to the north-east;
- Rugged and highly natural mountains, penetrated by steep-sided glens that contain well-used routes and provide arresting views;
- A landscape that generally well-defined by surrounding human elements in views from higher slopes; and
- Few human artefacts within much of the upland area, in contrast to some of the glens where hydro development is a recurring feature."

There are two references to Cononish:

- "Ben Lui is a very imposing hill, its massive north-eastern corrie, Coire Gaothaich and steep rocky spurs appear arresting, accentuated by the horizontal emphasis of the moorland below, especially on the approach from Cononish." (page 3); and
- "The busy A82 and A85, rail lines, the mine and farm buildings at Cononish and adjacent settlements of Crianlarich and Tyndrum also affect the sense of remoteness and sanctuary of the eastern part of WLA, where traffic noise is audible from the slopes above Strath Fillan and Glen Lochy."

6.4.3 Visual Baseline

6.4.3.1 Zone of Theoretical Visibility

A Zone of Theoretical Visibility (ZTV) map is included at Figure 6.i.

Cononish Glen is contained by the northern slopes of Beinn Dubhchraig and Ben Oss to the south, Ben Lui to the west and Beinn Chuirn and Meall Odhar to the north. The ZTV for the mine is consequently largely contained in the glen by the rising slopes of these hills. Views from the summits themselves will largely not be possible because the convex land forms between the steeper hillsides and the flatter hill tops prevent a line of sight. Longer distance views are also available from the east, from the west facing slopes of Beinn Challuim and from Ben More, although at this distance the existing exploratory mine is barely perceptible. The ZTV indicates that wider visibility of the site is not available.

6.4.3.2 Potential Viewers

Viewers (visual receptors) will largely be the farmers at Cononish, the occasional residents of the Tacksman's Cottage, hill walkers or mountain bikers, climbers or cross country skiers walking up the track up Glen Cononish on the approach to Ben Oss and Ben Lui, amongst other hills. Viewers also include visitors to Ben Lui National Nature Reserve. When conditions are suitable, viewers will include climbers approaching the frozen waterfall on the Allt Eas Anie, the ease of access (including by mountain bike) making it popular on those occasions when it is frozen. The approach to Ben Lui via Glen Cononish is longer than the popular approach from Glen Lochy, but it enables an ascent via the interesting ridges either side of Coire Gaothach, as well as via Central Gully, which is a popular climb in winter conditions.

The approach to Beinn Dubhchraig and Ben Oss, which tend to be walked as a pair, more usually utilises the track to the south of the River Cononish, so as to approach through the pine woods of Coille Coire Chuilc. Beinn Chuirn can be walked from either Glen Lochy or Glen Cononish. Meall Odhar can be walked as a circuit via Tyndrum and Glen Cononish, or may be as part of an ascent of Beinn Chuirn.

There are no formal paths, and so many different variations of routes and destinations are feasible. Legislation is such that walkers and other non-motorised access is permitted across most of the study area.

Other visual receptors include farmers or fishermen elsewhere in the glen, workers within the Forestry Commission Scotland plantation and people on the far side of Strath Fillan, including on the A82 road, the Crianlarich to Tyndrum cycle path and the railway. The mine is pointed out to users of the West Highland Way on a sign board near Auchtertyre. It is about 6km away at this point, and so although it can be seen, no detail is visible. The mine is not visible from either Tyndrum or Crianlarich.

6.4.3.3 Assessment Viewpoints

Twelve viewpoints were identified in the 2011 LVIA, and used to inform the assessment of effects upon views arising from the Permitted Development. Of these, seven have been selected, in agreement with LLTNPA, to inform the assessment of effects arising from the Proposed Development. These are listed in Table 6.7; viewpoint numbering has been retained from the 2011 LVIA, for ease of reference and as agreed by the LLTNPA. An additional viewpoint has been included to inform assessment of the new bridge over the Crom Allt.

Table 6.7 Representative viewpoints

No.	Viewpoint	Grid reference	Distance to mine site[1]	Receptors
1	Mine access track, east of the mine	229816, 728736	<100 m	This viewpoint is within the mine site, and will be experienced by mine workers. It also represents views of occasional walkers using the diversion route along the edge of the mine site.
4	Allt Eas Anie waterfall	228903, 728604	200 m	Ice climbers in winter
5	Meall Odhar	229791, 729628	800 m	Hill walkers
6	Creag Bhocan	230891, 727775	1.2km	Hill walkers
7	Access track to Cononish (below Creag Bhocan)	231378, 728624	1.4km	Hill walkers, mine workers, farm and forestry workers
8	Ben Oss	229089, 725873	2.6km	Hill walkers
9	Ben Lui (Carn Mhuirich)	226643, 726290	3.3km	Hill walkers
13	Crom Allt Crossing	234040, 728966	Adjacent to bridge	Hill walkers, mine workers, farm and forestry workers

[1] Approx. distance from viewpoint to Application Boundary around the mine/tailings stack area.

Photographs are provided alongside computer generated visualisations to illustrate the baseline views as well as potential future views of the Proposed Development. For viewpoints 1, 4, and 5, several montages are provided to illustrate the progressive creation and restoration of the tailings stacks over the lifetime of the project. The viewpoint locations for illustration were agreed with National Park staff.

6.5 Potential Effects

6.5.1 Introduction

This section describes the features and activities associated with the Proposed Development that may give rise to effects on landscape character and visual amenity (sources of effect). It goes on to outline the potential for significant effects to arise. Mitigation measures have been developed to reduce these effects, and are described in Section 6.6. Section 6.7 then presents the assessment of residual effects.

6.5.2 Sources of Effect

The following activities have been identified as potentially giving rise to significant effects on landscape and visual amenity, and are therefore considered in the LVIA. Activities have been separated into four development phases.

6.5.2.1 Site Establishment Phase

Site establishment will take place over a period of six months. The following activities have the potential to give rise to landscape and visual impacts:

- Establishment of temporary construction compounds, laydown areas, site fencing, etc;
- Establishment of a new car park close to the A82, south of the existing parking area at Dalrigh;
- Construction of new bridge over the Crom Allt;
- Expansion of the existing mine portal;

- Excavation and grading of building platform below the existing mine platform;
- Erection of the plant process building and ancillary structures;
- Erection of grid connection (consented separately, now likely prior to establishing increased processing, year 2 or 3); and
- Removal of temporary construction compounds, fencing etc.

6.5.2.2 Operational Phase

The operational phase will take either 10 years or 16 years, depending on the rate of processing. The LVIA considers effects over a 16-year period in order to assess the maximum effect. Most of the operations will take place underground or within the Process Plant Building. The following elements and activities have the potential to give rise to landscape and visual impacts:

- Presence of the Process Plant Building, with ancillary structures and outside stockpiles, including the cut/fill slopes and bunding;
- Phased creation of dry-stack areas, including:
  - Establishment of access;
  - Establishment of drainage including buried pipelines, settlement pond and emergency spillway;
  - Stripping and storage, as necessary, of soil and turf;
  - Addition of bare rock drainage layer and geotextile;
  - Building up of tailings in 300 mm layers; and
  - Movement of vehicles and equipment including dump trucks;
- Phased restoration of dry-stack areas, including;
  - Capping with soil and turf;
  - Seeding or mulching of remaining areas; and
  - Establishment of native woodland/scrub;
- General vehicle movements along the access road and use of the car park.

6.5.2.3 Decommissioning and Restoration

Decommissioning of the mine will take place over a period of six months, with a five-year aftercare plan, which would include monitoring the requirement to maintain the site drainage system and settlement pond, maintenance and replacement (i.e. replacement of failed trees). The following activities have the potential to give rise to landscape and visual impacts:

- Removal of Plant Process Building and ancillary structures;
- Re-grading of the building platform and the existing mine platform;
- Establishment of vegetation across the re-graded areas;
- Completion of restoration of dry-stack areas;
- Removal of the emergency spillway; and
- Establishment of native woodland/scrub.

6.5.2.4 Post-restoration

Following the decommissioning and restoration phase, the existing access track will remain, leading up to the secured mine entrance. The re-graded areas, and the dry-stack areas, will be allowed to fully re-vegetate naturally. The drainage ditches and settlement pond will be allowed to naturalise but it is likely that these features will remain visible.

6.5.3 Potential Effects on the Landscape

6.5.3.1 Sensitivity of receptors

Landscape receptors are the local landscape character areas (LLCA) described in Annex 6.2. Their sensitivity was assessed in the 2011 LVIA, and no changes have been identified that would alter this. A review of the sensitivity evaluations made in 2011 against the GLVIA3 criteria for susceptibility and value has confirmed that the sensitivity ratings are appropriate. They are presented in Table 6.8.

Table 6.8 Sensitivity of Landscape Receptors

LLCA	Sensitivity
Strath Fillan and Dalrigh	The mine is not visible from this location, and there are opportunities for enhancement, so susceptibility is low, while value is medium along this transport corridor within the National Park. Low sensitivity to the Proposed Development.
River Cononish and Coille Coire Chuilc	Susceptibility is medium as the mine already exists in views out of the contained glen, and there are opportunities to reinforce

	landscape character. The landscape value of the forested glen is medium. Medium sensitivity to the Proposed Development.
Cononish Farm Upland Glen	The mine site and farm influence the character of this area, which is judged to be of medium susceptibility, and medium value in the context of the National Park. Medium sensitivity to the Proposed Development.
Existing Exploratory Mine	The area is considered to be of medium susceptibility as it is already in use as a mine, and the project presents an opportunity for long-term enhancement of this area. The value of the area is low in the context of the National Park, due to the existing land use. Medium sensitivity to the Proposed Development.
Cononish and Strath Fillan Hills	The area is considered to be of medium susceptibility to the mine, since there will be limited visibility due to the natural bowl below the slopes of Beinn Chuirn, and the mine will be seen in the context of the transition to the more man modified landscape in the glen below the hills. This area is of high value, because of the views the hills afford of the surrounding area, and because of their natural landform and characteristics, their sense of wildness and being remote from man-made activities. Medium sensitivity to the Proposed Development.

6.5.3.2 *Site Establishment Phase*

The activities identified above will result in disturbance to the physical landscape, including the removal of landcover and introduction of plant and machinery. Changes in the character of the landscape may also occur as a result of this activity within the upland glen. Activities associated with this phase will be short term, but may be large in scale and affecting high sensitivity landscape receptors within the National Park. Site establishment therefore has the potential to result in significant effects on landscape features and landscape character. Measures have been developed that will help to mitigate these effects, as described in Section 6.6, and the residual effects are presented in Section 6.7.

6.5.3.3 *Operational Phase*

Potential landscape effects during the operational phase will arise from the presence of the above noted components and activities, which will likely result in a large scale and medium-term changes (16 years), to the landscape of the mine area.

Creation of the tailings stacks will comprise landscaping of tailings material into 10 discrete units across the mine area, constructed sequentially and subject to progressive reclamation and re-vegetation during the medium-term operational period. Individual stacks will be of varied dimensions with a maximum vertical height of 10 m. Figures 3.2-3.6 and Appendix 3 (Figures at Appendix F: Construction Sequencing), show construction sequencing and profile of the proposed dry stack areas. At any one time, only one stack is likely to be active (operational tailings placement). Stacks are likely to be most visible during their initial preparation, due to exposed rock, and then during their build up due to disturbance and vehicle movement. Some operational activities will be reversible, however, the completed stacks will remain as a permanent feature. The operational phase therefore has the potential to result in significant landscape effects.

6.5.3.4 Decommissioning and Restoration

This phase will see the reversal of many operational effects through the removal of the majority of operational phase components. Activities associated with the 6-month decommissioning period will be short-term and largely reversible, however the works may be perceived as large in scale. During the 5-year after-care period, planting will gradually mature, with the intention of reducing the level of effect. The occurrence of significant landscape effects is therefore considered likely during the decommissioning works, although the subsequent restoration, including planting and re-vegetation, is likely to give rise to positive effects.

6.5.3.5 Post-restoration

Following the Decommissioning and Restoration phase, most of the project components will be removed from the landscape. The restored dry-stacks will remain, as will the existing access track and naturalised drainage features. The long-term, permanent effects of the Proposed Development will therefore include changes to the landform of the site. As such, there is the potential for significant effects on the landscape to remain post-restoration. The removal and re-vegetation of existing mine infrastructure is likely to be perceived as a positive effect.

6.5.4 Potential Effects on Visual Amenity

6.5.4.1 Sensitivity of receptors

In general, a relatively small number of visual receptors will see the Proposed Development from the area within 1-2km of the site. Numbers are in the order of under 50 people most days, although occasionally more at weekends and during holiday periods, and often far fewer, particularly in winter.

Hill walkers and climbers tend to make occasional repeat visits to the same area, and so their duration of exposure to the view will be more limited than that of residents or regular workers in the area. More frequent recreational visits are likely to the accessible area of community woodland at the bottom end of Glen Cononish, out of sight of the mine though potentially being affected by intermittent vehicle movements.

The site is visible at a distance of 5.5-6.5km away from the West Highland Way between south west of Auchtertyre and the area around Kirkton Farm, when walking north-west. No views of the site will be possible from closer sections of the West Highland Way, near Dalrigh.

Susceptibility

Walkers and other recreational users, such as cyclists are considered to be of high susceptibility to change as their attention is focused on the surrounding landscape. Residential receptors are judged to be of high susceptibility to changes in their views and visual amenity. Workers, including people at the mine and agricultural, forestry and estate workers, are considered to be of lower susceptibility to changes. Transient receptors such as road users on the A82 are judged to be of medium susceptibility.

Value of the view

Much of the study area is located within the nationally designated LLTNP, and WLA 06 Ben Lui is situated to the south west of the mine area. The special qualities of the LLTNP and the key attributes and qualities of the WLA are noted in Section 6.4. A range of views are experienced from across the study area with some areas of particularly high value, such as views experienced from mountain slopes, ridges and summits, and areas of lower value such as those subject to localised screening by landform and vegetation.

6.5.4.2 Site Establishment Phase

The activities associated with this phase will result in potential changes to visual amenity largely experienced locally over a short-term period. Effects will mainly be experienced by receptors near Dalrigh, from parts of the access track between Dalrigh and the mine site, from parts of the wider Cononish Glen and a limited number of local summits.

Near Dalrigh visual receptors will include road users on the A82, cyclists on the Crianlarich to Tyndrum cycle path, recreational users on the West Highland Way, and those crossing Crom Allt and the River Cononish. From these locations the main source of effect is likely to be the establishment of the new car park and construction of the new bridge over Crom Allt. These activities will be relatively small in scale and generally experienced locally (being largely contained by landform and vegetation) but would potentially affect highly sensitive visual receptors.

Larger scale site establishment activities associated with the mine site will be experienced from parts of the access track and limited areas of the wider landscape within the study area. As noted in Section 6.4 the ZTV (see Figure 6i) indicates that visibility of the mine site is largely contained within Cononish Glen with some potential for longer distance views gained from Beinn Challuim and Ben More.

The site establishment phase therefore has the potential to result in significant visual effects.

6.5.4.3 *Operational Phase*

Potential visual effects during the operational phase will be confined to activities which are visible on the surface, as well as those associated with people and vehicle movements, and the operation of machinery. The main source of effect during this phase will be the presence of the process plant building, associated structures, and the phased creation and restoration of the dry stack areas. Some increase in vehicle traffic will also be experienced on the access track and bridge between Dalrigh and the mine site. The operational phase therefore has the potential to result in significant visual effects.

6.5.4.4 *Decommissioning and Restoration*

This phase will see the reversal of many operational effects through the removal of the majority of operational phase components. Activities associated with the 6-month decommissioning period will be short-term and largely reversible, however the works may be perceived as large in scale. During the 5-year after-care period, restoration planting will gradually mature.

6.5.4.5 *Post-restoration*

Certain elements of the Proposed Development will be permanently retained, including the tailings stacks, access track (existing) and drainage features. These features may result in a large-scale effect, and there is therefore the potential for long-term significant effects on views.

6.6 Mitigation

6.6.1 Introduction

This section presents an overview of the landscape mitigation measures for each period of the Proposed Development. A Landscape Restoration Plan is indicated on Figure 6iii. Detailed landscape mitigation presented in this Chapter will be combined with ecological and other restoration measures described elsewhere in this ES, and will be further developed and agreed in consultation with the landowner, LLTNP, SNH, and the developer before construction commences on site.

Measures will be incorporated into the Construction Method Statement, Environmental Management Plan and Contract Documents as appropriate. The successful implementation of these mitigation measures will be monitored and advised by an Ecological Clerk of Works.

Wider landscape enhancement, to be implemented in the early years of the project, will be developed and agreed in consultation with the landowner, LLTNPA, SNH, and the developer as part of the Greater Cononish Glen Management Plan (Appendix 12).

The following mitigation will be implemented to reduce the potential effects resulting from the Proposed Development. The mitigation measures are subdivided into those which are embedded into the design of the Proposed Development, and those additional measures that will be applied during site establishment, operation, decommissioning and restoration

6.6.2 Mitigation by Design

The mitigation of potential landscape and visual effects is embedded within the iterative design development process (see ES Sections 2.5 and 3.3), which has always had a view towards the final appearance of the landscape, when operations are completed and only restored elements remain. As such the objective has been to create 10 dry-stack areas with a naturalistic and sympathetically designed ‘moraine’ landscape profile. This design change from the Permitted Development removes the need for the tailings management facility (TMF), which comprised a 30m-high dam.

The phasing of the works is designed so that progressive restoration of finished areas can occur, so that bare un-vegetated areas can be kept to a minimum, and so that topsoil and peat turves can be replaced on graded areas including the dry-stack areas and the bund around the processing plant building, minimising any storage requirement.

The 10 dry-stack areas have been designed so that the ultimate finished landform will tie in with the existing generally hummocky landscape of small scale moraine deposits – the 'basket of eggs' topography – that is characteristic of the mine area.

The location, layout and detailed design of the associated building and plant equipment, including their aggregation, shape, and the texturing and colouring of external surfaces has been designed to help reduce the magnitude of the effects that will result from the scheme – i.e.:

- External clutter will be reduced by boxing in development components and containing them within a simple building with clean lines. Low level clutter around the processing and plant building will be screened by a vegetated earth bund. Minibuses bringing workers to the mine will park behind this mound;
- One building is proposed, rather than as several disparate buildings;
- Cut and fill has been kept to the minimum required to form the necessary platform area, and the siting of the new platform responds to the location and alignment of the existing mine entrance platform;
- All works have been designed to achieve a materials balance and so rock/peat/earth etc. will not need to be imported or exported from the site;
- Muted greens, greys and browns will be used for the colour of external surfaces, which will blend into the countryside and which do not stand out when viewed from a distance;
- Non reflective surfaces will be used; and
- Windows will be minimised, will be west facing (i.e. into the hillside of Beinn Chuirn), and shall be shuttered to prevent light spill.

During all phases of development the proposed new bridge over the Crom Allt will separate vehicular traffic associated with the Proposed Development from all pedestrian/cycle/equestrian traffic using the existing bridge. The inclusion of a car park is designed to reduce the amount of traffic using the access road, reducing effects on walkers using this route in to the hills.

The car park and new bridge have been designed to allow long term use by people, including walkers accessing the hills, following the completion of the Proposed Development, thereby offering a benefit for access and recreation.

6.6.3 Site Establishment Phase Mitigation

The following mitigation measures will be implemented throughout this phase to ensure landscape and visual effects are avoided or reduced wherever possible:

- Construction vehicles will not track across undisturbed areas of moorland outside their defined working area and access corridor;
- Materials and machinery will be stored tidily during the works. Machinery will not be left in place for longer than required for construction purposes, in order to minimise its impact in views;
- Lighting of compounds and works sites will be restricted to agreed working hours and that which is necessary for security;
- The contractors' compound and storage areas will be located away from visible areas as far as possible, and will utilise the existing mine platform and working area so as to avoid additional unnecessary disturbance;
- Peat turves, topsoil and the seedbank within it will be carefully stripped from all construction areas. Soils, soil forming materials including mineral soils and till, divots and mulch will be stored, as necessary, in areas where it will not be disturbed or tracked upon, in low uncompacted mounds. Where turf is not placed directly for restoration of the landscaped bund it will be stored separately and not stacked. Soft materials will be used to grade slopes prior to promotion of natural recolonisation of vegetation;
- The processing plant building will be located on a platform behind naturalistically profiled and vegetated mounding. Vehicles will also park behind this bund so they are largely screened from view;
- Regular looking engineered profiles will be avoided, and irregular concave and convex slopes mimicking existing contours, which match with the scale of the existing hillslopes, will be created as far as possible;
- Long-term visibly man-made rock slope reinforcement such as gabions, concrete or wire mesh will not be used: slopes will be designed and engineered so that such measures are not required or can be entirely

covered with peat turves and revegetated. Any reinforcement which is required will use geotextiles, of natural material, e.g. geojute;

- Localised areas of existing scarred track sides, slopes and tie-ins will be graded and peat topsoil/turves will be placed on gently sloping cutting slopes and track verges to encourage regeneration of vegetation;
- Seeding will be undertaken using locally native species appropriate to their location, and to tie in with adjacent vegetation types, only where considered appropriate and essential to prevent erosion;
- Some planting of native woodland may be undertaken at this early stage; and
- On completion of construction, all remaining construction materials and equipment will be removed from the site, and temporary compounds/laydown areas removed and restored to a natural appearance.

6.6.4 Operation Phase Mitigation

The following mitigation measures will be implemented throughout this phase to ensure landscape and visual effects are avoided or reduced wherever possible:

- Dry-stack areas will be constructed sequentially and subject to progressive reclamation and re-vegetation during the medium-term operational period. The 10 dry-stack areas will be shaped and graded so that the ultimate finished landform will tie in with the existing generally hummocky landscape of the mine area, and engineered profiles will be avoided;
- Each stack will be restored as soon as it is complete, using soil and turves stripped from the subsequent stack area, and augmented with seeding and planting as necessary. Native tree planting will be established to form naturalistic clumps around the lower slopes of each stack, in line with the agreed landscape management plans;
- Lighting will be carefully enclosed within the building so as not to contribute to light pollution/ light spillage off site/ glare to the sky. Skylights will face the mountain and will not be visible from Glen Cononish. Shutters will be used during darkness. There will be minimal security lighting in external areas (sensors will be used to ensure it does not get left on);

- Vehicular access to the mine will be minimised. Workers will park cars in the extended car park near Dalrigh and will travel to the mine by minibus; and
- The mine and the surrounding area will be maintained in a clean and uncluttered state: a site Environmental Management Plan will be implemented which will include landscape and habitat management.

6.6.5 Decommissioning and Restoration

Restoration proposals are detailed in ES Chapter 3 and Appendix 7, and indicated on the Landscape Restoration Plan (Figure 6iii). Further measures including wider scale planting and fencing to prevent grazing to help mitigate adverse effects during the period of mine operation and progressive restoration, and to improve upon the landscape of Glen Cononish in the longer term are indicated on the Landscape Masterplan on Figure 6iv.

Species of plants selected for landscape planting will be restricted to those which are native and occur locally (local provenance). Cues for planting, and any seeding if considered necessary to prevent erosion will be taken from the surrounding area and species will include those present in the surrounding moorland and grassland areas including *Agrostis spp.* (bents) and *Festuca spp.* (fescues).

Any landscape restoration works which fail within the first five years (i.e. erosion, failure of planting) will be revisited and alternative approaches taken to their restoration. Work will continue until these areas are successfully restored.

Once the operation and production periods of the Proposed Development cease:

- All defunct machinery, materials, and man-made objects will be removed from the area;
- All cutting and embankment slopes will be graded to tie in with existing natural slopes, and no sharp edges will be left, except where minor rock or scree faces may be considered appropriate;

- In re-grading the mine and building platforms and associated slopes, and completion of dry-stack areas, layers of topsoil, peat and peat turves will be replaced in the correct stratigraphic order
- After the re-grading of the building platform and the existing mine platform, and completion of the dry-stack areas, remaining vegetation will be established. Target establishment of native woodland/scrub is shown on Figures 6iii and 6iv.
- Any remaining boulders and rocks will be distributed in a naturalistic way.

6.6.6 Post-restoration

Mitigation measures described above will be applied throughout the lifetime of the Proposed Development, and are designed to minimise the level of residual effects that will remain in the long term. Following the completion of the aftercare process, the site will have been restored to a semi-natural appearance. Ongoing implementation of the Greater Cononish Glen Management Plan will continue to enhance the landscape of the area.

6.7 Assessment of Landscape Effects

6.7.1 Introduction

The assessment of landscape effects follows the methodology presented in Section 6.2 and Annex 6.1, and is based upon the Project Description contained in Chapter 3 of this ES. The LVIA reports on effects which will occur during the site establishment, operation, decommissioning and restoration, and post-restoration phases (as defined in Section 6.5), and the magnitude and significance of landscape effects assessed assumes implementation of all the mitigation measures outlined in Section 6.6.

The following sections present an assessment of the effects of the Proposed Development on the physical baseline. Consideration of these effects against the planning baseline (including the Permitted Development) is provided in Section 6.9.

6.7.1.1 Landscape Change in the Absence of the Proposed Development

Two possible scenarios may occur in the absence of the Proposed Development.

Scenario 1

If the Proposed Development does not go ahead and the Permitted Development is implemented, physical changes to the landscape will occur as described briefly in Section 6.4 and assessed in full in the 2011 LVIA.

Scenario 2

If neither the Proposed Development nor the Permitted Development go-ahead, it is expected that the landscape would continue to look much as it does today. It is likely that the present visible components of the mine will be removed and restored. Forestry trees in the glen will continue to grow and when mature may be felled. The future of the commercial forest will be subject to a Forest Design Plan which will be reviewed regularly by Forestry Commission Scotland. It is likely that any future replacement of forested areas would be with a greater percentage of native species.

The nature of the landscape is dictated by to an extent by the grazing pressure in the glen, and the future farming practices at Cononish Farm. The land owner currently works closely with SNH regarding the management of land falling within the Ben Lui National Nature Reserve. Measures such as tree planting and deer fencing have been implemented in the past and it is likely that similar activities may be undertaken in the future. Climate change, and its consequential implications for the may also result in gradual landscape change in the glen, as elsewhere.

6.7.2 Effects during Site Establishment

At the outset of the Site Establishment phase, the new car park will be constructed at the east end of the access road, and construction of the new bridge over the Crom Allt will commence. Construction of the car park will result in the loss of 302m^2 of rough grassland.

On completion of the bridge, construction works will move to the mine site, where a laydown area will be established, a compound will be set up on the existing mine platform, and the area will be securely fenced. A new plant platform of 4,176m^2 will be cut into the hillside at approximately 375m above ordnance datum (AOD), and the excavated material used to create the platform and a landscaped bund to its east.

The process plant building will be erected on this platform, behind the bund. The bund and any other exposed surfaces will be re-vegetated with material stored during stripping, and will be graded to achieve a natural profile. There will also be an increase in traffic travelling to and from the mine site along the access track.

The activities during site establishment will result in a large scale change to the landscape, over a localised area within the Existing Mine Site LLCA. Effects will be short term and partly reversible. Effects on landscape character will be major and significant within the local landscape, up to around 1km from the mine site.

Activities associated with the new car park and bridge will result in small scale changes over a very localised area of Strath Fillan and Dalrigh LLCA, and will be short term and partially reversible. Effects on landscape character will be minor and not significant.

6.7.3 Effects during Operation

During this phase the Process Plant Building, with ancillary structures, outside stockpiles and bunding, will be present within the landscape. The phased creation and progressive restoration of the dry stack areas will result in the introduction of 10 individual stacks of varied dimensions, with a maximum vertical height of 10m, into the landscape east of the mine site.

Creation of the dry stacks will involve establishing access, drainage (including channels, pipelines and a settlement pond) and the stripping and storage of soil. The stacks will be built up in 300mm layers, and progressively restored by capping with stored soil and turf, then re-vegetated. Re-vegetation of the dry stacks will include the planting of native trees and shrubs as shown in Figures 6iii and 6iv.

The phased creation and restoration of the dry stacks will introduce increasingly large features into the landscape. The stacks will be shaped and graded to tie into the existing hummocky landscape of the mine area, east of the mine site but will increase the influence of the mine during the operational phase. Associated vehicle movements will introduce additional movement into the landscape. However, by phasing their creation, and by progressively restoring the stacks, the activity and disturbance to the landscape and landcover is kept to a minimum.

Activities during this phase will result in a large scale change to the landscape, over a localised area within the Existing Exploratory Mine LLCA. Effects will be medium-term and partly reversible. Effects on landscape character will be major and significant within the local landscape, up to around 1km from the mine site. Beyond the immediate setting of the mine site, effects on landscape character will reduce, though will remain potentially significant along the local section of Cononish Glen, where there are clear views of the mine site. Effects on wider landscape character will not be significant. No significant effects are predicted in association with the car park or bridge.

6.7.4 Effects during Decommissioning and Restoration

During this phase the majority of project components will be removed, including the Plant Process Building and ancillary structures. The building platform and mine platform will both be re-graded to tie into existing contours. Restoration of the dry stack areas will be completed and all areas will be re-vegetated, including the planting of woodland and scrub vegetation shown in Figures 6iii and 6iv.

The site drainage system and drainage ponds will be removed or naturalised as required, and there will be an increase in vehicle traffic travelling to and from the mine site along the access track, as well as increased activity and movement associated with the decommissioning works.

Activities associated with this phase will result in a medium scale change to the landscape, over a localised area within the Existing Exploratory Mine LLCA. Effects will be short-term and partly reversible. Effects on landscape character will be moderate and significant within the local landscape, up to around 1km from the mine site. No further activity is proposed at the car park and bridge, and no significant effects are predicted.

During the five-year after-care phase, restoration and monitoring will continue. Re-vegetated areas will become established and increasingly naturalised, while tree planting will mature and begin to integrate the restored landscape with its surroundings. The level of effect over this period will gradually reduce, and due to the removal of both existing and proposed infrastructure will increasingly be perceived as a positive effect.

6.7.5 Post-restoration effects

Following the successful restoration of the mine site, including the naturalisation of drainage features, re-vegetation of the disturbed areas of the site, and the establishment of woodland planting, the remaining permanent effects of the Proposed Development will be limited.

The dry-stack mounds and associated drainage will remain as permanent features, but due to the embedded mitigation by design and subsequent restoration works, they will not appear substantially out of character with the wider landscape of the glen. While they may be noticeable new features for a few years after the end of the restoration phase, in time the naturalisation process will minimise the effect that these mounds have on the landscape. The new bridge and car park will also remain, but will form minor features within the landscape.

The permanent effects of the Proposed Development on the landscape will be small in scale and localised in extent. These effects are judged to be minor and not significant.

6.7.6 Consideration of designated and protected landscapes

The following sections consider the implications of the effects identified above for the identified special qualities and features of designated and protected landscapes in the study area. This section considers the Loch Lomond and the Trossachs National Park, and Wild Land Area 6 Ben Lui.

6.7.6.1 Loch Lomond and the Trossachs National Park

The special qualities of the National Park are described in published report and are summarised in Section 6.4 of this LVIA. Glen Cononish is referenced only once in the special qualities, in relation to the route it provides into the hills, and the views it enables to Ben Lui and other peaks. The Proposed Development will not affect these functions of Glen Cononish, though it may affect the experience of the upland glen landscape for people accessing the hills.

The Proposed Development may locally affect some of the more general special qualities of Breadalbane and the wider National Park, such as 'tranquillity', and the 'landscape of distinctive glens and straths'. Any such effects will be localised to Glen Cononish itself, as shown in the ZTV, and will be medium term over the life of the mine.

It is not considered that any of the identified special qualities of the National Park will be compromised or undermined by the Proposed Development.

6.7.6.2 Wild Land Area 6 Ben Lui

As noted in Section 6.4 of this LVIA, the Application Site is partly within this WLA. SNH have published Consultation Draft Guidance on assessing the impact of development on wild land (SNH, 2017), which should be used in place of the earlier guidance note (SNH, 2007). It should be noted that the Draft Guidance remains subject to consultation.

During scoping-stage engagement with LLTNPA, the need for a wild land assessment was not specifically highlighted, though the Scoping Opinion does make reference to wild land issues. The Draft Guidance states that wild land assessment is 'highly likely' to be required where a proposed development falls wholly or partly within a WLA. It is noted that such an assessment should not duplicate material covered in the LVIA.

Table 6.9 below summarises the process of wild land assessment, based on Box 1 from the Draft Guidance. The following paragraphs present the assessment undertaken.

Table 6.9 Wide Land Assessment Process

Stage	Requirement
Step 1 - Define the study area and scope of the assessment	Identify a study area appropriate to the scale of development and extent of likely significant effects on the WLA.
Step 2 –Establish the baseline	Confirm the wild land qualities of the study area and the nature of their contribution to the WLA. The assessment should identify which qualities are likely to be significantly affected by the proposal.
Step 3 –Assess the sensitivity of the study area	Identify which wild land qualities of the WLA, including the physical attributes and perceptual responses that contribute to those qualities, are most sensitive to the type and scale of change proposed.
Step 4 –Assess the effects	Given the size or scale of change, extent and duration, describe the effects on individual qualities and / or combinations of qualities, drawing out which physical attributes and perceptual responses will be affected and how, and the potential for mitigation.
Step 5 –Judgement of the significance of effect	Describe the significance of residual effects on the wild land qualities of the Wild Land Area. This should take into account mitigation.

6.7.6.3 Study area

The study area for the wild land assessment was taken to be that part of the ZTV, as shown in Figure 6i, that coincides with the boundary of WLA 6. This includes part of the east flank of Ben Lui, the north-west facing slopes of ben Oss, and the upper Cononish Glen. Given the localised area where significant landscape effects are predicted, it is unlikely there will be impacts on wild land beyond these areas. In line with paragraph 21 of the Draft Guidance, the experience of approaching the WLA via Glen Cononish is not considered.

6.7.6.4 Baseline, sensitivity and assessment of effects

The existing mine site is within the WLA boundary as defined. The site itself displays few of the physical attributes or the perceptual responses associated with wild land, as defined in the Draft Guidance.

The WLA description notes how the presence of *"the mine and farm buildings at Cononish (…) affect the sense of remoteness and sanctuary of the eastern part of the WLA."* More generally, the description repeatedly highlights the importance of the contrast between the upland area and the glens. *The "rugged and highly natural"* mountains are contrasted with the human artefacts that define the WLA, including transport routes, traffic noise, well-used routes within glens, and other human artefacts including hydro-electric infrastructure.

Table 6.10 presents an assessment of effects against each of the four key qualities of the WLA.

Table 6.10 Assessment of effects on WLA 6 Ben Lui

Baseline	Sensitivity	Assessment of effects
Contrast between the more massive and remote hills in the south-west and the arresting, more visible and popular hills to the north-east	**Medium** The Proposed Development is peripherally located to the north of the northern hills. The approaches to the visible and popular hills are more sensitive to development.	The establishment and operation of the mine will have a limited effect on the experience of approaches to Ben Lui and other hills, west of Cononish Farm and within the ZTV. The effect will be small in scale and localised in extent. It will be medium term and partly reversible. The level of effect will be moderate. Following restoration of the site, the long-term effect will be minor. Due to the removal of the existing mine this will be a positive effect.
Rugged and highly natural mountains, penetrated by steep-sided glens that contain well-used routes and provide arresting views	**Medium** The sense of sanctuary provided by steep sided glens is sensitive to development, though the naturalness of the mountains will not be affected.	The establishment and operation of the mine will have a small additional effect on the local sense of sanctuary, which is already limited by the mine and Cononish Farm. The effect will be localised, medium term and partly reversible. The level of effect will be minor. Following restoration of the site, the long-term effect will remain minor, but will be positive due to the removal of the existing mine.
A landscape that generally well-defined by surrounding human elements in views from higher slopes	**Low** This quality is not sensitive to additional development being located in peripheral parts	The Proposed Development will increase the amount of development already present at this peripheral location, emphasising rather than undermining this quality. The effect will be negligible at all stages.

	of the WLA.	
Few human artefacts within much of the upland area, in contrast to some of the glens where hydro development is a recurring feature	**Low** The Proposed Development is not within the upland area, but is within a glen where existing human artefacts are already a feature.	The Proposed Development will increase the amount of development in this glen, emphasising the contrast with the undeveloped upland area. The effect will be negligible at all stages.
Contrast between the more massive and remote hills in the south-west and the arresting, more visible and popular hills to the north-east	**Medium** The Proposed Development is peripherally located to the north of the northern hills. The approaches to the visible and popular hills are more sensitive to development.	The establishment and operation of the mine will have a limited effect on the experience of approaches to Ben Lui and other hills, west of Cononish Farm and within the ZTV. The effect will be small in scale and localised in extent. It will be medium term and partly reversible. The level of effect will be moderate. Following restoration of the site, the long-term effect will be minor. Due to the removal of the existing mine this will be a positive effect.

6.7.6.5 Judgement of the significance of effect

The Proposed Development will have a moderate and significant effect on the experience of approaching the north-eastern hills of Ben Lui, Ben Oss, etc from Cononish Farm, arising from the presence of the mine and associated activity in the glen. This effect will be medium term, for the life of the mine, and will be localised to the upper Glen Cononish Area. The effect on the local sense of sanctuary will be minor and not significant. Following site restoration, the removal and/or restoration of the mine area will enhance the naturalness of the existing situation, and will be a positive effect in terms of these wild land qualities. Effects on the other wild land qualities will be negligible and not significant.

6.8 Assessment of Visual Effects

6.8.1 Introduction

The assessment of visual effects follows the methodology presented in Section 6.2 and Annex 6.1, and is based upon the Project Description contained in ES Chapter 3. The LVIA reports on effects which will occur during the site establishment, operation, decommissioning and restoration, and post-restoration phases (as defined in Section 6.5), and the magnitude and significance of visual effects assessed assumes implementation of all the mitigation measures outlined in Section 6.6.

This section summarises the residual effects that will be experienced by the different receptor groups who will experience views of the Proposed Development. The assessment is based on detailed viewpoint assessments for each of the representative viewpoints listed in Table 6.7. These detailed assessments are presented in Annex 6.3.

A sequential assessment has also been undertaken, again drawing on the viewpoint assessment in Annex 6.3. This considers the experience of people passing through the area and viewing the components of the Proposed Development in turn, or the same components from different viewpoints.

The following sections present an assessment of the effects of the Proposed Development on the physical baseline. Consideration of these effects against the planning baseline (including the Permitted Development) is provided in Section 6.9.

6.8.2 Viewpoint Assessment

Effects on visual amenity at representative viewpoints are assessed in detail in Annex 6.3, and are summarised in Table 6.11.

Table 6.11 highlights that the most widespread effects are associated with the site establishment phase. This is the phase during which the most intensive activity and disturbance will take place across the application site. Significant effects are predicted at all of the assessment viewpoints, with the exception of Ben Lui, where effects will be minor and not significant. Site establishment is the only phase where the effects of the new bridge are likely to be significant.

Table 6.11 Summary of viewpoint assessment

Viewpoint	Sensitivity	Level of effect			
		Site establishment	Operation	Decommissioning and restoration	Post-restoration
1. Mine access track	Medium	Major	Major	Moderate	Minor
4. Allt Eas Anie waterfall	Medium	Major	Major	Moderate	Minor
5. Meall Odhar	Medium	Major	Moderate	Moderate	Minor
6. Creag Bhocan	Medium	Moderate	Moderate	Moderate	Minor
7. Access track to Cononish	High	Moderate	Moderate	Moderate	Minor
8. Ben Oss	High	Moderate	Moderate	Moderate	Negligible
9. Ben Lui (Carn Mhuirich)	High	Minor	Minor	Minor	Negligible
13. Crom Allt Crossing	Medium	Moderate	Minor	Minor	Minor

Over the life of the mine, activity on site will be reduced, and visible activity will be limited to the sequential creation and restoration of the tailing stacks, so that one only one stack will be 'active' at a time. Each will be shaped to tie into the existing hillocky landform east of the mine site, and will be individually re-vegetated as they are complete. At any one time, the most visually intrusive disturbance will be restricted to a single stack. As a result receptors likely to experience major effects will be largely limited to those in closest proximity (i.e. less than 500m), although moderate and significant effects are predicted at locations up to 2.6km.

Decommissioning works will see a return of higher levels of visible activity and disturbance on the site, though over the short term, as facilities are removed and the area restored. These short-term effects are considered significant (moderate) from several viewpoints, but will gradually reduce over the five-year after-care period.

Once this period is complete, the remaining elements of the project will appear as naturalised features within the landscape. Although their artificial origin may be perceptible, the level of visual intrusion will be limited. No significant effects are predicted in the long term.

6.8.3 Sequential Assessment

The viewpoint assessment considers effects at static locations. However, views of the Proposed Development will be experienced by people as they move through the landscape. Different parts of the Proposed Development may be seen in succession, or different views of the same elements. Consideration has been given to this sequential experience, with reference to the eight representative viewpoints.

As agreed with LLTNPA, the sequential assessment considers effects on walkers (as the most sensitive receptors) using likely routes through the landscape. Although a route passing all viewpoints would represent a worst case, this is unlikely to be a realistic route. Walkers are more likely to access Glen Cononish from the car park at Dalrigh, passing VP13 and VP7 on the access track. Most walkers will be continuing on to Ben Lui (VP9), but some may head for Beinn Chuirn, passing VP4, Meall Odhar (VP5) or Ben Oss (VP8). These are considered the most likely routes through the area.

Heading west from Dalrigh, and dependent on their precise choice of route, walkers may view the new car park and new bridge over the Crom Allt at the start of their walk. The two bridges will not be intervisible. Progressing along the access track towards Cononish the mine site will come into view after around 1.5km, though partly screened by forestry (see VP7). Approaching Cononish Farm, the mine area will remain partly screened by landform and forestry. Assuming walkers continue along the track west of Cononish, the mine area will be partly in view for around 3.5km.

Those heading to Ben Lui will now leave the Proposed Development behind, and will not view it again until they reach the higher ground some 3km further on (VP9). If they return the same way, middle-distance views of part of the mine site will be available from the summit, albeit predominantly screened, but quickly reduce along the descent. They will again view the mine at closer range around Cononish, but will then pass by, with no further views until the bridge and car park again. Some walkers may choose to return via Ben Oss (VP8) and Beinn Dubhchraig, keeping to higher ground where there are middle-distance views of the mine site, though within the context of panoramic views across the hills. From Beinn Dubhchraig the descent via Coille Coire Chuilc does not have views of the mine.

For those who choose to climb Beinn Chuirn, views of the mine site during the ascent are likely to be similar to VP4, dependent on the route selected. Views may be visible from most of the ascent, though not from the summit. On the descent, similar views are likely to be seen. Some walkers may carry on to Meall Odhar, with the mine site in view to the south. From here, the most common route is eastwards to Tyndrum rather than back into Glen Cononish.

With reference to the findings of the viewpoint assessment, walkers using these routes will experience the highest level of effect during the short site establishment phase. During the medium-term operational phase, effects will still be significant but will be reduced, except from the closest locations (VP1 and VP4). As such, walkers accessing Beinn Chuirn are likely to be most affected during this phase. It may be noted that there are a variety of routes ascending this hill, with more westerly ascents having reduced views. It may also be the case that some walkers will seek out views of the gold mine as a feature of interest in the landscape.

The experience of walkers accessing Ben Lui and/or Ben Oss will be less affected, as the areas of these hills with open views are more distant from the Proposed Development, and views from Ben Lui will be restricted to a limited extent of the mine site.

When considering the separate elements of the Proposed Development, the separation between the mine site and the bridge and car park, and the limited effects of the latter elements, means that they add little to the effect on visual amenity.

6.9 Summary

6.9.1 Residual Landscape and Visual Effects

6.9.1.1 Effects on Landscape Character

Significant effects on the local landscape are predicted within around 1.5km of the mine site, during site establishment and operation of the Proposed Development, with the highest levels of effect restricted to no more than 1km from the site. During decommissioning, significant effects will be more restricted. These effects will occur within the areas of upper Cononish Glen that are within the ZTV.

Effects on the wider landscape within the ZTV will be minor and not significant. No significant effects on landscape character are predicted, during any phase, as a result of the new car park and Crom Allt bridge.

Following restoration, there will be no significant residual long term effects as a result of the Proposed Development due to the mitigation measures proposed, including the design of the tailings stacks.

No effects on the Special Landscape Qualities of the National Park are predicted to arise. Effects on WLA 6 Ben Lui will be limited to a moderate (significant) effect on the experience of approaching the hills from Cononish, which will occur during the life of the mine. No other qualities or attributes of the WLA will be significantly affected, and following restoration no significant residual effects on the WLA will remain.

6.9.1.2 *Effects on Visual Amenity*

The Proposed Development will affect the viewing experience of visual receptors within the ZTV for the scheme, at up to 3km from the mine site. This includes people living at Cononish, and those working close to the existing exploratory mine. Recreational users in the glen and on the hills, and residents at Cononish, as the most sensitive receptors, will experience the most significant effects.

The highest levels of effect are only predicted at the closest viewpoints (within 1km) during the site establishment phase, and to a lesser extent the operational phase. Further afield, effects will be reduced though potentially still significant. Beyond 3km significant effects are not predicted at any phase, e.g. VP9 Ben Lui. Significant effects are only predicted during site establishment for the bridge and car park.

When considering the sequential effect on walkers moving through the hills, the greatest effect on visual experience will be for people accessing Beinn Chuirn from Glen Cononish, who will have close range views from the approach and the ascent, depending on the route taken. Views experienced by walkers heading to the other hills, such as Ben Lui, will see the mine site on the approach, but not from the ascent and only distantly, and predominantly screened from the summit. The car park and bridge are not considered to contribute significantly to sequential impacts on walkers.

Following restoration, no significant effects are predicted to occur in the long term, due to the mitigation measures proposed, including the design of the tailings stacks.

6.9.2 Consideration against the Planning Baseline

Table 6.10 highlights that the most widespread effects are associated with the site establishment phase. This is the phase during which the most intensive activity and disturbance will take place across the application site. Significant effects are predicted at all of the assessment viewpoints, with the exception of

Ben Lui, where effects will be minor and not significant. Site establishment is the only phase where the effects of the new bridge are likely to be significant.

Over the life of the mine, activity on site will be reduced, and visible activity will be limited to the sequential creation and restoration of the tailing stacks, so that one only one stack will be 'active' at a time. Each will be shaped to tie into the existing hillocky landform east of the mine site, and will be individually re-vegetated as they are complete. At any one time, the most visually intrusive disturbance will be restricted to a single stack. As a result receptors likely to experience major effects will be largely limited to those in closest proximity (i.e. less than 500m), although moderate and significant effects are predicted at locations up to 2.6km.

Decommissioning works will see a return of higher levels of visible activity and disturbance on the site, though over the short term, as facilities are removed and the area restored. These short-term effects are considered significant (moderate) from several viewpoints, but will gradually reduce over the five-year after-care period.

Once this period is complete, the remaining elements of the project will appear as naturalised features within the landscape. Although their artificial origin may be perceptible, the level of visual intrusion will be limited. No significant effects are predicted in the long term.

6. ANNEXES

Annex 6.1

Assessment Methodology
Assessing Landscape Effects
Assessing Visual Effects

Annex 6.2

Landscape Character
Regional Landscape Character Types
Local Landscape Character Areas

Annex 6.3

Viewpoint Assessment

Annex 6.1 Assessment Methodology

Assessing Landscape Effects

Significance of Landscape Effects

2. Judging the significance of landscape effects requires consideration of the sensitivity (nature of the landscape receptors) and the magnitude of effect on those receptors (nature of the effect). GLVIA3 states that sensitivity of landscape receptors should be assessed in terms of the susceptibility of the receptor to the type of change proposed, and the value attached to the receptor. The magnitude of effect on each landscape receptor should be assessed in terms of its size and scale, geographical extent, duration and reversibility.

3. These aspects are considered together, to come to a judgement regarding the overall significance of landscape effect (GLVIA3, Figure 5.1). The following sections set out the methodology and explain the terms used.

Sensitivity (Nature) of Landscape Receptor

4. The sensitivity (nature) of a landscape receptor varies depending on the condition of the existing landscape and its capacity to accommodate change. Landscape sensitivity is assessed in terms of the susceptibility of a landscape receptor to the type of change proposed and the value attached to the receptor. Landscape sensitivity varies according to the type of development proposed and the individual elements, key characteristics, inherent quality or condition, capacity to accommodate change, and the specific qualities associated with any landscape designations that may apply.

5. In accordance with GLVIA3, sensitivity is judged by considering both susceptibility and value. Combining judgements regarding susceptibility and value is straightforward when both susceptibility and value are high, when both are low or when both are medium. In these cases the sensitivity of the receptor would be high or low or medium. Judgements are more complex when susceptibility is low but value is high or vice versa. It may be the case, for example, that key attributes of landscape character may be affected adversely by the development (suggesting high susceptibility) despite this same area of the landscape having a low value, such that that overall sensitivity is judged to be high.

6. It should be noted that whilst designated landscapes, at an international or national level, are likely to be accorded the highest value, it does not necessarily follow that all areas of

such landscapes have a high susceptibility to all types of change (GLVIA3, p.90). There may be a complex, and variably weighted relationship between the value attached to a landscape and susceptibility to change. Therefore, the rationale for judgements provided regarding the sensitivity of the landscape is clearly set out for each receptor.

7. The sensitivity (nature of receptor) of the landscape receptor to change is defined as high, medium or low and is based on weighing up professional judgements regarding susceptibility and value, and each of their component considerations. Further information on each criteria is provided below.

Susceptibility of Landscape Receptors

8. Susceptibility is defined as "the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the proposed project without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies" (GLVIA3 para. 5.40).

Landscape Value

9. Landscape value is recognised as being a key contributing factor to the sensitivity of landscape receptors, and is determined with reference to the presence of relevant designations (such as the National Park) and their level of importance. However, in the context of the present study area, some indication of relative value is required, since not all landscapes contribute equally to the National Park designation. Reference is therefore made to the Special Landscape Qualities of the National Park, as well as criteria which are indicative of value, such as condition, scenic quality, rarity, representativeness, conservation interests, recreation value, perceptual aspects, and associations. Value encompasses both that of individual components of the landscape, as well as its resulting overall character.

10. Judgements regarding the sensitivity of landscape receptors made by combining the above considerations, and are recorded as high, medium or low as indicated in Table 6.12 below.

Table 6.12 Determining Sensitivity of Landscape Receptors

Determining Sensitivity of Landscape Receptors (susceptibility and value)	
High	A landscape of particularly distinctive character, where its character, land use, pattern and scale may offer very limited opportunities for the accommodation of change, and/or development of successful mitigation, and which is therefore highly susceptible to change. May contain features that contribute to a nationally designated landscape, or may display a strong degree of intactness and/or scenic quality, and/or particular rarity.
Medium	A landscape of notable character, which may offer some opportunities for the accommodation of change due to its nature, land use, pattern and scale, but which may demonstrate some susceptibility to the type of change proposed. May offer more opportunity for the development of successful mitigation. May contain features that make some contribution to a nationally or regionally designated landscape, or may display, to a lesser degree, relative intactness and/or scenic quality, and/or some rarity.
Low	A landscape which is of low scenic quality, and/or where its character, existing land use, pattern and scale are of low susceptibility to change and/or offer very good opportunities for successful mitigation, or enhancement. May contain features that make limited contribution to a nationally or regionally designated landscape, or may display little landscape and/or scenic quality, and/or may be commonplace.
Note: there is a gradual and blurred transition between each grade and judgments about the sensitivity of landscape receptors may include individual features or areas.	

Magnitude (Nature) of Landscape Effect

11. The overall judgement of magnitude of landscape effect is based on combining professional judgements on size and scale; geographical extent; duration; and reversibility. Further information on each criteria is provided below.

Scale and Geographical Extent

12. This is a measure of the extent of existing landscape elements that will be lost, the proportion of the resource that this represents, the contribution of such elements to the character of the landscape, and the size of the geographical area across which the impacts will be felt. In terms of landscape character, this reflects the degree to which the character of the landscape will change by removal or addition of landscape components, and how the changes will affect key characteristics. Scale is described as being **large**, **medium** or **small**, and the geographical extent over which the impact will be experienced

is described as **widespread** or **localised**, i.e. at a regional level, or associated with the more immediate setting of the site.

Duration

13. GLVIA3 states that "Duration can usually be simply judged on a scale such as short term, medium term or long term." (GLVIA3, para. 5.51). For the purposes of this assessment, duration has been determined in relation to the key phases of the Proposed Development, as follows:

- **Short-term** effects are those that occur during site establishment, and may extend into the early part of the operational period (e.g. construction activities), as well as effects associated with the decommissioning phase: short-term effects are those that generally last less than two years;
- **Medium-term** effects are those that occur during the operational period, during which the mine and associated works will be present in the landscape for up to 16 years; and
- **Long-term** effects which are effectively permanent, remaining after closure and restoration of the Proposed Development, and lasting longer than 16 years.

14. Effects which last for the life of the project but which will not extend beyond closure and restoration, or will be very much reduced at this stage, are considered to be medium-term.

Reversibility

15. Reversibility is reported as **permanent** (i.e. irreversible), **partially reversible** or **reversible**, and is related to whether the landscape change can be reversed at the end of the period of development under consideration (i.e. at the end of the construction or at the end of the operational lifespan of the development). Some of the operational landscape effects are considered to be reversible as the closure and restoration period will remove most project infrastructure at the end of the operational period. Landscape effects are therefore considered to be reversible except were specifically stated in the assessment.

16. Judgements regarding the magnitude of landscape effect are recorded as **high**, **medium**, **low** or **barely perceptible**, as indicated in Table 6.13 below.

Table 6.13 Magnitude of Landscape Effect

Magnitude of Landscape Effect (size and/or scale, geographical extent, duration, reversibility)	
High	A large change in landscape characteristics and/or over extensive geographical area and/or which may result in an irreversible landscape impact.
Medium	A moderate change in landscape characteristics and/or which may be over a large geographical area, and/or which may be reversible over a long duration of time.
Low	A small change in characteristics of the landscape and/or which may be over a relatively localised geographical area, and/or which may be reversible over a short duration of time.
Barely Perceptible	A virtually imperceptible change in characteristics of the landscape and/or which is focused on a small geographical area, and/or which is almost or completely reversible

Levels of Landscape Effect and Significance

17. Following evaluation of sensitivity (susceptibility, value), and magnitude (size and/or scale, geographical extent, duration and reversibility), the overall significance of the landscape effect is determined, by making an informed professional judgement, on the basis of weighing up all distribution of judgements for each of the aspects that have been considered. Although without a numerical or formal weighting system, appropriate weight is therefore given to the relative importance of each of the aspects that must be considered.

18. The levels of landscape effect are described as being **major**, **moderate**, **minor** or **negligible**, in line with **Table 6.14** below.

Table 6.14 Levels of Landscape Effect

Levels of Landscape Effect	
Major	Changes substantially affecting the character of the landscape or the elements therein. For example a major impact is likely when a receptor of high sensitivity is affected by a high magnitude of landscape impact.
Moderate	Change affecting, to a lesser degree, the character of the landscape or the elements therein. For example a moderate impact is likely when a receptor of medium sensitivity is affected by a moderate magnitude of landscape impact.
Minor	Slight change affecting the character of the landscape or specific elements therein. For example a minor impact is likely when a receptor of low sensitivity is affected by a low magnitude of landscape impact.
Negligible	No or minimal perceptible change, affecting the character of the landscape or specific elements therein. Note that this includes locations where there will be no landscape impacts.

19. Landscape effects are described as either **not significant** or **significant**, whereby **major** and **moderate** landscape effects are considered significant, as outlined in **Table 6.15** below. Note that there is a gradual, blurred transition between levels.

Table 6.15 Significance of Landscape Effects

Significance of Landscape Effects		
Not Significant Landscape effects may be reversible and/or of short duration, and/or over a restricted area, affecting elements and/or characteristics (including aesthetic and perceptual aspects) that contribute to but are not key to the character of landscapes.		**Significant** Landscape effects may be long-term and/or irreversible, and/or over an extensive area, affecting elements and/or characteristics (including aesthetic and perceptual aspects) that are key to the character of nationally valued landscapes.

Direction of Landscape Effects

20. As required by the EIA Regulations, the assessment must identify the direction of effect as either being **positive** ('beneficial'), **negative** ('adverse') or **neutral**. With regard to mineral developments, the direction of effect on the landscape is determined in relation to the degree to which the proposal fits with the existing landscape character.

21. The Proposed Development will comprise the introduction of a mineral extraction and processing facility into an upland glen landscape that already hosts a similar, though much smaller, facility. However, the nature of the works differs to the existing landscape character, and effects on landscape are therefore assumed to be negative unless otherwise stated. Some elements of the Proposed Development may be considered positive in the long term, e.g. landscape restoration works, and this has been indicated within the text where applicable.

Assessing Visual Effects

Significance of Visual Effects

22. As outlined in GLVIA3 "An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity" (GLVIA3, para. 6.1). Changes in views may be experienced by people at different locations within the study area including from static locations (normally assessed using representative viewpoints) and whilst moving through the landscape (normally referred to as sequential views from roads and other recreational routes (e.g. cycle and walking routes).

23. Visual receptors are individuals or groups of people who may be affected by changes in views and visual amenity, and they are usually grouped by reference to their susceptibility to change in views and visual amenity as a function of the occupation activity of the person experiencing the change (for example residents, motorists, recreational users etc.) and the extent to which their attention is deliberately focused on the view and visual amenity (GLVIA3, paras. 6.31 – 6.32).

Sensitivity (Nature) of Visual Receptor

24. The sensitivity (nature) of visual receptors may involve a complex relationship between a visual receptors (people's) susceptibility to change and the value attached to a view. Therefore the rational for judgements of sensitivity is clearly set out for each receptor in relation to both susceptibility and value.

25. Sensitivity to change is defined as high, medium or low and is based on combining professional judgements on susceptibility and value. Further information on each criteria is provided below.

26. The visual impact assessment assesses the impact of the proposed project on views, and the visual amenity of people who could experience views of the Proposed Development.

A particular person or group of people will be affected by a change in view or visual amenity in different ways.

Susceptibility of Visual Receptors

27. Susceptibility to changes in views and/or visual amenity is a function of the occupation or activity of people experiencing the view and the extent to which their attention is focused on views (GLVIA 3, para. 6.32).

Value Attached to Views

28. GLVIA3 also requires evaluation of the value attached to the view or visual amenity and relates this to planning designations and cultural associations (GLVIA3, para. 6.37).

29. Recognition of the value of a view is determined with reference to:

- planning designations specific to views or visual amenity;
- whether it is recorded as important in relation to designated landscapes (such as views specifically mentioned in the special qualities of the LLTNP);
- whether it is recorded as important in relation to heritage assets; and
- the value attached to views by visitors, for example through appearances in guide books or on tourist maps, provision of facilities for their enjoyment and references to them in literature and art.

30. It is common practice in visual impact assessment to assign a sensitivity level to the person or group of people experiencing the likely change in view. Level of sensitivity is usually assigned ranging from high, to medium, to low and is generally influenced by the susceptibility of the viewer to change in view of visual amenity. This may be further calibrated by reference to planning designations of a view and cultural significance, as indicated below.

31. A designated viewpoint or scenic route advertised on OS maps and in tourist information, or which is a significant destination in its own right, such as a prominent or popular hill summit offering panoramic views, is likely to indicate a view of higher value. High value views may also be recognised in relation to the special qualities of a designated landscape or heritage asset, or it may be a view familiar from photographs or paintings.

32. Views experienced from viewpoints or routes not recognised formally or advertised in tourist information, or which are not provided with interpretation or, in some cases, formal access are likely to be of lower value.

33. Judgements regarding the sensitivity of visual receptors made by combining the above considerations, and are recorded as of **high**, **medium** or **low** as indicated by **Table 6.16** below.

Table 6.16 Determining Sensitivity of Visual Receptors

Determining Sensitivity of Visual Receptors (susceptibility and value)	
High	Communities where views contribute to the landscape setting enjoyed by residents; people engaged in outdoor recreation (i.e. users of recreational footpaths whose interest is likely to be focused on the landscape); visitors to heritage assets or other attractions where views of surroundings are an important contributor to experience, and travellers on scenic routes where attention is focused on the surrounding landscape. These are receptors which are deemed to be of high susceptibility to change. Recognised views, perhaps referred to in literature, recorded in guide books or on maps.
Medium	Recreational or tourist travellers, perhaps moving more slowly though the landscape, on roads; people at their place of work whose attention is not on their surroundings, but where setting is important to the quality of their working life. These are receptors which are deemed to be of medium susceptibility to change. Views which are not formally recognised, but which may be valued locally.
Low	People engaged in longer distance travel on roads, outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape; people at their place of work whose attention is not on their surroundings, and where setting is of less important to the quality of working life. These are receptors which are of low susceptibility to change. Views which more ordinary, and which are not specifically valued.
Note: there is a gradual and blurred transition between each grade. The presence of a large number of viewers in a location that will otherwise be of low or medium sensitivity may increase the sensitivity.	

Magnitude (Nature) of Visual Effect

34. The overall judgement of magnitude (nature) of visual effect is based on weighing up professional judgements on size and scale; geographical extent; duration and reversibility. Further information on each criteria is provided below.

Scale of effect

35. The scale of the visual effect takes account of:

- The scale of the change in view with respect to the loss or addition of features and /or changes in composition, including the proportion of the view occupied by the proposed project;
- The degree of integration of new features or changes in the landscape into the existing view, in terms of aspects such as form, scale and mass, line, height, colour and texture; and
- The nature of the view of the proposed project, in terms of the relative amount of time over which it will be experienced and whether views will be full, partial or glimpses.

36. In this assessment of scale is described as being **large**, **medium**, **small** or **barely perceptible**.

Geographical Extent

37. The geographical extent of visual changes records the extent of the area over which the changes will be visible e.g. whether this is a unique viewpoint from where the proposed project can be glimpsed, or whether it represents a large area from which similar views are gained from large areas. In this assessment geographical extent is described as being **large** (widespread), **medium** or **small** (localised). The geographical extent of the visual effect varies in relation to different viewpoints and reflects:

- The direction or bearing of view of the development in relation to the main activity or view experienced by the receptor;
- The distance of the viewpoint from the proposed project; and
- The extent of the area over which the changes will be visible.

Duration

38. The duration of visual effects is reported as **short-term**, **medium-term** or **long-term**, as defined above in relation to the duration of landscape effects.

Reversibility

39. Reversibility is reported as **permanent** (i.e. irreversible), **partially reversible** or **reversible**, and is related to whether the visual change can be reversed at the end of the period of development under consideration (i.e. at the end of the construction or at the end of the operational lifespan of the development). Some operational visual effects are considered to be reversible as the closure and restoration period will remove most project infrastructure at the end of the operational period.

40. Judgements regarding the magnitude of visual impacts are recorded as **high**, **medium**, **low** or **barely perceptible**, as indicated in Table 6.17 below.

Table 6.17 Magnitude of Visual Effect

Magnitude of Visual Impact (Size and/or scale, geographical extent, duration, reversibility)	
High	Substantial changes, which may be seen for a long duration, and/or be clearly perceptible, and/or which may be in stark contrast with the existing view, and/or obstruction of a substantial part or important elements of views beyond the main project area, and/or which may result in an irreversible change.
Medium	Location affected by moderate changes in views, and/or visible for a shorter duration, perhaps at a slight angle from the main focus of the view, and/or where changes may be in contrast with the existing view, and/or obstruction of a noticeable part or elements of views beyond the main project area. The change may be reversible over a long duration of time.
Low	Location affected by slight changes in views, and/or visible for a short duration, perhaps at an oblique angle, and/or which may fit to an extent with the existing view. The change may be reversible over a shorter duration of time.
Barely Perceptible	Location affected by a change which is barely visible, and/or visible for a very short duration, perhaps at an oblique angle to the main focus of the view, and/or which may blend with the existing view, usually at some distance from the project, and/or where the change is almost or completely reversible.

Assessing the Significance of Visual Effects

41. As for landscape impacts, the evaluations against the considerations above are set out together to provide an overall profile of each resultant visual effect. An overview is then taken and an informed professional assessment made of the overall significance of each visual effect. This overview takes account of the judgements made in relation to each aspect considered. Therefore, although without a numerical or formal weighting system, appropriate attention is given to the balance and relative importance of each aspect in each case.

Levels of Visual Effect and Significance

42. Following evaluation of the various considerations (sensitivity: susceptibility, value; and magnitude: size and scale, geographical extent, duration and reversibility), the overall significance of the visual effect is determined, by making an informed professional judgement, taking account and weighing up all the aspects which have been considered.

43. Levels of visual effect are identified as being **major**, **moderate**, **minor** or **negligible**, as outlined in **Table** 6.18 below. Note that there is a gradual, blurred transition between levels.

Table 6.18 Levels of Visual Effect

Levels of Visual Effect	
Major	Changes substantially affecting views and visual amenity. For example a major impact is likely when a receptor of high sensitivity is affected by a high magnitude of visual impact.
Moderate	Change affecting, to a lesser degree, views and visual amenity. For example a moderate impact is likely when a receptor of medium sensitivity is affected by a moderate magnitude of visual impact.
Minor	Slight change affecting views and visual amenity. For example a minor impact is likely when a receptor of low sensitivity is affected by a small magnitude of visual impact.
Negligible	No or minimal perceptible change, affecting views and visual amenity. Note that this includes locations where there will be no impacts.

44. Visual effects are described as either **not significant** or **significant**, as outlined in **Table 6.19** below, where **moderate** and **major** visual effects are considered significant in the context of the EIA Regulations.

45. This determination requires the application of professional judgement and experience to take on board the many different variables which need to be considered, and which are given different weight according to site-specific and location-specific considerations in every instance. Judgements are made on a case by case basis, guided by the same principles as set out in **Plate 6.1** above.

Table 6.19 Significance of Visual Effects

Significance of Visual Effects		
Not Significant Visual effects on people who are generally less sensitive to changes in views/ visual amenity. Small changes and/or changes which are well integrated into the view, often involving features already present in the view. These may be reversible effects/ or of short duration.		**Significant** Visual effects on people who may be particularly sensitive to changes in views/ visual amenity, and/or at recognised viewpoints or recognised scenic routes. Large scale changes which introduce new, non-characteristic or discordant or intrusive elements into the view. These may be long-term/ irreversible effects.

Direction of Visual Effects

46. The direction of effect (**positive** ('beneficial'), **negative** ('adverse') or **neutral**) is determined in relation to the degree to which the proposed project fits within existing views, and the contribution that the Proposed Development makes to these views, even if it is in contrast to the existing character of the view.

47. Potential visual effects are assumed to be negative unless otherwise specifically stated in the text. In some instances, changes in views as a consequence of the Proposed Development and associated mitigation may be considered positive, and where applicable this has been indicated within the text.

Annex 6.2 Landscape Character

Regional Landscape Character Types

48. The Open Upland Glen LCT has the following landscape characteristics, opportunities and sensitivities (page 82-83 of the LCA):

Landscape Characteristics

Land Cover and Land Use

- Upland land use, with land unenclosed higher up, sheep grazing and sporting estates.
- Land enclosed lower down and locally in areas where the land has had potential for improvement; see LCT Farmed Upland Glens.

Settlement and Development

- Settlement is sparse, with occasional farms and access tracks, isolated farm buildings and utilities infrastructure. Buildings are generally only present lower down the glens and are often in a poor state of repair. Settlement tends to be associated with Farmed Upland Glens.
- Pylons and pipelines feature locally, where power generation and transmission occurs.

Access and Recreation

- Some Open Upland Glens are accessible by road and rail, forming traditional passes.
- In open landscapes hill tracks and paths can be visible, particularly where they have been upgraded, with erosion scars and culverts.
- Paths and tracks for recreation and for farmers to access the hills often follow burn sides, typically heading up to watersheds before zig-zagging up onto hill sides.

Biodiversity

- Lower and flatter ground is wet, with low-fertility, acidic, peaty soils. Bright-green flushes occur at spring lines.
- Scattered trees and native woodlands are found along the edges of burns. These are typically relict woodlands, including birch, oak, rowan and goat willow.
- Elsewhere, land use has been abandoned, with natural regeneration of scrub woodland.
- Vegetation includes heather in the better drained areas, typical moorland herbs, grasses, rushes, sedges and mosses, as well as bracken predominating locally.

Cultural Heritage

- Relict historic landscapes such as shielings and abandoned field systems.
- Historically, many of the upland glens have been used as passes and the remains of routes are common, including railways, viaducts, tracks, military roads, barracks and bridges. These are more visible in Open Upland Glens.
- Highland-type designed landscapes include estates and associated hunting lodges.

Visual and Scenic Qualities

- Classic views focus up and down the glens, framing the landscapes that lie beyond them.

Opportunities for landscape change

- Cultural remains should be kept clear through managed grazing.
- Remains would benefit from survey, any required conservation works and interpretation.

Sensitivities to landscape change

- The open qualities of these areas should be retained, with new native woodland schemes limited to expanding existing semi-natural woodland to low-density woodland cover gradually fading into open hills.
- Avoid developments and land use change that detract from unspoilt and wild land qualities, such as engineered hill tracks, new infrastructure, masts and commercial plantations. (Note: Environmental Impact Assessment requirements).

49. The open hills LCT has the following landscape characteristics, opportunities and sensitivities (page 75-76 of the LCA):

Landscape Characteristics

Land Cover and Land Use

- Upland land use, open and largely unenclosed, with sporting estates and sheep grazing.
- Upper margins of forests extend occasionally into otherwise open hill areas.
- Enclosed farmland confined to lower slopes, with occasional fences or walls.

Settlement and Development

- Unsettled, with absence of public roads and railways.
- Occasional masts and pylons.

Access and Recreation

- Access generally by foot, mountain bike or ATV, via paths and stalking tracks.
- Occasional hill and estate tracks, which can become badly eroded.
- Footpaths follow ridgelines and are most evident on the Munros and popular peaks.

Biodiversity

- Wide range of sward height of semi-natural vegetation: heather, typical moorland herbs, grasses, rushes, sedges and mosses.
- Rarer alpine species in the shorter swards on mountain tops.
- A predominance of bracken over lower altitudes.
- Small areas of native woodland and scattered trees, typically birch and oak, on lower slopes and in gullies.
- Herds of deer can be conspicuous in open expansive upland landscapes.
- Birds noticeable against open horizons and bird song audible on occasions.

Cultural Heritage

- Generally without recorded historic or archaeological features or land use patterns.
- Occasional relics such as shielings, sheep grazing structures and extraction sites, etc., where favourable soils, topography and orientation allowed seasonal use.

Visual and Scenic Qualities

- Expansive outlook and panoramic views across neighbouring uplands: north into extensive highlands and south over the lowlands and Clyde seaways.

- Glimpsed overviews down through upland glens and obliquely along glens to lochs and farmed strath floors below.
- Individual peaks are significant local and regional landmarks.
- Masts and pylons introduce scale references and artificial elements into an otherwise natural scene

Opportunities for landscape change

- Open Hills should be conserved and enhanced for their open, unspoilt and wild qualities; used by hill farmers with responsible open access encouraged.
- Appreciation of the dramatic landforms of the hills should be enhanced by limiting new tree planting to lower slopes and gullies, with Scots pine and oak on more rugged slopes.
- The existing diverse pattern of vegetation should be enhanced with native woodland regeneration encouraged along lower glens, in gullies and around upper forest margins, to achieve a more natural transition from lower woodlands to open hills.
- Upland path management techniques should be applied to eroded paths and key hill routes to minimise visual impacts and control effects of walkers' feet and water erosion.

Sensitivities to landscape change

- Elevated open hill land and skyline ridges are sensitive to highly visible built development including masts, pylons, wind farms and new tracks, which detract from unspoilt and scenic qualities. (Note: Environmental Impact Assessment requirements)
- Open qualities of upland slopes and summits are sensitive to extensive land cover change through planting or natural regeneration of new forests or woodlands.

Local Landscape Character Areas

The following text is extracted from the 2011 LVIA.

50. The relevant landscape character assessment provides high level background information about the landscape character of the area, much of which is specific to landscape types rather than being geographically specific (character areas). It was therefore necessary to undertake field surveys (March to June 2011) in order to understand landscape character at a detailed enough level for the purposes of the proposals being considered. The following paragraphs, and accompanying photographs, describe the character of the site and the immediate surrounding landscape within view of the mine.

51. Landscape character is described below sequentially, starting with the access track and car park, where the track leaves the A82, and progressing up the glen containing the River Cononish, to the farm at Cononish and up to the existing exploratory mine and waterfall on the Allt Eas Anie.

52. The wider landscape character is then described, focusing upon those areas which lie within view of the proposals, as indicated by the ZTV map (Figure 6i). There is

intervisibility between the areas which are described, except where views are enclosed within woodland, and the transition between one area and the next is gradual. Lines shown on Figure 6ii are therefore indicative. The hill areas overlook the glen areas.

53. Geographically specific local landscape character areas are described, and those landscape qualities which are considered by LUC to notable or representative are listed as bullet points. The areas are shown on Figure 6ii.

Table 9.1: Local Landscape Character Areas

Local Landscape Character Areas
Strath Fillan and Dalrigh (SNH upland glen type)
River Cononish and Coille Coire Chuilc (SNH upland glen type)
Cononish Farm Upland Glen (SNH upland glen type)
Existing Exploratory Mine (SNH upland glen type)
Cononish and Strath Fillan Hills (SNH hills type)

Strath Fillan and Dalrigh Upland Glen

54. A track leaves the A82, the main road which passes along the bottom of Strath Fillan. The strath is deep and steep sided, its flat bottom carved out by glacial activity, and at this point carries two railway lines. Glen sides are forested in part, and a notable visible feature is the old lead mine above Tyndrum. A sign at the Tourist Information office describes the gold mining heritage of the area. Another near Dalrigh car park, within an area which is promoted as Tyndrum Community Woodland, indicates the lead smelter site. The existing car park just off the main road is well used. The exploratory gold mine is not visible from here. The track leading up to the mine passes around the back of Dalrigh, to the north of the buildings. A short section of this track (about 300m) is followed by the West Highland Way national trail. The track is well used in its lower reaches, both by people enjoying the community woodland and by vehicles accessing the glen. Track sides are unvegetated and eroded in places. It winds through mixed woodland and under the railway, beyond which the character of Glen Cononish becomes more open, and views which had been enclosed become available, up the river. This point marks the boundary of the community woodland, beyond which recreational activity decreases. Walkers and climbers heading for Ben Lui or Ben Oss continue westwards along the track beyond the railway. Those heading to Ben Dubhchraig follow the track to the south of the river, towards Gleann Auchreoch. Much of this local landscape character area has little or no intervisibility with the mine.

55. Landscape qualities of the local area:

- the mosaic of native birch, alder and regenerating pine woodland across the widespread and sometimes large scale distinctive depositional hummocky glacial land forms in the lower part of the glen;
- the sculptured rock formations of the river beds of the Crom Allt and River Cononish;
- views of the high hills glimpsed through the trees and contrasting with the lower landscapes of the glens.

Plate 9.1: Community woodland at Dalrigh. Sign describes lead smelter site

Plate 9.2: Old lead mine above Tyndrum

Plate 9.3: Existing track to the Exploratory Cononish Gold Mine up Glen Cononish

River Cononish and Coille Coire Chuilc Upland Glen

56. Beyond the railway the landscape character becomes more open, and intervisible with higher parts of the glen and surrounding hills, although plantation forest (planted around 1973), in part restructured, encloses views to the north. Two large rectilinear fields enclosed by forest to the north of the river have an unnatural appearance. The terrain is characteristically hummocky, comprising a mosaic of distinctive glacial depositional land forms, drumlins and moraine vegetated with heather, bracken, bilberry and rough heathland grasses. More rushy areas, with birch and goat willow are found in the damp hollows between them. To the south the native Caledonian pine woods at Coille Coire Chuilc, growing across a similarly hummocky terrain are seen. As well as mature trees, there is evidence of successful regeneration of younger trees having occurred since the area was deer fenced. The softer appearance of this woodland is in contrast to the dense Sitka spruce plantations with their straight edges and associated fencing. Forestry Commission Scotland has recently deer fenced and planted the strip of land lying north of the access track, up to the existing forest edge. New pine trees are under 1m high at present. A sign in the area marks the eastern entrance to the Ben Lui National Nature Reserve, where there is an interpretation board noting the exploratory gold mine.

57. Landscape qualities of the local area:

- the soft characteristic colours and shapes of ancient Caledonian pine forest at Coille Coire Chuilc, seen against a backdrop of hills;

- the mosaic of vegetation creating a patchwork across the distinctive depositional hummocky glacial land forms of drumlins, moraines and river terraces in Glen Cononish;
- the shallow and fast flowing river forming a focus to views, which together with the shape of the enclosing river terraces, draw the eye up the glen;
- views of the dramatic high hills containing the glen, with Ben Lui at its head.

Plate 9.4: Glacial moraine creating a hummocky topography and mosaic of vegetation in Glen Cononish

Plate 9.5: Remnant Caledonian pine forest on hummocky topography - Coille Coire Chuilc

Plate 9.6: Distinctive terraced landform of glacial moraine above River Cononish

Plate 9.7: Forest plantation above River Cononish

Cononish Farm Upland Glen

58. Passing up the glen, the landscape gradually becomes more open although it is still enclosed by sitka spruce plantation to the north. Natural woodland is largely absent although historically would have extended up the glen (as can be seen by the stumps of former pines in the peat), and the glen feels open and exposed. As a result, man-made features such as fencing are very apparent, and the landscape feels quite degraded in places. The surrounding hills which enclose the glen are seen rising steeply above it. These limit views, Cononish Glen being contained by the northern slopes of Beinn Dubhchraig and Ben Oss to the south, Ben Lui to the west and Beinn Chuirn and Meall Odhar to the north. A bridge enables hill walker and farm access across the river 200m south east of the farm. The farm itself comprises a white painted farmhouse and a series of large bright green barns which are highly conspicuous when approaching. The Cononish Tacksman's house ('B' Listed) is situated between the barns and the River Cononish, set low down so that its north facing windows look towards a barn. Its garden lies on the south side of the house and is partly enclosed by sycamore trees. Dry-stone walls and fences enclose fields around the farm and are used for overwintering sheep. Behind the farm is a shelter belt of coniferous plantation forest, planted around 1973. The spoil heaps from the existing exploratory mine can be seen on the hillside above this, although being grey in colour they can be difficult to discern when the hillside is in shadow. They are more evident in the morning when illuminated by the sun. Visibility varies with the seasons and the contrast with the changing appearance of the vegetation cover. The spur below the Allt Eas Anie, as well as the shelterbelt, serve to limit

intervisibility between the area around the farm and the mine above, although the hills enclosing the glen can be seen. West of the farm is a relatively recent (about 15 years old) plantation of closely spaced pine (seed from the glen), birch, rowan and some holly, enclosed within deer fencing. From here the track continues west towards Ben Lui. A branch of the track follows the Allt Eas Anie up towards the mine.

59. Landscape qualities of the local area:

- views of the dramatic high hills containing the glen, with Ben Lui and its distinctive north east facing corrie at its head;
- views back down the glen to Beinn Challuim, with the River Cononish leading the eye down the sweeping U-shaped valley, framed by a series of lobed river terraces; and the steep and partly vegetated cliffs of Creag Bhocan;
- the dramatic cleft and waterfall of Allt Eas Anie in a side glen to the west of Cononish;
- a visible linear exposure of quartz as a fault line on Meall Odhar, in line with the exploratory gold mine seen below the waterfall on Allt Eas Anie.

Plate 9.8: Cononish Farm and green barns

Plate 9.9: Cononish Farm with mine on hillside above

Existing Exploratory Mine (within the open upland glen)

60. A track branches off the main track and path which continues to Ben Lui, following a tributary of the River Cononish alongside the straight edge of a Sitka plantation, and then winding up the hillside to the mine. The track is also used by climbers to access the waterfall in winter. Two flattened areas of unvegetated grey coloured spoil are evident, the upper one having two corrugated iron sheds located upon it. The mine entrance is gated, but machinery and rails can be seen inside. A small outflow of water issues from the mine. Below it, within an area of heather covered hummocky peat are a series of three small regularly shaped settlement ponds. This area has a disturbed quality. The land below the mine is concave, sloping gently into a bowl containing the burn, and consequently having an element of enclosure, and having more limited intervisibility with the surrounding landscape. The burn follows a fault line in its lower reaches, where for about 400m it is very straight (flows directly east) and has low but in places vertical gorge like walls, with water flowing rapidly downhill in a channel contained by vegetated low rock walls. There is some shrub vegetation. Above it, the waterfall on the Allt Eas Anie (a winter ice climb when in condition) flows down a steep sided ravine, and lies in shadow for much of the time. Three adits from lead mines worked in the mid-1800s are found in this area, and there are further adits around Allt an Rund. The hillside where the exploratory mine is located faces east and so is in the shadow of Beinn Chuirn in the afternoon and evening. Land cover is a mosaic of bare rocky outcrops, rough grasses, and species including bilberry, bracken, heathers, mosses and rushes. Some areas of exposed peat are seen where the ground cover has been disturbed. From the mine there are

views down the River Cononish, to the hills on the far side of Strath Fillan (Beinn Challuim) and up to the surrounding hillsides which contain the glen. The straight edges of the forest enclosing the fields to the north of Glen Cononish are very evident from here.

61. Landscape qualities of the mine site:

- the dramatic cleft and waterfall on the Allt Eas Anie above the mine entrance tunnelled into the hillside;
- views back down the glen to Beinn Challuim, with the River Cononish leading the eye down the sweeping U-shaped valley, framed by a series of lobed river terraces; and the steep and partly vegetated cliffs of Creag Bhocan;
- striped rock banding on the east face of Beinn Chuirn and a visible linear exposure of quartz as a fault line on Meall Odhar, in line with the exploratory gold mine seen below the waterfall on the Allt Eas Anie.

62. For some people a degree of understanding of the connection between geology, geomorphology and land use is triggered, in terms of views of:

- the evidence of the shaping of the landscape by natural glacial forces (the u-shaped Cononish valley, kame terraces seen in the glen, glacial corries on Beinn Chuirn and Ben Lui);
- the striped rock banding indicating bedding planes on the east face of Beinn Chuirn, and the visible exposure of the quartz vein which contains the minerals on the hillside below Meall Odhar; and
- use of underlying natural resources by man, as evidenced by the presence of the mine.

Plate 9.10: Cononish gold mine from track above Cononish Farm

Plate 9.11: Approach to Cononish gold mine

Plate 9.12: Mine entrance

Plate 9.13: Existing hardstanding and sheds


Plate 9.14: Allt Eas Anie Waterfall


Plate 9.15: View from the mine down the River Cononish

Wider Landscape Character - Cononish and Strath Fillan Open Hills

63. Cononish Glen is contained by the northern slopes of Beinn Dubhchraig and Ben Oss to the south, Ben Lui to the west and Beinn Chuirn and Meall Odhar to the north. Further east, the slopes of Beinn Challuim are also visible, and further away again, Ben More. SNH characterises all these areas as open hills. All the hill areas are frequented by occasional hill walkers or climbers.

64. These hills afford views of the surrounding area, and are characterised by their natural land form and open undeveloped characteristics, their sense of wildness and being remote from man-made activities. Above Glen Cononish, some parts of these hills enable views of the exploratory mine, located below the slopes of Beinn Chuirn, in the transitional area to the more man modified landscape in the glen below.

65. From the hills, the pattern of forest plantation is the most evident land use, along with the lines of existing hill tracks and the large green farm buildings at Cononish. The spoil heaps can be seen from the hillsides, but generally not from the summits themselves, as land plateaus-off, with convex slopes above the hills sides, preventing views. The grey spoil is of the same rock type as that found in the wider area, but in certain lighting conditions it can be clearly seen.

66. Landscape qualities of the hills surrounding Glen Cononish:

- the dramatic high hills which contain the glen, and the panoramic views available from them, including of man's activities in the glens far below;
- the wind, cloud and weather, affecting the mood of the hills, their feeling of wildness and the availability of views from them;
- seasonal variations and colour changes, with drama provided by winter snow cover;
- the sense of the hills being remote and 'unobtainable' and the rewards offered by time spent walking up into them.

Plate 9.16: Ben Oss from the mine

Annex 6.3 Viewpoint Assessment

Viewpoint 1 Mine access track, east of the mine			
Grid Reference	229816, 728736	**Figure Number**	6.1i to 6.1iii
RLCA	Upland Glens	**Landscape Designations and Protection**	LLTNP
LLCA	Exploratory Mine		
Direction of View	South west	**Distance from site**	<100 m
Viewpoint Location and Potential Receptors	This viewpoint is located on the existing track that provides access to Cononish Mine, at approximately 313m AOD, north west of Cononish Farm. It is within the mine site and will only be accessible to mine workers. However, it also represents views experienced by recreational visitors using the proposed diversion route alongside the mine site, on the boundary of FCS land.		
Description of Existing View	The immediate foreground of view is occupied by moorland sloping upward towards Beinn Chuirn, and a watercourse which meanders south east out of view. The rugged horizon is formed by the southern slopes of Beinn Chuirn and the background summits of Ben Lui and Ben Oss. The existing mine site and access track are visible in views looking west from this location, backclothed by the eastern flank of Beinn Chuirn (not visible in the view shown in Figures 6.1 to 6.1ii). Views looking directly north and east are largely contained by dense conifer forest, with some views across and along the Cononish Valley to the south and south east.		
Sensitivity	Occasional recreational visitors using the adjacent route are considered to be of high susceptibility as their attention would be focused on the surrounding landscape. The viewpoint is located within the nationally designated LLTNP and provides views looking south west towards WLA 06 Ben Lui. Taking account of the limited number of regular recreational receptors and presence of the existing mine the value of the view is considered to be medium. Sensitivity of receptors is judged to be **medium**.		
Magnitude of change and significance of visual effects during each assessment phase			
Site Establishment Phase	During this phase the main source of effect will be seen in views looking west towards the mine (outside the field of view shown in Figure 6.1), where site establishment activities will result in a large scale change in views. The majority of construction activities will be reversible, and areas of disturbance will be restored. Views looking south west towards the mountains (as shown in Figure 6.1) will be unaffected during this phase of development. The effect during site establishment will be large in scale over a localised area. It will be short term and partly reversible. The magnitude of visual change will be high, and taking account of the medium sensitivity will result in a **major** (significant) visual effect from this viewpoint.		
Operational Phase	During this phase large scale changes in the view will occur associated with the phased creation and progressive restoration of the dry stack areas, which as they are developed will form increasingly large features.		

Viewpoint 1 Mine access track, east of the mine	
	At any time, only one stack will be 'active', so that the visual effect will change over time. The mine site will be visible to the west, though development of the dry stack areas will increasingly obscure this feature. Views to the mountains will not be obscured. Phased development of the dry stack areas will result in a large-scale of effect experienced at a localised level. The effect will be medium-term and partly reversible: phased restoration will remove visual disturbance, although the stacks themselves will remain. The magnitude of visual change during the operational period will be high and will result in a **major** (significant) visual effect.
Decommissioning and Restoration	In views looking west, restoration activities will be seen in relative close proximity views. Activities associated with this phase will result in a large-scale change experienced at a localised level. Most of these activities will be short term (6 months) and reversible. The magnitude of visual change will be medium, and will result in a **moderate** (significant) visual effect.
Post-restoration	Post restoration the access track leading to the secured mine entrance will remain. All remaining elements will be naturalised and allowed to fully re-vegetate. The stacks will remain as large-scale permanent features but will tie into the surrounding hummocky landform of the mine area. The magnitude of visual change will be small, and the residual impact will be **minor** and not significant.

Viewpoint 4 Allt Eas Anie waterfall			
Grid Reference	229816, 728736	**Figure Number**	6.4i to 6.4iv
RLCA	Open Upland Hills	**Landscape Designations and Protection**	LLTNP
LLCA	Beinn Chuirn		WLA 6 Ben Lui
Direction of View	East	**Distance from site**	200 m
Viewpoint Location and Potential Receptors	This viewpoint is located on the eastern flank of Beinn Chuirn, at approximately 563m AOD, and represents views which will mainly be seen by ice climbers in the winter, at an angle from above this elevated location west of the site.		
Description of Existing View	The existing Cononish mine and associated structures are seen below in the foreground of view, the access track winding into the middle distance. In the background the mountainous skyline includes the prominent summits of Beinn Challuim, Ben More and Stob Binnein. The green barns at Cononish are seen in the middle distance north of the River Cononish.		
Sensitivity	Occasional recreational users (mainly ice climbers in winter but also some walkers at other times) accessing the eastern slopes of Beinn Chuirn are judged to be of high susceptibility as their attention would be focused on the surrounding landscape. The viewpoint is located within the nationally designated LLTNP and WLA 06 Ben Lui. Given the limited number of visitors to this location and apparent existing mine, the value of the view is considered to be **medium**. Sensitivity of receptors is judged to be medium.		

Viewpoint 4 Allt Eas Anie waterfall	
Magnitude of change and significance of visual effects during each assessment phase[2]	
Site Establishment Phase	Site establishment activities will result in a large scale localised change occurring in the foreground of the view. The effect will be short-term (6 months) and areas of disturbance will be restored, although components introduced for the operational phase of the mine will remain medium-term. The magnitude of visual change during this phase will be high, and will result in a **major** (significant) visual effect from this viewpoint.
Operational Phase	Visible at relative close proximity in the middle distance, the new building and phased creation and restoration of the dry-stack areas will increase the influence of the existing mine. Visual effects will change over the duration of the operational phase as each dry stack is created and restored, one at a time. Operational activities will result in a large scale of effect, experienced at a localised level. The effect will be medium-term and partly reversible; phased restoration will limit visual disturbance. The magnitude of visual change during the operational phase will be high and will result in a **major** (significant) visual effect.
Decommissioning and Restoration	Activities associated with this phase will result in a large scale change, experienced locally over a short-term (6 month) duration and reversible. This will include the planting of native trees and shrubs which over the restoration phase will begin to soften the edges of the existing blocks of conifer forest and the shelter belt north west of Cononish. The magnitude of visual change will be medium will result in a **moderate** (significant) visual effect.
Post-restoration	Post-restoration only the access track leading to the secured mine entrance will remain in the view. All other elements, including the existing mine site, will be allowed to fully re-vegetate. The stacks will remain as large-scale permanent features but will tie into the surrounding hummocky landform of the mine area. The magnitude of visual change in the long term will be minor and taking account of the medium sensitivity will result in a **minor** and not significant visual effect. Due to the removal of the existing mine site this will be a beneficial effect for this view.

Viewpoint 5 Meall Odhar			
Grid Reference	229791, 729628	**Figure Number**	6.5i to 6.5iv
RLCA	Open Upland Hills	**Landscape Designations and Protection**	LLTNP
LLCA	Meall Odhar		
Direction of View	South west	**Distance from site**	800 m
Viewpoint Location and Potential Receptors	This viewpoint is located on the western approach to the summit of Meall Odhar, at approximately 616m AOD, north east of the site, and represents views of recreational receptors, mainly hill walkers.		

[2] During winter, when ice-climbers access this waterfall, there is a chance that the Proposed Development will be masked by snow. This assessment disregards this in order to assess a worst case.

Viewpoint 5 Meall Odhar	
Description of Existing View	From this position the existing mine site and access track is visible in relatively close views, situated in the middle distance nestled into the lower eastern slopes of Beinn Chuirn. The focus of this view is on the skyline hills of Ben Oss and Ben Lui.
Sensitivity	Hill walkers to this less frequented hill summit are judged to be of high susceptibility as their attention would be focused on the surrounding landscape. The viewpoint is located within a nationally designated landscape, but given the limited number of visitors the value of the view is considered to be medium. Sensitivity of receptors is judged to be **medium**.
Magnitude of change and significance of visual effects during each assessment phase	
Site Establishment Phase	The main source of effect during this phase will be activities associated with site establishment; secondary effects will include an increase in localised vehicle traffic on the access track, heading to and from the site. This will result in a large scale change in the view, experienced locally. The effect will be short-term (6 months) and areas of disturbance will be restored, although components required to necessitate the operational phase will remain medium-term. The magnitude of visual change during this phase will be high, and taking account of the medium sensitivity will result in a **major** (significant) visual effect from this viewpoint.
Operational Phase	During this phase the main source of effect will be operational activities associated with the mine site, and the phased creation and progressive restoration of the dry stacks. The dry stacks will form increasingly large features as they are developed. Seen at relative close proximity in the middle distance, the phased creation and restoration of the dry stack areas will increase the influence of the existing mine, east of the mine site. Visual effects will change over time as each dry stack is created and restored, one at a time. The presence of the operational mine site and the phased development of the dry stack areas will result in a large-scale of effect experienced at a localised level. The effect will be medium-term and partly reversible; phased restoration will limit visual disturbance, although the stacks themselves will remain. The magnitude of visual change during the operational period will be high and taking account of the medium sensitivity will result in a **moderate** (significant) visual effect.
Decommissioning and Restoration	During this phase the main source of effect will be the removal of most operational components, and completion of all remaining elements, which will be re-vegetated. Native woodland and scrub will be planted and will soften the edges of the visible conifer forest and shelterbelt north west of Cononish. Secondary effects will likely include an increase in localised traffic heading to and from the site. These activities will result in a large scale change in the view, experienced at a localised level. Most activities during this phase will be short-term (6 months) and partly reversible; the dry stacks will be completed during this phase and will remain. The magnitude of visual change will be medium and taking account of the

Viewpoint 5 Meall Odhar	
	medium sensitivity will result in a positive moderate (significant) visual effect.
Post-restoration	Post restoration the access track leading to the secured mine entrance will remain. Completed elements, including the dry stacks will be allowed to fully re-vegetate. The stacks will remain as large-scale permanent features but will tie into the surrounding hummocky landform of the mine area. The magnitude of visual change will be low and taking account of the medium sensitivity will result in a positive **minor** (not significant) visual effect.

Viewpoint 6 Creag Bhocan			
Grid Reference	230891, 727775	**Figure Number**	6.6i to 6.6iv
RLCA	Open Upland Hills	**Landscape Designations and Protection**	LLTNP
LLCA	Beinn Dubhchraig		
Direction of View	North west	**Distance from site**	1.2 km
Viewpoint Location and Potential Receptors	This viewpoint is located on one of the various ways up and down Beinn Dubhchraig, at approximately 584m AOD, south east of the site, and represents views of recreational receptors, mainly hill walkers.		
Description of Existing View	The existing mine site and associated infrastructure is seen on the lower eastern slopes of Beinn Chuirn, above Cononish Farm, with the access track clearly visible. Hillocky moorland occupies the middle distance, contained by conifer plantation on the western flank of Meall Odhar. The view also takes in the summits of Beinn Chuirn and Ben Lui.		
Sensitivity	Hill walkers at this location are judged to be of high susceptibility as their attention would be focused on the surrounding landscape. The viewpoint is located within a nationally designated landscape, but given fewer users – this is one of a number of routes on this hill – the value of the view is considered to be medium. Sensitivity of receptors is judged to be **medium**.		
Magnitude of change and significance of visual effects during each assessment phase			
Site Establishment Phase	During this phase, site establishment activities, and secondary effects associated with an increase in vehicle traffic on the access track moving to and from the mine site will be evident from this location. These activities will result in a large scale localised change occurring in the middle distance of the view. The effect will be short-term (6 months) and areas of disturbance will be restored, although components introduced for the operational phase of the mine will remain medium-term. The magnitude of visual change during this phase will be high, and will result in a **moderate** (significant) visual effect from this viewpoint.		
Operational Phase	During this phase the operational activities associated with the mine site, and the phased creation and progressive restoration of the dry stacks will be evident from this location. The dry stacks will form increasingly large features as they are developed. Visible at relative close proximity in the middle distance, the phased creation and restoration of the dry stack areas will increase the influence of the existing mine, east of the mine site. Visual effects will change over the		

Viewpoint 6 Creag Bhocan	
	duration of the operational phase as each dry stack is created and restored, one at a time. The presence of the operational mine site and the phased development of the dry stack areas will result in a large scale of effect, experienced at a localised level. The effect will be medium-term and partly reversible; phased restoration will limit visual disturbance, although the stacks themselves will remain. The magnitude of visual change during the operational period will be high and taking account of the medium sensitivity will result in a **moderate** (significant) visual effect.
Decommissioning and Restoration	Visible in relative close proximity, activities associated with this phase will include the removal of most operational components, all remaining elements will be re-vegetated, and native woodland and scrub planted. Native planting will soften the edges of the conifer forest and shelterbelt north west of Cononish. Secondary effects will likely include an increase in localised traffic heading to and from the site. These activities will result in a large scale change in the view, experienced at a localised level. Most activities during this phase will be short-term (6 months) and partly reversible; the dry stacks will be completed during this phase and will remain. The magnitude of visual change will be medium and taking account of the medium sensitivity will result in a positive **moderate** (significant) visual effect.
Post-restoration	Post restoration the access track leading to the secured mine entrance will remain. Completed elements, including the dry stacks will be allowed to fully re-vegetate. The stacks will remain as large-scale permanent features but will tie into the surrounding hummocky landform of the mine area. From this location, over time the dry stacks will appear further naturalised by the native woodland and scrub planting, which as it matures will also partially screen the access track. The magnitude of visual change will be low and taking account of the medium sensitivity will result in a positive **minor** (not significant) visual effect.

Viewpoint 7 Access track to Cononish (below Creag Bhocan)			
Grid Reference	231378, 728624	**Figure Number**	6.7i to 6.7ii
RLCA	Upland Glens	**Landscape Designations and Protection**	LLTNP
LLCA	Cononish Farm Upland Glen		
Direction of View	North west	**Distance from site**	1.4 km
Viewpoint Location and Potential Receptors	This viewpoint is located on the access track between Cononish and Dalrigh, at approximately 259m AOD, south east of the site, and represents views of recreational receptors.		
Description of Existing View	The existing mine and associated structures are visible in the middle distance below the skyline formed by Beinn Chuirn. The distinctive lower lying hummocky landform is seen to the east and south east of the mine site, behind coniferous plantation and Cononish Farm. To the south-east		

Viewpoint 7 Access track to Cononish (below Creag Bhocan)	
	the focus of the view is the summit of Ben Lui.
Sensitivity	Recreational receptors (including hill walkers bound for Ben Lui) are judged to be of high susceptibility as their attention would be focused on the surrounding landscape. Although there are some human influences, the view towards Ben Lui is of high value. Sensitivity of receptors is judged to be **high**.
Magnitude of change and significance of visual effects during each assessment phase	
Site Establishment Phase	During this phase, site establishment activities, and secondary effects associated with an increase in vehicle traffic on the access track moving to and from the mine site will be evident from this location. From this distance these activities will result in a medium scale localised change in the view. The effect will be short-term (6 months) and areas of disturbance will be restored, although components introduced for the operational phase of the mine will remain medium-term. The magnitude of visual change during this phase will be high, and taking account of the medium sensitivity will result in a **moderate** (significant) visual effect from this viewpoint.
Operational Phase	During this phase the operational activities associated with the phased creation and progressive restoration of the dry stacks will be visible from this location. The dry stacks will form increasingly large features as they are developed, though existing conifer woodland south east of the mine site will partly screen some of the dry stack operations. The mine site including the plant processing building will be partially screened by the bund east of the mine, development of the dry stacks will increasingly screen the bund. The phased creation and restoration of the dry stack areas will increase the influence of the existing mine, east of the mine site. Visual effects will change over the duration of the operational phase as each dry stack is created and restored, one at a time. From this distance the operational mine site and the phased development of the dry stack areas will result in a medium scale of effect, experienced at a localised level. The effect will be medium-term and partly reversible; phased restoration will limit visual disturbance, although the stacks themselves will remain. The magnitude of visual change during the operational period will be high and taking account of the medium sensitivity will result in a **moderate** (significant) visual effect.
Decommissioning and Restoration	Activities associated with this phase will include the removal of most operational components, all remaining elements will be re-vegetated, and native woodland and scrub planted. From this location native planting will soften the edges of the conifer forest and shelterbelt north west of Cononish. Secondary effects will likely include an increase in localised traffic heading to and from the site. These activities will result in a medium scale change in the view, experienced at a localised level. Most activities during this phase will be short-term (6 months) and partly reversible; the dry stacks will be completed during this phase and will remain. The magnitude of visual change will be medium and taking account of the medium sensitivity will result in a positive **moderate** (significant) visual

Viewpoint 7 Access track to Cononish (below Creag Bhocan)	
	effect.
Post-restoration	Post restoration the access track leading to the secured mine entrance will remain. Completed elements, including the dry stacks will be allowed to fully re-vegetate. The stacks will remain and will be seen as medium scale permanent features from this location but will tie into the surrounding hummocky landform of the mine area. From this location, over time the dry stacks will appear further naturalised by the native woodland and scrub planting. The magnitude of visual change will be low and taking account of the medium sensitivity will result in a positive **minor** (not significant) visual effect.

Viewpoint 8 Ben Oss			
Grid Reference	229089, 725873	**Figure Number**	6.8i to 6.8ii
RLCA	Hills	**Landscape Designations and Protection**	LLTNP WLA 6 Ben Lui
LLCA	Ben Oss		
Direction of View	North east	**Distance from site**	2.6 km
Viewpoint Location and Potential Receptors	This viewpoint is located on the upper northern slopes of Ben Oss at approximately 941m AOD, south east of the site, and is representative of views experienced by hill walkers ascending and descending Ben Oss.		
Description of Existing View	The development will be seen at an angle from above at this elevated location south of the site. From this location the existing mine site is visible below, situated on the lower eastern slopes of Beinn Chuirn. Other associated elements including earthworks, settlement ponds and the access track are distinguishable. Other visible human influences include Cononish partly screened by woodland shelter belt.		
Sensitivity	Hill walkers at this location are judged to be of high susceptibility as their attention would be focused on the surrounding landscape. The viewpoint is located within the nationally designated LLTNP and WLA 06 Ben Lui, and offers panoramic views of the surrounding landscape. The value of the view is therefore considered to be high. Sensitivity of receptors is judged to be **high**.		
Magnitude of change and significance of visual effects during each assessment phase			
Site Establishment Phase	During this phase, site establishment activities, and secondary effects associated with an increase in vehicle traffic on the access track moving to and from the mine site will be evident from this location. From this distance these activities will result in a medium scale localised change in the view. The effect will be short-term (6 months) and areas of disturbance will be restored, although components introduced for the operational phase of the mine will remain medium-term. The magnitude of visual change during this phase will be medium, and taking account of the medium sensitivity will result in a **moderate** (significant) visual effect from this viewpoint.		
Operational Phase	During this phase the operational activities associated with the mine site, and the phased creation and progressive restoration of the dry stacks will		

Viewpoint 8 Ben Oss	
	be evident from this location. The dry stacks will form increasingly large features as they are developed. Overlooked from this location, the phased creation and restoration of the dry stack areas will increase the influence of the existing mine, east of the mine site. Visual effects will change over time as each dry stack is created and restored, one at a time. From this distance the presence of the operational mine site and the phased development of the dry stack areas will result in a medium scale of effect experienced at a localised level. The effect will be medium-term and partly reversible; phased restoration will limit visual disturbance, although the stacks themselves will remain. The magnitude of visual change during the operational period will be high and taking account of the medium sensitivity will result in a **moderate** (significant) visual effect.
Decommissioning and Restoration	Activities associated with this phase will include the removal of most operational components, all remaining elements will be re-vegetated, and native woodland and scrub planted. From this location native planting will soften the edges of the conifer forest and shelterbelt north west of Cononish. Secondary effects will likely include an increase in localised traffic heading to and from the site. These activities will result in a medium scale change in the view, experienced at a localised level. Most activities during this phase will be short-term (6 months) and partly reversible; the dry stacks will be completed during this phase and will remain. The magnitude of visual change will be medium and taking account of the medium sensitivity will result in a positive **moderate** (significant) visual effect.
Post-restoration	Post restoration, the access track leading to the secured mine entrance will remain. Completed elements, including the dry stacks will be allowed to fully re-vegetate. The stacks will be seen as permanent features but will tie into the surrounding hummocky landform of the mine area. From this location the stacks will appear as naturalised features. The magnitude of visual change will be barely perceptible and will result in a **negligible** (not significant) visual effect.

Viewpoint 9 Ben Lui (Carn Mhuirich)			
Grid Reference	226643, 726290	**Figure Number**	6.9i to 6.9ii
RLCA	Hills	**Landscape Designations and Protection**	LLTNP WLA 6 Ben Lui
LLCA	Ben Lui		
Direction of View	North east	**Distance from site**	3.3 km
Viewpoint Location and Potential Receptors	This viewpoint is located close to the summit of Ben Lui at approximately 1129m AOD, south east of the site, and is representative of views experienced by hill walkers to this popular Munro.		
Description of Existing View	The southern edge of the development will be seen at an angle from above at this elevated location south of the site. From this location the existing mine site is screened by Beinn Chuirn,		

Viewpoint 9 Ben Lui (Carn Mhuirich)	
	associated the access track are barely perceptible. Other visible human influences include Cononish, seen as a distant feature from this location.
Sensitivity	Hill walkers at this summit are judged to be of high susceptibility as their attention would be focused on the surrounding landscape. The viewpoint is located within the nationally designated LLTNP and WLA 06 Ben Lui, and offers panoramic views of the surrounding landscape. This is a popular well visited Munro, the value of the view is therefore considered to be medium. On balance overall sensitivity is judged to be **high**.
Magnitude of change and significance of visual effects during each assessment phase	
Site Establishment Phase	During this phase, site establishment activities mainly associated with the secondary effects of increased vehicle traffic on the access track moving to and from the mine site will be evident from this location. From this distance these activities will result in a small scale localised change in the view. The effect will be short-term (6 months) and areas of disturbance will be restored. Project components that will remain to necessitate the operational phase will be screened by Beinn Chuirn. The long-term magnitude of visual change will be small, and taking account of the high sensitivity will result in a **minor** (not significant) visual effect from this viewpoint.
Operational Phase	During this phase, the phased creation and progressive restoration of the dry stacks will be partly seen from this location. The dry stacks will form increasingly large features as they are developed. Other operational components associated with the mine site will be screened by Beinn Chuirn. Overlooked from this location, the phased creation and restoration of the dry stack areas will increase the influence of the existing mine, east of the mine site. Visual effects will change over time as each dry stack is created and restored, one at a time. From this distance the phased development of the dry stack areas will result in a small scale of effect experienced at a localised level. The effect will be medium-term and partly reversible; phased restoration will limit visual disturbance, although the stacks themselves will remain. The magnitude of visual change during the operational period will be small and taking account of the medium sensitivity will result in a **minor** (not significant) visual effect.
Decommissioning and Restoration	Activities associated with this phase will include the removal of most operational components, all remaining elements will be re-vegetated, and native woodland and scrub planted. From this location native planting will soften the edges of the conifer forest and shelterbelt north west of Cononish. Secondary effects will likely include an increase in localised traffic heading to and from the site. These activities will result in a small scale change in the view, experienced at a localised level. Most activities during this phase will be short-term (6 months) and partly reversible; the dry stacks will be completed during this phase and will remain. The magnitude of visual change will be medium and taking account of the medium sensitivity will result in a positive **minor** (not significant) visual

Viewpoint 9 Ben Lui (Carn Mhuirich)	
	effect.
Post-restoration	Post restoration the access track leading to the secured mine entrance will remain. Completed elements, including the dry stacks will be allowed to fully re-vegetate. From this location visibility of the re-vegetated dry stacks will be limited to those situated within the south east of the mine site, the other stacks being screened by Beinn Chuirn. The stacks will remain as a small scale permanent feature but will tie into the surrounding hummocky landform of the mine area. Over time the dry stacks will appear further naturalised by the native woodland and scrub planting, which as it matures will also partially screen the access track. The magnitude of visual change will be barely perceptible and taking account of the medium sensitivity will result in a positive **negligible** (not significant) visual effect.

Viewpoint 13 Crom Allt Crossing			
Grid Reference	234040, 728966	**Figure Number**	6.13i to 6.13ii
RLCA	Upland Glens	**Landscape Designations**	LLTNP
LLCA	Strath Fillan and Dalrigh		
Direction of View	North east	**Distance from site**	Adjacent to new bridge
Viewpoint Location and Potential Receptors	This viewpoint is located south of the existing Crom Allt ford crossing, at approximately 178m AOD, 4.9 km east of the mine site and directly south of the proposed bridge. It is representative of views experienced by recreational receptors, including walkers on the West Highland Way.		
Description of Existing View	From this location the existing Crom Allt ford crossing is visible in the foreground in close proximity views looking north. The watercourse and existing access track are contained by existing vegetation, which mainly comprises birch woodland and gorse scrub.		
Sensitivity	Recreational visitors to the area are judged to be of high susceptibility as their attention would be focused on the surrounding landscape. The viewpoint is located within the nationally designated LLTNP. This local, contained view is of no particular significance and the value is considered to be low. Sensitivity of receptors is judged to be **medium**.		
Magnitude of change and significance of visual effects during each assessment phase			
Site Establishment Phase	During this phase, site establishment activities mainly associated with construction of the bridge will be evident in close proximity views from this location. These activities will result in a medium scale localised change in the view. Activities associated with bridge construction will be short-term (6 months) and partly reversible. The magnitude of visual change during this phase will be medium, and taking account of the medium sensitivity will result in a **moderate** (significant) visual effect from this viewpoint.		
Operational Phase	During this phase traffic movement from Dalrigh to the mine site across the bridge will be evident. Traffic movements across the bridge will be time restricted, relatively minimal and largely limited to week days. This will		

Viewpoint 13 Crom Allt Crossing	
	result in a small scale of effect experienced at a localised level. The effect will be medium-term and partly reversible. The magnitude of visual change during the operational period will be small and will result in a **minor** (not significant) visual effect.
Decommissioning and Restoration	During this phase most components at the mine site will be removed and remaining elements completed. This will see some increase in vehicle traffic accessing the bridge, over the six-month decommissioning phase. The magnitude of visual change will remain small and the effect will remain **minor** and not significant.
Post-restoration	The bridge will remain long term providing additional access to the wider landscape from Dalrigh. The magnitude of visual change will be minor and taking account of the medium sensitivity will result in a **minor** (not significant) visual effect.

7 SURFACE WATER AND GROUNDWATER

7.1 Introduction

This section of the Environmental Statement (ES) describes the existing hydrological and hydrogeological conditions at the site and identifies and assesses the potential impacts that may be caused by the proposed development, which include site preparation, construction of the scheme infrastructure, restoration of construction works, operation project development across the site, and decommissioning and final restoration of the site. Mitigation measures that shall be employed to ameliorate any adverse effects are set out.

7.1.1 The Scheme

ES Section 3 describes in full the scheme elements, the construction, operation and removal or rehabilitation of which may result in effects on the surface water and groundwater environment. These elements are:

- site access at Dalrigh (existing – to be modified)
- off-site car parking at Dalrigh
- bridge over the Crom Allt at Dalrigh
- construction traffic access
- mine access track (existing – to be modified)
- mine portal (existing – to be modified)
- mine platform and workshop/core store (existing – to be modified)
- underground mine
- process plant building compound (including associated process plant feed stockpile, four vehicle parking spaces, security booth, tailings stockpile, water tanks and substation) and landscaped screening mound
- tailings stacks
- peat storage
- peat storage and habitat enhancement areas
- site drainage system (cut-off drains, catch ditches, settlement pond and associated pipelines)
- gauging point at River Cononish footbridge
- fencing (security/HSE requirements/stock/deer)

- lighting
- signage

7.1.2 Scheme information

The location of the development is shown on Figures 1.1, 1.1i and 1.1ii. Details of the proposals are illustrated in Figures 3.2 – 3.10. Reference may also be made to ES Appendix 3, the Tailings Management Feasibility Study prepared by Knight Piesold in connection with the design, operation, and restoration of the tailings stacks.

ES Appendix 7 collates Construction Method Statements for all phases of the scheme, taking cognisance of the relevant Scottish Environment Protection Agency (SEPA) Guidance notes. Further appraisal relevant to surface and groundwater and the River Cononish part of the River Tay Special Area of Conservation (SAC) is contained within ES Appendix 14, prepared to assist the Planning Authority (PA) as competent authority under the Habitat Regulations.

7.1.3 Consultee Responses

Points which have been raised by consultees and which are addressed in this section of the ES include:

- Peat volume calculations and management
- Surface water drainage proposals
- Conceptual restoration plan
- Potential impacts on groundwater flow and quality
- Site water management
- Water treatment proposals
- Deposition of extractive waste
- Assessment of flood risk
- Potential for pollution of watercourses
- Potential impacts on River Tay SAC
- Potential effects on surface water quality
- Potential effects on Scottish Water Assets at Dalrigh.

The management of water at the site including flood risk is the subject of detailed assessment, described in this section of the ES and presented in full in the Tailings Management Feasibility Study (ES Appendix 3) prepared in connection with the design, operation, and restoration of the tailings stacks.

Where engineering activities have to take place within a watercourse, the applicant is aware of the requirement to obtain a licence from SEPA under the Water Environment (Controlled Activities) Regulations 2011.

The site benefits from a data set of water quality monitoring which has been undertaken by SEPA since the date of the development of the exploratory adit in 1989/90 and which continues to present. Groundwater levels at the site area have been monitored routinely since November 2009.

In terms of abstraction from surface and ground water, none is proposed or required for process plant operations.

As the tailings stacks provide for the permanent storage of waste following the extraction of gold and metalliferous sulphides from the ore vein, they constitute a waste facility and fall to be regulated under the provisions of the Management of Extractive Waste (Scotland) Regulations 2010.

7.2 Assessment Methodology

7.2.1 Data Sources and Consultations

- Ordnance Survey mapping (both current and historical)
- British Geological Survey mapping
- Flood Studies Supplementary Report No. 16(i) (FSSR)
- MLURI soils and land use survey maps
- SEPA mapping of aquifers and groundwater vulnerability map of Scotland
- Site investigation data (trial pitting and drilling)
- Exploratory adit mine discharge quality and volume data
- Groundwater monitoring data (borehole installations)
- Archive data held by Dalgleish Associates Limited (DAL).

Scottish Natural Heritage (SNH) listings of natural heritage designations were examined and relevant constraints considered, in this instance the River Tay SAC, which includes the River Cononish as far as a point approximately 3km upstream of the mine site.

7.2.2 Planning and Development Framework

In preparing this section of the ES, consideration has been given to relevant planning guidance at all levels, which include, but are not limited to:

- The European Water Framework Directive (2000/60/EC) and associated daughter Directives including the Groundwater Daughter Directive (Protection of Groundwater Against Pollution, 2006/118/EC)
- The European Floods Directive (2007/60/EC)
- The European Groundwater Directive (80/68/EEC)
- The European Mining Waste Directive (2006/21/EC)
- The Environmental Protection Act 1990 (as amended)
- The Water Environment and Water Services (Scotland) Act 2003
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011
- The Pollution Prevention and Control (Scotland) Regulations 2012
- The Water Environment (Oil Storage) (Scotland) Regulations 2006
- The Management of Waste from Extractive Industries (Scotland) Regulations 2010
- Scottish Planning Policy (SPP) 2014
- Planning Advice Note 50 (PAN50) – Controlling the Environmental Effects of Surface Mineral Workings
- Planning Advice Note 51 (PAN51) – Planning, Environmental Protection and Regulation (2006)
- Planning Advice Note 61 (PAN61) – Planning and Sustainable Urban Drainage Systems (2001)
- Planning Advice Note 79 (PAN79) – Water and Drainage (2006)
- Scottish Environment Protection Agency Pollution Prevention Guidelines (Guidance for Pollution Prevention):
  - PPG01 – General guide to the prevention of pollution
  - GPP02 – Above ground oil storage tanks
  - GPP05 – Works and maintenance in or near water.

In addition, the following technical guidance has been taken into account in the design and assessment of the site development proposals:

- CIRIA publication – the SUDS Manual (C753), 2015;
- CIRIA publication – Site handbook for the construction of SUDS (C698);
- Health & Safety at Quarries: Quarries Regulations 1999, Approved Code of Practice (Health & Safety Executive) (as amended 2013);
- Handbook on the Design of Tips and Related Structures (Geoffrey Walton Practice, HMSO, 1991);
- Hydrology in Practice (E.M. Shaw, 1994; 3rd Edition);
- Field Hydrology (R Brassington, 2007; 3rd Edition);
- Hydrology – an Introduction (W. Brutsaert, 2005).

7.3 Significance Criteria

Impacts may be permanent or temporary and may have a negative (adverse) or positive (beneficial) effect on the environment (Table 7.1 refers).

Table 7.1 Hydrological/Hydrogeological Impact Magnitude Criteria

MAGNITUDE	IMPACT
Negligible	No perceptible changes in the hydrological or hydrogeological regimes
Minor	Slight but noticeable changes in the hydrological or hydrogeological regimes
Moderate	Material but non-fundamental changes in the hydrological or hydrogeological regimes
Major	Fundamental changes in the hydrological or hydrogeological regimes

Depending on the sensitivity of the receptor, the magnitude of the impact will have a varying degree of significance. Combining receptor sensitivity with impact magnitude gives rise to the following matrix, Table 7.2, where for example, an impact of moderate magnitude on a receptor of low sensitivity would result in an assessment of minor significance.

Table 7.2 Hydrological/Hydrogeological Significance Criteria

	Sensitivity			
Magnitude	Negligible	Low	Moderate	High
Negligible	Negligible	Negligible	Negligible	Negligible
Minor	Negligible	Minor	Minor	Moderate
Moderate	Negligible	Minor	Moderate	Major
Major	Negligible	Moderate	Moderate	Major

7.4 Existing Hydrological Regime

7.4.1 Existing Surface Drainage

The site lies on the eastern flank of Beinn Chuirn between 290m and 400m AOD. The surface run-off from the area flows eastwards from the hillside and ultimately into the River Cononish at Cononish Farm via the Allt Eas Anie and its tributaries. The surface hydrology is shown on Figure 7.1 Existing Hydrology.

The mine site lies outwith the River Tay SAC boundary at a distance of around 400m.

The Allt Eas Anie catchment, to its confluence with the River Cononish, includes the natural flows of the Allt Eas Anie itself, flowing from its source high on Beinn Chuirn, as well as the Coire na Saobhaidhe stream (the 'Forestry stream').

The catchment also includes drainage from the mine area. This currently consists of a perimeter ditch to the west and north of the mine area and drainage via a series of three settlement ponds. These lagoons are interconnected with a series of pipes allowing flows to be controlled between them (see Figure 7.2 Existing Site Hydrology).

7.4.2 Existing Water Quality

SEPA's River Basin Management Plan data sheet results have been consulted in order to assess the existing quality of the River Cononish. The River Cononish is a typical spate water, rising at 1130m and falling to 280m over the 10.21km stretch. The data sheets are annexed to this ES Section (Annex 7A).

7.4.2.1 *Water Chemistry*

2006 classification

In 2006 the water within the catchment was noted as generally very soft with a low pH; in terms of chemical analysis it is recorded as being very clean. There were high levels of faecal coliforms recorded in all but the Allt Eas Anie.

The water was very clean with respect to Biological Oxygen Demand (BOD) and organic pollutants. Nutrient concentrations were extremely low and the water would be classified as oligotrophic. The combination of extremely clean water with low productivity generates conditions suitable for salmonids, particularly migratory species, such as salmon and sea-trout. Metal concentrations were extremely low.

The overall category of the river in 2006 was A1 which equates to 'excellent' quality for river classification (categories are from A to D, with A being the highest quality and D the lowest quality). Chemistry, Aesthetics, Nutrients, pH, Ammonia, BOD and Dissolved Oxygen levels are all classed as A1, 'excellent'.

2011 Classification

SEPA's RBMP classification of the River Cononish gives it an overall status of Moderate with Medium confidence in 2008 with overall ecological status of Good and overall chemical status of Fail. The sheet (reference 6505) was created from data current at 15 March 2010.

The targets identified for this water body are either sustainable improvement in its status over time, or alternatively that no deterioration in status occurs.

Potential pressures identified as contributory to the Fail with respect to overall chemical status were *diffuse source inputs from mining and quarrying of minerals.*

From background monitoring and analyses of surface and groundwater, Scotgold Resources is aware of elevated levels of metals, as a consequence of the inherent geology of the catchment with its metalliferous veins.

Therefore, as there had been no diffuse source inputs from mining and quarrying of minerals in the River Cononish catchment over the period from 2006 to 2011, it is assumed that the geological conditions of the watercourse has solely contributed to the recent change in water quality status. No subsequent update to SEPA's RBMP classification is available

7.4.2.2 River Tay SAC – Salmo Salar (Atlantic Salmon)

The importance to the Tay fishery of the Cononish catchment is as a salmon spawning ground, although there is no significant rod and line fishery upstream of Killin, on the River Dochart. Salmon are present within the Cononish up to the waterfall at NN 290 273 and surveys suggest that there are significant areas of suitable gravels. There are none in the vicinity of the confluence of the Allt Eas Anie or for some distance downstream, the bed of the River Cononish being comprised of large cobbles and boulders. The closest gravel bed is some distance upstream of the confluence. Salmon have not been recorded within the Allt Eas Anie/Coire na Saobhaidhe Stream catchment and these minor tributaries have neither suitable substrates nor suitable access for salmon spawning.

As baseline data collection for the original planning permission, electrofishing surveys were also undertaken on the combined Allt Eas Anie/Coire na Saobhaidhe Stream catchment as well as the River Cononish. Within the Allt Eas Anie downstream of the Coire na Saobhaidhe catchment no salmon were recorded, however there were a number of trout present.

It should be noted that the Tay River Salmon Fisheries Board has regularly undertaken annual electrofishing surveys and these have consistently shown a low salmon population in the River Cononish, but of larger individuals. Some introduction of salmon parr from the River Fillan into the Cononish has been undertaken in an attempt to boost salmon numbers (TRSFB, personal communication, Dr David Summers).

7.4.2.3 The Allt Eas Anie

There are no SEPA data available relating specifically to the Allt Eas Anie. There are however historical monitoring data which were compiled as part of the baseline studies for the gold mine development which was permitted in 1996 (see Section 7.4.3).

Cononish Farm takes its potable water supply from the Allt Eas Anie, near to the Eas Anie waterfall.

7.4.2.4 The Coire na Saobhaidhe Stream ("Forestry Stream")

As for the Allt Eas Anie, no SEPA River Quality Classification data are available for this small watercourse, but some historical monitoring data are available relating to the 1996 planning permission.

7.4.3 Historical Flow Data

Detailed assessments of the Cononish catchment were undertaken in support of the planning application permitted in 1996. This included flows in the Allt Eas Anie, the Coire na Saobhaidhe stream and the River Cononish (up and downstream of the Allt Eas Anie confluence), as well as water quality, biotic and fishery status. As the Cononish and its tributaries are typical spate rivers they display a great range of flow volumes, which can drop to very low values during dry periods. Much of the precipitation during the late summer and early spring falls as snow and during these periods river flows can be as low as summer values.

In summary the flow ranges were as follows (all flows are m^3/sec):

Table 7.3 Historical Flow Data – Summary

Allt Eas Anie	<0.002	< 0.86	mean flow = 0.18
Coire na Saobhaidhe Stream	<0.002	< 0.71	mean flow = 0.12
River Cononish (Upstream)	0.14	< 6.72	mean flow = 2.33
River Cononish (Downstream)	0.13	< 7.48	mean flow = 2.58

7.4.4 Meteorology

Climatological information for the site is based on data from the Flood Estimation Handbook produced by the Institute of Hydrology. Catchment descriptors for the site were derived from the FEH web service (2017), and included the following parameters:

- SAAR – annual average rainfall
- DPSBAR – a measurement of catchment slope
- DPLBAR – the effective maximum channel length in the study catchment
- SPRHOST – standard percentage runoff based on the Hydrology of Soil Types
- AREA – the catchment area of the Allt Eas Anie

The annual average rainfall (1941 – 1970) is 2789mm and for the period 1961 – 1990 is 3035mm. Long term averages for the site catchment area have also been provided by the Met. Office for the Cononish site station; daily records for this latter period were acquired. Average rainfall and monthly distribution for these two data sets is comparable.

Table 7.4 Annual Precipitation (mm) 1941 - 1970

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
316	248	216	206	183	176	206	241	312	346	288	378	3117

Table 7.5 Annual Precipitation (mm) 1961 - 1996

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
408	263	347	159	154	148	161	198	285	314	337	370	3143

Table 7.6 Mean Temperature (ºC) (1941 – 70)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2.5	3.0	5.7	9.1	12.5	15.5	15.6	15.8	13.0	9.8	5.5	3.7	Max
-2.8	-2.7	-1.2	0.2	2.7	5.6	7.6	7.2	5.6	3.7	-0.3	-1.8	Min

The Soil Survey of Scotland (1982) describes the weather system as "cold and wet" and the area around the site is illustrated as being cool and wet to very cold and wet, with a high rainfall over 2400mm.

In winter site temperatures during December, January and February typically rise little above zero, with average summer maxima around 16°C. Evapotranspiration data indicate that on average there is negative evaporation from the site.

Meteorological and catchment parameters used in the modelling of existing runoff and proposed flows during management of water at the site, are the subject of detailed assessment, presented in full in the Tailings Management Feasibility Study (ES Appendix 3) prepared in connection with the design, operation, and restoration of the tailings stacks.

7.4.5 Soils

Soils are of the Strichen Association, parent material is moraine; this unit is recognised as having good forestry potential which is being exploited to the east of the site by the Forest Enterprise. Above the site on the adjacent hillsides soils are rockier and poorer, sub-alpine and alpine.

The site contains soils within Map Unit 504 with hummocky forms on valley floors, gullied sheet moraine on steeper slopes. Peaty podzols are found on the mounds and steeper slopes. Bog heather moor, atlantic heather moor on drier sites, blanket bog on peat and bent grasslands on steeper better draining areas.

Map Unit 510 occurs at the higher end of the site, on steep slopes. This unit is far rockier, again with peaty gleys but also peaty rankers and some peaty podzols.

Towards the summit of Beinn Chuirn there are soils of Map Unit 514; these are alpine soils with poor vegetation and a short growing season.

7.4.6 Flooding and Floodplain Issues

The proposed scheme is located upstream from the identified floodplain of the River Cononish. SEPA's Indicative River and Coastal Flood Map of Scotland has been consulted and the River Cononish valley is illustrated as being at risk of flooding from the river.

There is no flood risk to the site associated with either the Allt Eas Anie or the Coire na Saobhaidhe stream.

Hydrological calculations for existing catchments and proposed drainage channels are presented in the Tailings Management Feasibility Study (ES Appendix 3) prepared in connection with the design, operation, and restoration of the tailings stacks.

7.4.7 Catchment Survey – River Basin Management Plans

Surveys have been undertaken in consideration of potential impacts on the riparian resource and since this data is more pertinent to Ecological assessment is included at ES Section 8.

7.5 Existing Hydrogeological Regime

7.5.1 Geology and Geological Structure

7.5.1.1 Superficial Deposits

Frequent exposures within stream banks and extensive trial trenching and borehole investigation confirm the superficial deposits over the site area to be locally variable, typically comprising over-consolidated slightly clayey, silty, sandy, gravelly glacial till. The trial pitting and borehole investigations (1996, 2009, 2010 and 2011) indicate that the glacial till is variable in thickness. The range of depths is from <1m – 7m, deeper deposits being associated with glacial moraine mounds in the south west of the site area. Generally, depth of deposit is in the range <1m – 3m.

Groundwater within the superficial deposits was limited to seepage at a change in the lithological unit, i.e., till-bedrock or peat-till interfaces.

7.5.1.2 Bedrock Geology

The site lies in a highly metamorphosed zone between the Tyndrum fault to the south and the Ericht-Laidon fault to the north; the principal rock formation is a psammite, a metamorphosed sandstone, with minor pelitic bands (metamorphosed mudstone).

In addition to the surface mapping and borehole investigations carried out in connection with the 1996 planning permission, three further boreholes were sunk in 2009 to recover cores of the bedrock and investigate the permeability of the bedrock. The results of this drilling exercise confirmed the earlier investigations, i.e. the bedrock is strong – very strong with good rock quality, the predominant discontinuity observed being the foliation associated with the original bedding planes.

In situ permeability testing (packer testing) completed within the bedrock gave a range of 1×10^{-6}m/s to 1×10^{-8}m/s.

Groundwater monitoring wells were installed in all three 2009 boreholes, with completion zones within the bedrock. Water levels recorded in November/December 2009 indicate that groundwater table lies within the overburden units or near the top of the bedrock unit.

Details of the 2009 borehole investigation and permeability testing are given in ES AMEC 2011 SI and Lab Testing Results, ES Appendix 4.

7.5.2 Groundwater Vulnerability and Groundwater Resources

The Groundwater Vulnerability Map, derived by the BGS and Macaulay Land Use Research Institute under contract to SNIFFER in consultation with SEPA, and the Environment Agency, which has enabled Scotland's groundwater bodies to be characterised, as required by the Water Framework Directive, shows the area of the site to have very low fracture flow bedrock aquifer productivity (and no inter-granular flow), low to negligible superficial deposit aquifer productivity with some isolated small areas identified as having high productivity. Despite the very limited presence of groundwater the vulnerability of this resource is classed as moderate (4b).

The 1998 Hydrogeological Map of Scotland published by the British Geological Survey indicates that the site is underlain by impermeable rocks, generally without groundwater except at shallow depths (low primary flow).

Cononish Farm takes potable water from the Allt Eas Anie, near the Eas Anie waterfall. The water supply shall not be affected by the proposed scheme.

Two boreholes were drilled in 1989 in order to establish the groundwater resource in the vicinity, this formed part of the original investigations in relation to the gold mine. Pumping tests established that there is very limited groundwater in the area.

7.6 Potential Impacts on Hydrology and Hydrogeology

Any development in proximity to surface water courses or drainage channels or involving excavation in bedrock could have the potential to impact on surface and groundwater in the following ways:

- Physical changes to overland drainage and where applicable, removal of surface drainage/watercourses with associated ecological impacts
- Introduction of particulates arising from site earth moving operations into watercourses
- Contamination from fuels/oils used by plant in the construction process
- Contamination from site operational activities/processes

7.6.1 Construction Operations

The most serious risk of negative hydrological impact is likely to be experienced during the construction phase. ES Section 3 describes operations in detail. Figures 3.2 – 3.10 illustrate the scheme construction phasing, ancillary infrastructure and built elements. The main elements of the site involving earth moving works are:

- all vegetation and peat/peaty topsoil stripping
- construction of process platform and landscaped screening bund
- peat storage areas

- site staff car park area adjacent to public car park at Dalrigh
- Crom Allt bridge upgrading at Dalrigh – construction of abutments and landscaping
- preparation of tailings stacks
- preparation of site drainage system
- process plant water return line from recirculation pond
- discharge line to the River Cononish from the recirculation pond

Soils over the site comprise a variable, but generally thin peaty topsoil cover. Only limited areas of deeper peat have been identified, associated with degrading peat hags. Prior to any construction works taking place at any location, peat turves will be stripped and temporarily stockpiled for immediate replacement in a programme of rolling restoration, e.g. over the tailings stacks and the surface of the landscaped bund around the process plant building (see also Appendix 7, Decommissioning and Restoration Plan).

7.6.2 Hydrology – Potential Impacts

The proposed scheme has the potential to impact surface hydrology in the following ways:

- physical changes to overland drainage
- vulnerability of potential receptors downstream of the proposed development, including the River Tay SAC
- introduction of particulates arising from construction operations
- contamination from fuels/oils used by plant
- discharges to watercourses in terms of the quantity and quality of discharge

Detailed Construction Method Statements for the various construction activities required for the site elements listed at paragraph 7.6.1 are contained in ES Appendix 6. These also apply during final restoration and decommissioning of the site.

7.6.3 Hydrogeology – Potential Impacts

There is clearly a requirement to protect the groundwater resource but the only identified potential for effects on groundwater relate to the introduction of pollutants.

There are no surface excavations proposed of significant depth such as to cause localised groundwater drawdown, and with the potential to impact on habitat or species of a sensitive nature. The nature and location of the mine itself is such that drawdown will be steep and localised; no surface effects are anticipated.

No habitats or species of a sensitive nature been identified through detailed site survey (ES Chapter 8, Ecology and ES Appendix 5 refer).

There shall be no significant alteration to the permeability of the site area through site works, which are minor in nature and as such no issues have been identified with respect to groundwater relating to groundwater recharge.

Residual metals (copper, lead, zinc, and associated trace metals) associated with the tailings after the extraction of gold/gold bearing sulphides is a potential source of groundwater contamination from seepage from the tailings stacks.

A full suite of chemical testing including heavy metal analysis, acid – base accounting and net acid generation has been carried out on ore samples and drainage modelling on the proposed tailings stacks design using the SEEP/W software package undertaken. ES Appendix 4, Part G refers.

7.6.4 Assessment of Potential Impacts

7.6.4.1 Physical Changes to Overland Drainage

The River Cononish and the Allt Eas Anie shall not be affected in any way by the proposed development, either from physical disturbance by removal, re-routing, or by direct disturbance of beds of controlled waters, as these established watercourses lie outwith the site and do not require removal or diversion.

The site boundary has been designed with suitable buffer strips of at least 30m with the position of the existing site access crossings remaining unchanged.

There is a new culvert allowing access over the Allt Eas Anie, as previously permitted.

7.6.4.2 Particulates and Suspended Solids

Each of the following aspects of the site has the potential to cause sediment to enter watercourses, and mitigation primarily through the construction methods is required: tracks; bridge works; tailings stacks and settlement pond earthworks; pipeline route and other minor ancillary works.

This is an improvement on the currently permitted mine development, which required the diversion of the Allt Eas Anie.

All potential negative impacts relating to particulates and suspended solids may be addressed through appropriate best practice construction methods standard in civil engineering operations (see ES Appendix 6, Construction Method Statements). The applicant recognises the necessity to address the potential indirect impact on the River Tay SAC through strict control of site operations.

The stageboard to be installed at the footbridge close to Cononish Farm in conjunction with a Doppler electronic flow monitoring sensor does not require works to be undertaken within the River Cononish. The small sensor will be mounted on one of the bridge abutments. The details of the monitoring system, designed by Hydrologic, are annexed to this Section of the ES (Annex 7B).

The applicant is aware of the necessity to obtain a licence from SEPA for discharges to surface waters under The Water Environment (Controlled Activities) Regulations 2011, as well as for any construction within watercourses.

A discharge licence is currently in place (CAR/L/1001391).

7.6.4.3 *Assessment of Surface Water Flows*

A comprehensive assessment of surface water flows is included in the Tailings Management Feasibility Study, carried out by Knight Piesold Ltd, dated July 2017 (refer Appendix 3).

Flows generated from all site elements are considered. Overland flows from the separate sub-catchment areas are calculated and maximum design capacity of culverts required within the drainage system are derived.

No impacts on the hydrological flow regime of the site are anticipated.

7.6.4.4 *Contamination from Fuels/Oils*

Guidance in compliance with the European Groundwater Directive (80/68/EEC) and The Water Environment and Water Services (Scotland) Act 2003 has been issued by the then Scottish Executive Environment Group. The Control of Pollution (Oil Storage) (Scotland) Regulations 2006 and SEPA's Guidance for Pollution Prevention GPP2: Above Ground Oil Storage Tanks, shall be followed on the site with respect to fuel storage and handling as set out below:

- Risk assessments will be undertaken and List I substances identified (List I, oils, fuels and hydraulic fluids only; List II, no substances identified);
- All deliveries of oils and fuels shall be supervised;
- All storage tanks shall be located within impermeable bunded containment of minimum capacity 110% of the tank or 125% if more than one tank is situated within the containment area (as recommended in SEPA Guidelines, GPP2, Above Ground Oil Storage Tanks, and in accordance with the Oil Storage Regulations, 2006);
- Any valve, filter, sight gauge, vent pipe or other ancillary equipment shall be situated within the containment area;
- Waste oil shall not be stored on site and shall be removed to dedicated storage or disposal facilities;
- Management procedures and physical measures shall be put in place to deal with spillages;

- Maintenance procedures and checks shall ensure minimisation of leakage of fuels or oils from plant;
- Refuelling and servicing shall be undertaken in a designated area or with adequate precautions in place, e.g. dedicated impermeable surface with lipped edges to contain contaminants;
- Where vehicle maintenance is necessary in the field due to breakdown adequate precautions shall be taken to contain contaminants e.g. spill trays.

Diesel will be contained in two bunded storage tanks, each of 10,000 litre capacity. Oils will be appropriately stored in the underground workshop with minor quantities stored in the plant building for maintenance of the process plant.

7.6.4.5 Reagents used in ore processing

Collectors used in the flotation process (potassium amyl xanthate) will be stored in powder form in 120kg drums. The frother (methyl isobutyl carbinol) will be stored as a liquid in 50 gallon drums.

Storage quantities envisaged are a maximum of 3 tonnes of collector and 1 tonne of frother at any one time. Usage of these reagents is anticipated to be around 1 tonne per month in total.

Xanthates are bio degradable but are known to mostly attach themselves to the concentrate, as will the frother.

A modelling assessment of the xanthate compounds is presented in the Tailings Management Feasibility Study (ES Appendix 3) prepared in connection with the design, operation, and restoration of the tailings stacks.

The dried and bagged concentrate will be removed from site and shipped to Europe for smelting. There is no multi-element smelting facility available in the UK at which the concentrate may be processed.

Smelting of the gold recovered by the gravity separation process will require small amounts of silica / sodium borate mix.

Storage of all reagents will be in a designated area within the plant building. A small assay laboratory within the plant building will carry minor quantities of chemicals.

7.6.4.6 Site Spillage and Emergency Procedures

Site Spillage and Emergency Procedures shall be prominently displayed at the site and staff shall be trained in its application. In the event of any spillage or discharge that may be harmful or polluting to the water environment, all necessary measures shall be taken to remedy the situation. These measures shall include:

- Identifying and stopping the source of the spillage;
- Preventing the spillage spreading or entering watercourses by means of suitable material and equipment;
- Absorbent material, including oil absorbent material, will be available on site to mop up spillages. This will be in the form of oil booms and pads, and for smaller spillages quantities of proprietary absorbent materials. Sandbags will also be readily available for use to prevent spread of spillages and create dams if necessary. A water supply and pump will be maintained and readily available for use;
- Where it is considered that an oil/fuel spillage may have soaked into the ground, the contaminated ground shall be excavated and removed from site by a licensed waste carrier to a suitable landfill facility;
- The emergency contact telephone number of a specialist oil pollution control company shall be displayed on site; and
- Sub contractors shall be made aware both at contract stage and through site induction procedures of the proximity of the River Tay SAC (i.e. the River Cononish at this location) and of the guidelines for the handling of oils and fuels and of the spillage procedures at the site.

SEPA shall be informed of any discharge or spillage that may be harmful or polluting to the water environment. Written details of the incident shall be forwarded to SEPA no later than 7 days after the incident.

With all of the above management and contingency measures in place, the impact of contamination from fuels, oils and other substances is assessed as being negligible.

7.6.4.7 Discharges to Watercourses in Terms of the Quantity and Quality of Discharge

A discharge licence is currently in place.

The applicant is fully aware of the necessity to obtain a licence from SEPA for additional discharges to surface waters under The Water Environment (Controlled Activities) Regulations 2011.

A comprehensive assessment of surface water flows is included in the Tailings Management Feasibility Study, carried out by Knight Piesold Ltd, dated July 2017 (refer Appendix 3). Assessment of Xanthate within site discharge water is also discussed.

No impacts are predicted.

Acid Rock Drainage

Water quality data for the pile drainage, independently monitored by SEPA, is available from 1990 to the present.

In terms of Acid Rock Drainage (ARD) testing this is equivalent to a long-term field test. The water quality was evaluated to determine whether ARD has been generated. The near neutral pH throughout the monitoring time indicates that no mineral acidity has been measured. In addition, the concentration of dissolved metals indicates that no ARD has been generated from the pile.

Consequently, no impacts are predicted on surface waters from any ore/waste rock pile.

Tailings Analyses

Chemical analyses of the tailings which will be generated by the processing operation were also undertaken and the tailings samples compared with the average Earth's crust composition. It was found that the concentration of all major oxides, except for SiO_2, was below the average Earth's crust composition. SiO_2 content in the tailings was 60% higher than average earth's composition, which is unsurprising as the ore is associated with a quartz (SiO_2) vein.

SiO_2 is considered an inert mineral and therefore of no environmental concern. Trace elements were analysed in the sample and found to be either below or the same order of magnitude as the average Earth's crust composition for all the key elements except for lead (Pb) which was an order of magnitude higher. However, when the tailings sample is compared with the composition of soils determined for the baseline study of the project it was found that, for elements analysed in the baseline study, the composition of the tailings sample was within the concentration range encountered including Pb.

Given that the tailings are mainly quartz with a relatively low level of trace elements and are not Acid Rock Drainage (ARD) generating, it is unlikely that the pore water within the tailings will gain in levels of dissolved metals and therefore ponded water similarly.

It should be noted that the chemical analyses demonstrate that there are no drivers for metal leachability, in the tailings, whose composition is basically silica sand and that the trace elements are either of the same magnitude of the average Earth's crust composition or are within the range of the composition of local soils.

A modelling assessment of the xanthate compounds is presented in the Tailings Management Feasibility Study (ES Appendix 3) prepared in connection with the design, operation, and restoration of the tailings stacks.

(ES Appendix 4.E, Acid Rock Drainage Characterisation Report, prepared in association with the currently permitted mine development, refers. Section 3, details the approach to the study and presents the results of the chemical analyses undertaken).

Process reagents

SEPA has accepted the use of methyl isobutyl carbinol in association with the previous application and no change to the quantities in use are proposed. No queries have been raised by SEPA with respect to the use of methyl isobutyl carbinol, the frother used in the wet processing of the milled ore. The behaviour of the collector, potassium amyl xanthate (PAX) and its degradation has been assessed, as the predicted no effect concentration (PNEC) for PAX has been established at 18µg/l. Again this level of PAX usage per tonne has not changed from the previous application.

A modelling assessment of the xanthate compounds is presented in the Tailings Management Feasibility Study (ES Appendix 3) prepared in connection with the design, operation, and restoration of the tailings stacks.

7.6.4.8 Groundwater Pollution

Hazards associated with potential pollution of groundwater at the site relate to matters of contamination by oils, fuels or chemicals used during construction operations and again during decommissioning. Measures to control and/or mitigate these hazards are as set out in Section 7.6.4.4, above. These impacts are assessed as negligible.

Acid Base Accounting (ABA) and Net Acid Generation (NAG) testing undertaken on waste rock, ore and on the resulting tailings found that the sulphides associated with the Cononish ore vein are of low to very low reactivity. Metals are generally much more mobile in acidic conditions, so with no ARD generated and no elevated levels of metals in the tailings, the potential for seepage of trace elements to, and potential impact on groundwater from the TMF and from the deposition of tailings underground, is assessed as negligible.

7.6.4.9 Scottish Water Assets

There is an offtake and pumping station at Dalrigh, associated with Tyndrum Water Treatment Works. These assets are located adjacent to the proposed bridge location at the existing ford over the Crom Allt. No effect on these assets is anticipated as no instream works are proposed and no alteration to the existing track is necessary. All contractors and site personnel shall be made aware of this sensitivity and the physical infrastructure at this location to ensure that there is no effect. (Annex 7C refers).

7.7 Extractive Waste - Waste Management Plan

The implementation of the EU Mine Waste Directive (2006/21/EC) in Scotland is through the provisions of The Management of Extractive Waste (Scotland) Regulations 2010.

The proposed tailings stacks are not categorised as a "classified tip" under the Mines and Quarries (Tips) Regulations 1971, , unlike the TMF under the previously permitted scheme.

The design parameters of the tailings stacks are detailed in the Tailings Management Feasibility Study (ES Appendix 3) prepared in connection with the design, operation, and restoration of the tailings stacks.

Section 13 of this ES sets out the Regulations and their requirements and includes the Waste Management Plan for the scheme.

7.8 River Tay SAC

The qualifying features of the River Tay SAC are River lamprey, Brook lamprey, Otter, Clear-water lochs with aquatic vegetation and poor to moderate nutrient levels, Sea lamprey and Atlantic salmon. The potential impacts via hydrological and hydrogeological pathways to these sensitivities relate to pollution. Pollution includes suspended solids as these may blanket the stream substrate and consequently may affect spawning, as may any change in flow regime.

Through the mitigation measures proposed above, which are designed to protect the water environment itself, and compliance with the discharge licence, it is considered that any potential for impacts downstream are also controlled. Although the sensitivity of the receptor is heightened (due to the presence of the qualifying features and the status of the Tay as an SAC) successful mitigation depends on the same measures as proposed as the nature of the impacts is identical. To assist the National Park Authority an Appropriate Assessment Appraisal has been prepared (see ES Appendix 13).

7.9 Cumulative Impacts

There are two existing surface water abstractions at Cononish; the domestic supply is taken from the Allt Eas Anie, near to the Eas Anie waterfall, the agricultural supply is taken near to the confluence with the Cononish.

There is no potential for cumulative impact with regard to water quality and integrity of surface and groundwater. The supplies will be maintained throughout the operations at the gold mine. No other development has been identified during the scoping process which may give rise to cumulative effects.

7.10 Conclusions

This hydrology and hydrogeology report is based on a site and operation specific risk assessment methodology. Potential impacts relating to hydrological and hydrogeological systems have been identified.

The impact of physical changes to overland drainage is assessed as **negligible** in the short, medium and long term.

Ecological impacts on the aquatic environment have been assessed as **negligible**.

Management procedures and contingency measures have been proposed in order to minimise the impact of contamination from fuels, oils and other substances. **No residual impacts** have been identified.

There are **no potential impacts** identified relating to the proposed scheme with regards to groundwater.

The assessment concludes that the overall impact on surface water and groundwater from the proposed development at Cononish is predicted to be **negligible** in the short, medium and long term.

No residual impacts have been identified.

7. ANNEXES

Annex 7.1
River Basin Management Plan data sheet

Annex 7.2
Hydro-logic Report

Annex 7.3
Location of SW Assets

Annex 7.1 RBMP Water body information sheet for water body 6505 The Cononish

RBMP Water body information sheet for water body 6505 in Tay

General details

Water body name:	Cononish
Water body Identifier code:	6505
Length:	10.21 km
Water body category:	River
Baseline:	Y
River basin district:	Scotland
Area advisory group:	Tay
Catchment:	River Tay
Associated protected areas:	River Tay - SPECIAL AREA OF CONSERVATION River Tay - FRESHWATER FISH (EXISTING) River Awe - FRESHWATER FISH (EXISTING)
Associated groundwater:	Upper Tay bedrock and localised sand and gravel aquifers
Responsible body:	SEPA Perth
Heavily modified:	No Artificial:
	No
Typology:	Mid-altitude Medium Siliceous
National Grid Reference:	NN 30209 28164
Latitude:	56.41507
Longitude:	-4.75389

Current status of this water body

We have classified this water body as having an overall status of Moderate with Medium confidence in 2008 with overall ecological status of Good and overall chemical status of Fail.

This overall classification of status is made up of many different tiers of classification data. A complete set of classification data for 2008 is shown at the end of this document.

Targets for the future status of this water body

We have set environmental objectives for this water body over future river basin planning cycles in order that sustainable improvements to its status can be made over time, or alternatively that no deterioration in status occurs, unless caused by a new activity providing significant specified benefits to society or the wider environment.

For this water body we have set the overall environmental objectives for the first, second and third River Basin Management Planning (RBMP) cycles as:

Year	2008	2015	2021	2027
Status	Moderate	Good	Good	Good

We have established an ongoing programme of monitoring in order to identify pressures on our water bodies. The pressures listed below contribute to this water body's failure to meet good ecological status. River basin planning allows us to plan improvements for particular parameters over time. We have collaborated with others to identify measures which will act to protect or improve our water environment in order that all water bodies reach good status over successive RBMP cycles.

Pressures and measures on this water body

The pressures listed below contribute to this water body's failure to meet good ecological status or potential. River basin planning allows us to plan improvements for particular parameters over time. We have collaborated with others to identify measures which will act to protect or improve our water environment in order that all water bodies reach good status over successive RBMP cycles.

The following table shows our collated information on the pressures on this water body, their causes and the measures which could be introduced to mitigate their effects. We have also indicated the current funding status of the measure; with projected measures being potentially funded and agreed measures having funding in place. Finally, we have included information on the potential or actual owner of the measure, the date it will be effective and information on the justification for extending the deadlines or for setting an alternative objective, where appropriate.

Pressure	**As a Result of**	**Assessment Parameter**	**Objective**	**Reasons for Failure**
	Measure	**Funding**	**Owner**	**Effective date**
Diffuse Source Pollution	Mining and quarrying of minerals	Priority Substances (Annex 10)	Good by 2015	
	Reduce Diffuse Source Inputs	Neither Agreed nor Projected	SEPA	31/12/2014

Future work

Additional work to identify pressures and to develop and implement measures to mitigate their impacts will continue over subsequent river basin cycles.

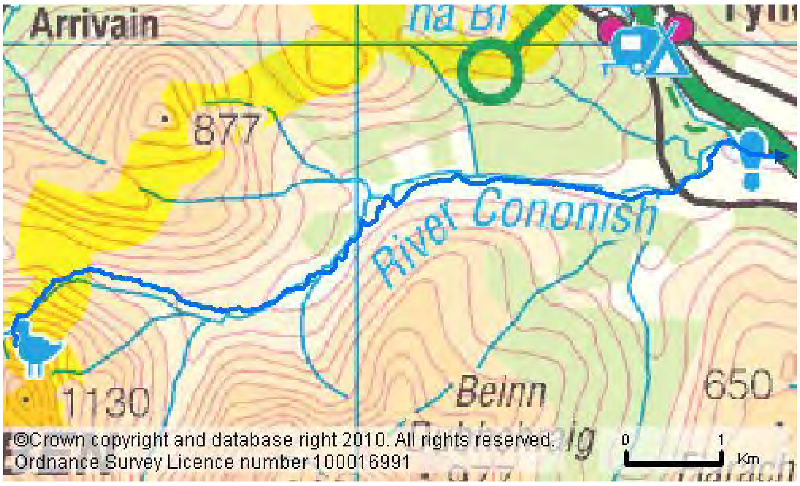
Complete classification for this water body in 2008

Parameter	Status	Confidence of Class
OVERALL STATUS	MODERATE	MEDIUM
Pre-HMWB status	Moderate	Medium
Overall chemistry	Fail	Medium
Priority substances	Fail	Medium
Cadmium	Fail	Medium
Lead	Pass	High
Nickel	Pass	High
Overall ecology	Good	Medium
Physico-Chem	High	High
Temperature	High	High
Soluble reactive phosphorus	High	High
pH	High	High
Dissolved Oxygen	High	High
Biological elements	High	High
Phytobenthos	High	Low
Macrophytes	High	Low
Benthic invertebrates	High	High
Macro-invertebrates (acid)	High	Low
Macro-invertebrates (RiCT)	High	High
Macro-invertebrates (ASPT)	High	High
Macro-invertebrates (NTAXA)	High	High
Alien species	High	Low
Fish	High	Low
Fish ecology	High	Low
Fish barrier	High	Low
Specific pollutants	Pass	High
Arsenic	Pass	High
Iron	Pass	Low
Copper	Pass	High
Zinc	Pass	Medium
Ammonium	Pass	High
Chromium	Pass	High
Hydromorphology	Good	Medium

Parameter	Status	Confidence of Class
Morphology	Good	Medium
Hydrology	Good	Medium
Hydrology (impoundment)	High	Medium
Hydrology (abstraction)	Good	Medium
Regulatory ammonium	High	High
Water quality	Moderate	
Morphological pressures	Good	

Location of this water body

You can find the geographical location of this water body by searching on water body ID in the interactive maps at www.sepa.org.uk/water/river_basin_planning.aspx



SEPA Contact Details: rbmp@sepa.org.uk

Figure 1: Cononish Burn at proposed location of Crump weir

3. Alternative flow monitoring strategy

3.1 Alternatives

A cheaper, lower risk flow measurement strategy would be to find a location which is suitable for the development of a conventional stage-discharge relationship. This is a relationship between water level and flow that is derived by taking individual flow measurements by current meter gauging and corresponding water level over a range of flows and fitting a mathematical relationship to the data points. This usually requires a minimum of about 12 – 15 gaugings for a stable bed section of river. It would appear that earlier attempts were made to gauge the river since during the site visit on the 1st April the Hydro-Logic staff concerned were shown an old water level recorder (see Figure 2). It is understood that no records have been located for this original gauge.

Figure 2: Old water level recorder installation on Cononish Burn

Another technique which is becoming increasingly more widely used to monitor flows in natural watercourses is to use Doppler technologies. These can be bed mounted or side mounted device. Due to the potential for very heavy bed movement on the Cononish we would not recommend a bed mounted Doppler. Nevertheless if a section with sufficient depth can be located then a side looker/horizontal ADCP (H-ADCP) may provide an alternative solution. These devices basically measure velocity in a slice across the river section. The measured velocity and is sometimes referred to as the index velocity. A relationship is derived between the index velocity and the mean velocity in the whole of the flowing cross-section by current meter gauging. This is referred to as the velocity index rating which can be used to derive the discharge. Just upstream of the old water level recorder site there is a shepherd's bridge (see Figures 3 and 4).

confluence with the Cononish where a stage-discharge gauging station could be installed.

Figure 7: Eas Anie burn – tributary of Cononish

An example of a temporary stage-discharge gauging station that has been installed on a Scottish Highlands burn is shown in Figure 8 below.

Figure 8: Example of temporary stage-discharge flow monitoring station

3.3 Work required

3.3.1 Survey

Prior to making a final recommendation on the proposed configuration a detailed site survey will be required. This will include:

Figure 3 **Figure 4**

Possible location for installation of H-ADCP

The cross-section underneath this bridge may be suitable for the installation of a 3000 kHz H-ADCP which will work in narrower channels and lower depths than other such devices. The advantage of the H-ADCP over conventional stage-discharge relationships is that because velocity and water level are measured it is better able to cope with unstable stage-discharge relationships. We would recommend that both an H-ADCP and a separate water level measurement system (as back-up) are installed on the Cononish. The H-ADCP has its own in-built water level sensor but by having a separate water level sensor this provides back-up in what is a very harsh operating environment. Therefore, we would propose a combination of an H-ADCP (velocity index rating) as the prime method and a conventional stage-discharge relationship as back-up.

Pictures of an H-ADCP being installed on a similar watercourse on the North York moors are shown in Figures 5 and 6.

Figure 5 **Figure 6**

H-ADCP being installed on old bridge abutment on North York moors

3.2 Tributary - Eas Anie

Scotgold have informed hydro-Logic that they may have to also monitor flows on the Eas Anie burn (see Figure 7). Several sites were identified near the farm house close to its

- Detailed cross-sectional surveys;
- Current meter gauging;
- GSM signal surveys;
- Trial with an H-ADCP to ensure that the system works on the Cononish. We have an arrangement with our suppliers to lend us a sensor prior to purchase so we can ensure that the device works. We see no reason why it will not work but very occasionally there are problematic sites.

On completion of the site surveys a detailed configuration design will be prepared and forwarded to Scotgold for approval. It is assumed that approval will be required by SEPA so we have allowed for the production of a report that will be acceptable to SEPA and the attendance of one of our more experienced senior staff at a meeting with SEPA in Perth, Stirling or East Kilbride.

3.3.2 Procurement, installation and commissioning

Once the go ahead has been given the equipment will be procured and any mounting brackets also ordered/fabricated.

Prior to installation and commissioning the equipment will be assembled and bench tested in its entirety in our Stirling office. This will include the checking of the calibration of the pressure transmitter(s).

Hydro-Logic can undertake the associated works required such as the mounting and fixing of the sensors, laying the cable ducting and the installation of a logger kiosk/box. However, the client may have a civil engineering contractor on site. Therefore, it may be better to make use of the contractor to undertake the minor civil works. This can be discussed at a later stage if the monitoring is to go ahead.

Once the infrastructure is in place the equipment will be installed and commissioned.

3.3.3 Gauging, regular downloading of loggers and maintenance.

Once the gauging stations are established, regular visits will be required to undertake gaugings to allow the development of both velocity index and stage-discharge ratings. In addition downloading of the data loggers, quality control checks and basic maintenance will also be required. We have allowed for monthly visits over the first year. These will be targeted whenever possible to capture as wide a flow range as possible. After one year the frequency of visits could probably be reduced, particularly if daily reports from the stations can be obtained via Hydro-Logic's Timeview system (see later). After one year training could be required and the installations handed over to the client, or Hydro-Logic could continue to provide a data provision, maintenance and check calibration service.

3.3.4 Development of velocity index ratings and stage-discharge relationships

The stage-discharge relationship for the site will be developed using Hydro-Logic's gauger analysis software and other in-house tools e.g. Excel based tools for extending rating curves using the stage-velocity-area method, Manning/Stevens and slope-area. No allowance has been made for the extension of the ratings using 1-D and 2–D modelling but Hydro-Logic have the in-house capability to undertake such work, if required by the client, at additional cost. In the first instance the rating development work will be undertaken by Peter Horne who is based in the Stirling office. Even though he is relatively new to the company Peter has already undertaken considerable rating development work on a reservoir inflow monitoring project being undertaken for Scottish Water. He will be supervised by the proposed Project Manager, Jens Petry and Stewart Child, Project Director, will also undertake a review of the rating development. A typical rating curve produced for a Scottish Burn for Scottish Water is shown in Figure 9.

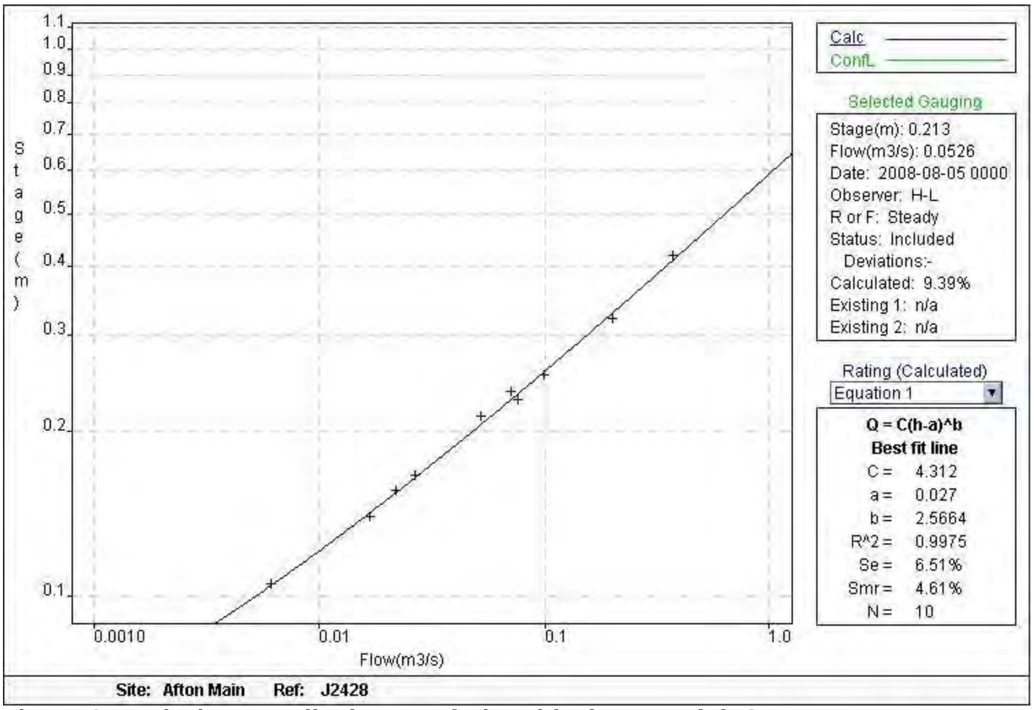


Figure 9: Typical stage-discharge relationship for Scottish Stream

Velocity index ratings will in the first instance be developed by Hydro-Logic's in-house Ratman software tool that was specifically designed and written by one of our company hydrologists for undertaking velocity index rating analysis. This work will be undertaken by Peter Horne under the guidance of Stewart Child. An example of a velocity index rating derived using Hydro-Logic's Ratman velocity index rating tool is shown in Figure 10.

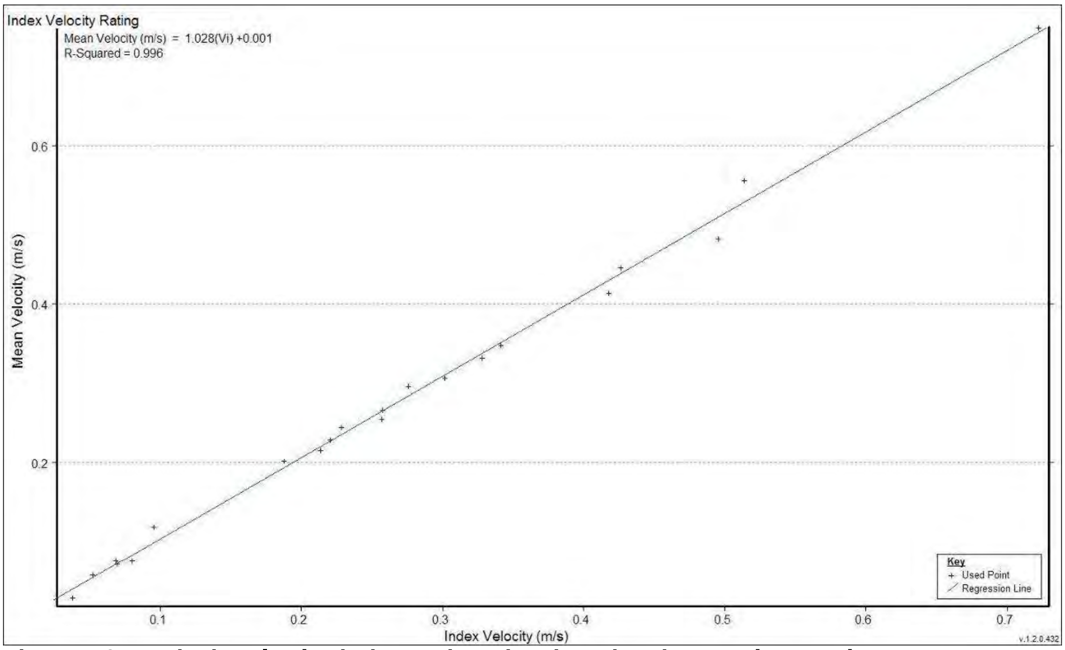


Figure 10: Typical velocity index rating developed using Hydro-Logic's Ratman VI tool

3.4 Proposed equipment

The following is proposed, pending confirmation following the detailed survey:

<u>ConoonishBurnGaugingstation</u>:

- A 3000 kHz H-ADCP
- I x Isodaq (Hydro-Logic's instrument division) Hawk data logger/GPRS/GSM telemetry outstation for recording data from the H-ADCP
- 1 x Isodaq Frog data loggers/GPRS (GSM) telemetry outstation 2 x Impress water level sensor (as low a range as possible);
- 1 x set of gaugeboard(s) for setting up and checking water level sensor;
- 1 x logger housing;
- Miscellaneous materials including ducting, support posts, weed proof etc.

<u>EasAnieTributarygaugingstation</u>:

- I x Isodaq (Hydro-Logic's instrument division) Hawk data logger/GPRS/GSM telemetry outstation for recording data from the H-ADCP
- 1 x Isodaq Frog data loggers/GPRS (GSM) telemetry outstation 2 x Impress water level sensor (as low a range as possible);
- 1 x set of gaugeboard(s) for setting up and checking water level sensor;
- 1 x logger housing;
- Miscellaneous materials including ducting, support posts, weed proof etc.

Notes:
1. Our specified logger and estimated costs assume that a GSM telemetry solution is feasible.

In the first instance GPRS telemetry (data transfer by cell phone) is proposed. However, until a detailed site survey been completed to ensure that adequate signal can be obtained this cannot be conformed. Hydro-Logic has recently started using a new greater strength of signal antennae which has allowed communications in previously difficult areas but the use of this still cannot guarantee a signal. At difficult sites it is sometimes possible to use a back to back radio system to transmit data from the monitoring site to a locally established logger site where GPRS is required. Alternatively a satellite phone communication system can be used but this is not our preferred option as it is more costly and less reliable than GPRS.

3.5 Work programme

If Hydro-Logic are requested to undertake this work the survey visit could be undertaken within two working weeks of being given the go ahead. Design and survey reports and equipment procurement will be finalised within two weeks of the survey. Procurement of equipment could take as long as 8 weeks but if possible the equipment will be obtained within four weeks.

Once the design and SEPA approval have been obtained, the installation will proceed as soon as the equipment is available.

The gaugings will be carried out on a fairly ad hoc basis to capture the range of flows required to build up robust velocity index and stage discharge relationships.

3.7 Key Staff

3.7.1 Summary

All the key staff proposed for this project have considerable hydrometric experience including gauging station feasibility and design studies.

The staff proposed for the project, are summarised as follows:

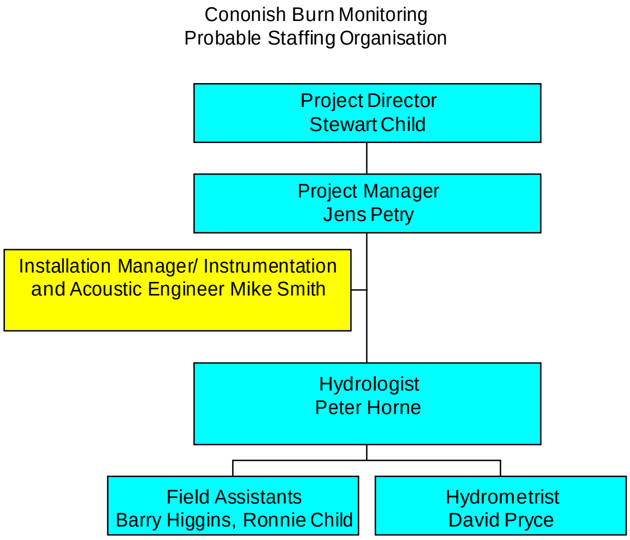
Name	Positioninteam	Mainroles
Stewart Child	Project Director/Hydrological Consultant	Overall review, management and quality control, rating development and guidance
Jens Petry	Project Manager	Day to management, survey, design, procurement, reporting, rating development, client liaison
Peter Horne	Hydrologist	Site survey, design, routine reporting, installation and commissioning, O&M of outstations, gauging, data processing, rating analysis, flow duration curve analysis
David Pryce	Hydrometrist	Installation and commissioning, O&M of outstations, gauging
Mike Smith	Principal Hydrometric Engineer	Acoustic specialist, installation manager
Ronnie Child	Assistant hydrometrist	Assist with site surveys, installation, calibration and commissioning and fieldwork
Barry Higgins	Assistant hydrometrist/trainee	Assist with site surveys, installation, calibration and commissioning and fieldwork

Hydro-Logic's proposed Project Director will be Stewart Child. Stewart is no longer a board member of Hydro-Logic but remains a shareholder. Also, he continues to be our nominated project Director on similar projects, particularly in Scotland. In addition Stewart was brought up in Argyll and as such is familiar with the Project Area. However, if the Scotgold require a full member of the board to be nominated, then Nik Whalley our Hydrometric Business Stream Director would fulfil this role. In any case Nik will take an overview of the project in his overall Business Stream role.

A summary of the experience of each key member of staff is contained in sections 3.7.3 to 3.7.9 below.

3.7.2 Staff organisation chart

The following staff organisation is proposed:



3.7.3 Stewart Child -

Position in the company – Principal Consultant

Stewart is a hydrologist whose specialities include Hydrometry, Water Resources Planning, Water Legislation (National and International), Management of Aquatic Weed Control Programmes and Environmental Impact Assessments. In particular he has many years of Hydrometric experience and has been responsible for the instigation, design and operational management of hydrometric networks both in the UK and overseas.

With a background in Engineering Hydrology, Stewart became a Senior hydrologist with the Thames Water Authority, before moving to Botswana in 1980. Working for the Department of Water Affairs as their Principal Hydrological Engineer, Stewart oversaw the development of a National Water Master Plan for Botswana. In this role, he managed a range of water development projects in semi-arid areas and the complex flood hydrology of the Okavango Delta. Stewart was responsible for training staff at all levels.

Since returning from Botswana in 1993, Stewart became involved in a wide range of projects as Hydro-Logic's Consultancy Services Manager, becoming a Director of the company in 1995. Stewart continued to work for a range of clients, producing the Environment Agency's "Review of Best Practices for Hydrometry" in 2000. He has undertaken and project managed a number of pre-feasibility, feasibility and design studies for new, or rehabilitation of existing, gauging stations. In addition he has undertaken a number of surveys and audits of flow measurement facilities at Waste Water Treatment Works and for abstraction and compensation flow monitoring. As Project manager and senior tutor on the Environment Agency hydrometric training contracts since 1995, Stewart managed the development of three core hydrometric training courses, which became Foundations I, II and III. In addition he has undertaken the development of a five-day course on stage-discharge relationships including flow measurement structures, and the development and delivery of two courses on using ADCP and side-lookers for flow measurement. In addition along with Alec Willis he has undertaken several MCERTS training courses for water companies and other interested parties. Stewart now sits on five International, European and British Standards committees and sub-committees. He is currently Chairman of the CEN committee for Hydrometry and the ISO Sub-committee on Velocity-area methods.

Stewart would be responsible for overall supervision of the project including overall review, management and quality control and rating development.

3.7.4 Jens Petry – Project Manager

Position in Company – Senior Hydrologist

Jens is a hydrologist whose specialities include Hydrometry and Water Resources Planning. In particular he has many years of Hydrological experience working for SEPA and has been responsible for the operational management of hydrometric networks both in the Scotland.

He has been involved with the evaluation of hydrometric equipment and its suitability for high quality data collection. Jens is also involved with the installation and all aspects of hydrological sensors, including pressure transmitters, telemetry outstations, tipping buck and storage raingauges to the prescribed British and International Standards.

This is work that Jens has undertaken at both SEPA and with Hydro-Logic Ltd. Jens currently manages the hydrometric sites that Hydro-Logic operate for all their clients in Scotland. This involves planning site visits and data quality checks for the staff at the Stirling office.

Prior to working for Hydro-Logic Jens spent three years working for SEPA in Galashields where he managed the area team that operated the hydrometric network. He also spent a year work for an oil drilling company in the North Sea.

Throughout the majority of his career Jens has managed and/or undertaken many field investigations including current meter gauging by wading, suspension derrick, boat and cableway and longitudinal and cross-sectional surveys of river systems. Most recently he has managed and undertaken the on site supervision of many field investigations throughout Scotland, including reservoir inflow monitoring sites and hydro-electric power feasibility studies.

Jens will be responsible for day to day management, site selection, design, procurement, reporting, rating development, and client liaison.

3.7.5 Peter Horne – Hydrologist

Position in Company – Hydrologist/Hydrometrist

Peter Horne joined Hydro-Logic's Stirling office in January 2009 as a hydrologist/hydrometrist. His duties include inspection of water level and rain gauge outstations, including the gauging of inflow and compensation flows, to ensure compliance with current legislation and specification. He also undertakes data quality analysis and processing as well as preparing monthly reports.

Peter previously worked as a Laboratory Technician for the Scottish Lime Centre Trust. Here he analysed sands and aggregates using a wide range of sampling and laboratory analysis techniques. Peter graduated in 2007 with a BSc. (Hons) in Environmental Geography, where his thesis examined historic fluvial change within the catchment of the River Tay. Peter also learned water quality analysis and sampling techniques as part of his degree.

Peter will be involved with most aspects of the work, including site survey, design, routine reporting, installation and commissioning, O&M of outstations, gauging, data processing, and rating analysis.

3.7.6 Mike Smith – Installation/instrumentation manager

Position in the company – Flow and acoustic instruments manager

Michael has been employed by Hydro-Logic Ltd for over eight years, having previously been employed by Northumbrian Water. In that time he has gained good experience in a wide range of hydrological and water resource instrumentation, including new hydrological measurement practices involving Acoustic Doppler instruments. Michael is able to cover a wide range of instrument applications and can draw on his vast experience in both the water and chemical industry. He has excellent practical and theoretical knowledge of a broad range of field instrumentation and communications systems. He also has a good grounding in all forms of field installations, measurement practices, data acquisition and quality control. Michael has recently supervised, managed and undertaken the installation of a number of hydrometric installations in remote parts of Scotland, including the Rothes flood warning scheme

Mike will be responsible for the management of the installation programme with particular responsibility for the acoustic technology.

3.7.7 David Pryce - Hydrometrist

Position in Company – Contract Hydrometrist

David is currently undertaking PhD research at Stirling University. He has been carrying out hydrometric work for Hydro-Logic on a part time basis for nearly 2 years. He has 11 years of previous experience in hydrometry working with the Environment Agency for England and Wales. David is due to complete his PhD during 2010 after which we would hope to secure his services on a full time basis.

David will be responsible for installation and commissioning, operation and maintenance of the outstations and gauging.

3.7.8 Ronnie Child – Assistant hydrometrist/Site supervisor

Position in the company – Assistant hydrometrist

Ronnie served with the Tayside police for 30 years from 1980 to 2010. When he moved to Aberfeldy in 1983 he joined the Tayside Police Search and Rescue Unit in which the volunteer members are specially trained for mountain rescue, low level searches over difficult terrain and boat trained for river and loch searches. He served in the team for 17 years during which time he attended a large number of call outs in all weathers and at all times of the day and as a result developed valuable skills in such things as hill craft and navigation. Throughout his police career and very often on his own, Ronnie was required to encounter potentially dangerous situations that required various levels of risk assessment and that emphasised the need for good health and safety practices. During leave periods and time off from his permanent employment Ronnie has assisted Hydro-Logic with the installation of water level recorders and raingauges, particularly at difficult, remote locations. In addition, he has assisted with site surveys and current meter gauging using conventional current meters and ADCPs.

In view of his mountain, first aid and health and safety experience with the police Hydro-Logic intend to employ Ronnie as a field assistant/site supervisor. He will be provided all the additional training required.

3.7.9 Barry Higgins – Field assistant

Position in the company – Field and workshop assistant

Barry has worked with Hydro-Logic since early 2010 providing hydrometric support on product preparation, testing and calibration and is also engaged in a supportive roll to Hydro-Logic's Hydrologists and Senior Hydrologists in a wide range of field based activities.

In his time with Hydro-Logic, Barry has gained an insight into the testing and calibration of Hydro-Logic's technology and also supports the Stirling based office with on site assessment and monitoring activities as well as assisting with the installation of Level, Flow and Rain gauge technology.

In former employment, Barry worked with Island Communications Ltd where he was engaged in monitoring Station installations and calibration, Flood Early warning systems and monitoring of related web based management systems.

Barry will assist with installations, calibration of instruments and gauging.

3.8 Field Equipment

Each of the Consultant's field staff/teams will be provided with the following:

- Juniper Archer ruggedised handheld Field Device (or similar)
- Current meter (Braystoke BFM 002, Seba M1 or similar), gauging rods and revolution counter;
- Electromagnetic current meter;
- ADCP (Streampro)
- Measuring tapes and rule;
- Water locating device;
- GPS;
- GSM signal testing logger and antennae.
- Level, staff and tripod;
- Installation tools;
- Personal protective clothing as required;
- First aid kit;
- Pegs to fix tapes and mark gauging sections;
- Camera.

4. Hydro-Logic Ltd

4.1 General

Hydro-Logic Ltd are independent consultants in water resources management and water environment monitoring technology, specialising in hydrometry and water resources consultancy services. The company is acknowledged as one of the UK's leading hydrometry specialists and the firm also markets a range of PC-based data management systems for processing records from water monitoring networks. The company has been established in Herefordshire since 1985, in Mortimer, near Reading since 1995 and in Stirling since 1999. The hydrometric management team is comprised of three principal Directors – Rod Hawnt, Alec Willis and Nik Whalley supported by Stewart Child, Principal Consultant who recently stepped down as a Director. Together they have accumulated over 120 years of experience in the fields of water resources planning and management and monitoring.

Hydro-Logic can offer consultancy services in water resources management, catchment hydrology, hydrometry, field monitoring and data management. One of Hydro-Logic Ltd's main specialities is to provide flow measurement consultancy services including feasibility studies and gauging station design and supervision. The Company's senior hydrometric consultancy staff are in a position to provide sound, effective, independent advice on all hydrometric activities and assignments in order to provide technically viable, yet cost effective solutions to meet all customer requirements.

4.2 Hydrometric capability

Hydro-Logic have undertaken numerous projects like the monitoring required on the Kames River since the Company was formed in 1985. Current projects include, but not limited to the following:

1. Reservoir inflow, reservoir level and rainfall monitoring for Scottish Water. Currently there about 15 – 20 systems being monitored, the majority of which are telemetered.

The work included the development of stage-discharge relationships for all the sites.

2. Monitoring of several streams for Falkirk Council to assist with flood assessment work.
3. Installation, commissioning and operation and maintenance of monitoring system for Perth and Kinross Council. The work included gauging to develop stage-discharge relationships.
4. Operation, management and expansion of the Dwr Cymru/Welsh Water Hydrometric Network (currently consist of more than 100 outstations.
5. Design, installation and commissioning and operation of several acoustic Doppler gauging stations on the River Thames near Oxford for Thames Water.
6. Design, installation, operation and maintenance for three gauging stations to monitor Hydro Power Potential, near Blair Atholl;
7. Design, installation and commissioning of a flood warning scheme for Morrison Construction acting on behalf Moray Council consisting of two raingauges and five water level gauges.

4.3 British, European and International Standards

Two of Hydro-Logic's permanent members of staff Stewart Child and Alec Willis have been involved with British Standards for the last 10 years. Stewart serves on the Sub-committee for Velocity-area methods. Alec serves on the hydrometric instrumentation sub-committee. As such Alec and Stewart have been actively involved with the development of new and revised standards during the last 10 years. Stewart also serves on the British Standards parent committee on Hydrometry and has represented the UK at International Standards Organisation meetings in recent years. In 2005 he took over from Dr Reg Herschy as the chairman of the CEN (European) committees for hydrometry and has also taken over the chair of the ISO sub-committee for velocity-area methods. Our involvement with Standards sub-committees can be summarised as follows:

Stewart Child	ISO TC113/1	Velocity Area Methods (Chairman)
	CEN TC 318	Hydrometry (Chairman)
	BSI CPI 113	Hydrometry
	BSI CPI 113/1	Velocity area methods
	BSI CPI/113/2	Flow measurement structures
	BSI CPI113 WG	Precipitation
Alec Willis	BSI CPI 113/5	Instruments

4.4 MCERTS

Hydro-Logic has fully embraced the MCERTS scheme. This is an innovative scheme instigated by the Environment Agency for facilitating the self-audit of effluent discharge monitoring facilities. From January 2004, all effluent discharges must be monitored in accordance with the Environment Agency’s MCERTS requirements. Four of Hydro-Logic's flow specialists have already been certified under the scheme and the company has been inspected by SIRA. In addition Alec Willis serves on the MCERTS Steering Committee.

Stewart Child and Alec Willis have developed and delivered an MCERTS training course to several organisations.

In addition several other members of staff including Stewart Child have undertaken a considerable number of audits and surveys as part of the MCERTS process.

4.5 CIWEM

Dr Paul Webster Hydro-Logic's Hydrology Business stream Director, is currently a member of the Chartered Institute of water and Environmental Management (CIWEM) committee on Rivers and Coastal management.

4.5.1 British Hydrological Society

Hydro-Logic's Managing Director Rod Hawnt was the President of the British Hydrological Society from 2005 until 2007. Hydro-Logic’s Director of Hydrometry, Nik Whalley, is currently serving as a member of the BHS South West regional committee.

4.6 Health and Safety

Hydro-Logic’s Health and Safety and Environmental Management Policy (87pp) has not been included, in the interests of brevity. A copy of Hydro-Logic’s Staff Health and Safety Policy is available from our web site: http://www.hydro-logic.co.uk/.

The Company operates a strict Health and Safety Policy, which includes the assessment of risk of working near, on or in water environments. This is reinforced through a Code of Practice for Safe Practice in Hydrometry Fieldwork. The latter document is consistent with BS 3680 part 3Q, “Code of Practice for Safe Practices in Stream Gauging”. The British Standard was revised in 2002 and is currently being considered for another revision, so the Code of Practice is currently under review. All staff proposed to undertake the work have been, or will be briefed and trained on the Consultant’s Health and Safety Policy and the Code of Practice for Safe Practice in Hydrometry Fieldwork. In addition, the Company makes reference to the Environment Agency for England and Wales Generic Risk Assessments for Hydrometric Activities (1999). Hydro-Logic personnel proposed for the assignment have, or will have, received instruction on all aspects of the management of Health and Safety and will be conversant with the Company’s Health and Safety and Environmental Management Manual. They will therefore have a comprehensive understanding of those specific elements relating to risk assessment and management under classroom and field conditions. Hydro-Logic operate health and safety (H&S), quality management and environmental management systems. All are audited to regular timetables, reported as standing orders at board meetings and are vital to the successful operation of our business and our social responsibilities.

The Company's H&S system has been in place since Hydro-Logic was created. Independent external auditors have certificated the Company's Quality Management System (QMS) against ISO-9001 since 1997. Our Environmental Management System (EMS) was implemented from 2002, largely in cooperation with the Groundwork Trust following the requirements of ISO-14001.

From 2004 an independent external consultancy (Citation plc) has reviewed Hydro-Logic's personnel, H&S and EMS systems regularly and kept the Company up to date with new legislation and best practices. In 2006 the Company launched QHSEMS - a combination of the Quality, H&S and EMS policies – that takes into account customer satisfaction, environmental impacts and health and safety compliance. It is believed that effective risk assessment and control is the keystone of Hydro-Logic's systems’ management.

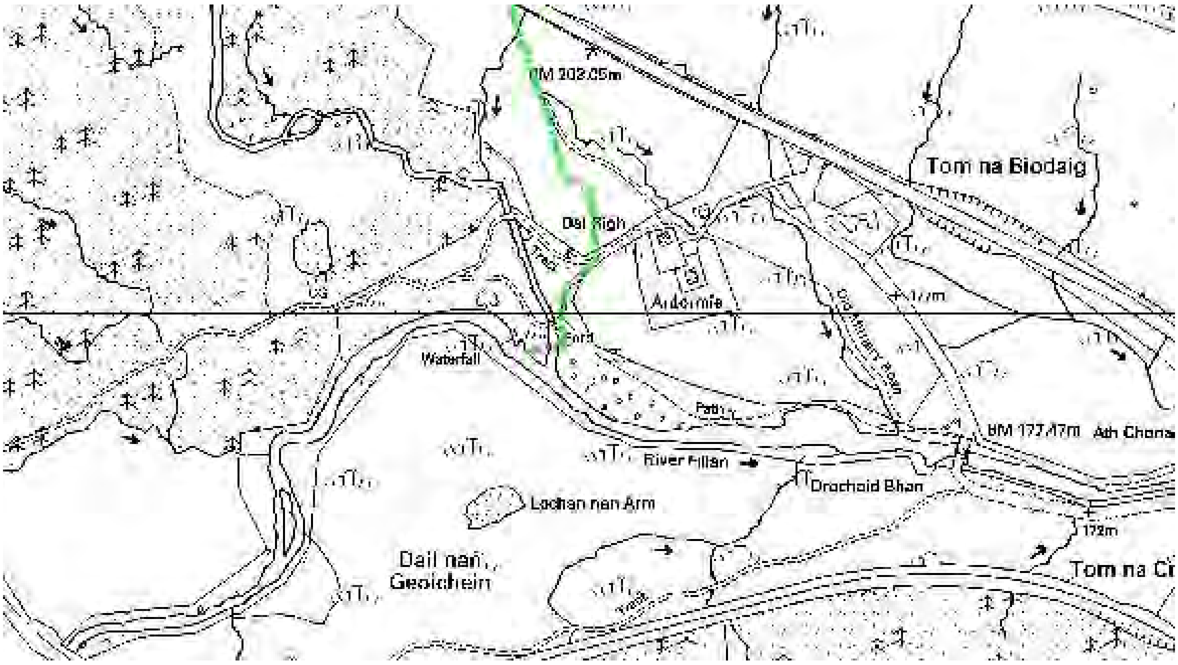
A central theme in the Company's systems is openness and communication to suppliers, clients and the public. Hydro-Logic was one of the first small - medium enterprises in the UK to publish key information of their management systems on their website. Hydro-Logic seeks a culture in which quality, health and safety and protection of the environment are an integral part of what we do. Hydro-Logic is strongly customer driven and believes that the Company should strive to solve problems before they occur.

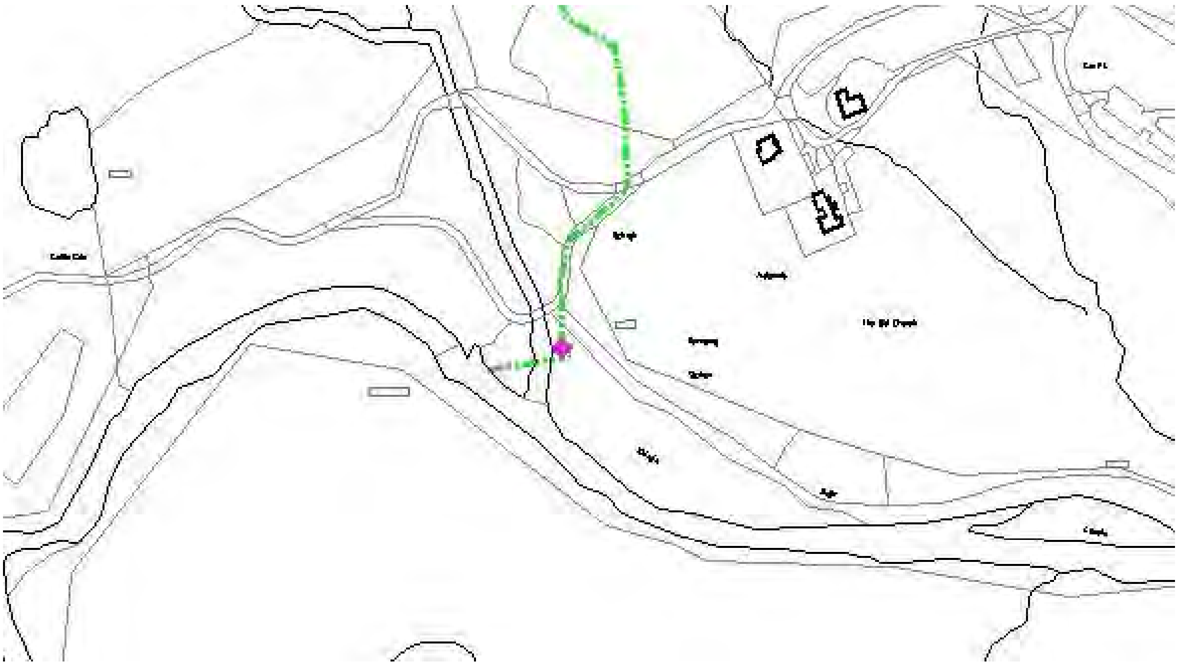
Hydro-Logic is very proud to report that the Company has received awards for both their Environmental Management System and Health and Safety System during the course of the year. Furthermore, the Company maintained a very good performance, ensuring full compliance against their targets of zero reportable incidents (health and safety and environmental). During the course of this year Hydro-Logic has been successfully externally audited on Health and Safety by both Dwr Cymru Welsh Water and Citation plc (who also audited the Company's Environmental Management System) and on their ISO 9001 Quality System by QMS Ltd.

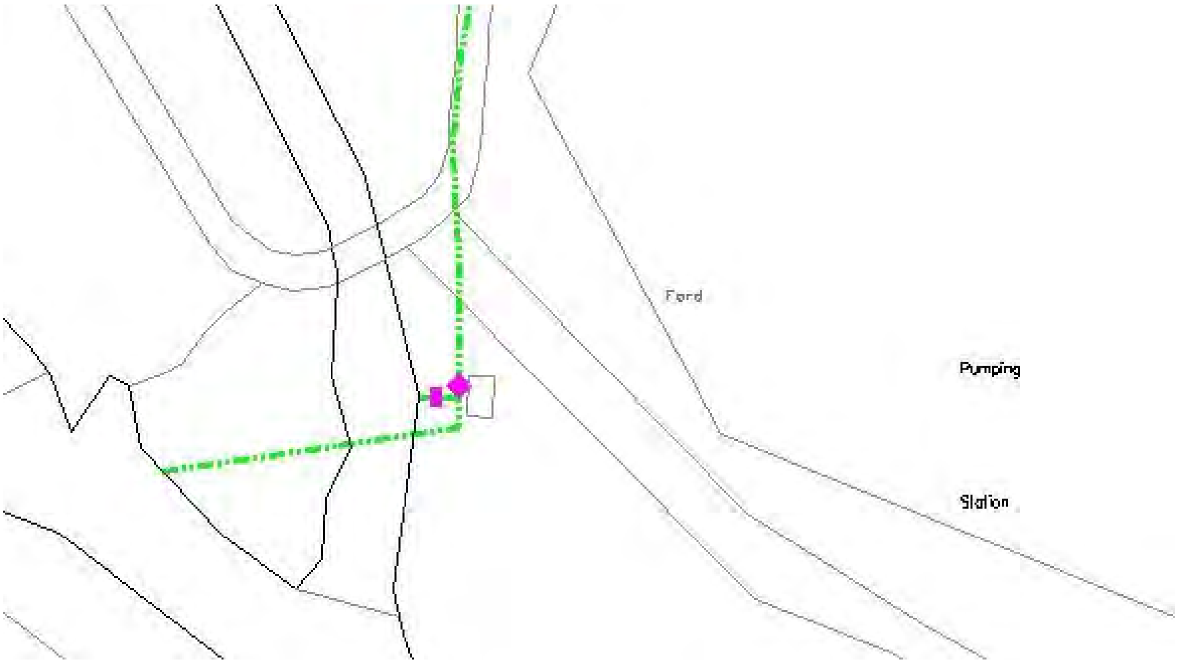
All Hydro-Logic's staff who undertake field work have received Health and Safety awareness training that includes a one-day First Aid for Appointed Persons course. Our Health and Safety advisor, has significant health and safety management experience developed throughout twenty years of practice and instruction in heavy industry and the water utilities. He has undertaken a NEBOSH General Certificate in Health and Safety Management with Hydro-Logic and now provides in-house advice and support to all offices within the Company In particular, he works closely with the Director for Hydrometric Services who has particular responsibility for hydrometric fieldwork.

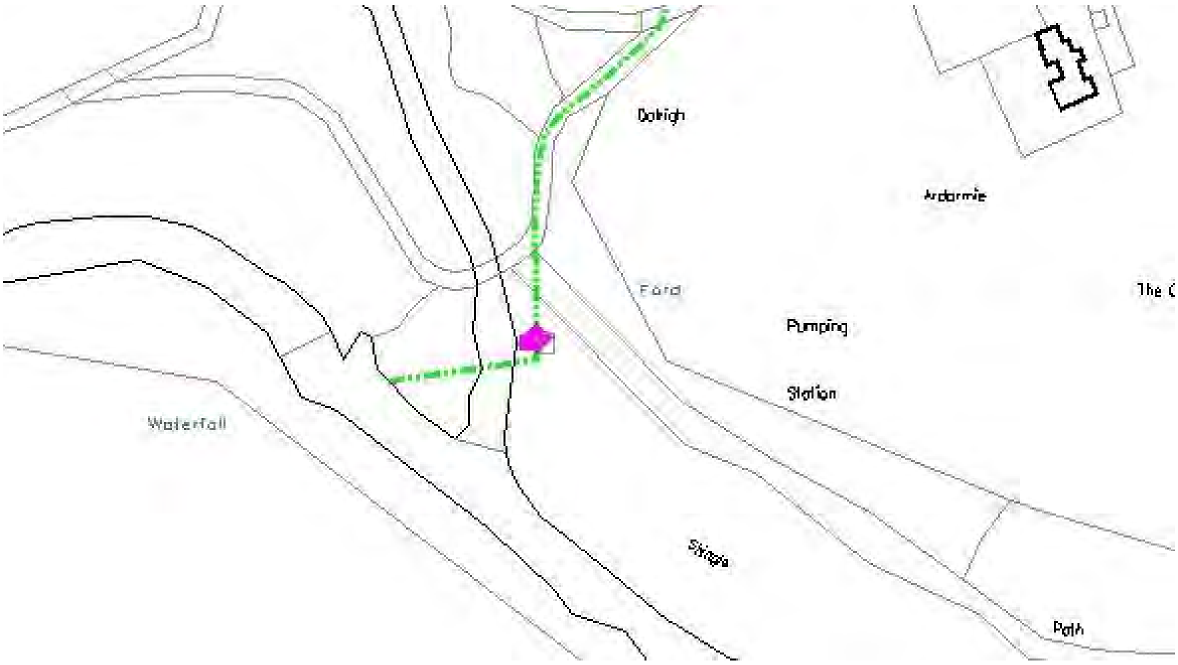
Hydro-Logic have a standard risk assessment form that provides for a scored 'risk–index' rating that is used to determine the risk control measures that are required at task level to maintain a safe working environment. Copies of completed forms together with guideline sheet will be provided to the client's representatives following the site reconnaissance visits. Key staff are required to undertake risk assessments prior to undertaking work at a site for the first time, and after a significant change in regime or other occurrence. All our field staff carry warning cards and will have received instruction on the requirement for precautions against Leptospirosis infection. Key staff have received training to allow confined spaces working. First aid kits are provided for each office and all company vehicles. Hydro-Logic staff involved with site activities have been issued with, appropriate protective clothing, e.g. fluorescent jackets/vests, hard hats, lifejackets and safety boots.

Annex 7.3 Location of SW Assets






Ford
Pumping
Station


Dalrigh
Ardormie
Ford
Pumping
Station
Waterfall
Path

8 ECOLOGY AND NATURE CONSERVATION

8.1 Introduction

This report identifies the potential impacts of the proposal on wildlife and nature conservation interests. The objectives of this assessment process are to ensure the maintenance, and enhancement, of biological diversity. This relates to maintenance of viable populations of native species throughout their natural range, and where practicable the improvement of the status of rare or endangered species.

A comprehensive NVC survey report incorporating a complete NVC polygon map and a peat depth map covering the whole of the development footprint is provided in accordance with scoping requirements. Protected species update surveys are also included. Appendix 5 refers.

The potential for effects on ecology and nature conservation is also considered against the planning baseline as there is an extant permission for the development of Cononish gold mine.

8.1.1 General Habitat Description

The site lies on the eastern flank of Beinn Chuirn between 290m and 410m. The surrounding landscape is open upland supporting a mosaic of dry and wet heath, mire and acid grassland.

There is a small block of coniferous plantation to the immediate north-west of Cononish Farm, with a slightly larger, more recently planted, woodland stand to the south-west. To the east, between the site and Tyndrum, is a significant area of coniferous plantation in the ownership of The Forestry Commission Scotland. The plantation was established in 1973-1974.

There are a number of watercourses in the site area, all flowing via the Allt Eas Anie into the River Cononish.

Areas of disturbed ground surrounding the mine entrance, buildings at Cononish Farm and associated access tracks and fencelines are the only visible built elements in the area. At the mine site there is currently a Bulk Processing Trial underway (2016/0366/DET), this BPT includes excavation of ore from the mine platform itself and processing using a small scale plant to produce concentrate and impure gold, doré.

8.1.2 The Proposal

8.1.2.1 Operations

The proposals involve the establishment of an underground mine accessed by a horizontal entry tunnel. Broken rock from the underground operations shall be transported to the surface where it shall be processed to remove the valuable mineral constituents; primarily gold and silver with ancillary lead, copper and zinc.

Processing consists of crushing the material to a fine powder. In slurry form a gravity concentration process removes approximately 25% of free gold which will be smelted on site to form an impure gold bar.

The residues from this process are further treated by 'froth flotation' to remove the remaining gold and silver into a sulphide rich concentrate (also containing lead, copper and zinc) which will be transported off site for further processing. Mine 'tailings' shall be dewatered and accommodated within the ten individual tailings stacks, referred to collectively as the Tailings Storage Facility (TSF).

The currently permitted development of the mine relates to the same underground mining and processing of ore. The treatment of tailings is the major variation; the permitted scheme included a single large cross-valley dam (embankment) behind which the tailings was to be pumped as a 'slurry' and gradually drained in situ. This large reservoir is referred to as the Tailings Management Facility (TMF). A further embankment would be necessary as part of the permitted scheme, to collect water draining from the tailings and recirculate process water from this pond. The formation of the TMF would necessitate the diversion of the Allt Eas Anie for around 750m.

The proposal allows for operation of the mine for 16 years however it is the applicant's intention to increase production after the first 2-3 years and reduce the overall duration of mining operations to around 10 years.

ES Section 3 details the proposed development.

8.1.2.2 Decommissioning and Restoration

A programme of rolling restoration will be implemented in tandem with operations starting with the site construction works (ES Section 3 refers).

A landscaped screening mound will be constructed around the process plant building using materials excavated for the footprint of the building and accesses. Vegetated 'turves', 'divots' and mulch will be set aside from the initial stack footprint and placed on the slopes of the screening mound following its construction. A similar process will be used for each tailings stack in turn, progressively restoring each stack, using material from the subsequent area to be stripped.

Approximately two thirds of the existing mine plateau, which comprised ore from the exploratory development of the mine, will have been removed for processing as part of the BPT. The processed material from the BPT is stored within geotextile bags and it is possible that this material will be re-processed during the full development of the mine. In either case, the remaining mine platform shall be regraded across the bags/bag storage areas to form a hummocky terrain, sloping, broadly in line with natural pre-existing topography. The available soil forming materials within the BPT planning area will enable some early revegetation of this re-landscaped slope with light seeding as appropriate.

On cessation of mining operations the mine will be decommissioned and all processing plant removed from the site. Built infrastructure will be dismantled and the footprint of the plant area and other site facilities graded with available soil forming materials, routed and seeded.

The tailings stacks will also provide a topography and substrate suitable for the establishment of heath and grassland mosaic. The re-introduction of mixed woodland is also proposed. The historical treeline, within the glen, was at least as high as the elevation of the mine site. Several tree stumps are visible within areas of peat across the site. The introduction of Scots pine, rowan, birch, willow, holly and aspen will be undertaken progressively.

The valleys, lower/gentler slopes will support peat and its range of associated plant communities, grading from waterlogged areas with restricted drainage to drier areas at the limit of peat forming capability with better drained slopes supporting a variety of acid grassland plant communities.

Appendix 7 details the proposed Decommissioning and Restoration Plan (DRP).

8.1.3 Ecological Impact Assessment Process

The ecological impact assessment process followed accords with best practice guidance published by the Institute of Ecology and Environmental Management (IEEM, 2016) and guidance relating to EIA published by Scottish Natural Heritage (SNH, 2013).

In order to assess potential impacts an existing *baseline* must first be established. This is done firstly by reviewing available literature and survey data. This desk study includes a search of published maps, data sets and consultation with relevant conservation bodies, including local and special interest groups. Desk studies then guide the requirement for field survey. Field Surveys are carried out in order to verify and update initial findings and to complete the baseline in relation to any gaps in current knowledge.

The second stage of assessment is to determine the *value* of habitats or species present. Sensitivities are assessed in terms of their conservation value and their level of value related to a geographical context. Protected status of sites and/or species also informs value/sensitivities.

Finally the *impact assessment* considers the potential impact magnitude and impact significance which is a function of magnitude and the value of receptors. Mitigation is proposed, in relation to working methods, ecological offset strategies and restoration and aftercare. The potential impacts are assessed against the proposed mitigation measures and also placed into their temporal context, considering short and medium-term impacts as well as long-term residual impacts, following restoration.

8.1.4 Legislation and Guidance

The following wildlife legislation and guidance has been identified and considered in the preparation of this environmental assessment:

- Habitats and Birds Directives – Council Directives 92/43/EEC and 79/409/EEC;
- Scottish Executive Interim Guidance on European Protected Species, Development Sites and the Planning System;
- The Conservation (Natural Habitats, & c.) Regulations 1994, as amended 2007;
- The Conservation (Natural Habitats, & c.) Amendment (Scotland) Regulations 2007, Explanatory Guidance for Species Related Activities;
- Wildlife and Countryside Act 1981;
- Nature Conservation (Scotland) Act 2004;
- Wildlife and Natural Environment (Scotland) Act 2011;
- Scottish Planning Policy (SPP) 2014;
- PAN 60 Planning for Natural Heritage;
- Guidelines for Ecological Impact Assessment in the United Kingdom 2016 IEEM;
- Bat Conservation Trust, Bat Surveys – Good Practice Guidelines 2016;
- Eurobats Publication Series No. 2, Protecting and managing underground sites for bats;
- Bat Conservation Trust, Bats Underground, Specialist Support Series;

- Scotland River Basin District (Surface Water Typology and Environmental Standards, Condition Limits and Groundwater Threshold Values) Directions 2009;
- The Forestry Commission Forest Research and the Royal Society for the Protection of Birds (RSPB) *Alternative Deer Fences in Core Capercaillie and Black Grouse Habitats: An Interim Best Guidance Note* 2001.

8.2 Ecological Baseline

Establishing the baseline includes scoping the assessment, as well as reviewing all previously published data. This includes an environmental baseline study undertaken by Cairns in 1990, on behalf of Fynegold Exploration Limited in relation to the Cononish Gold Mine as well as more recent submissions, notably the 2011 Environmental Statement.

8.2.1 Consultation and Scoping

Consultation, in line with Environmental Impact Assessment Regulations 1999 was undertaken. Scoping correspondence can be found in Appendix 2.

A summary of scoping requirements is noted below with a note of where these points are addressed within the submission.

Impacts on wet heath, dry heath, blanket bog plant communities, areas of deep peat and groundwater-dependent terrestrial ecosystems are all considered at ES Section 8.4. This includes loss to existing vegetation types and treatment of peat deposits, mitigation and restoration.

Risks of dust and dust management requirements are considered at 8.4.1.7 and in ES Section 10.

An assessment of impacts on otters is included at 8.4.1.12 and updated survey findings are attached at Appendix 5.

Works associated with the proposed bridge are considered in relation to fish at 8.4.1.10.

A Species Protection Plan has been requested and this is included at Appendix 6. This considers otters, bats and peregrine.

Restoration methods are included at Appendix 7, DRP. This plan includes consideration of the stack stability (detailed within the Tailings Management Feasibility Study, Appendix 3).

Target vegetation types for restoration inside the development footprint are noted at 8.4.1.1 and further detailed within Appendix 7.

The question of tailings material being different, physically and chemically, from the much more varied mixture of rock types and particle sizes in natural moraines and till is addressed at ES 3.6 and Appendix 7, as are restoration methodologies including turf, soil and sub soil management.

Fencing provision is detailed in the Greater Cononish Glen Management Plan and also shown at Figures 6.iii and 6.iv. The GCGMP remains part of the development, as previously proposed, this being subject to the detail of a Section 75 legal agreement.

Habitat maps for the areas affected by the proposed tailing stacks are included at Figures 8.1 and 8.2. An update NVC survey has been undertaken and is appended at Appendix 5.

An estimation of the volume of peat that is present within the stack footprint is provided at 8.4.1.7 including detail of the volume to be stripped with vegetation for use in restoration, excavated for use in habitat enhancement, and retained *in situ*; in all cases minimising carbon loss. Further detail is provided in Appendix 7, DRP.

The surface water drainage scheme is detailed within Appendix 3 and illustrated at Figure 7.3.

A Peat Management Plan is included at Appendix 6.

Data was also sourced from the National Biodiversity Network (NBN).

There is also extensive baseline data relating to the site and the wider ecology which has been prepared in support of previous planning applications relating to the gold mine. This data has been incorporated in and forms part of the baseline.

The data collected from these sources allows the scope of ecological impact assessment to be established. A National Vegetation Classification (NVC) Survey has also been undertaken (Appendix 5 refers). An update otter survey was also undertaken. The ornithological status of the site and the level of bat activity within the mine adit are kept up to date through continuing monitoring.

8.2.2 Topography

The site lies on sloping ground with an eastern aspect between 290m and 410m AOD. The ground is generally hummocky and consists of glacial till with rocky outcrops, mostly in the base of watercourses. The Allt Eas Anie flows east from the southern slopes of Beinn Chuirn over a high waterfall – the Eas Anie – and to its confluence with a northern tributary, which flows from Coire na Saobhaidhe to the east of Beinn Chuirn. Cononish Farm lies at the lower eastern end of the site, where the Allt Eas Anie flows into the River Cononish. Here the valley widens significantly, continuing east towards Dalrigh. The Cononish Valley is flanked to the south by a high ridgeline comprising two Munros; a third Munro, Ben Lui – the highest in the immediate area – lies to the west at the head of the valley. To the north the valley is enclosed by a ridgeline of lesser hills, between 590m and 880m.

8.2.3 Climate

The Soil Survey of Scotland (1982) describes the weather system as "cold and wet" and the area around the site is illustrated as being cool and wet to very cold and wet, with a high rainfall of over 2400mm.

8.2.4 Hydrology

The existing site hydrology is described briefly below. Detailed reference may be made to ES Section 7 Surface Water and Groundwater.

Natural surface flows consist of two tributaries to the River Cononish; the northern tributary flows south-east from Coire na Saobhaidhe within the valley between Beinn Chuirn to the west and Meall Odhar to the east; the Allt Eas Anie (the southern of the two tributaries) flows east, from the southern slopes of Beinn Chuirn over a high waterfall – the Eas Anie – and to its confluence with the Coire na Saobhaidhe Stream.

The mine development area itself and the area between the Allt Eas Anie and the Coire na Saobhaidhe Stream are drained by a series of ditches and drains associated with former exploratory operations at the mine. These watercourses join the Allt Eas Anie prior to its confluence with the Coire na Saobhaidhe Stream.

At Cononish Farm the Allt Eas Anie joins the River Cononish flowing eastwards to be joined by the Crom Allt at Dalrigh forming the River Fillan (later forming the River Dochart and after Loch Tay the River Tay itself).

8.2.5 Soils

The soils belong to the Strichen Association (Map Units 504, 510 and 514). The parent materials are drifts derived from arenaceous schists and strongly metamorphosed argillaceous schists of the Dalradian Series. This unit is recognised as having good forestry potential; this is being exploited to the east of the site. Above the site on the adjacent hillsides soils are rockier and poorer, sub-alpine and alpine.

Map Unit 504 contains soils with hummocky forms on valley floors and gullied sheet moraine on steeper slopes. Peaty podzols are found on mounds and steeper slopes, while peaty gleys and peats occupy the channels, hollows and gentler slopes. Bog heather moor is found on the peaty gleys and podzols, with some Atlantic heather moor in drier areas. Blanket bog communities develop on the peat, while bent grasslands tend to occur on steeper, drier areas.

Map Unit 510 contains soils that are peaty gleys, podzols and rankers, and occurs on hill sides with strong to very steep slopes and ranges from slightly to very rocky. The semi-natural plant communities are heath rush – fescue grassland and Atlantic heather moor.

Towards the summit of Beinn Chuirn there are soils of Map Unit 514. These are alpine soils with poor vegetation and a short growing season.

8.2.6 Land Use

With regards to land capability the Macaulay Institute for Soil Research – Soil Survey of Scotland, Western Scotland identifies the entire site area as lying within *"land capable of use only as rough grazings"* class 6_3 – vegetation dominated by plant communities with low grazing values, particularly heather moor and blanket bog. There is good forestry potential on less rocky areas. Above the site on the adjacent hillsides soils are rockier and poorer, sub-alpine and alpine.

8.2.7 Designated Sites

There are a number of designated sites in the vicinity of the site (Figure 1.1 Site Location Plan refers).

The **River Tay Special Area of Conservation (SAC)** is located approximately 500m to the east at its closest point; the site is hydrologically linked to the SAC as the River Cononish lies within the designation and ultimately flows into the Tay.

The qualifying interests of the SAC include: *Lampetra fluviatilis* (river lamprey), *Lampetra planeri* (brook lamprey), *Lutra lutra* (otter), Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* (clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels), *Petromyzon marinus* (sea lamprey), *Salmo salar* (Atlantic salmon).

Ben Lui National Nature Reserve (NNR)/Site of Special Scientific Interest (SSSI)/SAC also lies in close proximity to the site, on the southern shore of the River Cononish at its closest point. The boundary includes the northern slopes of Beinn Dubhchraig. The site is designated for its upland habitat and vascular plants as well as invertebrates.

Coille Coire Chuilc SSSI is located approximately 2.5km to the east at its closest point. The site is designated as it is the most southerly extensive remnant of ancient Caledonian Pinewood.

Inventory of Ancient Woodland

The Inventory of Ancient Woodland held by SNH identifies the closest element of ancient woodland being within the SSSI of Coille Coire Chuilc, some 2.5km to the east.

8.2.8 Habitat

To inform the 1990 assessment an extensive survey was undertaken, including an area of 13 square kilometres, habitat types recorded include:

- Forestry Plantations on the northern side of valley;
- Native Pine Forest (Coille Coire Chuilc) at the eastern end of Cononish Valley;
- Blanket Mire Communities on ground with shallow slopes;
- Grasslands on steeper better drained ground;
- Ericaceous Communities (heather and bilberry heathland);
- Mountain-top Communities (alpine communities above c.700m AOD);
- Cliffs, Broken Ground and Flushes on steep ground including the Eas Anie.

Some classifications have changed since the time of this original survey but the species compositions and physical parameters are unaltered. The area around the proposed scheme remains a mosaic of habitats dominated by grasses, rushes and heathland species.

This historical data was updated through Phase 1 Habitat Survey (Phase 1) during June & August 2007, May & June 2008, May 2009 and June 2011 (Appendix 5 refers). Field signs of any species of potential ecological interest were also noted, thereby establishing the requirement for any further species-specific surveys at that time.

The following habitats were noted and mapped as Figure 8.2.

8.2.8.1 *Coniferous Plantation (A1.2.2)*

To the north-east of the site, the lower slopes of the Meall Odhar are covered in dense *Picea abies* (Norway spruce) and *Larix decidua* (European larch) plantation.

8.2.8.2 *Wet Heath/Acidic Grassland Mosaic (D6)*

The majority of the survey area has been classed as a mosaic of wet heath and acid grassland. Ericoid species noted include *Calluna vulgaris* (heather) and *Erica cinerea* (bell heather), while graminoid species include *Molinia caerulea* (purple moor-grass), *Trichophorum cespitosum* (deergrass) and *Festuca vivipara* (viviparous fescue).

However, this habitat classification does not reveal the true picture. The hummocky nature of the topography supports a mosaic of habitats. The flat and poorly drained depressions support a mire habitat with *Carex* and *Sphagnum* species dominating with scattered *Erica cinerea* (bell heather). On steeper, and consequently better drained slopes, the mire habitat grades into a variety of acid grassland and heath habitat types depending on soil parent material, slope, altitude and aspect. Species such as *Juncus squarrosus* (heath rush) and *Nardus stricta* (mat-grass), as well as *Calluna vulgaris* (heather) dominate. *Racomitrium lanuginosum* (woolly fringe-moss) is the dominant bryophyte in the area.

8.2.8.3 *Standing Water (G1) and Running Water (G2)*

Natural surface flows consist of two tributaries to the River Cononish: the Coire na Saobhaidhe Stream flows south-east within the valley between Beinn Chuirn to the west and Meall Odhar to the east; the Allt Eas Anie (the southern of the two tributaries) flows east, from the southern slopes of Beinn Chuirn over the Eas Anie and to the confluence with the Coire na Saobhaidhe Stream.

The mine adit itself and the area between the Allt Eas Anie and the Coire na Saobhaidhe Stream are drained by a series of ditches and drains associated with previous exploration operations, including three settlement ponds that currently support a number of species including common frog, palmate newt and dragonfly and damselfly larvae. These watercourses join the Allt Eas Anie prior to its confluence with the Coire na Saobhaidhe Stream.

8.2.8.4 Mine (I2.3)

The mine portal is located approximately 1km to the west of Cononish Farm, on the lower slopes of Beinn Chuirn. Currently the adit extends horizontally around 1100m, there are a number of short side branches and a raise or shaft) which daylights within the Eas Anie gorge.

8.2.8.5 Bare Ground (J4)

Access to Cononish Farm and the mine adit is via a hardcore track extending some 4km to Dalrigh and the junction with the A82. Stockpiles (currently being worked) and the flat mine platform are adjacent to the mine entrance.

8.2.8.6 NVC (2009 and 2011)

The Phase 1 Habitat survey was further augmented by a detailed botanical survey, using National Vegetation Classification (NVC) survey methodology. This was undertaken in September 2009, and June 2011 in order to highlight variations in vegetation relating to slope, drainage and substrate. The survey was focussed on the areas directly impacted by the TMF and Allt Eas Anie diversion (Appendix 5 refers).

8.2.8.7 NVC (2017)

An update to the NVC has been undertaken. Sheep grazing has been significantly restricted on the mine site for a number of years (since around the time of previous survey) and habitats are altering in their details composition as a result.

Communities remain modified and this has blurred community boundaries; assigning definitive NVC communities is not always possible. This survey focussed on the proposed development footprint (Appendix 5 refers).

8.2.8.8 Summary

Survey shows the area to be a mosaic of habitats with species becoming dominant depending on local conditions such as slope and drainage patterns. The site has been subject to intensive grazing in the past although as this has been restricted more natural habitat is developing. The area is a wet heath acid grassland mosaic with elements of mire and rush-pasture; watercourses add significantly to habitat diversity. There is little exposed peat and very little tree cover, restricted to plantations and a few individual trees along the sheltered banks of the watercourses.

8.2.9 Fauna

As part of the 1990 assessment aquatic, ornithological and other faunal surveys were undertaken; these have all been updated subsequently as noted below.

8.2.9.1 Aquatic Survey

The biological status of the catchment is heavily influenced by the physical characteristics, the fast flow rates, mobile substrate and low nutrient levels, while climate also has implications. There is a good diversity of invertebrates within the catchment although species are present in relatively low numbers. The upper catchment is typical of "alpine" zone waters; the biota reduced, relative to water quality, by factors such as low winter temperatures.

The importance to the Tay fishery of the Cononish catchment is as a salmon spawning ground, there is no significant rod and line fishery upstream of Killin. Salmon are present within the Cononish up to the waterfall at NN 290 273 and surveys suggest that there are significant areas of suitable gravels. Salmon have not been recorded within the Allt Eas Anie/Forestry Stream catchment and these minor tributaries neither have suitable substrates nor suitable access for salmon spawning.

Electrofishing surveys were undertaken on the combined Allt Eas Anie/Forestry Stream catchment as well as the River Cononish. Within the Allt Eas Anie downstream of the Forestry Stream catchment no salmon were recorded, however there were a number of trout present.

Subsequent electrofishing surveys have been carried out on the Cononish regularly, by the Tay River Salmon Fisheries Board. When compared with the River Fillan, few, but relatively large, salmon were recorded on the River Cononish. A programme of restocking is continuing, although salmon numbers in the Cononish have not increased. It is thought likely that this is down to low nutrient levels in the Cononish leading to low invertebrate numbers.

8.2.9.2 Ornithological Survey

The survey undertaken in the late 1980s extended to 24 square kilometres in and around the valley of the River Cononish. Surveys carried out on behalf of Scottish Native Woods (2007) indicate that black grouse are present in the wider area (*The Tay Western Catchment Project*, Scottish Native Woods).

A number of ornithological surveys were then undertaken in the lead up to the 2011 submission in order to update this historical data.

The full and detailed ornithological report is appended to the ES at Appendix 5.

Regular monitoring of the site is undertaken and note is made of any ornithological interest. A complete species list for the wider area is included below at Table 8.1; those species in bold are known to occur on or near to the mine site itself.

Of particular note, peregrine falcons regularly breed in the area. There are two known preferred nest sites, one being close to the mine site. Merlin have also been recorded historically in the wider area and short-eared owl pellets were found during the suite of surveys for the 2011 assessment. No evidence of black grouse has been noted in the vicinity of the mine site although they were noted in 2011 on the upper plantation margins on Forestry Commission land further to the east, nearer Dalrigh (pers. comm. John Burton, Cononish Estate). One Red List species – skylark – was recorded in the vicinity of the mine site.

Table 8.1 Bird Species observed in the Cononish Valley

Common Name	Scientific Name
Blue Tit	Cyanistes caeruleus
Bullfinch	Pyrrhula pyrrhula
Black Grouse	Lyrurus tetrix
Carrion Crow	**Corvus corone**
Chaffinch	Fringilla coelebs
Coal Tit	Periparus ater
Common Gull	Larus canus
Common Redstart	**Phoenicurus phoenicurus**
Common Sandpiper	**Actitis hypoleucos**
Crossbill sp.	Loxia sp.
Curlew	Numenius arquata
Dipper	**Cinclus cinclus**
Goldcrest	Regulus regulus
Great Tit	Parus major
Grey Wagtail	**Motacilla cinerea**
Lesser Redpoll	Carduelis cabaret
Meadow Pipit	**Anthus pratensis**
Merlin	Falco columbarius
Mistle Thrush	Turdus viscivorus
Oystercatcher	Haematopus ostralegus
Peregrine Falcon	**Falco peregrinus**
Pied Wagtail	**Motacilla alba yarrellii**
Raven	**Corvus corax**
Robin	Erithacus rubecula
Short-eared Owl	Asio flammeus
Siskin	Carduelis spinus
Skylark	**Alauda arvensis**
Snipe	Gallinago gallinago
Song Thrush	Turdus philomelos
Spotted Flycatcher	Muscicapa striata
Stonechat	Saxicola torquata
Swallow	**Hirundo rustica**
Swift	Apus apus
Tree Pipit	Anthus trivialis
Treecreeper	Certhia familiaris
Twite	Carduelis flavirostris
Wheatear	**Oenanthe oenanthe**
Whinchat	**Saxicola rubetra**
Willow Warbler	Phylloscopus trochilus
Wren	Troglodytes troglodytes

8.2.9.3 *Otters*

Records available from the National Biodiversity Network (NBN) show that otters have been recorded throughout the area.

The site has been surveyed a number of times over the last 10 years; in February, May and June 2008, May and October 2009, June 2011, October and December 2012, and February 2014.

A furrther update has been undertaken to inform the current assessment, Appendix 5 refers.

The Cononish appears to be used occasionally by otters, but the surveys over a number of years do not indicate that it is regularly heavily used with only the 2012 survey showing signs of more frequent use.

The lower stretches of the Cononish in the study site are also likely to be occasionally used by otters although no signs were found in the areas surveyed.

8.2.9.4 *Bats*

Records show that a number of bat species are present in the Tyndrum area.

A number of surveys over the winter 2009-2010 were undertaken and the results indicate that the mine adit is being used as a hibernaculum by Daubenton's and Natterer's bats albeit with low activity levels.

Initial surveys were undertaken at the mine portal. Monitoring was undertaken using a Batbox Duet (heterodyne and frequency division) bat detector coupled with an MP3 recorder allowing for later detailed analysis of any bat sonograms recorded using the dedicated bat software BatScan. No activity was recorded in this way.

Passive monitoring was then undertaken using an Anabat SD1 bat detector and subsequently an Anabat Roost Logger placed within the mine adit. This has been undertaken at various locations within the mine, including the two secondary entrances which are linked to the main adit with a sub-vertical 'raise' (sloping shaft). Monitoring started on 5th November 2009 and continued throughout the winter 2009-2010. Subsequently monitoring has been undertaken at various times up to and including winter 2015-2016.

Monitoring data suggest regular low level activity within the adit, during hibernation; no summer activity has been recorded. All echolocation calls made within the mine have been analysed and attributed to *M. daubentonii* (Daubenton's bat) and *M. nattereri* (Natterer's bat).

Individual bats have been observed within the mine adit on a number of occasions. The maximum number of bats observed is three.

A species licence, for disturbance of bats, was issued in May 2012, valid for ten years. A variation/extension to the licence shall be sought as necessary to reflect any extension to this duration.

8.2.9.5 Other Fauna

Red deer frequent the site from time to time. Historically numbers have been controlled through culling and substantial areas are fenced to exclude deer.

Palmate newt, dragonfly, damselfly and common frog have all been recorded associated with settlement ponds at the site.

8.3 Conservation Value of the Site and Environs

8.3.1 General

Data has been collected on flora and fauna, and the recorded natural history of the area. Given this information, which has been presented in the preceding sections, it is possible to make an assessment of the conservation value of the various components of the survey area. This will then provide the basis for assessing the potential ecological impact of the proposed development within that area.

Conservation value of a site or its components relates to their own status as designated or priority sites/habitats and also their role in supporting any designated or priority species. A consideration of biodiversity action plans (BAPs) is useful here in highlighting recognised priorities, both UK and local.

8.3.2 UK Biodiversity Action Plan

UKBAP habitat and species action plans have been considered. The habitat surrounding the proposed development includes wet heath, mire and acid grassland as well as running water. *Rivers* (headwaters such as those at the site represent a qualifying feature) and *Upland Heathland* are identified within the UKBAP as are *Upland flushes, fens and swamps* and *Blanket bogs*.

There is a species action plan for Skylark which have been recorded on site; in addition otters are present in the area, while lamprey may be present, the Cononish is noted as only 'partly accessible' (SNH Commissioned Report 292); further downstream there are also brown trout and Atlantic salmon.

8.3.3 Criteria for the Evaluation of Conservation Value

Initially the survey area has been classified in terms of whether it contains, passes through or is adjacent to designated sites or priority habitats as well as supporting certain species (Table 8.2 refers).

This information is set against further criteria formulated by Ratcliffe (1977) which are generally accepted as forming the basis for appraising conservation value. These criteria include fragility, rarity, size, diversity, potential value, position within the ecological/geographical unit, typicalness, recorded history, naturalness and intrinsic appeal.

8.3.3.1 Fragility

Some habitats, communities and species are particularly sensitive to environmental change. Such habitats tend to be rare and the habitats within the area proposed for development are not regarded as fragile.

8.3.3.2 Rarity

Rarity is a matter of definition as rare species and habitats can be distributed in a number of ways, e.g. being locally rare a species can remain abundant nationally and vice-versa. No rare habitats have been identified within the proposed development area. Some species, such as Black Grouse, which are considered to be rare have been recorded in the wider area.

8.3.3.3 Size

The area affected is around 11ha. While the proposals will result in this loss of wet heath, mire and rush-pasture moorland habitat, there is widespread, similar habitat available in the area.

With the implementation of a considered, appropriate restoration scheme, and the use of appropriate techniques, similar habitat can be created at the cessation of operations.

8.3.3.4 Diversity

The site has a limited diversity of habitats and species. The survey area has low habitat diversity which is typical of the wider area. The site does not confer additional diversity to its environs.

Table 8.2 Conservation Value Classification of Survey Area

Level of Conservation Value	Designations, species or elements	Elements on or near the Site	Rationale
International	Internationally designated: RAMSAR Sites; Special Protection Areas; Biosphere Reserves; Special Areas of Conservation; World Heritage Sites; Sites supporting populations of internationally important species (with limited potential for substitution).	Ben Lui and River Tay SACs	Proximity to site (both SACs) and hydrologically linked (River Tay SAC)
National	Nationally designated: Sites of Special Scientific Interest (SSSI); National Nature Reserves (NNR); Marine Nature Reserves (MNR); Key habitat identified in the UK Biodiversity Action Plan (BAP); Supporting viable breeding populations of Red Data Book species or supplying critical elements of their habitat requirements (with limited potential for substitution).	Ben Lui NNR and SSSI Loch Lomond & The Trossachs National Park Wet Heathland, Acid Grassland, Rivers and Streams, Otters, Salmon, Brown Trout, River and Sea Lamprey, Skylark	Nationally designated sites All identified within the
Regional	Local Nature Reserves, SINCs, RIGS, Important Inventory Sites (Ancient Semi-Natural woodland and grassland), Sites supporting viable breeding populations of Nationally Scarce species.	While not nationally scarce the habitat forms part of the territory of an Annex 1 / Schedule 1 species	Annex 1 / Schedule 1 species supporting habitat, in this instance downgraded to regional due to limited scale
High Local	Sites meeting or exceeding the criteria for designation including amenity and educational criteria in urban areas, Designated SWT Reserves, Sites containing key habitat identified in the LBAP, Sites supporting viable breeding populations of species listed as rare in the LBAP or supplying critical elements of their habitat requirement.	Rivers, Upland Heath, Upland Flushes, Fens and Swamps	Supports habitat identified within the LBAP
Low Local	Undesignated sites which nevertheless are considered to appreciably enrich the habitat resource within the parish/neighbourhood, Greater potential for substitution.	No habitats which are not covered by higher level classification	N/A
Negligible	Low Grade and Widespread Habitats	Bare ground associated with tracks and / or Gold Mine operations	Providing habitat diversity and limited foraging value

Adapted from Regini (2000). Guidelines for Ecological Evaluation and Impact Assessment

8.3.3.5 Potential Value

Potential value relates to the possibilities for enhancing habitat diversity and creating new habitat. The opportunities for enhancement in relation to this development are limited and so this does not significantly increase the site's conservation value. Potential enhancement is considered further as part of the DRP (Appendix 7 refers). Wider landscape enhancements are described in Appendix 12 Greater Cononish Glen Management Plan (GCGMP).

8.3.3.6 Position within the Ecological/Geographical Unit

The habitat within the development site area is not assessed as adding significantly to the wider ecology as both the survey area and the surrounding countryside comprise a mosaic of upland habitats.

8.3.3.7 Typicalness, Recorded History, Naturalness

While fairly typical of the wider area this in itself is not assessed as conferring particular value to the survey area. Recorded history of this survey area relates only to surveys undertaken in conjunction with the gold mine development. The habitats have been affected by grazing, and drainage, and some areas have been affected by historical mining operations. The wider hillside, the watercourses and more inaccessible areas such as crags adjacent to the Eas Anie are generally natural.

8.3.3.8 Intrinsic Appeal

This category refers to the value of a site in a popular sense rather than ecological sense. The survey area as a whole has an intrinsic appeal due to its rural character. The existing impact of the Cononish Gold Mine does however play a part in setting the local character.

In the long term the proposed development is assessed as being unlikely to impact significantly on the overall appeal of the area, having further positive impacts on the intrinsic appeal of the site, as a consequence of the restoration of the area.

8.3.4 Conservation Value in Context

8.3.4.1 International Context

The River Tay and Ben Lui SACs are international designations as part of the Natura 2000 network.

8.3.4.2 National and Regional Context

Ben Lui is also a SSSI and a National Nature Reserve (NNR) and is therefore nationally designated, as is Loch Lomond & The Trossachs National Park as a whole. The survey area also supports habitats which are included within the UKBAP as well as forming part of the territory of an Annex 1/Schedule 1 species (peregrine falcon). The contribution the site area makes to the wider territory of this species is very limited due to its scale and this is therefore considered as of regional importance, particularly since this is not a scarce species.

8.3.4.3 Local Context

Habitats present have been identified as supporting European Protected Species but it is considered unlikely that these species rely on habitat within the site. Otters and the bats *M. daubentonii* and M. nattereri are common/widespread species, and as such the site is assessed as having local conservation value only in relation to supporting these species.

8.4 Impact Assessment

8.4.1 Potential Impacts

The assessment of potential impacts is made by setting the potential impacts of the development, construction, operation and decommissioning and their magnitudes against the ecological survey results and specifically the sensitivities of species and habitats present.

There are a range of criteria that can be used to assess the significance of the impact. This report aims to be as transparent as possible and follows a clear and logical assessment process (IEEM, Guidelines for Ecological Impact Assessment in the UK, 2016). The significance criteria are the potential impact magnitude (Table 8.3) and the value of the receptor (Table 8.2) which has been determined in the preceding section (ES Section 8.3 refers). The matrix to calculate significance of impact is as below (Table 8.4).

Table 8.3 Criteria for Assessing Ecological Impact Magnitude

High Magnitude	Loss of most of the habitat (i.e.>50% of the habitat area). Other effects (e.g. disturbance or damage arising from pollution) including indirect impacts having an adverse impact equivalent in nature conservation terms to a loss of >50% of the habitat area.
Medium Magnitude	Loss affecting 20-49% of the habitat area. Other effects including indirect impacts having an adverse impact equivalent in nature conservation terms to a loss of 20-49% of the habitat area.
Low Magnitude	Loss affecting 4-19% of the habitat area. Other effects including indirect impacts having an adverse impact equivalent in nature conservation terms to a loss of 4-19% of the habitat area.
Very Low Magnitude	Loss affecting up to 4% of the habitat area. Other effects including indirect impacts having an adverse impact equivalent in nature conservation terms to a loss of up to 4% of the habitat area.

Table 8.4 Ecological Impact Significance Matrix

Impact Magnitude	Value of Feature					
	International	National	Regional	High local	Moderate Local	Low Local
High	Critical	Major	Moderate or Major	Moderate	Minor or Moderate	Minor
Medium	Critical	Major	Moderate or Major	Moderate	Minor or Moderate	Minor
Low	Critical	Major or Moderate	Moderate	Minor or Moderate	Minor	Negligible or Minor
Very Low	Major or Critical	Moderate	Minor or Moderate	Minor	Minor or Negligible	Negligible

The potential impacts are directly related to the nature of the development and this includes the timescale of the operations as well as the habitat or species affected.

The assessment results, once placed within the temporal context, lead to identification of areas where mitigation is required. Mitigation is then proposed and assessed to identify potential effectiveness and any potential residual impacts, positive and negative that may be associated with the mitigation.

8.4.1.1 Direct Habitat Loss

Potential Impact

This includes the direct loss of habitat from land take. The development will cause both temporary and permanent habitat loss in a number of ways and over a variety of timescales. The area affected is 9.7ha (Tailings Storage Facility and Settlement Pond), 1.5ha (Processing Area and associated Screening Bund) of a mosaic of wet heath, mire and rush-pasture moorland. In terms of the updated NVC survey this relates to a loss of 2ha of acid grassland and flush mosaic, 1.7ha of wet heath, 3.7ha of wet heath and mire mosaic and 3ha of a wet heath, flush, and mire mosaic. Due to the complexity of the habitat each individual area of vegetation has not been mapped.

The approximate percentage within each polygon has however been noted; the indicative split between NVC communities affected is as follows:

Table 8.5 Habitat Composition – Mine Site

Broad Habitat	NVC	Affected Area (ha)
Acid Flush	M6c	0.5
Acid Flush	M6d	0.6
Wet Acid Heath	M15a	0.9
Wet Acid Heath	M15b	6.3
Blanket Mire	M17a	0.7
Acid Grassland	U5c	1.5

The remaining areas affected by development are currently bare or disturbed ground.

The car park at Dalrigh will also be extended resulting in the loss of a small area ($306m^2$) of low grade grassland with no identified sensitivities. The extension will involve a low level of operations comprising levelling and establishment of hardcore.

A new bridge is proposed over the Crom Allt and although this will increase shading over a short section of the Crom Allt but no other effects are predicted. No in-stream works are proposed.

This loss of habitat at the mine site is assessed as being of **low magnitude** due to the abundance of similar habitat in the area. This habitat has been assessed as having **high local value**.

Summary of Proposed Mitigation and Residual Impacts

At the mine site there is a temporary impact on habitat (a similar mosaic of habitats will be established upon cessation of operations within each affected area). The requirement for mitigation is directly linked with restoration proposals (Appendix 7 refers). Early habitat reinstatement will be an integral part of restoration to ensure an appropriate fit of topography and vegetation communities with the surrounding area.

The proposed restoration to a similar habitat range ensures that the potential effect is minimised. It is likely that the habitat mix at restoration will see an increase in *Nardus* grassland, associated with the drier slopes of tailings stacks. *Juncus* dominated flush habitat is also likely to increase, generally along drainage channels between stacks. While the extent of wet heath may reduce slightly, and the distribution of habitats is likely to alter, the overall habitat diversity is maintained. The permeability of the substrate will essentially be unaltered; it is only the change in topography which will affect the habitat at restoration.

The loss of a wet heath, mire and acid grassland is temporary and essentially reversible, on this basis the potential impact is assessed as **minor to moderate**.

With an appropriate construction methods and a scheme of rolling restoration there shall be no net loss of habitat.

Carefully managed restoration shall also include the establishment of further planting adjacent to existing native woodland and in the wider glen (Appendix 9 refers).

Woodland planting within the mine site is proposed and this shall result in a greater diversity of habitats, acting to offset identified impacts in terms of biodiversity.

Within the wider glen further planting is proposed together with management of forestry edges, details of these proposals shall be subject to final agreement through the GCGMP (Appendix 13 refers).

Around twenty-five trees will also be planted around the car park at Dalrigh. Once established, these will enhance the existing community woodland.

In the long term, there will be a **minor beneficial** impact.

8.4.1.2 Severance

Potential Impact

This includes the creation of barriers, which may divide existing habitats or wildlife corridors. This is likely to be a temporary and small scale impact due to the establishment of each tailings stack and placement of tailings. This operational phase in each area may present a barrier – during the lifetime of each stack – between adjacent areas of upland moorland. However it will be possible for animals to move around the operational area at all times. As such, this is assessed as an impact of **negligible** significance.

The development will be stockproof and deer fenced during the operational lifetime. This will have an effect on Deer movements but be beneficial to the habitat within the site allowing restoration to succeed and a natural sward to establish. Reduction in grazing pressures will enable regeneration of heath species in this area, in conjunction with the proposed native woodland planting (ES Section 6 and Figures 6iii and 6iv, Landscape Restoration Plan and Landscape Masterplan refer. Deer will continue to be able to graze the wider glen.

Summary of Proposed Mitigation and Residual Impacts

While it is not possible to entirely avoid this impact, the temporary nature of the barrier and the maintenance of wildlife corridors around the development, reduces the impact to an acceptable level. The potential effects of vehicle movements on the access track, within temporary operational areas and access routes shall be reduced through control of vehicle speed and driver awareness.

Upon final agreement (by those included in a Restoration Group) that the restoration of the site is sufficiently established, fencing may be removed and there shall be no residual severance impact in the wider area.

8.4.1.3 Loss of Life

Potential Impact

This type of impact is normally associated with roads where some creatures may be killed whilst trying to travel along established runs, traditional territory or foraging routes. The potential impact is assessed as being of **negligible** significance. Ground nesting birds represent the only significant potential for loss of life.

Proposed Mitigation and Residual Impacts

The impact on ground nesting birds may be entirely mitigated through the appropriate timing of construction and associated vehicle movements, N.B. this is a legal requirement. Areas of construction activity shall be subject to advanced site works as appropriate, i.e. stripping of soils in advance of the breeding season.

Control of vehicle speeds is essential; this is also a health and safety requirement. With this control in place no residual impact is predicted.

8.4.1.4 Disruption to Local Hydrology

Potential Impact

The development no longer requires the diversion of the Allt Eas Anie. Only artificial site drainage shall be altered with minor reduction in flows in natural watercourses within the affected catchment.

No impact on the wider hydrological regime, or on the associated flora and fauna, is predicted; ES Section 7 refers.

Proposed Mitigation

No mitigation is deemed necessary.

8.4.1.5 Possible Pollution of Habitat

Potential Impact

Possible pollutants include oil, dust and contaminated water. This is controlled through the appropriate construction method statement and operational controls, and as such is assessed as unlikely; therefore the risk, despite sensitive receptors, is **low**.

Proposed Mitigation

Any oil, fuel, lubricant or other potential pollutant shall be located within the plant building (ES Section 7 refers). Emergency spill kits will be maintained on site. Monitoring of water quality and control of discharge shall ensure no residual effects.

8.4.1.6 Physical Disturbance and Noise

Potential Impact

Physical disturbance and noise can impact adversely on flora and fauna within the vicinity of the site.

Physical Disturbance

This relates to disturbance outwith the operational boundary of the site where habitat may be physically impacted if work is carried out in close proximity. All development shall be undertaken within the application boundary and no physical impact on the wider habitat is anticipated. Minor, short-term disturbance may result from operations associated with the GCGMP, including fencing and tree planting; no significant effects on ecology are likely.

Noise

A full noise assessment has been undertaken, ES Section 10 refers. Construction noise shall give rise to short term impacts only.

There shall be no significant surface noise from underground mining operations. Noise from processing operations shall be controlled within the plant building. Additional noise from vehicle movements shall be intermittent and is not considered likely to significantly affect local fauna.

Proposed Mitigation

As no sensitive receptors have been identified no further mitigation is deemed necessary.

8.4.1.7 Dust

Potential Impact

Dust can impact adversely on flora and fauna within the vicinity of the site. The potential impact is assessed as being of **negligible** significance.

Impacts from dust are addressed in ES Section 10. The dust levels during turf removal will be negligible, due to the inherent moisture content. Construction and restoration activities involving the movement of tailings, soils and till, will not give rise to dust emissions, unless in extended periods of exceptionally dry weather due to the inherent moisture content and the prevailing wet climate. Dust levels at all times will be strictly controlled by good site management practices.

No significant impacts are anticipated.

Mitigation

Adherence to Site Dust Management Strategy shall ensure that dust is controlled; water shall be available for dust suppression as required.

8.4.1.8 Peat

Areas of peat have been identified within the development footprint (a soil with a surface layer greater than half a metre thick and composed of more than 60% organic matter). This extends to around 2ha, a total volume of 14,500cu.m. Figure PEAT1 at Appendix 5 refers.

Not all of this will require to be excavated however, around 6,700cu.m shall remain *in situ* beneath the proposed stacks as it lies below the nominal strip depth of 0.4m below ground level. Of the remainder, up to 6,000cu.m is likely to be stripped together with vegetation and the acrotelm and used immediately wherever possible in restoration. It's likely that around 2,000cu.m represents humified, catotelmic peat which may not be suitable for placement on previously disturbed areas for restoration. It has been identified however that there are areas of bare peat within the site which would benefit from enhancement. This could include the deposit of additional peat, if available, and establishing vegetation to prevent further erosion and release of CO_2 into the atmosphere.

The peat volumes associated with each stack footprint are predicted as shown in Table 8.6 below.

Table 8.6 Peat Volumes

Stack No.	Area (m^2)		Volume (m^3)			
	Total	**Peat**	**Vegetation Strip**	**Peat Strip**	**Peat Retained *in situ***	**Total Peat**
Stack 1	6,672	303	91	30	71	193
Stack 2	11,419	4,013	1,204	401	1,469	3,074
Stack 3	14,724	3,261	978	326	1,526	2,831
Stack 4	8,815	940	282	94	344	720
Stack 5	13,053	3,110	933	311	793	2,037
Stack 6	8,577	3,360	1,008	336	1,392	2,736
Stack 7	15,498	2,441	732	244	622	1,598
Stack 8	5,425	193	58	19	38	116
Stack 9	6,331	1,288	386	129	256	771
Stack 10	5,608	986	296	99	166	561
Totals	96,122	19,896	5,969	1,990	6,678	14,636

8.4.1.9 Groundwater Dependent Terrestrial Ecosystems

Some habitat present on site scores highly for groundwater dependency. There is a wide variation of slope and aspect on site currently, the high rainfall and low permeability allow GDTEs to develop on shallow/perched groundwater. The slope conditions, particularly the distribution of slope will be altered by the formation of tailings stacks. The prevailing weather conditions and low permeability of the underlying substrate shall however continue to provide conditions suitable for GDTEs across much of the site. No significant residual effect is anticipated.

8.4.1.10 Aquatic Effects

Mitigation

- Appropriate site management measures to prevent pollution
- In-stream works shall only be undertaken in accordance with an appropriate SEPA authorisation.

- Discharge in accordance with CAR licence.

Residual Impact

None

8.4.1.11 Ornithology

Mitigation

- Best practice fencing: ensuring new fences are sensitively located, not on known black grouse flight paths, using chestnut paling or wooden droppers to minimise collision risk
- Appropriate timing of establishment and construction operations
- Pre-clearance checks to avoid ground nesting birds

Residual Impact

There will be **negligible** adverse impacts on the ornithological resource of the site due to the loss of habitat; there is widespread availability of similar habitat in the surrounding area. Upon restoration, including additional tree cover, there shall be a **minor benefit** in terms of potential ornithological diversity.

8.4.1.12 Otters

Mitigation

- Depending on delay, update survey may be required prior to commencement
- Buffer and/or licence provision as necessary

Residual Impact

None

8.4.1.13 Bats

Mitigation

- Continuing survey

- Provision of refuges as per current species licence
- Additional licence provision as necessary

Residual Impact

Minor adverse impacts are likely in the medium to long term but **beneficial** post closure.

8.4.1.14 Deer Management

There are a number of post-and-wire fences within the proposed development area which do not currently restrict the movement of deer within the mine site. Deer are able to access the site and graze freely.

Current proposals include a fencing scheme (as part of the GCGMP) in order to control deer grazing and restrict their access to an area of around 62ha including the mine site area. This, together with the continued restriction of sheep grazing on the mine site itself shall assist restoration proposals (Figure 6.iv refers). The effect on deer *per se* is not assessed.

8.4.2 Cumulative Effects

Cumulative impacts may result from multiple developments affecting the same ecological receptor. No other development has been identified during the scoping process which may give rise to cumulative effects.

8.5 Conclusion of Ecological Impact Assessment

Desk study and field surveys have established that the site lies within an upland area with high precipitation and a mosaic of habitats including wet heath, mire, acid grassland, bare and disturbed ground, and running water, with coniferous plantation and native woodland close by. The site lies within a somewhat enclosed side valley on the flank of an open U-shaped valley.

The site supports internationally designated bird species albeit forming a small component of their foraging territory. Adjacent to the site there are two designated areas of international significance although this assessment finds that there shall be no significant impact on any qualifying feature. Broad habitats within the site area and its environs are of high local importance and the site supports two European Protected Species (otters and bats; as part of their habitat requirements).

Mitigation includes progressive restoration and habitat enhancement as well as standard good practice to prevent pollution or unnecessary disturbance to species or to areas outwith the development footprint. This assessment concludes that taking the nature of the development, together with proposed mitigation measures including a sensitive restoration scheme, there shall be no significant impact on natural heritage.

8.5.1 Consideration Against the Planning Baseline

The currently permitted scheme was assessed as being acceptable in relation to the likely ecological effects. The current proposal reduces the duration of construction, as well as the degree of physical alteration to the topography and substrates across the mine site. A similar total area is affected but allowing a far greater extent of progressive restoration to be undertaken during the operational phase. The permitted scheme introduced substantial elements of bare rock and larger water bodies. The diversion of the Allt Eas Anie represented a considerable civil engineering project, in itself, which is no longer necessary.

The same extent of tree planting is proposed at both the car park at Dalrigh and at the mine site, and all the benefits associated with the GCGMP shall be retained as an integral part of the current proposal.

The duration of the proposed development may increase (in the event that the production rate does not increase as planned) but considering the extent of disturbance as well as the duration of disturbance, the current proposal is assessed as an improvement in terms of ecological effects.

9 EMISSIONS AND BLASTING

9.1 Introduction

The Scoping Request noted that the effects of noise would be assessed in relation to specific topic chapters such as Ecology and Recreational Access. The Scoping Response accepted that no detailed ES chapters were necessary for noise or dust. The effects of blasting are also considered within this chapter.

Previous assessments have shown the principle of the development to be acceptable in terms of emissions. The nature of the underground operations has not altered and previous blasting assessment remains valid. It is worth noting that the proposal no longer necessitates surface blasting to form the Allt Eas Anie diversion. Updates in relation to noise and dust are provided, considering the alteration to the management of tailings and the associated surface operations proposed at the site. Potentially sensitive locations are illustrated at Figure 9.1.

9.2 Noise

To evaluate the potential noise impact associated with the previous applications to operate the mine, a full assessment was commissioned in 2009. This was undertaken by Vibrock Ltd, a national independent firm of environmental consultants. A study of the ambient noise levels at nearby sensitive locations was carried out, noise levels were predicted based on plant deployment for the proposed operations in 2011. Vibrock was then commissioned to update this assessment for each subsequent proposal for operations at Cononish. The applicant commissioned an update in relation to this current proposal and the letter-form report is attached at Appendix 8 together with the 2011 assessment and 2014 addendum for ease of reference.

9.2.1 The Measurement of Noise

Noise levels are expressed in decibels (dB). The levels are adjusted in terms of frequency to reflect the sensitivity of the human ear and expressed as dB(A). Table 9.1 gives typical noise levels in terms of dB(A) for common situations.

Table 9.1 Common Noise Levels

Approximate Noise Levels dB(A)	**Example**
0.0	Threshold of hearing
30.0	Rural area at night, still air
40.0	Public library
50.0	Quiet office, no machinery
60.0	Normal Conversation
70.0	Inside a saloon car
80.0	Vacuum cleaner
100.0	Pneumatic drill
140.0	Threshold of pain

The decibel scale is a logarithmic scale and therefore when two noise sources each of 40dB act together the resultant is not 40 + 40 = 80 dB, but rather 40 + 40 = 43 dB. This 3dB increase represents a doubling of sound energy, but would only just be perceptible to the human ear.

9.2.2 The Existing Situation - The Site Context

Environmental noise nuisance can be considered to be caused when unwanted noise intrudes into the existing environment. Potential noise arising from the proposed development must therefore be considered in terms of the existing situation, which may vary at different locations around the area of the proposals.

The L_{Aeq} or A weighted continuous noise index averages the noise energy over a period. It is the level of steady sound of equivalent noise energy and is referred to as the ambient noise level.

The L_{A90} index represents the noise level exceeded for 90% of the measurement period i.e. the quieter parts of the measurement period, and is referred to as the background noise level.

Noise measurements were carried out by Vibrock Ltd, specialist noise consultants, on Monday 30th November and Tuesday 1st December 2009 to determine the existing background noise climate in the vicinity of the mine area. Monitoring was carried out at Cononish Farm and on the footpath to Ben Lui. Technical details of the survey methods and instrumentation may be found in Appendix 7. Figure 9.1 shows the proposed development and the noise monitoring locations. There has been no change in activity within the glen that could give rise to changes in background levels.

9.2.3 The Proposed Operations

The proposal is detailed at ES Section 3. It is proposed that underground mine operations shall be undertaken on a 24 hour a day basis with processing being undertaken 24 hours a day, Monday to Saturday (with no operations on public holidays). Construction operations shall be undertaken between 06.00 and 21.00 Monday to Saturday (and not on recognised public holidays). Haulage of minerals from the site or acceptance of deliveries between 08.00 and 18.00 Monday to Saturday inclusive (and not on Sundays or recognised Scottish Public Holidays.

Tailings will be produced by the processing of ore and a stockpile shall be formed to the north of the plant building. These mining wastes shall then be hauled to Tailings Storage Facilities (TSF) or 'tailings stacks', generally one return vehicle movement per hour during daytime hours. The tailings shall be placed and compacted in 300mm layers, generally 5-10 minutes of compaction per day, during daytime hours. Upon completion of each tailings stack the tailings shall be subject to restoration and naturalistic vegetation be established as soon as practicable.

Each of the ten stacks shall be formed and restored sequentially; working corridors shall also be restored once each stack or group of stacks is complete and restored.

At the cessation of mining the plant and processing building shall be decommissioned and the site subject to final restoration. A fiver year aftercare period shall be applied to each restored area and ultimately to the entire site, upon mine closure.

Typical Construction Site Noise Criteria

Table 9.2 details noise conditions that have been applied to construction projects to avoid undue annoyance to local residents. Noise limits that are not to be exceeded are lower at times of the day when residents may be more sensitive to noise, which reflects the guidance given in BS 5228.

Table 9.2 Indicative Noise Limits for Construction Sites

Period	Hours	L_{Aeq} (Db)	L_{Amax} (dB)
Monday to Friday	0700 - 0800	65	73
	0800 - 1800	70	85
	1800 - 2100	65	73
Saturday	0700 - 0800	65	73
	0800 – 1300	70	85
	1300 - 2100	65	73
Sunday	0700 - 0900	50	58
	0900 - 1700	65	73
	1700 - 2100	50	58
Nights	2100 - 0700	45	55
Unattended Plant		45	55

9.2.4 Noise at Recreational Areas

It is considered that during the relatively short-lived construction phase, the noise criteria in place to safeguard the amenity of residents at their homes would be applicable to recreational users as their exposure to noise would be of short duration.

Once the mine is operational there will be less obvious signs of activity and a criterion of 65dB $L_{Aeq,1h}$ is proposed as being appropriate. The 65dB limit is recommended within Planning Advice Note (PAN) 50, Annex A: The Control of Noise at Surface

Mineral Workings, which recognises that *"open spaces which the public uses for relaxation may be considered to be noise-sensitive in some circumstances"*. With regard to guideline noise limits the document states that *"the limits would not be expected to be as low as at dwellings, and it is suggested that 65 dB* $L_{Aeq,1h}$ *during the normal working day and 55 dB* $L_{Aeq,1h}$ *at other times would be reasonable"*. PAN 50 Annex A considers that footpaths and bridleways should not normally be regarded as noise sensitive.

9.2.5 Methodology and Predictions

Having carried out a survey of existing noise levels, predictions were made of noise levels which could occur at these locations due to the operations associated with the proposed mine development.

Predictions of noise from the proposed development were made in accordance with the guidance given in BS5228-1: 2009, "Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise" which incorporates recommendations made in Planning Advice Note (PAN) 50, Annex A, "The Control of Noise at Surface Mineral Workings" which was issued in 1996.

The level of noise that arises from a development site shall depend on a number of factors. These include:

- The sound power levels of the plant or equipment used on site;
- The periods of operation of the plant on site;
- The distance between the noise source and the receiver;
- The presence or absence of screening effects due to barriers, or ground absorption; and
- Any reflection effects due to facades of buildings etc.

Site operational conditions are set out in detail in Section 3 of this Environmental Statement.

Knowing the sound power levels of individual noise sources, the distance of operation from the nearest properties and the topography of the site, the resultant sound pressure levels in the vicinity can be calculated in terms of the hourly L_{Aeq}. Details of static plant measurements and plant sound power levels are presented in Table 1 of the 2017 Noise Update, Appendix 8 refers.

Tables 2.1 to 2.3 of the Update (Appendix 8) compare the measured ambient and background levels from with the worst case predicted noise levels at the same locations arising when all plant is operating at the closest point to each property. Table 2.1 includes consideration of the trigger levels calculated in accordance with BS 4142:1997.

9.2.6 Discussion of Results

It should be noted that worst case scenario predictions given are of operations being undertaken at their closest distances to sensitive locations and therefore have the greatest influence on the noise levels at these locations. These levels may only last for a few weeks or even days throughout the envisaged working life of the proposed development.

Location 1: Cononish Farm

The highest predicted noise level at Cononish Farm due to the operations associated with the proposed gold mine is 54 dB $L_{Aeq,15min}$. This worst-case noise level is predicted on the basis of 15 min reference time in accordance with BS4142: 2014. This reference time, and prediction only relates to night time operations and including the placement of tailings.

The extraction of material from the mine and associated processing is predicted to generate a worst-case noise level of 50 dB $L_{Aeq,1h}$ at Cononish Farm.

In order to ensure that this level of 50 dB L_{Aeq} is not exceeded no tailings placement in proposed during night time hours. The predicted noise level at Cononish Farm may therefore be kept below the World Health Organisation limit of 50 dB L_{Aeq}, recommended to protect the majority of people from being moderately annoyed during the daytime.

Locations 2 and 3: Footpath to Ben Lui and Eas Anie

The highest, worst-case, noise level predicted on the Ben Lui footpath is 46 dB $L_{Aeq,1h}$.

It should also be considered that any exposure to noise emanating from the mining activities would be transient to walkers on the Ben Lui footpath.

The highest predicted noise level at the Eas Anie waterfall is 49 dB $L_{Aeq,1h}$.

At no time do the worst-case predicted noise level exceed the PAN 50 recommended limit of 65 dB $L_{Aeq,1h}$ for recreational areas.

9.2.7 Potential Impact and Mitigation

9.2.8 Noise from Site Operations - Proposed Noise Limits

Potential Impact

Noise from the proposed operations could have an impact on the environment and amenity, particularly for residents at Cononish Farm or recreational visitors.

Mitigation

Consideration has been given to the residential property at Cononish and areas or recreational interest, the footpath to Ben Lui and Allt Eas Anie Waterfall.

Construction works associated with the processing building and plant erection are estimated to require a period of six months. The predicted noise levels generated during these periods accord with those generally accepted for construction operations.

The predicted noise levels from the mine operation and the construction of the tailings stacks comply with the levels recommended by the World Health Organisation.

The predicted noise levels at open space used for recreational purposes meets the criteria recommended in PAN 50 Annex A.

9.2.9 Site Traffic

Potential Impact

On-site and off-site traffic has the potential to cause disturbance at residential properties through engine noise.

Mitigation

Vehicle movements associated with the mine development have been assessed; this includes the transportation of ore to the processing building and the transportation of tailings to the tailings stacks, and despatch of concentrate. Traffic movements attributable to employees shall be minimal due to the proposed use of a park and ride facility. No significant impact is anticipated.

9.2.10 Control Measures

The following control measures shall be implemented to minimise noise nuisance:

Embedded mitigation:

- the strategic location and layout of the process plant and building
- the use of acoustically clad processing plant building
- the formation of a landscaped bund to maximise the effect of screening
- the reduction in construction activity – removing the TMF and recirculation pond embankments and the Allt Eas Anie diversion

Operational mitigation measures (including those proposed at Section 7 of Vibrock report ref. R14.6123/ADD/2/RK, where relevant):

- vehicle reversing alarms shall automatically adjust to operate at a pre-determined level above the prevailing ambient noise level;
- all plant shall be properly maintained to ensure the integrity of silencers, lubrication of bearings etc;

- plant noise levels shall be checked on arrival on site and periodically thereafter.
- all openings of the processing building, including windows and doors, should be kept closed where possible when the plant is operational.
- the plant feed hopper should be lined with rubber to reduce the potential of impact noise generated by material hitting the sides.
- the potential break-out of noise through vents, louvers and openings should be considered, ensuring sound attenuating vents are used where appropriate.
- the resident of Cononish Farm should be informed in advance of any operations within the vicinity of the property that could potentially cause disturbance.
- a noise complaint procedure should be implemented to ensure that any complaint is investigated thoroughly and effectively, informing the complainant of any mitigation measures that may take place as a result of the complaint.
- no construction activities should take place within 350m of Cononish Farm during the period 0600 – 0700 hrs.

9.2.11 Management

The Site Manager shall be the person responsible for ensuring that the noise management strategy is enforced, at all times.

All site staff, including contractors, shall receive appropriate training to ensure that employees are conversant with the site noise control strategy and the need to be noise vigilant, at all times.

9.3 Air Quality

The assessment of potential dust nuisance was undertaken by Dalgleish Associates Ltd using the guidance set out in The Environmental Effects of Dust from Surface

Mineral Workings (Department of Environment, 1995), Planning Advice Note 50 (PAN 50 1996) and PAN 50 Annex B: The Control of Dust at Surface Mineral Workings 1998.

This assessment considers:

- an evaluation of existing conditions;
- an evaluation of potential dust sources and mitigating measures; and
- the identification of potential dust sensitive receptors and an assessment of the potential dust emissions associated with the proposed operations at these locations

9.3.1 The Existing Situation

The site is situated in rural Perthshire; the surrounding landscape is predominantly open upland with rough grazing, there are forestry/woodland features and a number of watercourses in the area. The closest residential property is Cononish Farmhouse which is located some 60m to the east of the application boundary.

The existing local dust climate is potentially influenced by emissions from the bare ground at the mine platform and from the existing access tracks for the mine and farm. No dust impacts have been identified during the Bulk Processing Trial, which is currently operational.

9.3.2 Proposed Development

The proposal is detailed at ES Section 3.

The production of airborne dust can arise from point sources, from within the processing building, or as a result of activities outside. External sources of dust will be subject to the effects of climatic conditions; rain, wind and the drying capacity of the air are all important. Dust production from enclosed sources, such as the crusher, is largely independent of such climatic factors.

Mining operations at Cononish have the potential to produce dust from a variety of sources and activities associated with the:

- haulage of ore from the mine portal to the ore stockpile
- stockpiling and transfer of ore to the processing plant
- processing of ore
- stockpiling of tailings
- loading and haulage of tailings
- placement, compaction and storage of tailings within tailings stacks
- haulage of concentrate, delivery of materials and movement of light vehicles on the mine access track.

9.3.3 Dust

The term *dust* (BS 6069 Part 2) is used to describe particles between 1μm and 75μm in diameter - that is between one millionth of a metre (1 micron) and 75 millionths of a metre. They originate through the action of crushing and abrasive forces on materials. Depending upon the chemical composition dust can be chemically active e.g. limestone, or effectively inert e.g. sand. The colour varies through brown to white.

The process by which dust becomes airborne is referred to as 'dust emission' (or 'dusting'). It occurs through saltation of particles across a surface or suspension of particles and their entrainment in airflow. Wind has the potential to lift dust particles from surfaces depending upon the speed of the wind, the condition of the surface and size of the particle. Tipping of materials leaves particles exposed to wind blow as they fall through the air.

PAN 50 Annex B advises that large dust particles (greater than 30μm) make up the greatest proportion of dust emitted from mineral workings and will largely be deposited within 100m of sources. Intermediate sized particles (10-30μm) are likely to travel up to 250-500m. Smaller particles (less than 10μm), which make up a small proportion of dust emitted from most workings, can travel up to 1km from sources.

The release of dust to the atmosphere and its resultant spread is very weather dependant and as a result the amount of dust deposition can vary greatly over a short period of time. This variation is quite normal in urban and rural environments; though it is perhaps more relevant in rural environments due to seasonal ground conditions and agricultural activities.

A study has been published (Warren Springs Laboratory), which relates typical dust deposition rates (in milligrams per square metre per day, $mg/m^2/day$) to various localities nationally and these results are summarised in Table 9.3, below.

Table 9.3 Typical UK Dust Deposition Rates

Location	Long Term Average $mg/m^2/day$	Monthly Ranges $mg/m^2/day$
Rural	40	15-201
Town Outskirts	68	29-301
Town Centre	100	35-340
Industrial	206	97-293

The figures show, for example, that long term averages for dust deposition in rural areas are lowest, but nevertheless short-term events (monthly range) are comparable with urban and industrial deposition rates. Cononish is located in a rural environment where long term average dust deposition rates of 40 $mg/m^2/day$ may be expected. Short term events can occur, however, (such as agricultural activities in dry, windy conditions) with deposition up to five times that amount.

9.3.4 Climatic Conditions

Weather conditions are important in the consideration of the potential for dust generation from any ground disturbing activity. The prevailing meteorological conditions of any site will be dependent upon several factors including its location and local topography.

Western Scotland experiences a maritime climate. According to soil Survey Scotland (1982) the weather systems are controlled by three main air sources which are variable in intensity and frequency. Heavy continuous rain is produced by depressions that originate from the Azores high pressure area, cooler north Atlantic air brings showers to the coastal lowlands and air streams from the polar regions bring clear skies and intensely cold weather with occasional snow. The main features of a maritime climate are a small annual variation in mean air temperature, high wind speeds at sea level, and a high rainfall fairly evenly spread throughout the year.

Rainfall

Climatological information for the site is based on data from the Flood Estimation Handbook produced by the Institute of Hydrology (2009). Long term averages for the site catchment area have also been provided by the Met. Office for the Cononish site station. The annual average rainfall from 1941 – 1970 is 3117mm and for the period 1961 – 1995 is 3143mm.

The periods during which the risk of dust generation is likely to be highest are when potential evaporation exceeds rainfall and drying conditions result. Seasonal rainfall distribution usually shows the driest months in spring and early summer. These months must be considered times of greatest potential for dust arising due to moisture deficits in surface materials, either in particulate matter within the tailings management facility or unbound surface areas.

Wind

Wind is a significant meteorological factor in that the wind direction determines the transport of fugitive dust and wind speed affects the pick-up of fugitive dust and the distance it is carried from source.

Met. Office data on wind speed and direction from the closest recording station at Rannoch, which is located some 20km to the north-east and is considered to be generally representative of conditions at Cononish, indicate that for more than half the time wind speeds are in the range of 3.5-8m/s, winds less than 3.5m/s occur for one third of the time and only 10% of winds exceed 8m/s. However 5% of the winds during winter months, November to December, exceed 11m/s. The prevailing wind is west to south-west for around 27.1% of the time with a secondary wind coming from the north-east to east for 13.6% of the time. The prevailing wind is particularly dominant from July to November, occurring on average 39.5% of the time, whilst the easterly wind is most dominant in February and May, occurring 23% and 19.7% of the time respectively.

If similar wind speeds occur at Cononish, they can initiate dust blow, providing other conditions are suitable.

9.3.5 Potential Impacts and Mitigation

Potential effects from dust may relate to nuisance, health or ecology and may result from activity associated with different phases of the development: establishment and construction; operations and progressive restoration; decommissioning and final restoration.

9.3.5.1 Nuisance

The effect on neighbouring properties is measured principally in terms of potential to cause a significant nuisance. Annoyance and the loss of amenity can result as dust falls out, usually as a visible thin layer, causing the discoloration of buildings, interference with the enjoyment of outdoor leisure, increased washing of windows, problems with drying washing outdoors, and increased cleaning of surfaces. Most dust is deposited close to its source, as the larger, heavier particles are not carried very far by the wind.

The areas from which dust can arise from operational procedures shall be identified and subsequently dust emissions shall be controlled at source by water suppression. Particular attention to dust suppression shall be paid during dry spring and early summer periods.

9.3.5.2 Health - PM_{10} Mineral Particulates

The nuisance effects of dust are usually measured with reference to dust deposition or soiling, whereas the effects on health centre on the effects of inhalation and respiration of fine airborne dust particles, especially the smaller size fractions e.g. PM_{10} (small particles, 10 microns and less in diameter).

PAN 50 Annex B advises that smaller particles, 10 microns and less in diameter, may travel up to 1km from sources. However, it is also noted that these smaller particles make up only a small proportion of dust emitted from most workings.

No PM_{10} monitoring has been carried out in the vicinity of the site. Reference has therefore been made to the Scottish Air Quality Database, which provides projections of background concentrations for each 1km x 1km of Scotland. The data for the 1km grid square that contains the proposed site gives a projected PM_{10} concentration of 7.41μg/m^3 for 2010 and 7.20μg/m^3 for 2015. Published research (the 'Newcastle Report') suggests that an additional loading of 2μg/m^3 be attributed to site operations. On the basis of an addition loading of 2μg/m^3 of PM_{10}, the daily mean objective for PM_{10} set in The Air Quality (Scotland) Amendment Regulations 2002 would not be compromised.

9.3.5.3 Effects upon Vegetation and Grazing Livestock

Detailed chemical assessment of the tailings has been undertaken and is set out in Appendix 4.E.

The tailings are chemically inert and, with a pH of 4.5, similar to many of the surrounding soils. Chemical analysis has confirmed that all metal concentrations shall be within the normal soil range and well below the levels at which toxicity is considered possible. Metal concentrations shall be comparable with the existing range of soil concentrations at Cononish.

In dry windy conditions, without mitigation, there is potential for the wind to pick up and disperse particles of dust from the surface of the active tailings stack (i.e. during placement). Analysis has demonstrated that the chemical composition of the tailings is similar to many of the surrounding soils. As such, dust blow from the tailings stacks shall not raise the existing natural levels of metals in the surrounding soils by any appreciable quantity. Most plant and tree species are relatively dust tolerant and no species have been identified where dust deposition would have any significant effect. Having consideration of the likely levels of dust emission and climatic variables, the potential impact of dust on flora is assessed as negligible.

Only a limited proportion of any potential dust blow could be deposited outwith the site boundary. In view of the prevailing winds, and the separation distance which is in excess of 400m at the closest point, it is considered unlikely that any significant quantities of dust will be carried towards Ben Lui SSSI/SAC/NNR, the River Tay SAC or the SSSI at Coille Coire Chuilc.

Consideration has also been given to the effects of tailings dust deposited upon the leaves of vegetation and subsequent ingestion by grazing livestock. A variety of variables is involved, such as the amount of material eaten, the age and size of the animals, the period over which grazing takes place and the accumulative effect of each element.

The large number of rain-days per year (250-300) should ensure that dust particles deposited on leaves are unlikely to accumulate and should quickly be washed from the leaves. Furthermore, it has previously been established that the concentration of metals within the tailings are within the range found in the Earth's crust (Appendix 4 refers). No significant impact is anticipated with respect to livestock or wildlife.

9.3.5.4 Establishment and Construction

Dust generation during this phase will be entirely as a result of construction activities and traffic movement around the site. The dust will be of essentially natural origin produced during the soils/till/rock moving exercise. The materials' inherent moisture content will help mitigate dust generation. Dust concentrations will not be high, will only be of a temporary nature, and will be dispersed over a very limited area. Rock placement, to form basal drains in each stack area may require damping if undertaken during extending dry periods, although geotextile covering is proposed which will also mitigate dusting potential. Impacts are anticipated to be negligible.

9.3.5.5 Operational Phase

During this phase potential sources of dust are:

- mine ventilation system after blasting;
- ore breaking, crushing and milling;
- roadways and traffic movement; and
- tailings management facility.

Mine Ventilation System after Blasting

Dust generated by drilling and blasting operations in the mine at the end of each shift will not be extensive. Using a figure of 24g dust/tonne of ore blasted, the total dust produced per day will be 12kg. This will be well diluted by the throughput of air (28-40m^3/s) and dust particles will also be absorbed onto the wet sides of the mine, so that external emissions will be minimal and only of short duration each day. The potential for a dust impact is assessed as negligible.

Ore Breaking, Crushing and Milling

The crushing and processing of ore will create dust. Any dust generated from the crushing and grinding of the ore will be contained within the process plant building and will be removed from the atmosphere by a pulse jet dust collector, or similar, this being required to satisfy COSHH occupational exposure limits for operative. As such the principal source of a dust event relates to the potential for an operational failure of the dust collectors; this can be mitigated against be regular maintenance and systematic monitoring of operations. Accordingly, the potential for a dust impact is assessed as negligible; all subsequent processes are wet, with no further potential for dust generation.

Roadways and Traffic Movement

A certain amount of fugitive dust might be expected to be generated from conveyors and site roadways. However, the high levels of rainfall experienced on site (annual average rainfall is around 3100mm with 250-300 rainy days per year) will tend to keep dust sources damp. Should it be considered necessary, through on-site monitoring, additional dampening shall be undertaken as required. The access routes to stack areas shall be subject to regular monitoring as these temporary routes have the greatest potential for increased dusting during dry periods. Transportation of materials off-site is very limited (an average of around 2 vehicles daily). Materials shall be fully enclosed during transportation. The potential for a dust impact is assessed as negligible.

Tailings Storage Facility

The tailings stacks have the potential to generate dust and the potential effects have been investigated with respect to agricultural land; plants and livestock.

The principal factors that affect dust generation ('dusting') relate to particle size distribution within the tailings, the inherent moisture content of the material and the effects of compaction.

The low clay content of tailings will reduce the potential for dust generation and the tailings shall retain a moisture content of around 16%. Although surface drying may occur following placement, compaction will be undertaken daily which will reduce the potential for this drying effect. Should it be considered necessary, through on-site monitoring, additional dampening shall be undertaken as required.

Progressive restoration works are not likely to be dust generating as natural materials will be appropriately stored to maintain their moisture content. This progressive restoration of tailings stacks shall also mitigate the potential for dusting in the longer term as vegetation shall be established on stacks.

9.3.5.6 Decommissioning Phase

The principle sources of dust during this phase will be from dismantling of plant and machinery, and traffic movement.

Restoration works are not likely to be dust generating as natural materials will be appropriately stored to maintain their moisture content.

The dismantling of plant and the associated vehicle movements shall be of short duration. The inherent moisture content in soils/till will help mitigate dust generation. Dust generation from replacement of soils is likely to be of a short duration, of low magnitude and comparable to the normal agricultural activities which may be undertaken in rural areas.

9.3.6 Control Measures

The Scottish Office Guidance PAN 50 Annex B includes a summary of dust control measures they consider should be observed by operators. These recommendations reflect the advice contained in the DoE Review of Good Practice (1995). These measures shall be implemented as standard practice at Cononish and will be included in the Dust Management Strategy with consideration given to:

- site layout;
- method of working and dust control measures to be adopted;
- site management systems; and
- monitoring and response procedures.

9.3.6.1 Site Dust Management Strategy

With the emphasis on the use of best practice to maintain acceptable site dust levels, identification of dust sources and the most appropriate mitigation must be considered within overall site management practices. A Dust Management Strategy has therefore been developed which adopts the principles of prevention and containment and includes the following control measures in order to minimise dust nuisance:

- Dust collection systems within the processing plant building shall be serviced and inspected on a regular basis;
- An adequate supply of water shall be made available for dust suppression;
- All vehicles used for the movement of materials within the site shall be equipped with exhausts pointing away from the ground;
- All relevant heavy plant shall be fitted with radiator fan deflector plates;
- If, in extreme adverse conditions the aforementioned measures are not adequate, the following action shall be taken:
  - (a) Restriction on the speed of vehicles on site;
  - (b) Temporary cessation of activities giving rise to concern.

The following measures shall be adopted to ensure effective day to day dust management during operational periods:

- The project manager will be the responsible person for ensuring that the dust management strategy is enforced. In his absence, a suitable competent person will be nominated.
- Regular visual inspections of dust conditions will be undertaken by site staff. The frequency of inspections will be determined daily, in accordance with prevailing conditions.
- Regular visual assessments of dust emissions will be made daily by site supervisory staff and remedial actions initiated as necessary. The results of such monitoring will be recorded in a daily log book.
- Site management will give attention to advance weather forecasts and organise dust management requirements accordingly.
- In the event of a complaint concerning dust emission, the site manager shall immediately undertake an investigation and instigate any necessary remedial action.

9.3.6.2 *Activities Regulated under the Environmental Protection Act (EPA), the Pollution Prevention and Control Regulations (PPC) and COSHH Regulations*

The Pollution Prevention and Control Regulations were made by the Scottish Parliament in September 2000. The Regulations shall, in phases, cover the control of all processes which have the potential to cause pollution.

Where operations are carried out under the PPC Regulations the process must be authorised. Authorisations are issued by the Scottish Environment Protection Agency (SEPA). On-site operations which shall be controlled by SEPA relate to the crushing and milling of ore bearing rock.

The COSHH Regulations require assessments to be made by competent persons to enable a valid decision to be made as to the steps necessary to control substances hazardous to health in the workplace. Dust is included in the Regulations and where it cannot be guaranteed that exposure limits are not being exceeded, or that particular control measures are working properly, a regular monitoring programme has to be implemented in order to identify the levels of dust to which employees are being exposed. It follows that, if exposure limits are being complied with on-site, it is unlikely that unacceptable dust concentrations will be experienced at the nearby residential property.

9.3.6.3 *Non-Regulated Sources*

In respect of non-regulated sources, the proposed measures have been designed to control the generation of dust from specific activities with regards to:

Soil/till/peat/vegetation Stripping and Storage: Where necessary, haul routes shall be dampened, any soil/till storage mounds shall be accessible for water spraying and shall be turved and/or seeded to provide ground coverage at the earliest opportunity.

Tailings Stacks: The surface of the deposition area shall be maintained in a moist condition by water spraying, as necessary. Compaction shall be undertaken daily and restoration as soon as practicable.

9.3.6.4 Natural Mitigation

The general area has a high annual rainfall of around 3100mm which is spread relatively evenly throughout the year. Discussions with the Met. Office as to the sensitivity of their recording instruments and logged weather data indicate that 'trace' or 1mm rainfall may represent, for example, a summer shower, where puddles may form on the ground. It is considered that this amount of rainfall will act effectively on fine dust in the air and substantially wet particles of earth or rock.

9.4 Blasting

9.4.1 The Proposal

No change to underground working is proposed and as such previous assessment of mine blasting remains valid. No surface blasting is now proposed as the requirement to divert the Allt Eas Anie has been removed; the diversion having been proposed in a rock channel. Some minor surface works may be required.

The previous assessment undertaken by Vibrock to inform the 2011 application is appended for ease of reference, Appendix 9 refers.

9.4.2 Guidance

The Quarries Regulations 1999, which came into force on 1 January 2000, revoked the Quarries (Explosives) Regulations 1988 and the Miscellaneous Health and Safety Provision Regulations 1995 and is now the main control over blasting operations at mineral workings.

Part 3 of the Environmental Protection Act 1990 places a mandatory duty on local authorities to investigate any complaints of nuisance and then take action where a nuisance is found. This includes nuisance from noise emissions and vibration. The relevant British Standards are:

- BS 6472 Guide to Evaluation of Human Exposure to Vibration in Buildings; and
- BS 7385 Evaluation and Measurement for Vibration in Buildings.

The Scottish Executive Development Department Planning Advice Note 50 (PAN 50) Annex D: "The Control of Blasting at Surface Mineral Workings" was published in February 2000 and "*provides advice on how the planning system can be used to keep blasting from surface mineral workings within environmentally acceptable limits".* Whilst specifically focussed on surface mineral workings the guidance on vibration is equally applicable to underground workings and is considered to constitute best available guidance.

Paragraphs 12 – 36 discuss ground vibration and address issues such as measurement, magnification levels, frequency, human response, effects on structures and prediction. Paragraph 13 states: *"that it is always in the operator's interest to reduce both ground and airborne vibration from blast events to the minimum possible for any specific blast design because it is this that substantially increases the efficiency, and therefore, economy of blasting operations".*

Paragraphs 37 – 54 discuss air overpressure giving consideration to measurement, human response and the effects of topography, meteorological conditions and blast design. It is acknowledged that: *"due to the unpredictable and uncontrollable effects of prevalent atmospheric conditions, air overpressure cannot be determined with any degree of accuracy"*. Therefore: *"minimising air overpressure at source, such that, even under unfavourable weather conditions, all such energy is within acceptable criteria at distance, remains the best practicable approach".*

The report recognises the limitations of blasting stating that: "virtually all aspects of blast design can affect the performance and efficiency of a blast and therefore the resulting vibration levels generated at source". In recognition of this fact blast levels are usually designed with a 95% probability criterion. Paragraph 84 advises that: "the values chosen should recognise the fact that blasts in practice must be designed so that the intended level of confidence is rarely approached or exceeded. In theory therefore, blasts must be designed for mean or average vibration values around half of the 95% confidence level. In practice, more values will in fact be generated below this average value".

Paragraph 86 recommends that: "Generally, individual blasts should not exceed $12mms^{-1}$. Average levels should not exceed $10mms^{-1}$, and usually will be below $6mms^{-1}$ in 95% of all blasts. These levels conform to BS 6472, 1992 and BS 7385, Part 2: 1993".

9.4.3 Potential Impacts

9.4.3.1 Ground Borne Vibration

When an explosive detonates within a borehole stress waves are generated causing localised distortion and cracking. Outside this immediate vicinity, however, permanent deformation does not occur. Instead, the rapidly decaying stress waves cause the ground to exhibit elastic properties whereby the rock particles are returned to their original position following the passage of the stress waves. Such vibration is always generated even by the most well designed and executed blasts and will radiate away from the blast site attenuating as distance increases. With experience and knowledge of the factors which influence ground vibration, such as blast type and design, site geology and receiving structure, the magnitude and significance of these waves can be predicted at any location.

9.4.3.2 Measurement of Ground Vibration

Much research has been undertaken, both practical and theoretical, into the damage potential of blast induced ground vibration, by the United States Bureau of Mines (USBM), Langefors and Kihlstrom in Sweden and by Edwards and Northwood in the UK. All have concluded that the vibration parameter best suited as a damage index is particle velocity. Studies by the USBM have also shown the importance of adopting a monitoring approach which includes frequency.

The four interrelated parameters that may be used to define ground vibration at any one location are therefore: displacement (in mm), velocity (mm/sec), acceleration (mm/sec^2) and frequency measured as oscillations per second, measured in Hertz (Hz).

The peak particle velocity measurement is the basis for all recognised satisfactory vibration levels with respect to damage to structures and human perception.

9.4.3.3 Human Perception Levels

The human body is very perceptive to vibration and levels as low as 0.5mms^{-1} may be felt by individuals in some circumstances. Normally individuals become aware of blast induced vibration at levels of around 1.5mms^{-1}, but once an individual's perception threshold is attained, complaints can result from 3% - 4% of blasts, irrespective of their magnitude.

Most complaints arise over concerns of possible damage to property due to blasting. The British Standards Institution document BS6472:1992, British Standard Guide to Evaluation of Human Exposure to Vibration in Buildings (1Hz – 80Hz), covers these perceptive effects and also concludes that a satisfactory magnitude of blasting vibration at residential type property is 8.5mms^{-1} at a 90% confidence level, with an absolute limit of 12.7mms^{-1}.

9.4.3.4 Structural Damage

British Standard 7385: Part 2: 1993, Evaluation and Measurement for Vibration in Buildings, entitled "Guide to Damage Levels from Groundborne Vibration" gives guide values to prevent cosmetic damage to property, these being 20mm/sec at a frequency of between 4Hz and 15Hz, and 50mms^{-1} at 40Hz and above. The British Standards Institution's structural damage committee have investigated blast induced vibration with respect to its damage potential and found no evidence of any blast induced damage at levels less than those recommended above. It should be noted that the duration of the vibration can have a marked effect on structural response and may give rise to magnification due to resonance within the structure. Consequently, for continuous vibrations, the values above may need to be reduced by up to 50%, especially at the lower frequencies.

Daily environmental changes and domestic activities can cause levels of induced strain greater than that induced by blasting activities. Typical domestic activities will produce strain levels corresponding to vibration of up to 20mms^{-1} and greater. It is for this reason that many domestic properties will exhibit cracks that may be wrongly attributed to blasting activities. Although dealing with surface blasting, the Department of Transport and Regions (DETR) publication: "The Environmental Effects of Production Blasting at Surface Mineral Workings" 1998 usefully details vibration levels and air overpressure values with corresponding everyday activities that would produce similar levels at or within property (Table 9.4 refers).

Table 9.4 Vibration Levels Generated by Everyday Activities

Vibration Level	Activity
1.0 – 2.5 mms^{-1}	Walking, measured on wooden floor
2.0 – 5.0 mms^{-1}	Door Slam, measured on wooden floor
12 – 35 mms^{-1}	Door Slam, measured over doorway
5 – 50 mms^{-1}	Footstamp, measured on wooden floor
30 – 70 mms^{-1}	Daily changes in temperature and humidity
120dB	Constant wind of 5ms^{-1}, Beaufort Scale 3, Gentle Breeze
130dB	Constant wind of 8ms^{-1}, Beaufort Scale 4, Moderate Breeze

9.4.3.5 Air Overpressure

Airborne pressure waves, of a transient nature, are generated when a blast is set off. As the air pressure wave spreads out from the blast location, and passes a receptor (either a person or a building), it causes a rapid rise in air pressure at that point to a value above atmospheric pressure, before dropping more slowly to that ambient level. The effect experienced is one of sound (above 20Hz is perceptible to the human ear as noise, whilst below 20Hz is inaudible infrasound). This sound and infrasound together is known as air overpressure.

However, all frequency components both audible and inaudible can cause a structure to vibrate in a way which can be confused with ground vibrations. The lower, audible, frequencies are less attenuated by distance, buildings and natural barriers and can more readily set up a response in structures. Where perceptible effects occur, these are caused by air overpressure including vibrations of a higher audible frequency within a property and, in extreme cases; it is this secondary rattling of windows or crockery that can provoke complaint.

PAN 50 Annex D advises that routine surface blasting operations may regularly generate levels at closest adjacent residential properties of 120dB. An air overpressure level of 130dB is equivalent to a wind velocity of 8m/sec (Beaufort force 4, moderate breeze). The PAN advises that whilst such magnitudes will be perceived by individuals they are entirely safe.

9.4.4 Methodology and Predictions

9.4.4.1 Operational Details

Figures 1.1, and 1.1i show the site boundary, including the extent of the underground mine. Figure 9.1 shows the ultimate location of the proposed site infrastructure and identifies potential blast sensitive locations.

Underground

Drilling and blasting will be required at the mine to develop roadways and to fragment the mineral vein before it is hauled to the surface for further processing. Most of the mineral to be won, over 90%, will be at a depth in excess of 50 metres below ground level. In these areas it is proposed that the maximum instantaneous explosive charge to be utilised will be some 27.5kg. In the parts of the mine closer to the surface smaller explosive charges will be used. The minimum depth to the surface will be around 8 metres.

Surface

No surface blasting is proposed although it is possible that trench blasting is required in the formation of the site drainage system/spillway. This is commonplace on civil engineering projects; for example, pipeline works when hard rock is encountered. If this proves necessary it is likely to relate to very limited areas and will be a short-term operation.

9.4.4.2 Residential Properties

For residential properties Vibrock Ltd has recommended a blast vibration criterion of 6.0mm/sec^{-1} peak particle velocity at 95% confidence level, this being the lower end of the range recommended in PAN 50 Annex D.

The report indicates that the utilisation of an underground maximum instantaneous explosive charge of 27.5kg can be employed up to a separation distance of 315 metres from any vibration sensitive residential property whilst complying with the recommended criterion.

For any surface blasting requirement, the report indicates that the utilisation of a maximum explosive charge of 4kg can be employed up to a separation distance of 120 metres from any vibration sensitive residential property whilst complying with the recommended criterion.

At the closest point of contact, the mine development plans indicate that underground blasting shall take place in excess of 1015 metres from Cononish Farmhouse. The use of a 27.5kg explosive charge at this location is predicted to give rise to resulting vibration levels in the range 0.4-1.2mms^{-1}, effects which are considered to be imperceptible and comfortably below the recommended criterion of 6 mms^{-1} at a 95% confidence level.

In the event that surface blasting is necessary, for the formation of site drainage/spillway, the utilisation of a 4kg charge at distances greater than 120m is predicted to result in vibration levels varying between 0.2-6.0 mms^{-1}. Should blasting be necessary closer than 120m, the charge weight will be reduced to ensure compliance with the recommended criterion.

9.4.4.3 Eas Anie

On occasions during severe winters the Eas Anie waterfall can become frozen, turning it into a water-ice climb. As the integrity of the ice is variable depending on, for example, the duration of below zero temperatures and the daytime freeze/thaw conditions, it is considered inappropriate to set a vibration criterion at which it would remain safe to undertake a climb during a time when blasting at the mine is to occur.

Scotgold is aware of the recreational use of the ice rock climb and has proposed the following mitigation when conditions may be suitable for ice climbing:

- Every effort will be made to avoid blasting in the east section of the mine (within 300m of the waterfall) at these times although, for operational reasons, a full exclusion is not possible.
- No blasting will take place in the east section of the mine (within 300m of the waterfall) unless the climb is clear.
- In addition, blasting will not take place in the east section of the mine (within 300m of the waterfall) after 1900 hours on a Friday, until Monday evening when the climb is clear, thus the ice would be subject to prevailing climatic conditions for a full overnight period before any judgement is made by climbers on the condition of the climb on a Saturday morning.
- During the remaining weekday evenings, no blasting would take place in the east section of the mine (within 300m of the waterfall) after 2200 hours.

Any effects of blasting will become apparent very soon after the shot has gone off and, in line with normal practice, any climber ascending after a blast would have to ensure the conditions were safe for an ascent. Signs advising of the normal blasting times will be posted on all approaches to the waterfall and this should assist in minimising inconvenience to climbers and the operator.

9.4.4.4 Hill Walkers

The track heading south-west from Cononish Farm is used by walkers to gain access to Ben Lui and other nearby mountains and recreational areas. Blasting in the mine will take place some 350 metres from the footpath. The use of the maximum anticipated 27.5kg charge at this closest separation distance will give rise to vibration levels in the range 1.4 – 5.0mms^{-1} which, whilst perfectly safe, will at times be perceptible. Signage shall be erected advising walkers of the times of blasting and an audible alarm shall be sounded prior to the initiation of the shot.

9.4.5 Mitigation

Vibrock Ltd has recommended a criterion for restricting vibration levels from production blasting in order to minimise the potential for annoyance to nearby residents. Accordingly, a criterion, derived from PAN 50 Annex D, of 6mms^{-1} ppv for 95% of events is proposed as a satisfactory magnitude for vibration from blasting.

A programme of blast monitoring shall be undertaken, the results of which shall be utilised to confirm compliance with the vibration criteria and used to continually update the regression analysis to ensure that future blasts are designed appropriately.

UK weather is very variable and therefore the intensity of the air overpressure wave can vary with the meteorological conditions. It is better therefore to control the effects at source. This is recognised in PAN 50 Annex D.

Accordingly, any surface blasting requirement shall be undertaken in line with the current best accepted modern practice in the civil engineering and mineral extraction industries. Safe and practical measures shall be adopted that ensure the minimisation of air overpressure generated by blasting at source, considering such factors as initiation technique.

Given their distance from the mine portal, the underground blasting operations in the mineral vein should not give rise to in any significant air overpressure effects.

9.5 Monitoring and Records

Noise monitoring shall be undertaken periodically, or in the event of a complaint.

The proposed Site Dust Management Plan includes provision for monitoring and record keeping.

A blast monitoring programme shall be implemented, monitoring being undertaken at Cononish Farmhouse to demonstrate compliance with the proposed criteria. In the event of a query or complaint, monitoring may be undertaken at an alternative agreed location.

Records of all monitoring shall be made available to the Planning Authority on request.

9.6 Cumulative Effects

The simultaneous working of two or more developments could result in unacceptable cumulative noise, air quality or blasting impacts. No other developments within the general vicinity of the proposal have been identified through scoping which may result in cumulative effects.

9.7 Conclusion

The proposed control measures along with effective day to day site management shall ensure that the proposed development is undertaken without significant noise, air quality or blasting effects.

The Cononish gold mine development was approved in 1996. The supporting information submitted at that time demonstrated that the operation could be undertaken without any significant noise, dust or blasting impact. Subsequently in 2011 and 2014 further assessment has been undertaken to inform various proposals to operate the mine. The Bulk Processing Trial is currently operational and no significant noise or air quality impacts have been identified. This planning application relates to a revision of the tailings management at the site and while construction effects are reduced, operational traffic movements have the potential to increase effects. These have been assessed, considering noise and dust potential. No significant effects are predicted.

This assessment has considered the method of working, the control measures (mitigation) to be employed, the duration of potential noise, dust and blast vibration generating activities, meteorological conditions, and the location and sensitivity of receptors.

The regulation and control of potential nuisance dust from the site shall be based around the principal of "best practice" and emphasis is placed on day to day site management to identify on-going requirements for dust mitigation and to ensure prompt remedial action in the event of a failure.

There is no significant potential for cumulative impact as there are no other developments to consider.

No residual impacts are predicted.

10 TRAFFIC

10.1 Introduction

Previously, the potential traffic effects of developing a goldmine at Cononish were assessed on the basis of traffic flow data up to 2008 and the proposal was found to be comfortably within the road network's operating capacity.

This assessment provides an update in relation to the reduced vehicle numbers now proposed, and the increased flows which now form the baseline.

10.1.1 Consultation and Scoping

An update to the previous traffic assessment which accompanied the application for the currently permitted development has been requested.

Stirling Council as roads authority has stated that conditions previously attached would be appropriate.

As a result of discussions during the preparation of previous EIAs for the development of the goldmine a scheme of mitigation had been identified and agreed to ensure that the proposed development can be undertaken without impact to the road/rail system.

10.2 The Existing Situation

The access track to the mine from Cononish Farm was constructed along with, drainage facilities, settlement lagoons and water monitoring facilities in connection with the previous planning permission. In 2000 the project was put on care and maintenance. Access to the site for heavy plant is via the railway crossing track at Tyndrum Lower Station, joining the track in the Cononish valley at a point some 2km east of the mine site. This is the access currently used for agricultural access and for any HGV related movements in that respect. Access for general vehicles and employees is via the private access route, the existing junction onto the A82(T) being located some 2.2km to the south-east of Tyndrum. The existing accesses onto the A82(T) have appropriate visibility splays although an agreement to upgrade the Dalrigh access on to the A82 (associated with the current permission) shall be fulfilled.

10.3 The Proposal

10.3.1 Construction Phase

During the site establishment and construction phase, major plant will be brought to the mine site via the railway crossing track at Tyndrum Lower Station, joining the track in the Cononish valley at a point some 2km east of the mine site. A 6-month construction phase is anticipated. Enabling works undertaken at the outset, will include: upgrading the access onto the A82; the establishment of the car park at Dalrigh; and the installation of the new Crom Allt bridge.

Vehicle movements in relation to the construction at the mine site comprise low loaders bringing plant on-site at the commencement of the development and taking some plant off-site once the initial Construction Phase has been completed.

Low loaders will also be employed to deliver the processing plant and the plant building (steelwork and cladding). During the construction period, a shuttle transport service shall transfer staff to the mine site from the dedicated car park at Dalrigh.

During the Construction Phase vehicle movements in relation to the development will comprise:

Cars/Light Vehicles

- Car movements on A82(T) 25 per day to park and ride facility (50 return movements); and

- Light vehicles (shift bus - 10 seater or similar) - 8 per day from park and ride facility to mine (16 return movements).

Heavy Goods Vehicles

- Low loaders - 60 movements in relation to the transportation on-site and off-site of mobile plant (120 return movements); and
- Flat bed trucks - 15 movements with respect to the delivery of materials for the plant building construction (30 return movements).

The construction development phase would generate some 66 car/light vehicle movements daily (100 on the A82(T)) and some 150 HGV movements over a period of 6 months.

It is proposed to increase production after an initial period of around 3 years. This will require the installation of additional plant, relating to around 50 HGVs (100 return movements, over a period of 2-3 months).

10.3.2 Operational Phase

Vehicle movements during operations shall relate to site staff movements, the despatch of concentrate for processing and the delivery of supplies to site. A shuttle transport will continue to transfer staff to the mine site from the dedicated car park at Dalrigh. Gold bearing concentrate will be transported from the site in 1.5 tonne bulk bags by a small (15 tonne) commercial vehicle to a suitable container loading site and shipped in 28-tonne containers either by road or road/sea to Europe (Belgium) to a multi-metal smelting facility. Loaded vehicles departing the site shall travel south.

During the operational phase vehicle movements in relation to the development comprise:

Cars/Light Vehicles

- Car movements on A82(T) around 50 per day to park and ride facility (100 return movements); and
- Light vehicles (shift bus - 10 seater or similar) - 8 per day over 24 hours from park and ride facility to mine (16 return movements).

Heavy Goods Vehicles

- Concentrate – 1 x 15t truck per day at full production; 6 trucks per week. Initially this will be around 1 truck each two days, or 2-3 per week.
- Explosives - 1 x 5t trucks per month;
- Diesel – 1 x 10t truck per month;
- Reagents - 4 trucks per year;
- Mill balls - 8 trucks per year; and
- Other supplies – 2 deliveries per week.

As such the development would generate some 116 car/light vehicle movements daily (100 on the public highway), and around 18 HGV movements on a weekly basis; an average of around 3 daily HGV movements.

It is proposed that the mine shall operate on a 24-hour basis, six days per week.

It is envisaged that the majority of employees shall be locally based which, for a relatively remote rural location such as Tyndrum, is likely to relate to living within a 25-35 mile radius of the development.

10.3.3 Decommissioning and Restoration

As restoration shall be undertaken progressively and plant for tailings placement and restoration shall remain on site throughout the operation there shall be far less traffic associated with decommissioning and restoration when considered against the currently proposed scheme. There shall however be a requirement for additional plant to decommission the processing plant and remove built development from the mine site. This relates to around a 6-month period and requires fewer vehicles than at construction as no works to the access are necessary at this time and the car park and bridge are to remain in perpetuity.

10.4 Assessment of the Existing Road Network

The A82(T) a primary distributor route within the local and regional road network linking central western Scotland to the north of Scotland, from Glasgow through Fort William and ultimately on to Inverness. The A82(T) also provides links onto the A85, going east from Crianlarich to Perth and west from Tyndrum to Oban.

Transport Scotland provided traffic data for its monitoring site (No. 108370) which was located at NGR NN 35470 28230 on the A82(T) some 2km to the south-east of the site access. These data were produced by an automatic counter giving an Annual Average Daily Flow (AADF) over the 16-year period January 1993 to December 2008 of 5068 vehicles (7-day flow), the annual average varying between 4486 and 5522 vehicles. For the 7-day flow the traffic breakdown indicates that rigid and articulated HGVs accounted for an average of 8.01% of the daily flow i.e. some 406 vehicles. During the 16-year monitoring period traffic increased by 20.6%, an average of 1.25% per annum.

Updated traffic flow data are available for a counter located at NN 36200 27400, also on the A82 to the south-east of the site access. The latest figures available are from a count undertaken by automatic counter in 2016. Total traffic was recorded at 6270 vehicles with HGVs accounting for 6.6% (416).

The Scottish Executive document: Indicators of Sustainable Development for Scotland: Progress Report 2004, Indicator 14 – Travel Distance Road, forecast that traffic shall rise by 27% on 2001 levels by 2021. In fact an update produced in 2009 identified a slowdown in the rate of increase at that time it was up 11% on the 2001 figures.

With respect to vehicle congestion, Transport Scotland's Strategic Transport Projects Review Report 1: Review of Current and Future Network Performance, December 2008, assesses the volume/capacity (v/c) ratio, by showing the percentage of available capacity utilised on the Trunk Road network. For the A82 between Glasgow and Oban the report shows the car journey v/c ratio at the morning peak in 2005 as being below 40% and forecasts that it will continue to be less than 40% up to 2022.

It is clear therefore that the A82(T) currently operates comfortably within its capacity and, allowing for predicted traffic increases in future years, can comfortably accommodate the proposed vehicle movements associated with the operation of the gold mine.

10.5 Potential Impacts and Mitigation

The additional vehicle movements as a result of the proposed development represent a 1.7% (103/6270) increase in overall vehicle movements and a 0.7% (3/416) increase with respect to HGV movements.

The Institute of Environmental Assessment's 'Guidelines for the Environmental Assessment of Road Traffic' sets out two basic rules for assessing whether a highway link requires to be the subject of impact assessment:

Rule 1 ***Highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%);***

Rule 2 ***Include any other specifically sensitive areas where traffic flows have increased by 10% or more.***

As the increase in traffic flow as a result of the proposed development is below these thresholds, a full Traffic Impact Assessment is not necessary. Nevertheless consideration has been given to potential impacts with respect to the current road network.

Potential impacts from traffic could include impact from:

- increased traffic movements;
- air pollution;
- traffic noise and vibration;
- road safety and disruption to other road users.
- pedestrian delay/amenity
- fear and intimidation
- visual impacts
- ecological impacts
- cumulative impacts

10.5.1 Increased Traffic Movements

10.5.1.1 Potential Impact

An increase in the number of vehicles could result in the roads operating at or over the maximum recommended capacity leading to congestion.

10.5.1.2 Assessment/Mitigation

There shall be no significant increase in vehicle movements. The current and predicted future volumes of traffic, in terms of the available capacity on the highway network as previously defined is acceptable. Traffic generated by the development, even at peak periods, can be satisfactorily accommodated.

10.5.2 Air Pollution

10.5.2.1 Potential Impact

Traffic movements have the potential to cause disturbance through air pollution. The nuisance effects of dust are usually measured with reference to dust deposition or soiling, whereas the effects on health centre on the effects of inhalation and respiration of fine airborne dust particles.

10.5.2.2 Assessment/Mitigation

Two sets of criteria for identifying significant traffic change were identified at the time of the previous application by JMP Consultants Ltd:

- Environmental Protection UK “Development Control: Planning for Air Quality (2010 Update)”: A change in Annual Average Daily Traffic (AADT) flows of more than 5% or 10% (depending on local circumstances) on a road with more than 10,000 AADT.
- Design Manual for Roads and Bridges (DRMB) Air Quality Screening Criteria:
    - Road alignment will change by 5m or more; or
    - Daily traffic flows will change by 1,000 AADT or more; or
    - Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or
    - Daily average speed will change by 10 kilometres per hour (km/hr) or more; or
    - Peak Hour speed will change by 20km/hr or more.

As the proposed vehicle movements relate to an average increase of <2% for overall traffic movements, and none of the above criteria is exceeded, the proposal does not constitute a ‘significant traffic change’ and detailed assessment of the change in air quality is not required. The air quality assessment (within ES Section 10) has considered the impacts of vehicle dust and exhaust emissions; air quality objectives shall not be exceeded.

10.5.3 Noise and Vibration

No significant change in traffic volumes is predicted and as per the previous proposal no discernible change in noise levels. Consideration of vehicle speed off-site can minimise engine noise and reduce body slap.

The level of vibration created relates largely to the size of an individual vehicle. For the number of vehicles involved, and proposed vehicle loading for despatch, the increase in movements/vibration for properties on the A82(T) shall be imperceptible.

10.5.3.1 Potential Impact

Operations may have potential to cause disturbance due to traffic generation during unsociable hours or at peak hours.

10.5.3.2 Assessment/Mitigation

HGV movements are minimal, shall be restricted to during the day and shall have no effect on traffic movements at peak hours. Whilst car movements shall be generated on a 24-hour basis due to the shift working, the proposed park and ride facility at Dalrigh, near the access to the A82(T), is sufficiently removed from residential properties to ensure that there shall be no impacts associated with car/mini-bus movements at the shift change-over.

10.5.4 Road Safety and Disruption

10.5.4.1 Potential Impact

When considered in relation to specific road conditions, an increase in vehicle movements, particularly heavy goods vehicles, has the potential to impact on road safety and cause disruption for other road users and pedestrians.

10.5.4.2 Assessment/Mitigation - A82(T)

The increase in vehicle movements is low and is unlikely to cause any disruption for other users. The existing accesses onto the A82(T) have appropriate visibility splays, the access shall nevertheless be improved as per previous agreements. The impact on the A82(T) in terms of road safety is assessed as negligible.

10.5.4.3 Assessment/Mitigation - Cononish Glen Track

The private access route between the A82(T) and the mine is also an acknowledged route for walkers. The drivers of HGVs on the forestry access during construction and HGVs (service vehicles) and mini-buses on the access along the Cononish valley during normal operations shall be made aware of the status of the access track and shall drive at appropriate speed (15mph) and with due care and consideration for other users. Signage shall be erected to make pedestrians aware that the route is utilised for the mine development. The risk of potential conflict between mine vehicles and other road users or pedestrians is considered to be low/negligible. A drivers' code of practice is proposed (10.5.12, below).

10.5.5 Pedestrian Delay/Amenity

10.5.5.1 Potential Impact

Vehicles could potentially delay pedestrians and have an impact on amenity due to the effect of vehicle movements on the pleasantness of a journey.

10.5.5.2 Assessment/Mitigation

As the gold mine is located in a rural location, at distance from areas of residential build-up, there is no significant pedestrian activity.

The Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic, 1993 suggests that a threshold for judging the significance of pedestrian amenity would be where the traffic flow (or its lorry component) is halved or doubled. As there shall be no significant change in the volume of HGV movements on the A82(T) there shall be no significant change in current amenity impact.

With respect to the Cononish Glen access track, the private access route from the A82(T) to the mine, vehicle movements are largely restricted to some 2-3 small HGVs per day with mini-bus movements at the start and end of shifts. There shall be no significant pedestrian delay and the impact on amenity is considered to be low/negligible. ES Section 13 also considers the effects on access and recreation.

10.5.6 Fear and Intimidation

10.5.6.1 Potential Impact

A further impact on pedestrians may be fear and intimidation due to the volume of traffic, its HGV composition, its proximity to people or the lack of protection caused by factors such as no/narrow pavements.

10.5.6.2 Assessment/Mitigation – A82(T)

Whilst there are no pavements on the A82(T) or the access route, the verges would allow any pedestrians to use these routes without feeling threatened.

Vehicle movements are minimal and speed limits on the public highway shall ensure that vehicles are travelling at appropriate speeds. Given the limited pedestrian usage it is considered that the potential for intimidation on the A82(T) is low/negligible.

10.5.6.3 Assessment/Mitigation – Cononish Glen Access Track

On the Cononish Glen access track, a private track, a Code of Practice will be imposed by the Mine Operator on vehicle operations, including a speed limit appropriate to the condition of the track and its use by walkers, particularly the 300m stretch shared with the West Highland Way near Dalrigh. Only authorised vehicles will be allowed on the track, all drivers being subject to site induction with respect to the Code of Practice. With mitigation the potential for intimidation is anticipated to be low/negligible.

10.5.7 Visual Impacts

10.5.7.1 Potential Impact

Vehicles could have a visual impact in terms of the visual intrusion of vehicles and the visual obstruction of views.

10.5.7.2 Assessment/Mitigation

A Visual Impact Assessment has been undertaken as part of the EIA (Section 6 refers). Impacts attributable to mine vehicles on the A82(T) are considered to be negligible. Whilst vehicles shall be visible to other users on the private access route, this is for a short period only and shall have no significant impact on the recreational pursuits being undertaken in the surrounding area.

10.5.8 Ecological Impacts

10.5.8.1 Potential Impact

Vehicles could have an impact on the ecology of the area as a result of dust, spillage or the removal of habitats to accommodate vehicle routes.

10.5.8.2 Assessment/Mitigation

It is proposed to use existing access routes. The potential for dust impacts has from vehicle movements has been assessed as negligible; no plants have been identified as being particularly dust intolerant. With the exception of fuel deliveries, there are no deliveries to the site considered hazardous to plants and the potential for ecological impact on the access route due to spillage is considered to be negligible.

10.5.9 Transport Scotland

To ensure that traffic associated with the establishment, operation and decommissioning of the mining operation do not adversely impact on the safe and free flow of traffic on the Trunk Road Transport Scotland have recommended that the following issues be controlled by planning condition:

- A method statement for the routing of traffic associated with the establishment, operation and decommissioning of the mining works shall be submitted and agreed with the planning authority after consultation with the trunk roads authority prior to any works commencing on site.
- The visibility splays shall be provided and maintained.
- The existing access at Dalrigh shall be upgraded and be constructed by the applicant to a standard as described in the Dept of Transport Advice Notice 41-95 (Vehicular Access to All-Purpose Trunk Roads) complying with Layout 6.

The applicant is agreeable to these requirements, Appendix 6, CEMP refers.

10.5.9.1 Stirling Council Roads, Transport and Open Space

Stirling Council Roads have identified that the initial 58m length of the Cononish road leading off the A82(T) is adopted and maintained by Stirling Council. To ensure that this stretch of road is maintained in an appropriate condition Stirling Council have advised that an appropriate planning condition should be attached to the consent stating:

- Road Survey Condition: A survey of Cononish Road from its junction with the A82(T), over its adopted distance of 58m (as indicated red on the attached plan) shall be carried out before the commencement of any site works. Any defects within this section of road shall be agreed between the applicant and the Roads Authority. A further inspection shall be undertaken upon completion of all site works to identify any deterioration in the road caused by site traffic during the works. Any defects identified outwith the initial survey shall be repaired/reinstated at the cost of the applicant.

The applicant is agreeable to this condition. Appendix 6, CEMP refers.

10.5.10 Network Rail

Vehicles bringing materials and plant on-site will use the Level Crossing at the Lower Tyndrum Station. The Applicants have provided Network Rail with details of proposed traffic movements over the crossing to allow Network Rail to assess the situation with a view to the Applicants entering into formal contract to become an authorised crossing user.

The Applicant is agreeable to Network Rail's condition requirements that:

- the developer pays for a Network Rail crossing keeper to control and monitor the construction traffic at the level crossing; and
- the developer pays for any necessary upgrade at the level crossing.

10.5.11 Forestry Commission Scotland

The Forestry Commission Scotland (FCS) had previously recommended that a survey of the forest road is undertaken with an FCS Engineer prior to commencement to ensure that the road is capable of accommodating traffic over the construction period and to ensure that any necessary post-remedial measures are agreed. The Applicant is agreeable to a planning condition to this effect.

10.5.12 Drivers' Code of Practice

In order to minimise the potential effects of vehicle movements in particular on the two private access routes from the public highway to the mine site, Scotgold proposes a code of practice for all drivers. The Code of Practice comprises the following:

1. *All hauliers using the site will be issued with a copy of the Code of Practice and will be required by contract to adhere to the Code.*
2. *Be courteous to other road users and be vigilant for potential overtaking vehicles on the A82(T) when accessing/leaving the site.*

3. *No lorry shall enter or leave the site before 0700 or after 1900 Monday to Saturday.*
4. *A speed limit of 15mph will apply to the entire site on all internal access routes, including the FCS and Ben Lui tracks.*
5. *All drivers, at all times, will:*
    - *Drive at a speed appropriate to the conditions of the road and not exceed site speed limits;*
    - *Avoid the need for adverse braking;*
    - *Practice the utmost courtesy when encountering other vehicles or pedestrians;*
    - *Be prepared to stop and give way to other road users;*
    - *Slow down considerably when cyclists, pedestrians or equestrians are on the access routes; and*
    - *Keep off verges.*
6. *Drivers shall report any obstructions to site management.*
7. *Concentrate despatched from site shall be securely covered.*

N.B.

Other non-motorised users of the access track shall have precedence. When passing any member(s) of the public, vehicles shall proceed with care at a reduced speed and ensuring that the public remain sufficiently clear of the roadway.

If a vehicle approaching the New Crom Allt Bridge meets any recreational user already on the bridge then the member of the public shall have right of way and the vehicle must stop until the bridge is clear.

If a vehicle is already on the proposed bridge then it is accepted that they have right of way over a recreational user approaching the bridge. Safe stepping off areas are available to either side of the bridge, visibility from one side of the bridge to the other ensures that there shall be no conflict on the bridge itself.

Horses using the Cononish Track shall be treated with additional care. In accordance with the recommendations of the British Horse Society it is noted that horses may become agitated by the presence of vehicles, particularly larger, noisier vehicles and air brakes for example. Drivers must be prepared to stop engines if needed.

It is not likely that any vehicle should meet a public motorised vehicle on the Cononish Track as this is a private road, and is signed as such. However should this occur the first priority is the safety of both drivers (and their passengers). There are existing passing places on the track; standard courtesy includes generally giving way to vehicles traveling up steep hills, smaller more manoeuvrable vehicles generally reversing to give way to larger, less manoeuvrable vehicles.

Always leave gates as you find them and take care near livestock.

Be aware of wildlife and livestock on and around the access track. Take special care in spring and early summer.

Drivers failing to adhere to the Code of Practice will be given a written warning. Drivers who persistently breach the Code will be refused access to the site.

Scotgold Resources Ltd will only engage the services of contractors willing to comply with the Code of Practice.

10.6 Conclusion

With appropriate mitigation potential impacts on walkers on the Cononish Glen access track are assessed as low/negligible, ES Section 13 also refers.

No significant impacts are anticipated in respect of traffic associated with the proposed development.

10.6.1 Consideration Against the Planning Baseline

The currently permitted scheme was assessed as being acceptable in relation to the generation of traffic. In the time since that assessment the number of vehicles on the A82 has increased in line with predictions, the traffic levels remain well within the operating capacity of the road.

The current proposal reduces the duration of construction, as well as the number of vehicles required to mobilise and demobilise plant, this is a direct result of removing the requirement for a TMF embankment and the diversion of the AEA. The proposed increase in production, after around 3 years, will necessitate the delivery of additional processing plant, this requiring a similar number of HGV movements to the works which would be necessary to raise the TMF embankment for each of three 'lifts', which are an integral part of the currently permitted scheme.

The duration of the proposed development may increase (should the production rate not increase as planned) but the levels of traffic generated are at a low level, such that this potential increase in duration is not considered to be significant. On balance, the current proposal represents a slight improvement in relation to the potential for traffic effects.

11 SOCIO-ECONOMIC ASSESSMENT

11.1 Background

The Cononish Gold and Silver project was first granted planning permission in 1996 at which time, the project was held by Caledonia Mining Corporation though its subsidiary Fynegold Exploration.

Since the original permission was granted the Loch Lomond and the Trossachs National Park has come into being, in 2002, following the passing of the National Parks (Scotland) Act 2000 and the Cononish Mine Site falls just within the northern boundary of the Park, within the Stirling Council administrative area.

Scotgold Resources Limited, a company founded primarily to advance Cononish and regional gold exploration in Scotland, acquired the project and obtained new Crown agreements in 2007. A period of updating initial technical studies and further exploration led to an initial planning application in 2010 which was narrowly refused and a revised application was made in 2011 which was granted subject to finalising some conditions and legal agreements. These were concluded in February 2012.

The following section is drawn largely from the 2011 application with relevant statistics and references updated where available, though it is noted that specific economic data relating to mining in Scotland and also relating to the economic status of the Tyndrum Crianlarich communities remains sparse. It is considered, however, that the Section remains relevant and applicable to the current application.

The report prepared by Professor David Bell of Stirling University as part of the 2011 application which examines the economic drivers for the project and the potential direct, indirect and induced economic benefits of the development in the local regional and national context is included in Appendix 10. This report is presented in full and as noted while some of the ‘hard’ numbers may have changed slightly, it is believed the report and its conclusions and the economic benefits identified remain relevant and intact.

Economic indicators and trends are an essential part of a socio-economic assessment. Economic data specific to the Park, which covers parts of four administrative areas, are poor, the little data available at the time of the appended socioeconomic assessment relating to the period 2007 – 2009. As an indicator, in the broader scale, of trends relevant to the population of the local, Tyndrum area of Breadalbane, and of general relevance to the National Park, key background documents and the Parks Corporate Reports and Policy Documents provide a developing picture of conservation, visitor experience and rural issues. (ES Appendix 10, "Socio-economic aspects of the construction of a gold mine at Cononish"). The Loch Lomond and the Trossachs National Park Profile (2014) refers to 2011 census data, The Park's population having decreased, the reliance on the service sector including accommodation and food services and recreation (likely to be driven by tourism) is higher than that in the Highlands and Islands and Scotland as a whole.

11.2 Background Information Sources

11.2.1 Scotlands Mountains: Key Issues for their Future Management

Forces for change in Scotland's mountain areas, of which the Park is one, had been the subject of a number of studies undertaken by the Nature Conservancy Council, and its successor body, Scottish Natural Heritage, in the years leading up to 2002. In 2002, the International Year of Mountains, an SNH commissioned report, "Scotland's Mountains: Key issues for their Future Management", examined and compiled data on the conservation and management of Scotland's mountain areas (Price, Dixon, Warren & McPherson, 2002). The report provides "a comprehensive analysis of information and experience across mountain land use, conservation and the local economy, notably from a sustainable stance. …..the consideration of sustainable mountain development issues provides a clear analysis of integrated approaches to caring for mountain areas." Presented as a summary of topic papers, policy documents and interviews with leaders in their fields across the whole range of issues, many of which in 2011 remain pertinent, this overarching report substantially informs the background to this assessment.

Importantly the report found a “dearth of basic information and statistics, which limits both reporting on trends within Scotland” and concluded that “integrated approaches to supporting policy development should be acted on quickly”. This comment is relevant today, as information in the public domain on tourism related activities in the area is lacking. Included within this Mountains Report of 2002 is a synopsis, at that time, of the issues facing those who live in and are concerned with Scotland’s mountain areas. It provides a useful perspective and overview.

11.2.2 Loch Lomond and The Trossachs National Park: State of the Park 2005; National Park Plan, the Corporate Plan and the National Park Plan Mid-term Review March 2010

An examination of the situation in 2005 was made, by reference to the LLTNP “State of the Park” Report. Many of the themes and issues in this report acknowledge and address key points of the Mountains Report. Subsequent papers follow through the development of policies and progress on the strategic issues identified, providing the socio-economic and policy context for the Scotgold proposals. This continues to be followed through in more recent publications including the Corporate Plan 2012-2017 identifying aims such as “sustainable economic development in a difficult economic climate”, the realisation of the Park’s “full economic potential with more and better employment opportunities for people”, maintaining “high quality landscapes that deliver multiple benefits and an economic return and “enhanced cultural heritage that delivers multiple environmental benefits and an economic return.

11.2.3 Loch Lomond and The Trossachs National Park: Valuing the National Park, Final Report

This report presents an assessment of the current demographic of the National Parks, examines age profile and employment sectors, housing and wages. The report attempts to assess the value of the consumer surplus associated with a number of tourist related activities in the Park, including hillwalking.

11.2.4 Strathfillan Community

As part of this socio economic assessment, it is important to consider developing trends and in the local context the Community Action Plan 2014-2019 now provides the most up to date and relevant analysis of the local community and issues facing it.

11.2.5 Tourism in AILLFV (Argyll, the Isles, Loch Lomond, Forth Valley)

Scottish tourism statistics are available from Visit Scotland Research, the assessment at Appendix 10 was based on figures for 2009. The visitor profile for AILLFV, which includes the National Park area, has a breakdown of tourist provenance, time of year and duration of stay, transport used, type of accommodation and visitor attraction footfall. Such information is helpful in the context of local/regional opportunities for the possible development of gold mine related enterprises based in Tyndrum or environs.

Although only 2007/2008 figures were referenced, percentage changes for 72 attractions were listed, the majority of which experienced a downturn, probably as a consequence of the recession. Insufficient data was available to establish trends in popularity of type of attraction. Entry cost may be a significant consideration.

11.2.6 Visitor Counts and Surveys; Traffic Counts

In examining visitor numbers relating to specific activities which may have direct or indirect interaction with Scotgold's proposals, data in the public domain were found to be limited, for example, analysis of walkers on the West Highland Way is numerical only, and relies on a counter at Dalrigh. Numbers of walkers in Cononish Glen, taking the track to Ben Lui, or on the longer ridge walk starting from Dalrigh and via Ben Dubhcraig and Ben Oss, or the shortest, direct route from Glen Lochy, have not been the subject of study or assessment by Argyll and Bute or Stirling Council in the past, or currently by LLTNP. SNH has provided estimates of walkers on Ben Lui.

In trying to refine the potential for impact on this part of the visitor profile a snapshot survey was undertaken by Dalgleish Associates at the junction of the West Highland way with the Cononish Glen track, near Dalrigh, over the Easter 2010 weekend. A more extensive survey was undertaken in 2011, by Scotgold, at the point where the ascent to Ben Lui leaves the track in upper Cononish Glen. The period covered included the Easter weekend, the immediately following May Day holiday and the four weeks following.

Additionally soundings were taken from the local community, including the landowner at Cononish. Ancillary, relevant information on general numbers using tourist facilities in Tyndrum was obtained from the "Green Welly", which operates a footfall counter (a figure of 750,000 per annum was quoted by management).

Traffic data for the A82 at Crianlarich were obtained from Stirling Council. These 5 day and 7 day average figures reflect the tourist season, peaking in July/August in terms of car and bus usage. Comparing the 5 and 7 day figures there is an uplift in car use at weekends, substantially so in the spring/summer/autumn, mirroring the above.

11.2.7 Natural Heritage/Mining Heritage Visitor Attractions

A number of visitor attractions UK wide were contacted and a short telephone survey carried out. Staff profile, seasonality issues, footfall, facilities offered, charges/spend per visitor were noted where that information was available.

11.3 Defining Mountain Areas

The Scotgold proposals, located at the Cononish Farm, in Glen Cononish, lie at the transition from Open Upland Glen into Open Hill, both typical of this part of Breadalbane. Approaches to defining mountain areas in Scotland are based on the measurable criteria of altitude, slope, relief or the interpreted existence of particular land cover types. People living in, managing or visiting mountain areas generally perceive them as encompassing broader landscapes which have a certain congruity. This has led to the possibility of defining of specific mountain areas as a basis for planning at a regional or landscape scale (taking into consideration topography, ecosystems and human activities – leading to a sense of place). The Landscape and Visual Assessment, at Section 6.3, enlarges on this subject and on the Landscape Character Assessment: Loch Lomond and the Trossachs National Park, prepared in 2009.

The Natural Heritage Futures Initiative developed by SNH (2002), defined 21 areas in Scotland, 12 of which included mountainous areas and of which Loch Lomond, the Trossachs and Breadalbane was one. In 2002, Loch Lomond and the Trossachs National Park was created, fulfilling the recommendation made by the then Countryside Commission in 1990.

11.4 Scotland's Mountains: Key issues for their Future Management, (Price, Dixon, Warren & McPherson, 2002).

This report addresses the prevailing issues at the time of the creation of the Loch Lomond and the Trossachs National Park. The comprehensive report provides a 2002 baseline against which change may be measured.

11.4.1 Proposals for sustainable mountain development

The 2002 Mountains report recognises the aspirational aims of the Countryside Commission which were re-iterated in the vision of "how the natural heritage of Scotland's hills and moors could look based on sustainable use of natural resources" set out in the Natural Heritage Futures documents (Natural Heritage Futures: An Overview and Natural Heritage Futures: Hills and Moors; SNH 2002) whilst recognising the management challenges.

Experience gained from such integrated land use projects has highlighted that conservation and recreation as goals of land management, in a climate of declining farm incomes and support systems, could result in a dependence on a narrow set of land use opportunities, where excessive emphasis is placed on mountain areas as a recreation and tourism resource. It quotes the Nevis Strategy as one of the initiatives that "aims to balance the needs of visitor management of a popular tourism destination with the needs of local populations beyond tourism service providers, and of key habitats and species".

Integrated approaches necessarily address the needs of the local population and there is a need for community involvement. The report further recognises that management approaches are required that are "adequately robust to ensure protection of land uses while retaining sufficient flexibility to cope with new ones and to "move with the times"".

The key issues identified are firstly, the employment of people living in mountain areas, and matters relating to services and opportunities, secondly, land ownership, as ownership and management of resources are inextricably linked and thirdly, tourism and recreation, as the largest employer in these areas.

11.4.2 Employment

In the Mountains report the lack of specific area information was highlighted in the examination of population figures, indeed, the report notes "that most data for other socio-economic characteristics are also only available at broad regional levels". Data paint a picture of a declining population other than the old and the young – "in the middle, as soon as people can, they go".

A major factor in driving population trends was found to be the range of employment possibilities, with one of the main contributors to high youth employment and outmigration being the long-term decline in agriculture and forestry, formerly the primary source of employment in these rural communities and which was further affected by the FMD outbreak of 2001.

Mountain areas were found to be characterized by high levels of long term unemployment (about 31%), self-employment and numbers of small businesses. (This was reflected in the findings of the Strathfillan Community Profile document, Section 1.7 refers). Average earnings in 2002 were found to be 8% below the Scottish average.

Tackling out-migration by young adults would require facilities for education and skills training, based in the rural communities. With respect to small businesses, support in achieving a better knowledge and understanding in management, marketing and use of technology is important and necessary "to maximize the potential and competitiveness of the many small businesses that are characteristic of Scotland's mountain areas." An interesting point which the report makes is the importance of the development of "niches of excellence", adding value to the crafts sectors by developing high quality value-added products, which can provide new sources of employment and income. Ensuring widespread access to modern electronic communication and technologies is critical in preventing a sense of peripheralisation for young people in these communities.

The influx of people into the mountains is primarily tourism or recreation related, and of short stay duration. Equally there are those who come into the area through retirement, or lifestyle choice and throughout the Highlands this has been a driver for an uplift in house prices, often making the few properties that come onto the market outwith the reach of locals, again a fact highlighted in the Strathfillan Community Futures report. The upside is the potential for an influx of fresh capital to the local economy – with the positive knock on effect of employment potential.

Interestingly the Mountains report recognizes that such incomers may foster recognition in the community that Scotland's mountain areas have to "find their niche in a Scottish, British, European and global economy – a message strongly promoted by agencies responsible for economic development". Furthermore "the traditional way of life has always mixed a variety of income sources; (the challenge is) to maintain that with new sources of income generation."

11.4.3 Land Ownership

The Land Reform (Scotland) Act of 2003 delivers benefits to the public, in providing a greater potential for enjoyment of the recreational opportunities of mountainous areas such as those around Strathfillan. Perhaps unrecognized is the contribution that landownership makes to that experience for the public. Land well managed for nature conservation is often dependent on the income generated from the landholding – from commercial activities on the land, or the landowner's private income. In Cononish Glen, grazing management agreements are already in place with the landowner and SNH.

11.4.4 Tourism and recreation

In the Highlands of Scotland, in 2002 tourism accounted for 30% of the GDP (including indirect effects), a significant proportion coming from domestic tourists and recreationists. Tourists participating in hiking/walking make up 15% of this total, according to the 2002 Mountains report. At the time of that report it was considered that the National Parks would act to drive the local economy by attracting more tourists, as do those in other parts of the world. The attractors are many and varied, depending on the particular interest of the visitor, and should be seen as important opportunities for increasing length of stay (and presumably spend). An important point is made in the report is that "many people may not understand that the landscape that attracts them is a cultural landscape, changed and fashioned by human activities." The key challenge is one of "branding", one of the strategic findings of the Strathfillan Community Profiles document, for this particular, peripheral area of the Loch Lomond and the Trossachs National Park. In 2012 tourism accounted for £913m; £740m of direct expenditure and a further £174m of indirect expenditure.

Nevertheless tourism is a fragile industry and cannot be depended upon as a source of income, exemplified by the closure of much of Scotland during the 2001 FMD outbreak. Mountain areas were hard hit, although the outbreak was confined to the south of Scotland. It was estimated that direct losses to tourism were 5.5 – 7.5 times the losses to agriculture, and indirect losses were estimated at 4.5 – 5 times. Such occurrences are very critical for those employed in tourism and recreation, as many of the jobs are seasonal or part-time.

11.4.5 Recreational Users

The Centre for Mountain Studies at Perth College conducted a postal survey to investigate the opinions and preferences of the three stakeholder groups discussed above. The findings are summarized in the report.

18% of the questionnaires were returned from "locals", 51% from recreational users via the Mountaineering Council for Scotland and the John Muir Trust, 39% from landowners in mountain areas. The overall sample of mountain recreationists is a rich, well-educated group that is also older than average (40 – 65 age group) and predominantly male. Open-air recreation seems to be predominantly a pastime for the well-off and well educated, begging the question as to whether government investment in open-air recreation is likely to be regressive – giving money back to the richest members of society.

Usefully this survey informs strategies for effective targeting of information - at one level, those existing users, at another, strategies for education of those who may not currently participate in mountain recreational pursuits to encourage "passers through" in Strathfillan to become "stay overs".

It may be expected that recreational visitors are more likely to agree with strong conservation measures, since they gain the benefits without suffering the costs – the root of historical local vs. national development conflicts – but the environment also serves to attract tourists.

However an often ignored fact is that recreational users often travel long distances to visit the mountains for recreation. The postal survey found the average distance travelled to be 112 miles and 40% of the respondents had made more than 20 visits to the mountains in the previous years, with consequential vehicle emissions, with the potential for exacerbating climate change and its effect on sensitive mountain environments.

11.4.6 Goals

In conclusion the authors of "Scotland's Mountains: Key Issues for their Future Management" recognize that there are "differences of opinion and goals", but the three key elements of sustainable mountain development: economic, environmental and social must be addressed in an integrated way. Management of the landscape and its resources requires continued investment – "there isn't a market for scenery". "Significant investment only occurs when cash flows are dependable and substantial, yet most of the commercial activities relating directly to the use of the land and its resources – sheep farming, grouse shooting, deer stalking – are barely profitable, if at all".

The authors acknowledge that one of the key constraints to the writing of their report was a lack of data and information specific to Scotland's mountain areas, whether considered as a whole, or taken as smaller regions. They consider that standardised methods of data collection and analysis may not provide useful results. But information is needed on which to define management practices and to "contribute to an enlightened discussion among decision makers, as well as among the general public".

Landscapes may be the primary draw for tourism, which is the most important economic sector in the mountains, but the variety of sources of employment needs to be expanded, especially to retain young people, through training, the provision of services, support for innovation and small businesses. “The drivers for scenarios in the hills won’t happen in the hills – external influences drive them. They include political and policy decisions, subsidies, grants, market opportunities, the externally generated income of landowners (in turn affected by fluctuations in global money markets), the perceptions and desires of tourists and climate change”.

A main point emerging from the study is the pressing need for integration, not only of sources of income, but of land uses and policies – that latter are often far from integrated and work against one another. The authors quote one of their contributors, “What we need to do is to ensure that public policy structures and decision making processes exist to make the appropriate determination of the way forward to achieve a win-win situation – which is what sustainable development is.”

11.5 Loch Lomond and the Trossachs National Park

A number of corporate papers have been prepared in the period 2002 – 2010 by LLTNP. In 2005 LLTNP prepared a report entitled “State of the Park”. Using available data, again recognised as lacking, or non-specific, the report addressed keynote issues under various subject headings. Subsequent papers brought forward policies or reported on progress in achieving the aims set out, namely the National Park Plan 2007 – 2012, the Corporate Plans 2008 – 2011 and 2012-2017, and the National Park Plan Mid-term Review, which was published in March 2010, the National Park Partnership Plan 2012-2017. Those reports/data most relevant to this socio-economic assessment are considered in greater detail, recognising that many of the issues are linked and require an integrated approach in assessing the potential benefits and dis-benefits of the Scotgold revised development proposal.

11.5.1 State of the Park - 2005

11.5.1.1 The Natural and Cultural Resource (including geology and landscape)

A need to develop a strategic framework for prioritising areas and habitats for conservation management was recognised, given possible conflicts between habitat management objectives of conservation organisations and other land uses, also the need to reconcile nature conservation priorities and legitimate socio-economic expectations and aspirations. Unrealised opportunities to extend and improve public enjoyment and understanding were identified; "The unique and very visible nature of the geology of the Park provides opportunities, which are currently not realised, to promote a greater understanding of the geological and geomorphological influences in shaping the landscape and natural environment, specifically, there are opportunities to integrate geological information with other educational and interpretive material on landscape, fauna and flora, to provide a holistic picture of the natural environment".

The cultural resource includes cultural and historic landscapes – for which there is no national statutory protection mechanism. Landscape, as defined by the European Landscape Convention (2000) is; "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors". One of the issues identified at the time of the report was a need to improve knowledge and understanding, together with public awareness through education, interpretation and specific recreation opportunities for the Parks historic landscapes.

Linked to geology, the 2005 report acknowledges the historical sources of building materials from quarrying within the Park, but identifies the potential for impacts on the natural and cultural heritage that could accompany mineral extraction, including gold mining at Cononish. A minerals policy framework appropriate for the protection of the special qualities of the Park was considered necessary. The Local Plan was at Inquiry in May 2011, at the time of the assessment. The Local Development Plan 2017-2021 is currently in place, ES Section 4 refers.

11.5.1.2 Economy and Employment

As the National Park area does not coincide with the geographic units in which data are collected (typically Local Authority areas), the 2005 report acknowledges that obtaining an accurate picture is difficult.

Tourism, land based businesses and the service sector dominate the local economy. Hotels and restaurants are the main employers in the Park, but it involves seasonal employment and low wage jobs, the former making it unattractive to local people. In 2002, tourism revenue was estimated at £200m for the Park as a whole, with some £42m generated in Breadalbane. By 2005 this figure for the Park had increased to around £226.5m.

Agriculture related employment was showing a declining trend, with many farming families having another part-time job off the farm, or no longer employed in that sector. High dependency on support payments is typical, with diversification not seen as an easy solution. Forestry is also a minor employer.

The National Park has significantly higher levels of self-employment and home working than the Scotland average. The 2011 Census indicated self-employment at 20.6%, the national figure 10.9%. In summary 32% of the Park residents are dependent on tourism or land based employment (Table 39 of the 2005 report). Over twice as many people living in the National Park in 2011 work in the Accommodation and Food Services industry than for Scotland as a whole.

The main issues identified in the Profile of Economy and Employment included:

- the need for data collection specific to the Park area, which is essential to establish future trend data
- opportunities for the improvement of skills and qualifications in the workforce
- year round employment opportunities to maintain viable communities
- need to diversify the economy to provide a wider range of job opportunities in different sectors
- ensure adequate employment and training opportunities to retain young people in the Park
- need for sustainable and innovative approaches to developing rural employment initiatives, particularly focussing on the benefits and special qualities of the Park
- lack of affordable housing close to employment

- limited availability of public transport
- need to create opportunities for business development which contribute to residents' quality of life and to the special qualities of the Park

11.5.1.3 Community Futures

The National Park Community Futures Programme was established at the outset of the National Park, "to better understand the views, aspirations and priorities of communities in and around the Park".

The Community Action Plans set out the priority issues as a means of securing funding for projects and to influence the strategies and work plans of the National Park Authority. The Strathfillan Community Action Plan for 2007 – 2010 was considered in the assessment at Appendix 10. A 2014-2019 update has now been produced, the principal factors remain the same as does the support for the gold mine and associated opportunities for heritage/gold visitor centre.

11.5.2 National Park Plan 2007 – 2012: Mid-term Review March 2010

The National Park Plan, approved by Scottish Ministers in March 2007, set out through its policies and Corporate Plan, its key aims and the means of their control or implementation. In the Corporate Plan, under the theme of Place Making, enhancing the National Park's unique sense of place is seen as being delivered through the planning service, looking at the provision of visitor facilities and experiences and focussing on the Park's special qualities and historic and cultural heritage. Developing the National Park as a destination and associated sub-destination brands in conjunction with partners to develop products and experiences is a stated area of action.

The National Park Plan Policy SE1, Strategy for a Sustainable Park Economy, brings together, under a number of general headings, the means of promoting a "stronger, more diverse and sustainable economy". It is acknowledged that long term, non-seasonal jobs based in the Park will encourage young people to stay in the Park area, particularly where there are linked training initiatives (Policy SE2). Taking forward a theme mentioned in the Mountains Report of 2002, opportunities are seen for locally produced goods and services, “gaining market advantage by being associated with the area’s high quality environment and the Park’s special qualities”.

The Plan sees the Park as a visitor destination in itself, within it being a series of sub-destinations, each with its own particular characteristics and ability to offer different visitor experiences and “provide specific business opportunities”. This is especially relevant to the Scotgold proposals and is considered further in this assessment.

In examining the key issues set out in paragraph 1.5.1.2, the Mid-term Review is the most current indicator of progress towards those goals. It re-iterates the National Park Plan’s “Vision for 2007”, two of its stated aims relating directly to socio-economic issues which are of relevance in assessing the Scotgold development.

These are:

- Vibrant, sustainable and inclusive communities which are active in shaping their future and celebrating their distinctive cultural heritage.
- A prosperous living and working countryside that maximizes the Park’s social, economic and environmental assets.

The three main areas of work of the National Park Authority are conservation, visitor experience and rural development. The Review presents the delivery of Key Achievements in each sector, recording those areas where delivery is not on target, or may not meet target. A re-prioritisation means some projects will not be taken forward.

Key achievements were the meeting of conservation objectives and the improving of the visitor experience (although this relates more to the Loch Lomond area of the Park) through policing and stricter bye-laws. The Ranger service works with schools, promoting responsible visits to the Park. Other educational targets were met such as social inclusion for those with special education needs and Barriers Project for under-represented and hard to reach groups.

In September 2008 the Park was awarded the European Charter for Sustainable Tourism in Protected Areas. The Charter status recognizes that the Park Authority has a socio-economic role and provides a framework for engagement with local business, residents and visitors.

Strategic priorities were identified under the headings of Conservation, Visitor Experience and Rural Development. However many of these are tourism focused.

An examination of progress in the Planned Areas of Activity contained in the Appendices to the Mid Term Review identifies areas where targets may not be met, or projects not carried forward which have relevance to the Scotgold development proposals. In the field of land use, involvement in the Scotland Rural Development Plan has been limited; with respect to visitor experience actions, implementation of the Park Interpretation Strategy by the NPA and its partners has also been limited and an initiative to develop and introduce measures to increase public awareness and understanding of land management activities is not being taken forward.

In the Awareness, Understanding and Involvement, further work has to be done on developing measures to raise public awareness and understanding of the Park's cultural heritage and in the developing of involvement opportunities for young people (education) and seniors (health benefits) and in promoting the cultural heritage of the Park through festivals and events.

Progress has since been made in developing indicators of sustainable communities through collaboration with community organizations; proposed monitoring includes improved services for communities, the number of retail applications that support the community, renewable energy schemes, enhancement of the wireless network and delivery of zero waste objectives. (Monitoring Statement 2015)

Economic Growth and Sustainability is firstly linked to developing a quality destination. An area requiring further work is the development of an integrated network of Park tourist and visitor information/interpretation centres, facilities and services, securing more sustainable and accessible delivery mechanisms.

Critically, undertaking further market research and analysis of tourism trends to identify specific quality indicators is not on target, with an initiative to establish business activity in the Park and its four sub areas not being taken forward.

Secondly, with respect to business, collaborative working with local businesses either in public/private sector partnerships for the provision of visitor services, is in its early stages, with no progress made in developing frameworks for business involvement in the development of the Park's destinations, cultural and natural heritage initiatives, trails and outdoor activities. Linked surveys and research in developing a knowledge and understanding of the Park's cultural heritage are yet to be brought forward.

In highlighting the issues above, these are potential areas where partnerships with developers may be beneficial in achieving positive outcomes.

11.6 The Local Community

With a population of 353 (in 200?) full time residents, the villages of Tyndrum and Crianlarich are located astride the A82 in the north-east of the Loch Lomond and the Trossachs National Park. They are served jointly by the Strathfillan Community Council. In 2007 the Strathfillan Community Futures Steering Group produced a Community Profile to inform the Strathfillan Community Action Plan for 2007 -2010. This report summarised facts and figures on the local situation and made comparison with previous years, with other parts of Stirling District, and with Scotland, was used as a key document in this assessment. As noted above a 2014-2019 update has now been produced, the principal factors remain the same as does the support for the gold mine and associated opportunities for heritage/gold visitor centre.

11.7 Strathfillan Community Profile

11.7.1 Transport and Tourism

The Community Profile document recognises the importance of transportation - initially the rail links which brought prosperity to Strathfillan through the creation of jobs and the bringing of visitors to the area, which continues nowadays mostly by road. As an employer, the rail network now provides work for only a few local people.

Tourism has developed into the main industry in Strathfillan and as a consequence it is the major employer. It is estimated that annually over 300,000 visitors travel through or stay in the area, and local businesses have developed to cater for this mostly transient tourist population. The Community Profile report recognises that one of the challenges for local businesses is to encourage tourists to spend more time in the area, to increase the potential input to the local economy through increased spending on accommodation and facilities.

The rest stop facilities in Tyndrum for motorists passing through the area have extended in more recent years to include a modest shopping outlet for Scottish produce and outdoor clothing. These are also relatively convenient for the two touring coach hotels in the village, whose role is as a base for 4 or 5 day holidays, with full day coach excursions made from Tyndrum. Itineraries may however not provide for much time in the village.

For others spending time in the area hillwalking is a major activity, with the local Munros of Ben More, near Crianlarich and Ben Lui, Beinn a Chliebh, Ben Oss and Ben Dubhcraig near Tyndrum and more distant Ben Challum. The West Highland Way passes near Tyndrum at Dalrigh, at the entrance to Cononish Glen. Local walks are available in the Community Woodland at Dalrigh and at Kirkton.

11.7.2 Environment and Heritage

The cultural history of the area has evidence of early Christian settlement, St Fillan arriving from Ireland at the end of the 7th century. Tyndrum has been the site of a battle in Pictish times and later between Robert the Bruce and supporters of the English King Edward.

The SACs and SSSIs of the area are seen as providing interest for naturalists and geologists, ranging from the rare alpine flora of Ben Lui and the remnant Caledonian pinewoods of Glen Falloch and Glen Cononish to the mineralized veins of the Crom Allt SSSI.

The latter is part of an extensive series of mineralized veins in this area which were worked as early as 1428 for their silver content. From the early 18th century commercial mining for lead with silver was undertaken, establishing the village of Clifton, the industry supporting up to 200 people at various times, until the last mine closed in the early 1920s. The former workings can be seen stretching from the base of Ben Lui following the mineralized veins behind Cononish Farm at the Eas Anie, and on the southern and northern flanks of Meall Odhar with the most extensive working on the north side of Sron nan Colan and further stretching to Beinn Odhar

The Community Futures report identifies an opportunity to promote this wealth of cultural, mining and natural heritage information more visible and use it to attract visitors to the area through “branding”.

11.7.3 The Strathfillan Demographic

Compared with the LLTNP, in particular, with Stirling Council and with Scotland as a whole, Strathfillan has a higher percentage of under-5s, 16 – 19 year olds, 20 – 44 year olds nad 45-64 year olds and a lower percentage in the 65 plus age group. The area has a much younger community than the National Park average.

Strathfillan has low numbers of owner occupied houses compared to Stirling, the National Park area and Scotland; around 50% rent their homes. There is limited housing supply in the area and also restrictions in the Local Plan on building outside the village envelope. It is difficult for people to get a mortgage as incomes are not high in tourism related employment and local families are moving outwith the area because of a lack of housing and full time, well paid employment opportunities.

11.7.4 Employment and the Local Economy

In Strathfillan, the Community Profile reports that there are very high numbers of self-employed people – 4 times greater than Scotland as a whole. It is believed that this is due to the number of bed and breakfast establishments, hotels and local tradesmen. The hospitality industry and tourism related activities are now the main employers in the area, having replaced agriculture, forestry and the railways as the main rural industries.

In 2007 it was estimated that 155 people were employed within the tourism sector, compared with 127 in 1996. Tourism jobs are now available, albeit on reduced hours, into the early spring and late autumn. Many employees are temporary and migrant staff, recruited via websites or employment agencies in London and come from Eastern Europe, South Africa, Australasia. (It is generally recognized that the standard of training is often higher in particular in Eastern Europe and employees from this area are sought after within the hospitality industry). The effect on the numbers of immigrant workers, resulting from recent election manifesto policies, may see these reduce.

In the same year it was estimated that 27 people were employed in agriculture, forestry and estates, a significant decrease from the 42 employed in 1996. Retail employees number 15 and there are 6 local tradesmen (SCF report - Table 5, overpage).

Other major local employment relates to Stirling Council posts, in schools, the local constabulary, the fire service etc.

The balance of employment numbers is made up of self-employed/small businesses and the perception is that these are hampered by lack of premises, lack of business support and bureaucracy.

Economic Position	Strathfillan	LLTNP	Stirling Council	Scotland
All people aged 16-74	295	11625	63552 67240*	3731079 3970530*
Employed F/T (>30 hrs)	36%	37%	38% 37%*	40% 40%*
Employed P/T (< 30 hrs)	8%	11%	11% 16%*	11% 16%*
Self employed	27%	15%	9% 9%*	7% 8%*
Unemployed	2%	3%	3% 5%*	4% 6%*
Full time student	2%	2%	4%	3%
Economically Active Total	75%	68% ~70%*	65% 68%*	65% 69%*
Retired	8%	16%	14% 15%*	14% 25%
Students	2%	3%	6% 8%*	4% 6%*
Looking after family	5%	5%	6% 3%*	6% 4%*
Permanently Sick	7%	5%	6% 4%*	7% 5%*
Other	4%	3%	3% 2%*	4% 2%*
Economically Inactive Total	26%	32%	35% 32%*	35% 31%*

Source Census 2001, Stirling Council and LL&TNP

***2011 updates**

11.7.5 Employment Commuting

As would be expected for such a rural community, people commuting out of the area, whether on a daily or less frequent basis, are usually travelling to the larger cities, for employment not available in Strathfillan, whereas those travelling into the area are usually working within the tourism business.

11.7.6 Key Issues for Employment in the Strathfillan Area

Issues related to tourism jobs have been identified as lower self-esteem of residents compared with confident seasonal staff, low wages and little incentive or opportunities for career progression. There are no local training/apprenticeship schemes. There is a lack of business premises.

The report highlights that more jobs, in sectors other than tourism, are needed for people in the 20 - 44 age group, to encourage them to stay in the area, to provide better salaries and thus enable local people to become home owners.

11.8 Tourism in Argyll, The Isles, Loch Lomond, Forth Valley (AILLFV)

11.8.1 Data

Using the limited data available from Visit Scotland Research a visitor profile for this general area may be established, with the possibility of extrapolation to the National Park in particular.

The National Park Gateway, Balloch, David Marshall Lodge, Aberfoyle and the Trossachs Discovery Centre are the 3rd, 4th and 6th most popular visitor attractions in the area – entry is free. For comparison the top attraction is the Falkirk Wheel, with 476,778 visits in 2009 (500,829 visits in 2008), Stirling Castle, next, with an entry fee, attracted 383,293 (375,344), and the National Park Gateway 328,204 (301,271).

The average length of stay was 3.8 (3.7) nights in the AILLFV for UK tourists, 4.3 (4.6) for overseas tourists. 70 % (78%) of trips were for holiday purposes. UK tourist trips were less seasonally biased than overseas tourists, which peaked substantially in the summer months. In 2009 the highest percentage of overseas tourist was from Germany and the USA, closely followed by visitors from France, and the Netherlands. German and USA expenditure per head was the highest, double that of France and the Netherlands.

69% of UK tourists came to the area by car, with 9% on an organised coach tour. No definitive data are available for overseas visitors other than 87% used air transport into the UK.

25% of overseas visitors stayed with friends or relatives, 26% used hotels, compared with 34% and 29% for UK visitors. Self-catering accounted for 15% and 19% respectively, but a significantly higher percentage of overseas visitors, 13% used B&B accommodation, compared with 4% for UK visitors.

In 2006 10.2% of the AILLFV workforce was employed in tourism related jobs.
(see ES Appendix 10, Figure 3 and Figure 4; pp17 – 18)

11.8.2 Visitor Profile Analysis

In 2009 15% of visitors were from the USA, which has strong cultural links with Scotland. One quarter of overseas visitors stay with friends or relatives and it is probable that a significant proportion of these may be from the USA as a consequence of these cultural links. The USA visitors have the second highest average spend, at £16 million. Conversely some of this may be linked to USA visitors' preferences for good quality hotel accommodation, which is more costly.

Germany and the Netherlands have a long and well established environmentally aware culture, including at a political level and this may be a possible motivation for their visit, targeting the National Park as a destination.

B&B usage is higher for overseas visitors than for UK visitors. Many establishments now have web pages and this may simply be a reflection of pre-trip organisation by overseas visitors, also wishing to experience local hospitality in preference to self-catering accommodation.

UK visitors are mobile, arriving by car, which may enable a multiple destination visit within the AILLFV, not necessarily picked up in the statistics. With no major towns other than Stirling in the area, as a singular destination served by main-line rail, it is reasonable to assume that overseas tourists will utilise a hired car to access other parts of the area.

The survey does not present data on age group or activities and can therefore only provide a broad brush picture of tourism in the general AILLFV area.

11.9 Visitor Counts and Surveys: The West Highland Way and Cononish Glen

The mountainous Strathfillan area attracts visitors to enjoy the landscape, either passing through it on the road network, or on foot, either as local walkers or tackling higher and more difficult terrain.

As indicators of numbers of walkers using the areas where operations associated with the Scotgold development have the potential for interaction, the West Highland Way and its crossing point near Dalrigh at the entry to Cononish Glen were targeted. Other than the entry from the A82 to the Community Woodland the Cononish Glen track is privately owned and there is no vehicular access.

Routes from the car park in the Community Woodland at Dalrigh lead up the track, past Cononish Farm to Ben Lui, via its steep northern and eastern faces. Distances involved to Ben Lui on this route are approximately 18kms.

Alternatively the ridge walk on the south side of the Glen, leading from Dalrigh through Coille Coire Chuilc, hence onto the shoulder of Beinn Dubhchraig and its summit, then via the intervening cols to Ben Oss and ultimately Ben Lui, with the potential to descend the steep northern or eastern corries to the head of the Cononish Glen track. This round trip is of the order of 22 – 24kms with some 1800m of combined vertical ascent.

In contrast the direct route to the summit of Ben Lui is from the public car park in Glen Lochy, ascending on the marked path beside Eas Daimh. This route is approximately 9km, there and back, ascending from 200m AOD to the summit at 1130m. A slightly longer route from Glen Lochy is from Succoth Lodge, via the Beinn Chleibh ridge to the west of Ben Lui. A track, then path leads alongside the pylons of the overhead transmission line for 4km from the Lodge, then an unmarked route of a further 4km to the summit of Ben Lui.

SNH estimates around 10,000 walkers on Ben Lui annually, on these four routes. The majority of walkers attain the summit of Ben Lui from Glen Lochy.

The owner of Cononish Estate, with family properties at Dalrigh and Cononish Farm, estimates that around 5000 walkers access the Glen annually.

The Parks Authority Access Officer confirmed that no data were available for Glen Cononish, but were able to provide counter information for the West Highland Way at Dalrigh. Subsequently a counter had been installed in the glen although specific has not been provided.

11.9.1 The West Highland Way at Dalrigh

Figures for walkers are available for the period 2003 – 2008. They show a steady increase from 18,907 in 2003 to 27,451 in 2007, with a sharp drop in 2008 to 24,393. Very low activity occurs in the months of January, February, November and December, with the peak activity in May and June (around 5000). These figures may be skewed in June by the Caledonian Challenge, and in May by Challenge walkers training on the route. July figures of around 4000 may be more representative of peak summer usage.

11.9.2 Cononish Glen Recreation Survey

In the absence of any information relating to users of Cononish Glen, two surveys were undertaken. The first of these was a snapshot survey undertaken by DAL on the weekend of 17/18 April 2010. The survey location was the crossing point of the WHW with the Cononish Glen Track and took the form of a short questionnaire (Annex 1), with its findings summarised below.

The second, more extended survey, was a count of walkers at a point where the ascent to Ben Lui leaves the Upper Cononish Glen path. The survey commenced on 19 April 2011, included the Easter weekend, the shortly following public holiday of the Royal Wedding and the early May holiday and continued until 14 May (see ES Appendix 10)

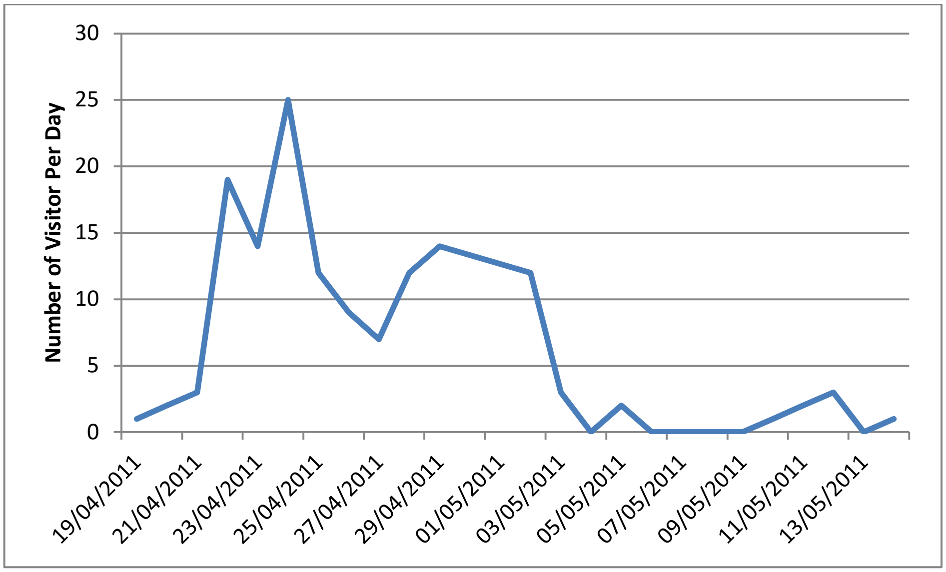
Table 11.1 Recreation Survey 17/18 April 2010

Total of 44 respondents to the survey.
6/44 were local
42/44 were aware they were in the National Park
20/44 on West Highland Way
10/44 had been in area before
29/44 had noticed the existing mine
16/44 were aware of the current application
40/44 expressed positive interest:
4 of these also noted the importance of environmental protection
2 stated they were not interested personally but they thought it would be of general interest
4 locals (one family) totally opposed due to a belief that no economic benefits would result and to the detriment of the environment.
Without prompting several respondents suggested a visitor centre would be of interest (22 in total implied the value of a facility/attraction), others noted the relevance of historical mining to the area's heritage (6/44 again without specific prompting).

Location of survey: West Highland Way / Cononish track at NN 337 290

The 2011 survey showed a peak around Easter weekend. Outside weekends there are relatively few visitors. Assuming these weeks are representative, it indicates that the number of visits to Ben Lui by this route is around 2500.

Plate 11.1   2011 Survey – Walkers (upper Cononish Glen)



Location of survey: Cononish track at Allt an Rund NN 2806 2735
Note: no count on30/4, 01/05, 7/5 and 8/5

11.10 Assessment of Potential Impacts and Benefits

11.10.1 Visitor interaction with Scotgold development proposals

11.10.1.1 Ben Lui

The landscape and visual impact assessment (ES Section 6), examines the new elements which will be introduced into the landscape – the process building, the TSF 'stacks', settlement ponds, site drainage arrangements . The TSF 'stacks' grows incrementally over the operational period during the proposed life of the mine and are progressively restored. Woodland planting is proposed both as mitigation and a contribution long term landscape and land use management proposals for Cononish Glen. Fencing in association with these proposals will manage grazing pressures from deer and assist in extending a beneficial grazing regime for the current sheep farming activities of Cononish Estate.

From Ben Lui summit itself, views to the site are partial, distant views of the mine site, Stack 3 being the only visible operational tailings stack. If approached by the ridge from Dalrigh, elevated views may be obtained only once the higher part of the shoulder of Beinn Dubhcraig is reached. To then obtain continuous views of the site along the ridge to Ben Lui via Ben Oss requires keeping to its northern side. Views are at distances ranging from 2.5km – 3.5km, mostly at 3km and will be weather condition dependent (see LVIA, ES Section 6, and photomontages).

In contrast to the previous application, the major construction work now involves the erection of the processing plant and associated buildings/structures and will be completed within around 6 months. Preparation of the initial stack area is also expected to be complete within around 6 months with deposition of at an average rate of 1000m^3 per month (approximately 10 trucks per day). Subsequent stack area footprints will be developed according to the schedule shown at Appendix G of the Tailings Management Feasibility Study – ES Appendix 3.

The few daily vehicle movements of personnel and gold bearing sulphide concentrate are described in ES Section 10, Traffic. The distant sound of plant may be perceived and this has been assessed in Section 9 of the ES.

11.10.1.2 West Highland Way

Potential for direct interaction with Scotgold's operations is limited to common usage of the Cononish Glen track from the Crom Allt westwards to the take off point north from the track of the West Highland Way a distance of some 235m. ES Section 12 refers and mitigation is proposed at 12.3.1.1, this being with the prior agreement of the Planning Authority (Access and Recreation team).

Scotgold usage of the track is limited to two return staff minibus journeys per shift during the day, a maximum of four return private vehicle trips, two return concentrate truck dispatches from the mine and delivery of supply materials to the site, on average three vehicles per week. The nature of the track in itself limits speed and Scotgold will impose strict conditions on use of the track by site vehicles to minimise potential conflict with walkers. This Code of Practice will form part of the proposed Planning Obligations for the development.

Indirect impacts relate to views towards the site from the West Highland Way. None are obtainable closer to the development. Limited views may be obtained from a short stretch of the route in the vicinity of Auchtertyre, 5.5km to the east.

11.10.1.3 Cononish Glen

Recreational users of Cononish Glen will have limited views of the site from the Glen track. At about 750m from the site, approaching from the east, in the final stages of its development, the upper parts of the TSF 'stack area' will be visible. Each stack will be subject to restoration following completion of final slopes in any area. Details of the restoration techniques are presented in ES Appendices 6 and 7.

At closest approach, on the track to the immediate south of the site, views are obscured by the intervening shoulder.

Photomontages are presented in ES Figures 6.1ii – 6.13i showing stages of the site development from agreed viewpoint locations at varying distances and elevations from the development.

Site construction and routine operational noise (processing) has been assessed (Section 9 of the ES refers).

Walkers and site vehicles are as described above, for the West Highland Way.

11.10.1.4 Other recreational areas

No data are available for walkers who may ascend from Strathfillan to Meall Odhar, to the north of the site, or to Beinn Chuirn, to the west, which may also be climbed from Glen Lochy. Views of the site are not obtained from the summit of Beinn Chuirn, or its lower eastern slopes, the site only being visible from the crags immediately above and to the west of the mine site. Beinn Challuim affords only distant views to the site, 9km to the west. Views from Ben More are at a distance of 15km. The site is scarcely discernable at these distances, even in good visibility conditions. Photomontages of several of these views are presented in ES Figures 6.1ii – 6.13i.

11.10.1.5 Land Reform (Scotland) Act 2003

Part 1 of the Act gives everyone statutory access rights to most land and inland water. People only have these rights if they exercise them responsibly by respecting people's privacy, safety and livelihoods and Scotland's environment. Equally land managers have to manage their land and water responsibly in relation to access rights.

Under the Act there are a number of exclusions; active minerals sites are excluded from public access on health and safety grounds. Fencing proposals for site safety and in relation to grazing management have the potential, if not carefully located, to "box in" walkers and/or sever obvious topography determined routes of ascent and descent. Appropriate types and location of crossing points are also a consideration. Mitigation of these direct impacts is design led to avoid the potential for adverse impact on walkers.

The Scottish Outdoor Access Code has been approved by Ministers and the Scottish Government. Scotgold's proposed Code of Practice for vehicle movements on the track ensures adherence to the principles of the Outdoor Access Code.

11.10.2 Data Analysis

Data relating to recreational users of the Cononish Glen area is limited to walker counts on the West Highland Way, to an SNH figure for walkers ascending Ben Lui, an estimate of numbers from the landowner and the DAL and Scotgold surveys undertaken in 2010 and 2011.

Compared with the Strathfillan Community Profile quoted figure of 300,000 tourists passing through or staying in the Tyndrum/Crianlarich area, the numbers from the DAL and Scotgold surveys using Cononish Glen represent 1.0% of that figure.

The usual route to the summit is stated in the Walkhighland website as being from the western approach, from Glen Lochy. A cost-benefit analysis based on “Modelling Recreational Demand Using Choice Experiments: Rock Climbing in Scotland” (Hanley, Koop and Wright (2002) is presented in ES Appendix 10. This analysis attempts to allocate monetary value to the various attributes defined by climbers and extrapolated to recreational users of the Cononish Glen locality. These values are then compared with the identified wages generated in the local community and the effects on the economy within Loch Lomond and the Trossachs National Park examined.

If it is assumed, for the purpose of analysis that some 5000 walkers annually ascend Ben Lui from the east, from Cononish, then, a monetary value may ascribed to the negative direct use effects of the mine on users, over its lifetime. The value using this methodology was £17.91 per walker/climber using the Cononish Glen approach to Ben Lui. The amount required to compensate climbers annually, at 2010 prices is therefore 5000 x £17.91 ~ £89,600. Over the lifetime of the mine and until the site was re-instated, this could amount to around £1m. (An alternative methodology was used in the “Valuing the National Park” report, which gave a lower figure of £8.74 per trip, income to the Park area from walkers).

As positive direct use effects from the development and operation of the gold mine give a figure of £11.8m increase in incomes over the life of the mine, these significantly outweigh the potential negative direct use effects (see ES Appendix 10, Section 2; Multiplier effects on the Local and National Economies).

Local visitor attitudes to the environment have not been the subject of any study to date. The snapshot survey undertaken by DAL at Easter 2010 does however indicate a mostly positive perspective in respect of the proposed gold mine development, but equally an environmental awareness. Many of the respondents were aware of the current exploratory adit and 36% of the respondents were aware of the planning application (the 2010 submission). All but two of the respondents knew that they were in the National Park. 85% of those interviewed were visitors from outwith the area.

It is interesting to note that without prompting several respondents suggested a visitor centre would be of interest (22 in total implied the value of a facility/attraction), others noted the relevance of historical mining to the area's heritage (6/44 again without specific prompting).

11.11 Economic Potential of the Development

11.11.1 Aims and Objectives of the National Park

The aims and objectives of the Loch Lomond and Trossachs National Park include fostering an understanding of the natural environment. "Conservation of natural and cultural heritage; sustainable use and economic and social development; understanding and enjoyment". The economic benefits of the gold mine development are assessed in this section, (see ES Appendix 10, Sections 1 and 2 for a full economic analysis of the viability of the gold mine and multiplier effects on the local, regional and national economies).

11.11.2 Ore Reserves

Since 2007 Scotgold Resources Ltd has committed significant funding to a programme of exploratory drilling, core analysis and orebody interpretation at the Cononish project. The gold and silver bearing orebody has a mining inventory ('reserve') to support a ten year operation at full production (or sixteen years at half production), inclusive of one year's pre-production development works and restoration works in the final year.

11.11.3 Economic Climate - Metalliferous Minerals

Commodity prices and cycles are notoriously difficult to predict. Most metalliferous minerals are generally governed by traditional supply/demand economics. Gold in common with other mineral commodities has seen a sustained period of rising prices and corrections over the past ten years. In the case of 'true commodities' (copper, zinc etc), prices have been driven by increasing demand for the commodities from the developing economies of East Asia and China in particular and whilst the commodities 'boom' of the late 2000's and early 2010's has subsided, prices generally remain significantly increased from early 2000's levels but volatile.

There are three main sources of demand for gold - jewellery, industry and investment. There are strong reasons to believe that each of these has been putting upward pressure on the gold price in recent years. First, the demand for gold from rapidly developing countries such as India and China has soared. This is partly due to their very rapid growth rate of the Indian and Chinese economy which has fuelled a huge rise in the demand for gold, particularly for ceremonial occasions such as weddings. India was the world's largest gold market, consuming 960 metric tons in 2010; China has now overtaken India in gold consumption. In 2010, world jewellery demand (excluding the use of scrap) amounted to 1333 metric tons, 15.6 per cent up on the previous year[3].

Industrial demand has also been growing, mainly for the electronics sector. Industry consumes a much smaller share of gold output, at around 420 tons, but still showed strong growth of around 12 per cent in 2010. In this sector, there is strong competition from other metals and demand for silver has been growing even more rapidly. Silver will also be produced at Cononish and its price quadrupled between 2000 and 2010.

In the case of gold there are other potential determinants including US$ weakness (or strength), oil price, global financial health, inflationary (or deflationary) climates, global political events and to a lesser extent recently traditional supply and demand, with the US$ and oil price probably exerting the strongest influence.

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[3] Commodity Online, China, 'India fuel global gold jewellery demand'

There have also been substantial increases in the demand for gold for “portfolio” purposes. This means that sovereign states and individuals are investing in gold because they believe it to be a secure store of wealth. From the mid-1980s to the early part of this century world politics were stable, economic growth in the West was steady and inflation was low. Investors were willing to take risks to earn high returns and therefore saw little need to hold gold in their wealth portfolios. The outlook has changed radically since the 2008 financial crisis. World politics are no longer stable. Many western economies have long-term sovereign debt problems and inflation has increased. Given that the difficulties of repaying sovereign debt may lead to currency depreciation, gold has become attractive to investors. Better to hold gold, even though it offers no rate of return, than assets denominated in currencies whose value may fall. Gold prices have the property of being negatively correlated with stock returns which is very beneficial for defensive investors. The experience of the financial crisis has made investors more risk averse, one consequence of which has been the rapid rise in the gold price.

11.11.4 Gold price volatility

Concerns were previously expressed by the National Park Authority that fluctuations in the gold price might impact on the viability of the mine and consequently might negate its beneficial socio-economic impact (the third Aim of the Park), thus not outweighing the conflicts which the development raises with respect to the first (conservation) aim.

The underlying issue regarding the viability of gold production at Cononish is not whether gold prices are “volatile”. It is whether (1) demand for gold from the rapidly growing economies of India and China is expected to fall suddenly and (2) whether the world economy will return to the political and economic stability experienced during the 1990s, giving investors an incentive to be less defensive in their portfolio choices. The assessment is that neither of these possibilities is likely and therefore that the gold price will remain around its current level for the foreseeable future (see ES Appendix 10)

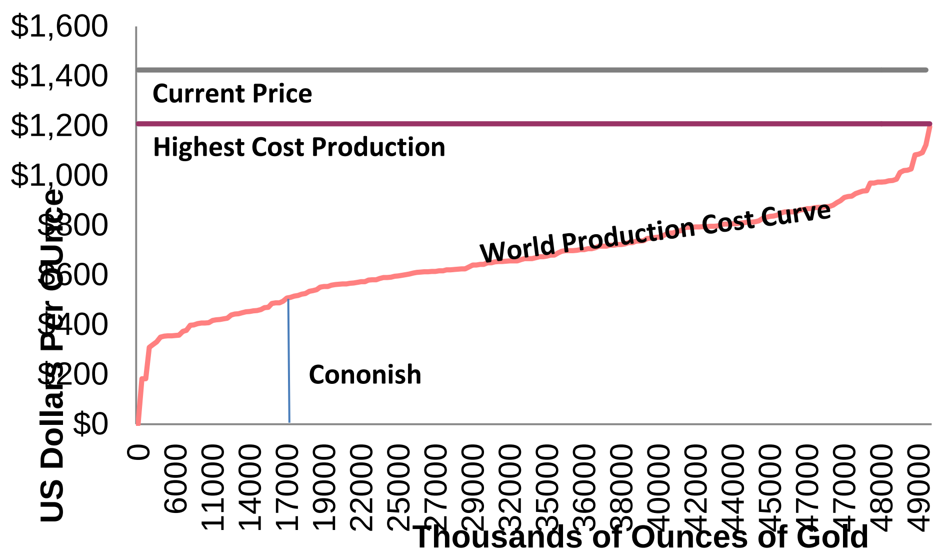
Global financial events over the last three years have led to continued strength in the price of gold. The price has risen from its nadir in 2002 of £190/oz and in April 2011 was £892/oz more than four times greater than it 1996 value, when permission was first granted for the mine. In June 2011 the price had risen to £955/oz.

Although price forecasting for gold is virtually impossible, industry experts opine on the short term outlook and a more general outlook. Whilst consensus is rare, the majority view for the short term price is one of continued strength with prices over the next two to three years to remain around current levels. Subsequent to this period, various long term prices (those a potential project lender might use to evaluate a project's ability to support debt financing) have been proposed and are around £560/oz.

A statistical analysis of long term gold prices (unit root test) shows that there is no evidence that gold prices will revert to its long run mean, which is significantly lower than its current price. (See ES Appendix 10, Section 1 and also Appendix 1 to that report).

At current GBP£ gold prices (£955/oz), the project has a quick return on capital and by its nature (initially capital intensive) subsequent to that has a low operating cost of less than £300/oz and as such under the current climate, is regarded as robust. Plate 11.2 The gold production cost curve, below, shows the current price of gold. At this price, all of the mines, which together produce 48.8 million ounces of gold, are profitable. It also shows estimates of costs at Cononish. Many mines would be rendered uneconomic before Cononish. Therefore given the current demand for gold, the costs associated with the Cononish gold mine are consistent with its ability to make a profit during its lifetime and therefore for the operation to continue to be viable. As a result in the decline in price in 2013 to the c.$1100 – 1300 levels, cost profile have reduced slightly – the position of Cononish is now slightly lower than that indicated below.

Plate 11.2 The gold production cost curve



Source: GFMS and SB Global Markets research – Mine Costs. Based on data from 213 mines

11.11.5 Employment

A range of skills is required for the mining operations. At pre-production stage the permanent workforce is 10 persons, rising to the full complement of 52 when production commences. All positions are full time.

The table below sets out the positions and salary range and indicates whether these staff may be sourced from the local area - "available" skills (or may be readily trained) and those specialist positions requiring skills which may not be available locally.

2017 BFS UPDATE

Annual Labour costs (half production)

	Salary Range £ pa[1]	Number	Skills available[2]	Skills not available	Annual Gross Labour costs £
Underground Mining	37000 - 48000	15	9	6	638150
Plant	30000 - 48000	13	10	3	463650
Staff	25000 - 85000	9	4	5	456350
TOTAL		**37**	**23**	**14**	**1558150**

Annual Labour costs (full production)

	Salary Range £ pa[1]	Number	Skills available[2]	Skills not available	Annual Gross Labour costs £
Underground Mining	37000 - 48000	29	26	3	1217300
Plant	30000 - 48000	21	21		804200
Staff	25000 - 85000	12	5	5	559350
TOTAL		**62**	**52**	**8**	**2580850**

Notes

1) Salary Range includes bonus, shift allowance and Employer NI and Pension contributions

2) Skills available means positions for which skills are available locally or through on the job training / apprenticeships

The average salary will be £32,500. The average salary was noted in 2010 as being 21 per cent above the median wage for employees in the whole of the Stirling local authority. The projected average wage at Cononish is lower than the average UK wage in "Other mining and quarrying" in 2010, which was £30,600, but more than double the UK mean of £12,400 in the industry described as "Accommodation and food services" which captures most of the tourism sector, the mainstay of the LLTNP economy. If the data on "Accommodation and food services" reflects wages in the tourism sector in LLTNP, the projected average wage in the mine will be more than double that in the largest industry in employment terms in the Park (11.5.1.2 and 11.7.4 refer).

Linked to tourism, income in the National Park is also highly seasonal and hence highly variable in its demand for workers. Consequently for most of those workers the average employment spell is very short.

11.11.6 Temporary construction employment

Contractors will be appointed to undertake the ground works associated with the Tailings Storage Facility and the processing plant building area. Some 10 – 20 persons will be employed by contractors during this period, in addition to mine labour.

In addition to mine staff, an Ecological Clerk of Works will be employed during site operations, liaising with the Contractor's site engineer, to ensure protection of sensitive habitats. The Ecological Clerk of Works will supervise progressive, intermittent and final restoration operations and monitor the subsequent efficacy of revegetation measures.

11.11.7 Transferable skills and competencies

Employment with the mine will produce a great deal of skills and competencies associated with mining that have been lost to the UK in recent decades. Scotgold has investigated opportunities for modern day apprenticeship schemes in association with Edutrain and it is hoped that a number of such positions can be offered. It may be expected that these skills will command a premium in the labour market after the Cononish deposit has been extracted and although these may be in positions outside the Park area, workers may choose to remain resident in the Park for quality of life reasons. This pattern of commuting out of the park is very common among existing Park residents. In 2001, 3440 (47%) of the 7269 employees resident in what is now the Park area worked outside its boundaries (11.7.5 and 11.7.6 refer).

11.11.8 Financial Analysis – Multiplier effects on local and national economies

In that this is a unique project for Scotland – or the mainland UK, there are no direct national comparators for estimating the value chain associated with the development. Most economic impact studies use multipliers derived from input-output tables to estimate the indirect and induced effects of proposed developments. An input-output table aggregates the economy into different production sectors. The tables themselves comprise the set of inter-industry transactions necessary to produce final demand.

There are no recently estimated multipliers for metal ores extraction in Scotland. This is because in 2007, when the last input output tables for Scotland were constructed, there were no extant metal mines in Scotland; this remains the case.

However, when a firm's business plan is available, multipliers can be estimated directly, since a description of the pattern of purchases is an integral part of a normal business plan. Multipliers can therefore be constructed that are more accurate than the estimated average multipliers derived from the input-output tables. Using the business plan for the Cononish gold mine the pattern of purchases, i.e. Type 1 multipliers can be estimated. Type 2 multipliers include purchases of goods and services *induced* by increases in employment and incomes arising from purchases along the company supply chain, for which additional statistical information is required.

11.11.8.1 Type 1 Multipliers – mine operations

The detailed financial analysis presented by Professor Bell in his report (ES Appendix 10, Section 2) estimates a Type 1 multiplier for the mine of 1.31, i.e. for every £1m production from the mine a further £310,000 of purchases will be generated within Scotland. This figure is commensurate with the most recent (1998) estimate of Type 1 multiplier for metal ores extraction in Scotland of 1.38.

11.11.8.2 Type 2 Multipliers – mine operations

Type 2 multipliers were taken from "other mining and quarrying" in the Scottish input-output tables. This gave an estimated Type 2 multiplier for the mine of 1.55.

11.11.8.3 Type 2 Multiplier – construction phase

The construction phase of the development will involve spending £14.7m in Scotland. Construction and restoration phases (which utilise similar plant), will have different multiplier effects from the operational stage of the mine. The relevant Type 2 multiplier for the mine is 2.08. Assuming conservatively that only 75 per cent of this activity is purchased in Scotland, the income induced by the construction phase in Scotland will cause further indirect and induced purchases worth £9.2m.

11.11.8.4 Economic activity generated by the Cononish Gold Mine

For the operational phase, the analysis suggests that every £1m production from the mine will indirectly generate a further £520,000 worth of purchases of goods and services within Scotland. In total the operational phase of the mine will generate additional economic activity in Scotland to the value of £72.2m, while the construction phase will generate a further £9.2m. This implies that in total the mine will generate an additional £81.4m of economic activity in Scotland over its lifetime. These are the 2011 figures and although there is less upfront construction cost, slightly increased costs above the previous 'construction' costs are registered in operating costs. The Company believes the overall impact is negligible if not increased overall when new figures are substituted.

11.11.8.5 Local, Regional and National economic benefits

There are no estimates of input output tables for the National Park and therefore no multipliers available to gauge the impact of introducing a new economic activity within the Park boundaries.

Most of the workers and some of the contractors are likely to reside within its boundaries and will contribute in some measure to the generation of additional economic activity within the National Park. National Park residents tend to spend a large proportion of their income outwith the Park boundaries and it is almost certainly the case that individuals employed directly or indirectly by the mine will also spend a large part of their incomes outside the Park (ES Appendix 10).

The mine will increase the income earned in the National Park by £1.45m pounds each year of its operation. A large part of that may be spent outside the Park and would be the case regardless of the new economic activity being proposed. Spending outside the Park is a consequence of lack of choice and the small scale of the businesses in the Park. The mine will help slow down the decline of the park economy by contributing to additional spending power.

Further economic benefits may accrue to the development. One of these is the retention of income by Scotgold to fund further exploration activity leading possibly to future precious and rare metal developments. This has recently been the subject of a Government Select Committee (Strategically Important Metals, House of Commons Science and Technology Committee). The following is an extract from that report, under the heading of "Domestic Extraction".

"27. The evidence shows that there are unexploited deposits of various strategic metals in the UK but, in many areas, it is unclear whether extraction is economically viable. The use of modern geophysical prospecting methods could identify economically accessible reserves. The Government should work with the British Geological Survey to ensure that Government has a comprehensive and up-to-date understanding of potentially valuable domestic mineral resources. (Paragraph 178)

28. Research is underway into the potential to extract metals from industrial waste streams. We recommend that, if these techniques become economically viable, the Government ensure that current planning regulations do not unnecessarily restrict the use of significant potential reserves such as the 100 million tonnes of oil shale spoil heaps in West Lothian. (Paragraph 179)

29. We consider that domestic mining for strategic metals could alleviate the risk associated with sourcing metals from external supply monopolies. While any new mining in the UK is likely to have some environmental impact, this is likely to be lower than it would be abroad and so reduce the export of the UK's environmental impact. It is important that the Government invests in the necessary research, to ensure that future domestic mining has the least possible environmental impact. However, perception of the environmental impact also matters, and the public rightly needs to be certain of the effects of mining in the UK. The mining industry has a role to play in demonstrating that a modern mine, run to standards can be a good neighbour. (Paragraph 185)

30. We are concerned by reports that uncertainty and delay in the planning process is preventing some mining companies from even considering prospecting for reserves in the UK. The nature of mineral reserves is such that they are where they are, that is, their location is a given. Therefore any substantial local opposition and resulting rejection of planning applications may result in mining companies pursuing an overseas location. In order to make the most of the UK's valuable domestic resources and to speed up the planning process, we recommend that the Government classify mines, in particular those containing strategic metal reserves, as nationally significant infrastructure. (Paragraph 192)"

11.11.8.6 Scottish Gold

There is significant support from jewellers for the use of Scottish Gold because it is ethically sourced (see ES Appendix 2). Production of ethical gold in Scotland may restrict the expansion of "dirty" gold and the consequent negative impacts on societies and environments outside Scotland. There is already a market for jewellery manufactured from gold panned from rivers in Scotland, but there is an extreme shortage of gold from this source.

The level of interest among jewellers suggests that there are significant opportunities to increase the local multiplier effects from the gold mine, by supporting the production of high value-added, low transport cost jewellery that is highly marketable worldwide. Clearly, it would be particularly advantageous if production was located within the National Park area, but this would be a commercial decision. Production of Scottish Gold from the BPT has attracted considerable interest with a significant premium being generated from the sale of the first commercially produced Scottish gold in the form of 'rounds' Scotgold has also recently concluded an agreement with two very well-known Scottish jewellers for further Scottish gold from the BPT at a considerable premium.

11.11.8.7 Conservation and Educational Benefits

Policy SE1 of the National Park Plan seeks to foster a collaborative approach to economic growth between businesses, communities and agencies. There are several ways in which the Scotgold proposals may act as a driver for longer term sustainable communities in addition to the economic benefits outlined above.

The natural heritage of this area of the Loch Lomond and the Trossachs National Park is intrinsically linked to the underlying geology. The composition of the bedrock, in tandem with the ice sculpted topography, underpins the ecology of the Ben Lui SAC. The topography of the Cononish valley has resulted from glacial action, with many glacial features evident such as kames, drumlins, corries and hanging valleys.

Scotgold Resources Ltd is committed to providing funding to the local Community for schemes which may be identified by the Community as enhancing or benefitting its local environment and hence its economy. Some funding is committed to a long term landscape and ecological Management Plan for Cononish Glen, in liaison with the Park Authority, SNH and the landowner. (ES Section 6 and Appendix 7 refer).

Fostering an appreciation of the natural heritage is one of the tenets of the Park. Scotgold has and continues to played host to numerous parties from universities and interest groups, providing conducted tours of its current operations. The Company has already provided support for one PhD and eight MSc dissertations and indications are that a further PhD position may be granted. The mine is likely to prove popular with university geology departments for field trips as having access to working mines will help develop Scotland's and the UK's skill base as evidenced by St Andrews University annual mapping and logging field trip over the last two years Mineral ore extraction has almost disappeared from the UK, leaving students of geology and mining engineering with no examples of working mines.

Scotgold has been involved with the Heritage Group of the National Park and contributes to a number of events in the local area. In association with the development of mining heritage walks, Scotgold is willing to explore mine visitor opportunities. Post closure an opportunity could present itself to develop the mine visitor option. In liaison with the Park (Access Officer), Scotgold will support the Ranger Service in the area. With the geology underpinning the landscape and the ecology of the Ben Lui area, “formal” viewpoints in Cononish Glen can be provided with interpretation boards to promote an understanding of the geodiversity of the area.

11.12 Conclusion

Encouraging diversification to produce a sustainable economy is recognised as key to maintaining vibrant rural communities, with opportunities for full time employment for the 20 - 65 age group enabling and encouraging younger people to remain in the community where they grew up.

In Strathfillan, the economy is heavily dependent on tourism, which in 2007 accounted for the employment of 155 persons out of the economically active population of 213 (SCF 2007 figure). Tourism is economically fragile – 2008 figures show a significant drop in numbers over the previous, pre-recession year, which was also seen in the FMD outbreak of 2002.

In the Highlands of Scotland tourism is estimated to account for 30% of GDP (including indirect effects). Net attractors include the “branding” of an area, a theme taken forward in the creation of the Loch Lomond & Trossachs National Park itself, which now looks to establish a brand for each of its sub-areas, of which Breadalbane is one.

One of the National Park Plan’s stated aims is establishing business partnerships, to further sustainable development and to contribute to achieving the wider aims of the Park, which is of especial relevance in the current economic climate. Scotgold, through a funding programme in tandem with its proposals, has identified areas where it may support these aims.

The Scotgold proposals have been assessed against the wider socio-economic policy background presented in the Parks corporate documents and the National Park Plan, including policies SE 1 and SE 2, which set out the Parks thinking as to how its aims should be achieved, highlighting sustainability and the need to balance environment and conservation interests.

A scarcity of area specific data makes detailed analysis and projections difficult. In terms of local information, Strathfillan Community Futures Community Profile, information from local businesses and recreational (walkers) data has been used to provide a quantifiable measure of those tourists engaging in walking on the West Highland Way or in Cononish Glen and environs, who may have the potential for interaction with operational activities at the mine. Proportionately numbers are very low indeed, compared with the tourist aggregate for Tyndrum/Crianlarich.

The snapshot survey generally indicated a positive attitude towards the development. The survey also showed an awareness in the respondents of environmental issues, which Scotgold has fully addressed in its planning application.

An analysis of the demographic of this recreational group found it to comprise socio-economic groups A, B and C1, the higher paid end of the social spectrum, thus begging the question that conservation objectives are not necessarily equally benefiting less well-off members of society. This informs the primary target for education of the aims and aspirations of the National Park, with a view to further engaging and inspiring interest in the natural heritage.

The matrix below presents the assessed interaction of the Scotgold proposals against other factors, including conflicting land uses.

For every job created in the minerals industry additional jobs are supported with respect to supply/servicing, representing a potential significant socio-economic benefit within the local area. With rural employment opportunities at a premium, the gold mine would be a significant contributor to the economy of the area through the provision of 62 full time positions at full production. It would also provide training and work experience for entrants to the employment market as well as to those wishing to extend their job skills and longer term prospects.

Table 11.2 Socio-economic vs development effects

development stages	Short Term (construction)	Medium Term (mine operation	Long Term (post restoration)
socio-economic resources			
Tourism#	Low Neutral[a]	Low Neutral[a] Medium +ve[b]	Low Neutral[a] Medium +ve[b]
Recreation# (primarily walkers)	Medium -ve	Low/medium –ve	Low -ve
Employment	Low/medium* +ve	High +ve	Medium** +ve
Strathfillan Economy (GDP)	Medium +ve	High +ve	Medium +ve
Natural Heritage*** Education	High +ve	High +ve	High +ve

This factor is dependent on personal preferences and perceptions

[a] Reflects balance of core positive/negative preferences in general tourist population

[b] Through branding visitor facility seen as a destination attraction

* Construction employment dependent on contractor (local/regional)

**Training and experience/transferable skills/creation of spinoff long term jobs

***Achieved through partnership and associated project funding

As a consequence of full time, better paid employment, the housing market in the general area would open up to those currently unable to contemplate home ownership. Retaining the local workforce within the area in itself, keeps that economically active population in Strathfillan.

Both during the operational life of the mine and post closure, sustainable employment opportunities will present, through the proposed visitor facility and associated attractions, heritage trails and mine visits, encouraging longer stays in the area, or attracting fresh interest, through the branding power associated with “Gold”.

12 RECREATIONAL ACCESS

12.1 Introduction

This section brings together the assessments which have been made under several topic headings and considers the direct and indirect impacts on recreational access.

The relevant topic sections are:

- Landscape and visual impact assessment (ES Section 6)
- Noise (Emissions) and Blasting (ES Section 9)
- Traffic (ES Section 10)

Recreational Access has also been considered within the Socio-economic assessment, ES Section 11, in particular at 11.9. An economic analysis of recreational use of the area is presented in ES Appendix 10 at Section 4.

Site elements and operations are described in ES Section 3.

This assessment updates the findings of the earlier assessment, made in connection with the currently permitted development.

12.2 The Existing Situation

12.2.1 Path Network

There are several well used routes in the area, including the West Highland Way.

There are three catalogued routes, CS319, CS321, and CS322: CS319 extends from the A82 at Dalrigh to Allt an Rund at the western end of Cononish Glen, where the track terminates; CS321 leads from Tyndrum Lower Station; it contours round Sron nan Colan through Forestry Commission plantation and joins the main Cononish Glen access track at the 250m contour. CS322 is an alternative minor deviation to path CS321.

The National Park Authority has produced core path plans in accordance with the Land Reform (Scotland) Act 2003 and has identified two access routes to Cononish Glen from the east, from Tyndrum Lower Station through Forestry Commission Scotland Plantation (CS321) and from Dalrigh (CS319). These paths meet at NN 316 286.

The West Highland Way (WHW) passes around 3.5km to the east, with some 300m of the path using the Cononish Glen access track near Dalrigh. This route is confirmed as being a long distance 'core path'.

Figure 16.1 shows all of these formal paths.

12.2.2 Wider Area Access

The Land Reform (Scotland) Act 2003 permits responsible access to the Scottish countryside.

There are no formal paths other than those identified above, although many other informal routes have been established, many different variations of routes and destinations are feasible. Legislation is such that walkers and other non-motorised access is permitted across the majority of the study area.

Flanking Cononish Glen are the summits of Beinn Dubhchraig and Ben Oss, to the south. Ben Lui lies to the south-west, at the head of the Glen. These three peaks are over 3000 feet in height, and therefore classified as Munros. Beinn Chuirn lies to the west of the mine site and the minor summit of Meall Odhar to the north.

The Eas Anie (waterfall) is located immediately to the south of the mine portal and is a winter ice climb.

The approach to Beinn Dubhchraig and Ben Oss, which tend to be walked as a pair, more usually utilises the track to the south of the River Cononish, so are approached through the pine woods of Coille Coire Chuilc. Beinn Chuirn can be walked from either Glen Lochy or Glen Cononish. Meall Odhar can be walked as a circuit via Tyndrum and Glen Cononish, or may be as part of an ascent of Beinn Chuirn.

The approach to Ben Lui via Glen Cononish is longer than the popular approach from Glen Lochy, but it enables an ascent via the interesting ridges either side of Coire Gaothach, as well as via Central Gully, which is a popular climb in winter conditions.

12.2.3 Recreational Users

Recreational use may be broadly classified:

- seasonal – winter climbing and ice climbing
- all year round – low level walking/mountain biking/canoeing
- all year round – high level walking
- all year round – long distance paths

In general, a relatively small number of visual and/or aural receptors in the order of under 50 people most days, although occasionally more at weekends and during holiday periods, and often far fewer, particularly in winter) will have exposure to the site from nearby (i.e. from in the order of a 1-2km radius from the site).

Historical survey data (2010 and 2011) suggests an average of 22 walkers per day on the WHW at Dalrigh, similar numbers were recorded within the upper glen at peak times (e.g. Easter weekend). Peak numbers on the WHW are known to be far higher, although potential effects on users of this route are limited. The site is visible at a distance of 5.5-6.5km from the WHW, between Auchtertyre and Kirkton Farm, when walking north-west. No views of the site will be possible from closer sections of the West Highland Way, near Dalrigh. Effects are essentially limited to traffic associated with the mine, which may be encountered on a short section of the route.

Hill walkers and climbers tend to make occasional repeat visits to the same area. More frequent recreational visits are likely to the accessible area of community woodland at the bottom end of Glen Cononish, out of sight of the mine.

12.3 Potential Impacts, Assessment and Mitigation

12.3.1 Potential Impacts

Impacts on recreational users may be **direct** or **indirect**.

Direct impacts relate to the restriction of access over an area. Indirect impacts could result from the consequences of the development such as the visual and aural effects of the mine and its activities, in the circumstances where views are obtainable or operations are audible. An additional indirect impact is identified as arising from the use of the Cononish Glen access track by mine related vehicles.

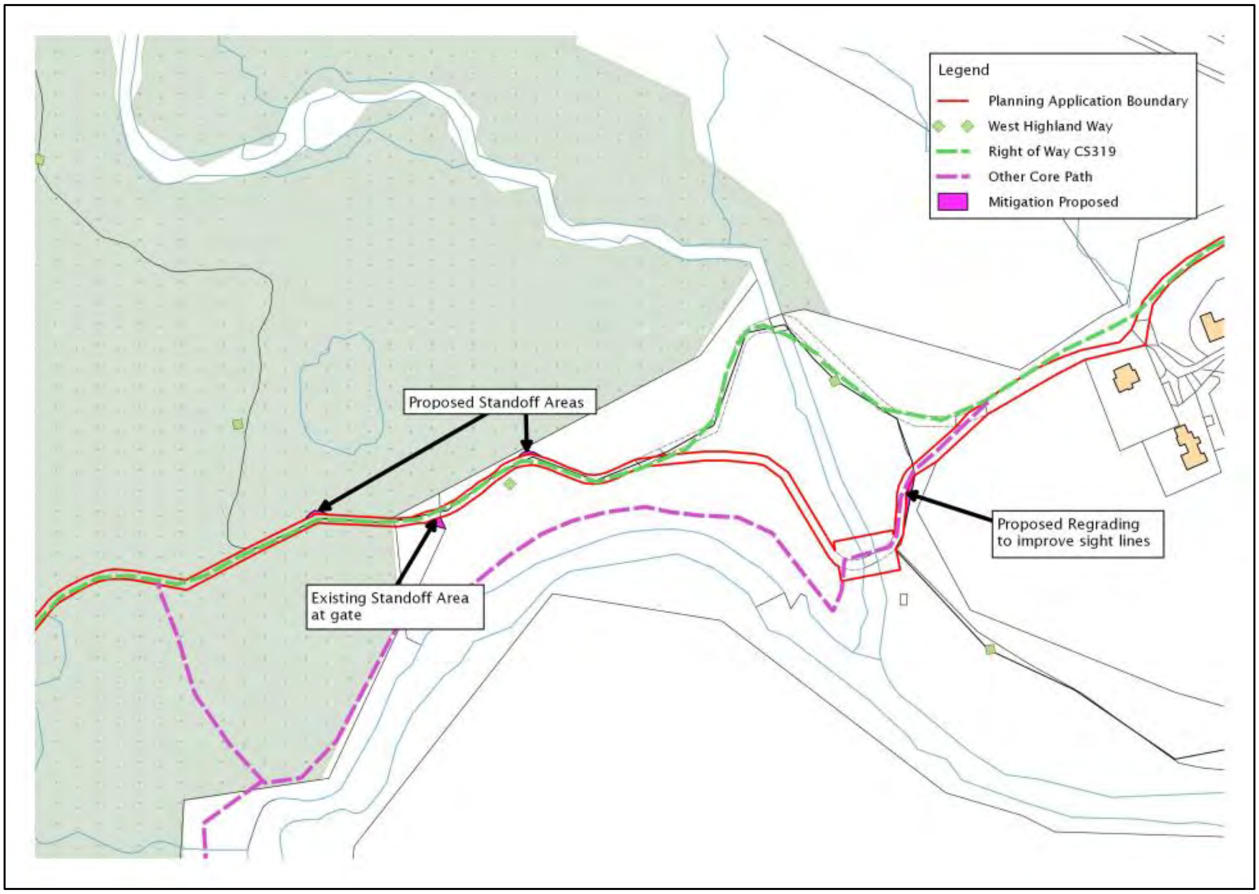
12.3.1.1 Direct Impacts

During establishment of the car parking area and installation of the Crom Allt bridge at Dalrigh, short-term temporary access restrictions will be in place. Signage will be erected in order that members of the public are made aware of the activities. There shall be no restriction in relation to the WHW as access shall be maintained and the use of the existing bridge will be unaffected. There is the potential for recreational visitors to meet mine traffic, particularly on the short section of the WHW which is shared by the mine access route. This has been discussed with the PA and considered in detail at a site meeting (July 2017). Mitigation for the relatively low number of vehicles relates primarily to provision of safe stand-off areas, facilitating the passing of vehicles/recreational users. There is also one area identified for regrading enabling improved visibility to reduce potential conflict, Plate 12.1 WHW Mitigation Summary refers.

Access over the mine site area will be restricted over the period of the mine operations, including final restoration. This is an obligation under Health and Safety legislation. Appropriate signage, as required, will inform members of the public.

Fencing around the mine site area shall be established/maintained. Alternative access was agreed in connection with the currently permitted development and these measures shall be established to ensure public access around the mine site is not unduly restricted, Figure 6.iii refers.

Plate 12.1 WHW Mitigation Summary



Deer fencing around the wider area shall also be erected, to protect proposed native woodland planting and to manage grazing pressures from deer and sheep. This shall encompass the planning application area and its environs and has the potential to limit access to these areas. The area to be deer fenced is shown on Figure 6.iii and Figure 6.ivi. Gate specification has been previously agreed in relation to the currently permitted scheme.

12.3.1.2 *Indirect Impacts*

Construction and Decommissioning

The greatest potential for impacts on recreational users is at times when a larger number of plant items are operational at the site, i.e. during the establishment phase and decommissioning. A lesser plant complement will be operational during mining and progressive restoration.

The construction phase will necessitate the mobilisation and demobilisation of a more extensive plant complement as well as the delivery of the processing plant and building, around twenty 40-foot shipping containers. The elevated number of vehicles on the access route(s) to the site as well as the level of activity associated with construction and site establishment works give rise to greatest potential to impact adversely on the 'countryside experience' for walkers and other recreational users. This will however be dependent on their proximity to the development and the period for which they are exposed to these effects. The visual impacts are described in the landscape and visual impact assessment, ES Section 6. Many of these potential effects are short term and reversible. Timing of vehicle movements will reduce possible effects; grouping deliveries into convoys, to facilitate management of the railway crossing, will also reduce the duration of any potential exposure for recreational visitors. The magnitude of these effects will be high for any recreational visitors affected. Similar large scale but short-term effects are likely at decommissioning.

Underground Mining Operations

Indirect impacts identified relate to the potential effects of blast vibration from mining operations on the Eas Anie ice climb. The effects apply only at times when very low temperatures prevail such that the climb is in suitable condition. There is no restriction on access to the base of the climb, which lies outwith the mine site (Figure 6.iii indicates the access route to the ice climb, which shall be signed as previously agreed in relation to the currently permitted scheme Appendix 11 refers.

No surface blasting is now proposed; the currently permitted development did include the diversion of the Allt Eas Anie and the formation of the diversion in rock required surface blasting.

ES Section 9 describes fully the potential impacts.

Ore Processing

All ore processing is contained within a single building. The building is acoustically clad and coloured a recessive brown. There is potential for visual and noise impact on recreational users, ES Sections 6 and 9 refer.

TSF Operation and Vehicle Movements

The alteration in tailings management from a large TMF to ten discrete tailings stacks (the Tailings Storage Facility - TSF) does introduce an additional requirement for vehicle movement at the mine site. The delivery and placement of tailings may however be restricted to around one vehicle movement per hour during daytime operating hours, and 5-10 minutes of tailings compaction each day, on average. The update noise assessment has considered these additional effects and they are not assessed as significant, ES Chapter 9 and Appendix 8 refer.

Given that the number of vehicle movements on the Cononish Glen track is very low, there are no identified potentially significant impacts on recreational users associated with the shared use of the access track during the operational phase.

12.3.2 Impact Assessment

12.3.2.1 Direct Impacts

Mine Site

Some 32ha – the mine site – will not be accessible to the public during the life of the development. In the context of the wider area this impact is assessed as **negligible**.

Fencing

Fencing proposals in respect to grazing management have the potential, if not carefully located, to "box in" walkers and/or sever obvious topographically determined routes of ascent and descent. Mitigation of these direct impacts is design led to avoid the potential for adverse impact on walkers through the appropriate location of crossing points and types. These were agreed in the preparation condition compliance reports associated with the currently approved development and form part of the Greater Cononish Glen Management, Appendix 12. The number of walkers affected is **low** and impacts are assessed as **negligible**.

12.3.2.2 Indirect impacts

Traffic Impacts

The effects during site establishment/construction and the ultimate decommissioning of the site will be greatest. They shall however be short term and mitigated by appropriate traffic management measures, these are specified within the Traffic Management Plan as approved in connection with the currently permitted scheme – Appendix 6 refers (CEMP include update C19 Rev.1 TMP)

During the operational phase, there are likely to be around 10 return vehicle movements on the access track per day, ES Chapter 11 refers. Against the current baseline of the operational Bulk Processing Trial this is considered a **slight-moderate** impact.

Visual Impacts

ES Section 6 should be referred to for the full assessment of visual impacts. Viewers (recreational users) are defined as having **high** sensitivity to change. Viewer numbers are **low**.

Effects on visual amenity have been assessed as **moderate** – **minor**, depending on distance from the site. **Major** adverse effects on visual amenity are limited to winter ice climbers at the Eas Anie Waterfall (see ES Section 6.7.38).

From Ben Lui summit itself, views to the site are partial, distant views. If approached by the ridge from Dalrigh, elevated views may be obtained only once the higher part of the shoulder of Beinn Dubhcraig is reached. To then obtain continuous views of the site along the ridge to Ben Lui via Ben Oss requires keeping to its northern side.

Few walkers tend to ascend from Strathfillan to Meall Odhar, to the north of the site, or to Beinn Chuirn, to the west, which may also be climbed from Glen Lochy. Views of the site are not obtained from the summit of Beinn Chuirn, or its lower eastern slopes, the site only being visible from the crags immediately above and to the west of the mine site. Beinn Challuim affords only distant views to the site, 9km to the west. Views from Ben More are at a distance of 15km. The site is scarcely discernible at these distances, even in good visibility.

While the major site establishment works shall be undertaken over a six-month period, the progressive operation of the TSF does involve stack preparation throughout the development. This proposal does however reduce the extent of the site which is disturbed at any time and facilitiates early restoration, as each stack is completed.

Noise Impacts

The relevant guidance has been applied in the assessment of potential impacts from site construction activities and from operational noise. Noise emissions from the site will not exceed the normally accepted construction noise criteria, nor will the operational noise exceed the suggested criteria within WHO Guidelines and PAN 50, where relevant (see ES Appendix 8).

Blasting Impacts

Potential effects of blasting on the ice climb have been explored by the Blasting Consultants, Vibrock. ES Appendix 8 contains their report, assessment, and recommendations, with the ice climb addressed at Section 9.3 of that report. Condition 39 attached to the current permission adequately mitigates the potential effects.

In summary it is considered inappropriate, due to the variable effects of freeze-thaw conditions to set a vibration criterion at which it would be safe to undertake a climb during a time when blasting at the mine is to occur.

Potential impacts on climbers will be mitigated by avoiding blasting within 300m of the waterfall, i.e. in the east section of the mine, when the ice climb is in condition. In addition, at these times, no blasting will take place over the weekend period, from 1900hrs on Fridays until Monday evening, when the climb is clear. Consequently the ice will be subject overnight to the prevailing climatic conditions and on the following day to the normal judgements made by ice climbers before ascending.

12.4 Summary of Impacts

Direct impacts on access are limited to the exclusion from the area of the mine site. There shall be no restriction on the usage of existing informal footpaths or identified draft core paths. Fencing installed for landscaping/ecological improvements has been designed such as to avoid "boxing in" walkers with appropriately located and designed crossing points. This has been agreed in connection with the currently approved scheme and no changes are anticipated. Direct impacts are therefore assessed as **negligible**.

Potential impacts on Cononish access track users in terms of temporary disturbance (noise and vehicle movements) due to construction are assessed as **minor**. Decommissioning shall have similar impacts to those at construction.

During construction, operational and final restoration/decommissioning phases the scheme has potential for adverse effects on recreational users; this relates to visual amenity and assessed as **moderate** to **minor** dependent on distance from the mine site. **Major** adverse effects on visual amenity are restricted to users of the Eas Anie ice climb.

12.4.1 Residual Impacts

Post restoration **no residual** adverse effects are identified.

Long term effects on recreational users of the area, as a consequence of the landscape mitigation proposed are considered overall to be **beneficial**, this is terms of visual amenity and increased area access.

12.4.2 Consideration Against the Planning Baseline

The proposed changes to the development compared to the currently permitted scheme include the alternative bridge proposed, the reduction in site establishment requirements and construction traffic, and an increase in site traffic associated with the TSF. The likely changes to access and recreation are therefore: a **relative benefit** at the time of bridge construction, longer directly affecting access on the WHW; a **relative benefit** in terms of total construction traffic as well as construction operations themselves, with reduced site establishment requirements for tailings storage and no requirement for a diversion to the Allt Eas Anie and associated blasting; and an **slight adverse effect**, relating to the indirect effects of potential disturbance associated with traffic movements on site during tailings placement. On balance this is considered to be an improvement in relation to access and recreation throughout the lifetime of the mine with a further improvement permanently, due to the improved landscape fit of the current proposals, ES Chapter 6 also refers.

13 MANAGEMENT OF WASTE FROM EXTRACTIVE INDUSTRIES

This ES Section sets out the procedure for the management of wastes from the mine in accordance with the Management of Waste from Extractive Industries Scotland Regulations 2010. Further details are provided in the succeeding Annex 13A (Annexes A, B and C referred to in the Guidance).

Although the design of the facility and method proposed to store tailings has changed from the previously submitted and approved Waste Management Plan compiled by Scotgold with assistance from AMEC Earth and Environmental, a substantial body of the technical information provided in the then Appendix 3 and supporting Appendices, most specifically in terms of characterisation of the waste and also process water chemistry remains valid.

It is noted that processing methodology has NOT changed and thus no change is anticipated to either the chemical or physical nature of the tailings (other than a reduction in water content when placed), nor to process water chemistry. As such, relevant sections of the AMEC Tailings Management Technical Report Review ('AMEC Technical Report'), (ES Appendix 4) are included for information and are appropriately referenced where relevant to the current application.

The current design has been carried out by Knight Piésold and their report Tailings Management Feasibility Design (referred to as the '**KP Technical Report**' or **KP Report'**) is included in Appendix 3.

13.1 Introduction to the Mine Waste Directive

The European Union Directive 2006/21/EC on the management of waste from the extractive industries the "MWD" – Mine Waste Directive sets out requirements for the management of material, such as overburden, rock, and process wastes, arising from the prospecting, extraction, treatment and storage of mineral resources and the working of mines and quarries. The Scottish Government has transposed the MWD through the Planning System in the Management of Extractive Waste (Scotland) Regulations 2010.

The requirements imposed by the MWD are dependent on the characteristics of the waste material at individual sites and also the manner and length of time for which it is to be stored. This is intended to ensure a lighter regulatory touch for sites that do not pose serious risks to the environment or human health whilst recognising that a more stringent approach is needed where failure or incorrect operation could result in significant damage.

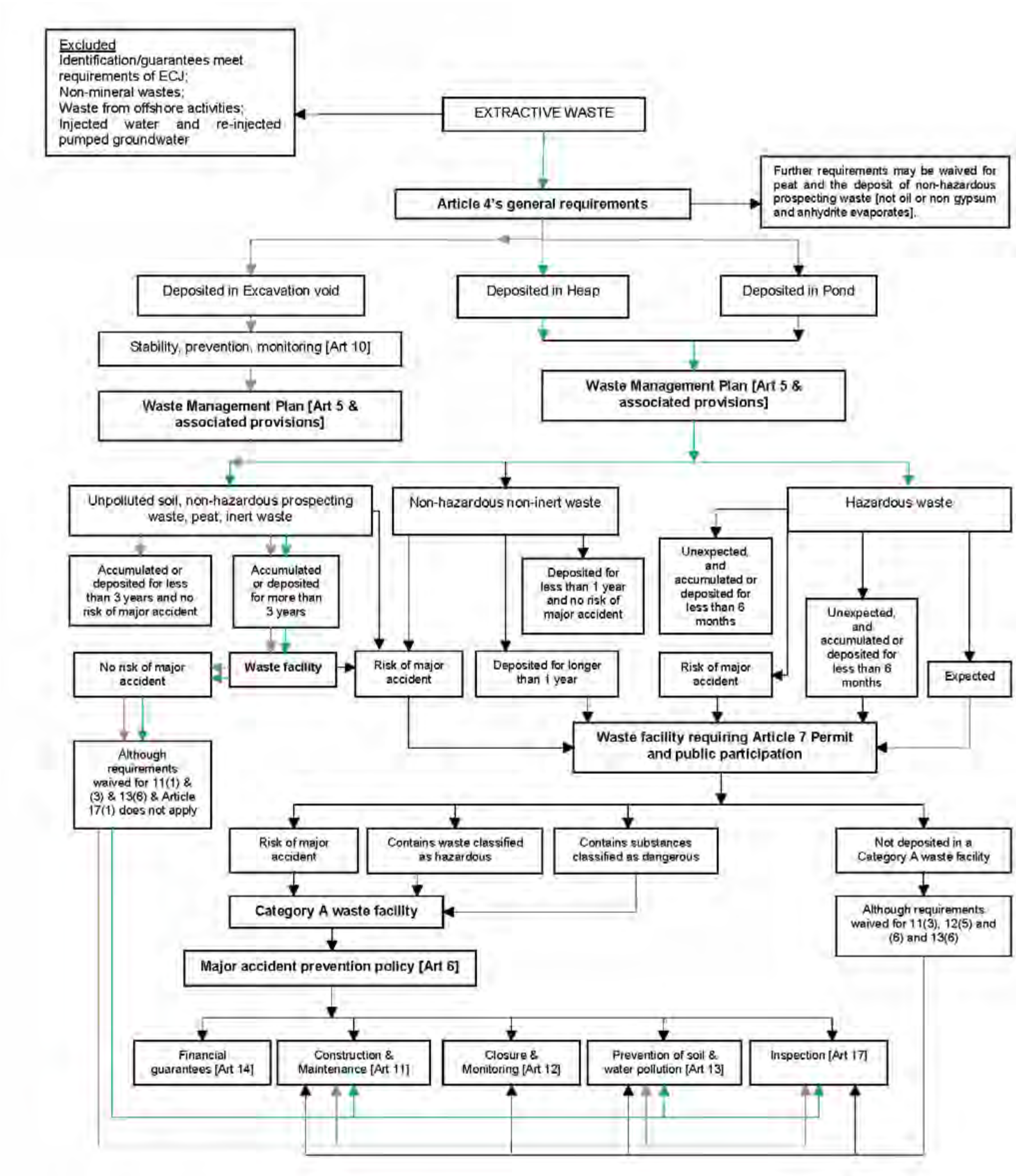
The flow chart at Plate 13.1 shows graphically how the Regulations will apply at Cononish.

The format of the Waste Management Plan described below follows that suggested by the Guidance on Management of Extractive Waste (Scotland) Regulations 2010.

Application is made for two Waste Facilities – one to contain inert mine 'tailings' for a period exceeding three years and similarly for mine rock which may be stored underground for more than three years prior to use for construction.

Waiver is also requested for unpolluted soil and peat which will be used in construction and restoration.

Plate 13.1 Classification of Waste under Management of Extractive Waste (Scotland) Regulations 2010



Classification for underground mine waste facility
Classification for tailings storage facility

13.2 Waste Management Plan

This section presents the information required by the Guidance and other relevant annexes where applicable. Further detailed technical information is contained within the KP Technical Report ES Appendix 3 with supporting associated technical information from the AMEC Technical Report (ES Appendix 4) and comment is provided in the following section emphasizing key points within the report.

An introduction to the Waste facility is provided by the Executive Summary to the KP Technical Report and is reproduced below.

13.2.1 KP Technical Report Technical summary

Knight Piésold Limited has undertaken the feasibility design for the tailings management system at the Cononish Gold Mine, Tyndrum, Scotland. The mine is in an environmentally sensitive location, located within Loch Lomond and the Trossachs National Park. The tailings management design has been modified from previous design (a conventional cross valley slurry storage dam) to minimise the visual impact on the area, to remove the requirement for watercourse diversion and to provide a cost-effective solution to the Project. The design has been carried out in accordance with the normal standards applicable internationally for such facilities and meets the requirements of EU, UK and Scottish regulations, specifically that of the Directive on the Management of Waste from Extractive Industries 2006/21/EC as implemented in Scotland as The Management of Extractive Waste (Scotland) Regulations 2010 (and associated Guidance) and the Quarries Regulations 1999 (QR1999) and associated Approved Code of Practice (ACOP), second edition 2013, as amended 2014. The waste facility will be classified as a tip under QR1999 and be subject to those regulations to "ensure safety" (Regulation 30).

The mine will produce approximately 0.5M tonnes / 0.3 Mm3 of inert tailings over its life. There are two production scenarios: a base case of 3,000tpm with a life of mine of 16 years, and an increased production scenario of 6,000tpm after three years of 3,000tpm with a 10 year life of mine. The tailings have been shown in past studies to be non-acid generating. Samples of ore have been ground to optimum sizes for gold recovery, and tested for filtration and geotechnical properties. The assumed P80 for the tailings is 125µm.

The feasibility design comprises the dewatering of the tailings (to below 20% moisture content) at the processing plant using a filter press, followed by stacking the filtered tailings in mounds in the valley immediately below the plant. The tailings stacks have been designed to replicate the glacial landscape of the area and represent forms typical of nearby moraine deposits.

The tailings stacks will be constructed by tipping the filtered tailings on a pre-prepared footprint after vegetation, soils and any wet peat has been removed, as necessary. An initial basal drainage layer comprising barren mine rock will be placed over the stack footprint. This will be covered by a geotextile separation membrane and tailings placed on top. The tailings will be placed at their optimum moisture content in 300 mm thick layers and compacted using a towed roller. This will maximise the stability of the stacks. The shape of the final landform will be formed using an excavator to trim the stack to approximately the designed shape. Each stack will store about a year's production at the higher production rate. The stacks have been designed and stability checked in accordance with normal international standards for such structures under all anticipated load conditions, including static and pseudo static loading, as well as varying groundwater conditions including extreme scenarios such as blocked drainage.

Three areas of tailings stack are proposed, each comprising two to four individual stacks. As one stack is being completed, preparation for the following stack will be in progress. On completion of each stack, the mound will be re-soiled and vegetation established (closure condition). Should sufficient humified peat require removal from stack footprints this will be placed into areas between the stacks where degraded areas of peat habitat are present; the conditions will be suitable to maintain the peat in its optimum condition and regenerate bog type habitat.

Before construction of the tailings stacks begins, surface water diversion channels will be constructed upslope of the site so that clean water does not enter the site. Channels will be excavated at the toe of each stack to collect seepage from the basal drainage layer and runoff from the stack slopes. The seepage and runoff ditches will discharge to a settlement pond at the base of the site. Discharge from the settlement pond will be pumped to the processing plant for reuse or piped to the confluence of the Allt Eas Anie and River Cononish for discharge in compliance with the existing consent. The discharge will be regulated by electronically controlled release valves tied to a gauging station. A waste facility water balance has been developed.

Costs have been estimated for the dewatering of the tailings and construction of the tailings stacks for the two production scenarios and with new or refurbished filter plant and hired or purchased earth moving equipment. Two optimum scenarios are presented below, for the lowest Life of Mine costs and for minimising CAPEX.

13.2.2 Operator Regulation 11 1a

The operator of the facility will be SGZ – Cononish Ltd (Company Registration Number) with registered offices at Upper Tyndrum Station, Tyndrum, FK20 8RY.

13.2.3 Proposed Location and alternatives Regulation 11 1b

The location of the proposed facility is shown in Figures 3.2 – 3.6.

The location of the previously proposed facilities had been derived through an iterative process encompassing considerations including those mentioned in the AMEC Technical Report – selection of Dam Site and the current 'general location' approved in 1996 as the most appropriate given the potential impact at other locations within the site.

Alternatives for the general form of the then proposed TMF which were considered at the initial stages included 'paddock type' ring dyke structures on flat ground in the

Cononish valley above the farm, a substantially larger structure as a result of aggressive topography towards Coire nan Saobhaidhe and the fields between forestry plantations below Cononish Farm, as being potential alternatives locations. These options were again reviewed by Scotgold's competent person at the time of the previous application.

Plate 13.2, below shows the locations of some of the alternative considered at that time.

Plate 13.2 Consideration of Alternatives - General Location

Subsequent reviews of technological advances, current practise relating to dewatering technology and further environmental considerations based on experiences of operating the Bulk Processing Trial at Cononish (started in June 2016) led to a comprehensive review of storage methodology.

In particular, the use of stacked tailings methods of disposal which dewater tailings prior to deposition were considered to be a potentially improved solution both environmentally and technically and Knight Piésold (KP) were retained to examine the feasibility of employing such a method.

Subsequent to confirming the feasibility of such a storage method, KP examined a number of possible locations for the facility based on a number of factors including distance from the processing plant and visual impact, the process was further refined with input from Dalgleish Associates and LUC. The current proposes a series of tailings stacks located in the valley, which seek to replicate similar morphological features found within the general locality.

Whilst the areal footprint is slightly larger than that previously proposed facility, appropriate use is made of mine rock generated through the development of the mine as providing the basal drainage layer to the stacks and obviating the removal and replacement of the large amounts of till previously required for construction of the TMF retaining wall. Sequential stack development also minimises the area under 'operation' at any one time and further facilitates ongoing restoration with a considerably reduced disturbed area in evidence at any one time. The progressive nature of the restoration significantly reduces the risk of failure or use of inappropriate techniques during the operation of the mine and provides an opportunity for an 'ongoing' restoration trial to ensure that the ultimate restoration is successful and in accordance with the required outcome.

In addition, stacks are located outside a 30m buffer zone on either side of the Allt Eas Anie and there is no requirement diversion.

13.2.4 Objectives of Waste Management Plan Regulation 11 1c

The objectives of the Waste Management Plan are outlined in the prescribed Annex C – Suggested checklist for WMP objectives and are stated below:

Other than unpolluted soil (and peat) for which waiver is requested see below, waste is generated from two activities namely:

- Mine rock generated from the establishment of the underground mine and its subsequent development and
- Waste generated from the processing of gold bearing material – 'tailings'

The overall operation at Cononish has been designed with a view to waste minimisation in the context of the deposit:

- Underground mining operation – parts of the deposit would be amenable to cheaper more intrusive open cast activities
- The underground method employed, 'sub level open stoping on retreat' minimises the production of mine rock
- Mine rock generated underground is used either for construction rehabilitation or in some cases may be stored underground until required for construction

The underground mine has been designed to minimise the production of mine rock. All mine rock extracted during the operation of the mine will be used to form the basal drainage layers of the tailings stacks. Some waste may be stored underground to obviate surface storage depending on the ongoing requirements of the schedule.

The tailings generated through processing of ore are inert and are to be stored in a series of stacks compliant with current standards and regulations.

The placement of tailings will be undertaken in accordance with operating tipping rules as required by the HSE under Regulation 60 to 66 of The Mines Regulations 2014 (MR2014). Further, the operation of the facility and compliance with these operating rules will be independently audited at regular intervals by a Geotechnical Specialist, as defined under MR2014.

Construction of each stack will be supervised by a qualified engineer using recognised civil engineering contractors and assessed by a Geotechnical Specialist on completion and during operation in accordance with MR2014.

KP will compile an Operations, Maintenance and Surveillance manual to be implemented by suitably trained mine staff for routine operation and monitoring of the facility in compliance with applicable legislation in addition to inspection by a suitably qualified independent third party.

13.2.5 Categorisation of facilities Regulation 11 1d

The process to assess the potential for waste facilities to qualify as Category A facilities as described in Chapter 3 of the Guidance and following Decision 337/2009/EC is shown in the completed Annex B following.

The facility has been designed in accordance with MR2014, EWD and Management of Waste from Extractive Industries Scotland Regulations 2010, taking into consideration international design standards (eg ICOLD). Furthermore, the facility has been designed in accordance with UK earthworks standards, adopted for the construction of the tailings stacks (Design Manual for Roads and Bridges: Volume 4, Section 1, Part 5, HA 70/94. Construction of Highway Earthworks). Dams / reservoirs regulations are not relevant for a stacked facility and have not been referenced for the Cononish tailings facility design.

With reference to the Guidance on Category A Waste Facilities:

10. The Decision on Category A classification followed a study DHI Water· Environment· Health in cooperation with SGI, Swedish Geotechnical Institute and AGH, University of Science and Technology, Krakow:
http://ec.europa.eu/environment/waste/mining/pdf/mwfs_report_dec_07.pdf
carried out for the EC and several aspects help with understanding the 2009 decision:

- The study considered alternative risk assessment methodologies and recommended a source-pathway-receptor basis where all elements of that chain must be present.
- For high-amplitude low-frequency events, such as dam failures, it is appropriate, for classification systems, that risk assessments concentrate on the consequences. However the procedure is aiming only to establish the

classification of the facility – it is not the intention to explore the potential consequences in great detail or to perform any detailed EIA.

The risk assessment, undertaken as part of the design process, has been used to confirm the categorisation of the facility. The categorisation undertaken in accordance with the requirements of the guidelines fails to identify a complete source-pathway-receptor for the Cononish TSF

source - the inert waste (stacked tailings)

pathway – no pathway is evident in the absence of a suitable transport mechanism for the dry stack tailings

receptor - the receptor would be the Cononish River SAC due to its location below the facility but no pathway exists.

The contained material is inert and does not comply with regulation 2b or 2c of The Management of Extractive Waste (Scotland) Regulations 2010 and would not classify as Category A for these criteria.

In the absence of a pathway for the source to enter the receptor, the resulting outcome indicates the facility is NOT to be classified as a Category A facility and should be classed as a Waste Facility

13.2.6 Characterisation of waste in accordance with 2009/360/EC Regulation 111e

With reference to the Principal Guidance Chapter 4 paragraphs 9 to 16:

Background information

The Cononish gold and silver deposit is proposed to be mined by underground methods (sub level open stoping on retreat) extracting around 72,000t of gold and silver-bearing ore annually. Material for treatment is brought out of the underground mine and will be crushed and ground (in a ball mill) and gold and silver recovered from a combination of gravity and flotation techniques. Gold and silver will be recovered into a 'doré' bar (unrefined gold and silver bar) and to a sulphide rich flotation concentrate which will be transported off site for further treatment.

Geological Background of deposit to be exploited.

The general geology of the area is shown in Figure 2.2

The Cononish deposit is hosted in a meta-sedimentary sequence of schists, pelites, quartzites, psammites and calcareous rocks of the Appin and Argyll Groups belonging to the Dalradian Supergroup characterisation of the local sequences encountered in mining operations is given in ES Appendix 4 AMEC appendices G.ARD Section 4.1.

The gold and silver mineralisation occurs within a steeply-dipping quartz vein which is up to 8.3m wide and has an average width of about 1.8m. The current identified mining inventory (reserve) amounts to some 550,000t to be mined over a period of between 10 and 16 years depending on a planned increase in production in year 3 subject to successful financing.

The vein system was emplaced during the late to post-tectonic late Silurian to early Devonian episode of granitoid intrusion in the Grampian Highlands. It shows both brittle and ductile style deformation and completely postdates metamorphism and associated Caledonian foliations. Quartz veining is associated with the Tyndrum Fault, one of a set of northeast southwest trending, left lateral, faults characterizing the Scottish Highlands.

Gold occurs as electrum (a natural gold / silver alloy) and some minor amounts of native (pure) gold; silver occurs additionally as minor tellurides. The gold/electrum is fine-grained, generally <100 µm in size. Visible gold up to 1,000 µm to 2,000 µm in size is rare. Assay data suggests that gold and silver is spatially associated with sulphides in the quartz vein. The main sulphide is pyrite, but galena, chalcopyrite and sphalerite occur in small amounts.

Although the vein outcrops on surface in limited areas, this will not be exposed by mining and little weathering and no supergene alteration has been encountered to date.

The waste and its intended handling

Some till is excavated from the establishment of the initial foundations from the stack 1 area and this will be used for the formation of the plant screening bund in association with other till material excavated from the plant platform.

Shallow peat (unpolluted soil) is retained for restoration.

Areas of deeper peat (>0.5m) exist on the site and this material will be removed if necessary and suitably stored for rehabilitation purposes

<u>Waiver in terms of the regulations is sought for this material</u>.

Other 'Waste' is produced from two sources

- Mine rock from development of the underground mine infrastructure which will be used for construction of the basal drainage layers of the stacks and restoration. Mine rock not required immediately for these purposes will be deposited underground.
- 'Tailings' – the resultant material from processing operations from which gold and silver have been extracted.

Around 172,000t of mine waste will be produced over the active life of operations. This material will be used substantially in preparing the basal drainage layers of the stacks. It is possible due to the timing of development activities that some of this material may be required to be stored underground for a period in excess of the stipulated threshold according the Regulations and hence application is made for the establishment of a waste facility underground. The mine rock to be used for construction and stored underground has been classified as **<u>inert</u>**. ES Appendix 4 AMEC appendices G.ARD Section 5.2

Tailings to be stored in the TSF have similarly been classified as **inert**. ES Appendix 4 AMEC appendices G.ARD Section 5.2

Under the current mining inventory, around 530,000 of tailings will be produced with approximately 5% of material mined being removed from site in the form of concentrate for further processing. The 'stack area' will have a designed capacity of 530,000t.

Description of waste transport system

Mine rock is removed from the underground mine in diesel powered truck and will be used for construction of the basal drainage layers of the stacks. If required, waste destined for storage underground will be 'direct' tipped into suitable underground voids to facilitate reclamation for construction at a later date

Tailings are dewatered to 15-20% moisture content in the processing plant and emitted to a small stockpile for transport to the operating stack by truck prior to placement and compaction.

Description of Chemical Substances to be used during treatment

A frothing agent, methyl isobutyl carbinol (MIBC) and collecting agent Potassium Amyl Xanthate (PAX) are to be used in the flotation process. Both substances are degradeable and in regular use throughout the EU and elsewhere. Predicted discharge concentrations are below Predicted No Effect Concentration PNEC levels proposed by SEPA. (Reference KP report Section 7)

Classification of waste according to Commission Decision 200/532/EC the European Waste Codes including hazardous properties

Further guidance on the classification is contained in Chapter 4 of the principal guidance note:

para.31. **Inert waste** is defined in these Regulations as waste "that does not undergo any significant physical, chemical or biological transformations; inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health; the total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not such as to endanger the quality of either surface water or groundwater."

para 32. Further guidance on this definition has been provided by the EC (Decision 2009/359 /EC Article 1). This states that extractive waste shall be considered as being inert waste where all of the following criteria are fulfilled in both the short and the long term:

a the waste will not undergo any significant disintegration or dissolution or other significant change likely to cause any adverse environmental effect or harm human health;

b the waste has a maximum content of sulphide sulphur of 0.1 %, or the waste has a maximum content of sulphide sulphur of 1% and the neutralising potential ratio, defined as the ratio between the neutralising potential and the acid potential, and determined on the basis of a static test prEN 15875 is greater than 3;

c the waste presents no risk of self-combustion and will not burn;

d the content of substances potentially harmful to the environment or human health in the waste, and in particular As, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, V and Zn, including in any fine particles alone of the waste, is sufficiently low to be of insignificant human and ecological risk, in both the short and the long term. In order to be considered as sufficiently low to be of insignificant human and ecological risk, the content of these substances shall not exceed national threshold values for sites identified as not contaminated or relevant national natural background levels; and

e the waste is substantially free of products used in extraction or processing that could harm the environment or human health

para 33. The EC decision further confirms that waste may be considered as inert waste without specific testing if it can be demonstrated, to the satisfaction of the competent authority, that the criteria set out above have been adequately considered and are met on the strength of existing information or valid procedures or schemes.

With reference to the Guidance on the Management of Extractive Waste Scotland Regulations (2010), Guidance on Category A facilities, Annex A (Annex 17 A) shows the Waste Codings from Decision 2000/532/EC.

Cononish Waste Rock

Waste rock is classified as 01 01 01 Waste from mineral metalliferous excavation from Decision 2000/532/EC.

Section 3.3 of the 2011 AMEC Technical Report classifies the waste rock as inert as inset below.

"…***and the details of testwork regarding this classification are presented in ES Appendix 4, AMEC Appendices; G. ARD, Sections 4 and 5. Waste rock underwent acid base accounting on all samples, NAG testing on selected samples and mineralogical characterisation on selected samples***" (ES Appendix 4 AMEC appendices G.ARD Section 5.2.3, 5.3 refer).

In addition, samples were taken from the existing rockpile at Cononish ES Appendix 4, AMEC Appendices; G. ARD, Section 5.2.1, 5.3 refer.

Extracts of comments regarding the mineralogical composition state:

- ***"For trace elements of concern, the representative samples are either a similar order of magnitude or lower than the Earth's crust average and for those elements data is available for lower than the baseline soils contents for these elements***
- ***future waste rock composition is more benign than some of the local soils with the exception of iron.***
- ***Future waste rock is unlikely to generate a problem of metal leachability***
- ***Based on these results it can be concluded that the future waste material is inert"***

Cononish Tailings

Tailings are classified in a 'mirror' entry, coded 01 03 05* - Waste from physical and chemical processing of metalliferous minerals – other tailing containing dangerous substances. 'Mirrored' hazardous entries are those which can either be hazardous or not depending whether they contain 'dangerous' properties'.

Cononish tailings are shown NOT to be hazardous according to the definitions given by Decision 2009/359 /EC Article 1, paragraph 32 (above).

The details as required by paragraphs a and b are contained within the ES Appendix 4 AMEC appendices G.ARD Section 5.2.2 and appendices A B and E of that report.

Tailings are substantially composed of silica inert and non combustible and other stable oxides as shown in the ES Appendix 4 AMEC appendices G. ARD Section 5.2.2 and Table 11. Table 12 of that section shows the concentration of elements potentially harmful to the environment. The analysis shows minor amounts of these substances present in the tailings though all are either around or below the Earth's crustal and/or local soil levels and as such can be regarded as inert. Tables 11 and 12 from that Section are reproduced below in Table 13.1 and Table 13.2.

Table 13.1 Major Oxide Composition of Cononish Tailings

Table11: X-Ray Fluorescence (XRF) Determination of Major Oxides, %		
Oxide	Tailings	Earth's Crust Average
SiO_2	94.5	59.07
TiO_2	0.04	1.03
Al_2O_3	0.85	15.22
Cr_2O_3	0.06	
Fe_2O_3	1.58	3.1
MnO	0.03	
MgO	0.06	3.45
BaO	0.15	
CaO	1.04	5.1
K_2O	0.43	3.11
Na_2O	0.03	3.71
P_2O_5	0.01	0.3
Total	99	

Table 13.2 Trace Element Analysis of Cononish Tailings

Table 12: Trace Elements Analysis, ppm				
Trace Element	Tailings Sample	Earth's Crust,	Soil,	Cononish Baseline Soils
As	4.1	1.8	1-50	1 - 32
Cd	0.21	0.2		< 1
Co	2.3	25	1-40	
Cr	333	100		
Cu	78.4	55	2-100	2 - 47
Hg	0.009	0.08		0.01 – 0.15
Mo	5.85	1.5		
Ni	10.1	75	5-500	
Pb	215	12.5	2-200	8 - 490
V	4	135	20-500	
Zn	36	70	10-300	4 - 456

Note for soils levels not quoted in Table 13.2:

Mo levels in UK soils range between 1 – 5 ppm Ref: Trace Elements in Soils and Plant; Pendias

Chrome levels in soils range from >100 - <700 ppm but up to 12000ppm – Ref: Information on Land Quality in Scotland: R&D Technical Report P293, B Smith, B G Rawlins, A J Ferguson, F Fordyce, M G Hutchins, J R Finnamore, D M Barr

Reagents used in processing

Chemicals methyl isobutyl carbinol (MIBC) and potassium amyl xanthate (PAX) used during processing operations, by their nature as frother and collector, are largely removed to the concentrate and the balance retained in the processing water which is largely (c.80%) recycled. MIBC degrades rapidly and PAX degradation is commented on in the KP report Section 7

Based on the foregoing, **both waste rock and tailings are classified as inert**.

13.2.7 Operation generating waste and any subsequent treatment Regulation 11 1f

Gold and silver bearing ore is produced from long hole open stoping on retreat from an underground mine. Ore will be processed by a 'gravity/flotation' process. Ore is passed through two stages of crushing before entering a ball mill to reduce the size of material to 80% passing 125 microns. Sized ball mill product is then fed to a 'gravity' circuit which will recover liberated particles of 'free gold' estimated at 20% - 30% of gold contained. The balance of the gold and silver is associated with base metal and iron sulphides in the ore which will be recovered by 'flotation'. MIBC and PAX are used as frother and collector respectively in the flotation process – both are degradable. A large proportion (c.80%) of these substances is retained with the concentrate and the balance in the process water which will be recirculated. A limited amount associated with the retained moisture in the tailings will be deposited in the stacks. Dilution calculations are presented in the Knight Piésold report Section 7 and discharges are within Predicted No Effect Concentration (PNEC) limits proposed by SEPA.

It is estimated that 5% of the material mined will be recovered to a 'flotation concentrate' which will be bagged for transport off-site for further treatment. The balance of the material is in the form of inert 'tailings' which require to be stored.

Mine rock from underground operations not immediately used in construction of the basal drainage layers of the stacks and for restoration will be stored in underground workings for reclamation as required.

13.2.8 Placement of extractive waste into voids Regulation 11 1h

At present, all mine rock generated is required for construction of the basal drainage for the various stacks. Any excess waste produced prior to its requirement for the construction of the stacks, will be stored underground and reclaimed as required for construction. The mining sequence and geometry of the underground operations contemplated does not facilitate the placement of tailings underground.

13.2.9 Plan for closure Regulation 11 1i and 22 1g

Details of the proposed progressive and final restoration plans are described in ES Sections 3.6, 6.6.5, and Appendix 7.

The facility will continue to be monitored until it is considered to pose no geotechnical or geochemical risk and can be 'closed' – provision is made for such costs under the 'Restoration Bond'.

13.2.10 Topographic survey and description of land Regulation 11 1k

ES Section 2.7 and ES Figures provide the required details.

13.2.11 European or National Designations Regulation 22 1c

The facility is located in the Loch Lomond and The Trossachs National Park and in hydraulic connection with the River Tay SAC. The site adjoins the Ben Lui NNR /SAC.

13.2.12 Suitably constructed managed and maintained Regulation 22 1c

Note: Stability of extractive waste tips at operational quarries is covered by the Quarries Regulations 1999 (QR1999).

QR1999 makes the operator responsible for designing, operating and maintaining tips and lagoons so as not to endanger human beings within or outwith the site as far as practicable.

QR1999 is backed by statutory systems involving inspection, identification of hazards, specialist geotechnical assessment including consideration of consequences of failure and notification to the HSE.

The Cononish TSF will be covered by QR1999. As noted above, the facility has been designed to all relevant and applicable Scottish, UK and EU standards and legislation.

Specifically, in terms of hydrology, seepage and runoff channels have been designed for the 1 in 100 year flow. The settlement pond is designed to retain a 1 in 10 year flood with a spillway provided to conduct 1 in 100 year flows safely.

In terms of seismicity, the tailings stacks have been assessed for stability under all credible conditions, including under seismic loading. The same seismic acceleration of 0.15g as used in the AMEC design has been adopted by Knight Piésold, with factors of safety under such conditions exceeding internationally recognised recommendations.

Construction of the facility will be carried out by experienced civil engineering contractors under the supervision of Scotgold's engineer.

The ongoing construction (compaction) of the facility will be under the auspices of Scotgold, and the facility requires daily and weekly inspection according to the KP Operations Manual. These routine inspections enable early identification of potential problems.

Inspection on a regular basis will be provided by an independent geotechnical specialist with the proposed report structure in accordance with Schedule 2 of MR2014.

The suggested contents, as provided MR2014 is indicated below:

- Site survey
- Site investigation
- Cross-sections based on site investigations
- Plans based on site investigation
- Assumptions made before analysis
- Findings of analysis
- Design coming out of analysis
- Requirements during and after construction

13.2.13 Prevention or minimisation of surface water or groundwater pollution or deterioration Regulation 111g

To minimise the possible interaction between mine and surface water and to facilitate control of rainfall away from the stack areas, diversion channels reduce the catchment area of the TSF and a large portion of surface catchment water is diverted away from the TSF. Location of the diversion channels are described and shown in ES Appendix 3 KP Report Section 5.7 and Appendix F respectively.

Approximately 80% of the process water is recycled through plant operations with 15 – 20% retained by the tailings for disposal. Channels / collection drains are excavated at the toe of each stack to collect seepage through the basal drainage layer and also run off from direct precipitation in the stack area. This water will report to the settlement pond at the bottom of the facility prior to either recirculation to the processing plant or discharge to the Cononish River under the permitted discharge consent.

Groundwater quality will be monitored downstream of the facilities through observation wells.

All discharge is via a controlled valved outlet in the settlement pond to meet the discharge consent for the River Cononish as described in ES Section 7 and also referenced in the KP Technical report (ES Appendix 3).

The water balance for the project is on average positive and therefore water will be required to be discharged to the environment. Four sources of water are identified as contributing to water for potential discharge:

- Mine water
- Direct precipitation onto the TSF
- Undisturbed catchment (below diversions)
- Liquid phase of the tailings

The liquid phase from the tailings slurry has been analysed during metallurgical testing and the results are shown in ES Appendix 4 AMEC appendices G.ARD Appendix G

Testwork (ES Appendix 4 AMEC appendices G.ARD) has shown the tailings to contain low levels of trace elements and as the tailings have been shown to be non acid forming, water released from deposited tailings will not gain in significant concentration of dissolved metals.

Mine water quality has been obtained from the testing of site drainage since 1990. The metals content of direct precipitation onto the TSF and water from the undisturbed catchment are likely to have metals concentration below normal instrumentation detection limits.

Section 5.12 of the KP report demonstrates that discharge from the settlement pond is at all stages in compliance with the dilution required by discharge consent.

In respect of chemicals used in processing that may enter surface waters, as above, the concentrations at discharge to the Cononish are at or below PNEC thresholds (see (ES Appendix 3 KP Report – Section 7))

13.2.14 Prevention or minimisation of soil pollution Regulation 11 1g, 22 1c, d and 23 1b

The TSF will be engineered to contain all wastes, which are inert, within the footprint of the facilities. The tailings by virtue of their characteristics and disposal system will be deposited and confined within engineered stacks that are rehabilitated on completion of each stack in two phases.

Mine rock has been shown to be inert and will thus not pollute soil.

13.2.15 Prevention or minimisation of air pollution Regulation11 1g, j, 22 1c, d and 23 1b

The inert tailings will be transported to the TSF as a ‘damp sand’ and the moisture content of the deposited material will be controlled to prevent dust generation.

In periods of prolonged dry weather, provision will be made for dust suppression through wetting of the exposed surfaces as required. ES Section 9 assesses air quality and sets out a dust management strategy.

Progressive restoration of the stacks will minimize the potential for dust generation.

13.2.16 Construction to minimise damage to the landscape Regulation 22 1c

Construction method statements for activities associated with the construction of the TMF are contained within ES Appendix 6.

13.2.17 Provide a document demonstrating that a major accident prevention policy, a safety management system for implanting that policy and an internal emergency plan as described in Regulation 18 are in effect or will be put into effect prior to the operation of the facility Regulation11 3

As the TSF is not a Class A facility, there is no legislated requirement for a major accident prevention policy, a safety management system for implanting that policy or an internal emergency plan. However, suitable site policies, systems and procedures will be put in place to ensure an appropriate response to any untoward incidents. All relevant agencies will be consulted in relation thereto.

13.2.18 Management of facilities in hands of a competent person Regulation 22 1a

The management of the TSF will be in accordance with MR2014 under the auspices of a competent person appointed by Scotgold, who will give effect to the Operations, Maintenance and Surveillance manual. This provides for ongoing operation of the facility and the daily and weekly monitoring of the facility.

In addition, the facility will be subject to regular over-inspection by an independent suitably qualified geotechnical specialist.

13.2.19 Technical development and training Regulation 22 1b

Competency levels are prescribed by the MR 2014 and appropriate training and development of staff will be provided.

13.2.20 Arrangements for monitoring and inspection Regulation 22 1e

MR 2014 prescribes such activities which will be specified in the Operations, Maintenance and Surveillance Manual.

13.2.21 Arrangements for records of waste management operations Regulation 22 1f

The operator is required to record the volumes and tonnages of all waste deposited in accordance with the requirements of the MR 2014.

13.2.22 Information for Emergency Planning Department Regulation 19 1

No longer Category A facility and thus not required – see 17.2.17

13.2.23 Use of cyanide Regulation 23 5

No cyanide will be used in the processing of the ore.

Annex 13.A European Waste Codes

EXTRACT FROM EUROPEAN WASTE CODES SET OUT IN DECISION 2000/532/EC

Chapter 01:	Wastes Resulting from Exploration, Mining, Quarrying, and Physical and Chemical Treatment of Minerals
01 01	Wastes from mineral excavation
01 01 01	Wastes from mineral metalliferous excavation
01 01 02	Wastes from mineral non-metalliferous excavation
01 03	Wastes from physical and chemical processing of metalliferous minerals
01 03 04*	Acid-generating tailings from processing of sulphide ore
01 03 05*	Other tailings containing dangerous substances
01 03 06	Tailings other than those mentioned in 01 03 04 and 01 03 05
01 03 07*	Other wastes containing dangerous substances from physical and chemical processing of metalliferous minerals
01 03 08	Dusty and powdery wastes other than those mentioned in 01 03 07
01 03 09	Red mud from alumina production other than the wastes mentioned in 01 03 07
01 03 99	Wastes not otherwise specified
01 04	Wastes from physical and chemical processing of non-metalliferous minerals
01 04 07*	Wastes containing dangerous substances from physical and chemical processing of non-metalliferous minerals
01 04 08	Waste gravel and crushed rocks other than those mentioned in 01 04 07
01 04 09	Waste sand and clays
01 04 10	Dusty and powdery wastes other than those mentioned in 01 04 07
01 04 11	Wastes from potash and rock salt processing other than those mentioned in 01 04 07
01 04 12	Tailings and other wastes from washing and cleaning of minerals other than those mentioned in 01 04 07 and 01 04 11
01 04 13	Wastes from stone cutting and sawing other than those mentioned in 01 04 07
01 04 99	Wastes not otherwise specified
01 05	Drilling muds and other drilling wastes
01 05 04	Freshwater drilling muds and wastes
01 05 05*	Oil-containing drilling muds and wastes
01 05 06*	Drilling muds and other drilling muds containing dangerous substances
01 05 07	Barite-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06
01 05 08	Chloride-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06
01 05 99	Wastes not otherwise specified

'Waste' rock from Cononish is classified as **01 01 01 – Waste from mineral excavation - Waste from mineral metalliferous excavation**.

Tailings from Cononish are classified as **01 03 05* – Wastes from physical and chemical processing of metalliferous minerals – Other tailing containing dangerous substances**. Tailings have, as previously, been classified as non-acid generating and inert

* This is a mirror entry and as demonstrated, the material is not hazardous and can thus be classified as inert.

Annex 13.B Categorisation process

This process assesses potential for waste facilities to qualify as Category A facilities as described in Chapter 3 and following Decision 337/2009/EC

	Operator assessment of Potential for Category A facilities
	Preliminary
Q1	Does the waste management plan include any waste facilities?
	Yes
Yes	You should identify the facility and follow the questions below
No	If you have no waste facilities no further consideration is needed.
Note	Categorisation as a waste facility is described in Chapter 3 .Some sites will not have any. Some sites may have more than one facility
	Identification of facility
	The location of Cononish Tailings Management Facility and underground waste facility are shown on the accompanying Drawings 13.1 and 13.2. The centre of the project site is defined as 229,600 mE and 728,600 mN (NN29602860).
Note	Insert Name or NGR ref above or state “None”

	Hazardous waste or dangerous substances
Q2	Will the waste facility which will contain hazardous waste or dangerous substances?
	No – material to be stored is classified as inert thus Article 7 and 8 are not applicable – see Annex 13 A (Annex B) for European Waste Code classifications: waste rock from mineral metalliferous excavation is classified as 01 01 01; tailings are classified as 01 03 05 - Waste from physical and chemical processing of metalliferous minerals – other tailing containing dangerous substances. This is a mirror entry (which can be hazardous or non-hazardous). ES Appendix 4e AMEC report appendices G.ARD demonstrate the material is non-hazardous and thus classified as inert.
Yes	Consider the thresholds in Decision 337/2009/EC. If exceeded the facility will be Category A.
No	The facility will not be Category A on account of material. Move on to question 3

Notes	Chapter 2 describes the scope for hazardous waste

	Major Accident-Serious danger to human health or loss of life
Q3	Does the existing facility (or would the planned facility) constitute a significant hazard under the terms of the Quarries Regulations 1999
	No – a detailed geotechnical assessment of the TSF has been undertaken as part of the design process in compliance with the requirements of the Quarries Regulations 1999 and Mines Regulations 2014.
Yes	You should continue to question 4
No	The facility should not pose a serious danger to human health or loss of life but you should still make the confirmation required in Question 4
Q4	Can you confirm as operator the following?
	(a)that in your opinion structural failure or incorrect operation of the waste facility would not result in potential for loss of life or serious danger to human health considering any human beings other than site workers, who are present outwith the site, permanently or for prolonged periods. (b)(i) the operation complies with the Quarries Regulations 1999 (or for mines The Mines and Quarries Tips Act 1969 and Regulations), (ii) that where the facility is or would qualify as a significant hazard, the necessary geotechnical assessment work for the waste facility has been undertaken (iii) any notifiable tips have been notified to the HSE.
	a) Yes – ref Decision 2009/337/EC Article 4 para 2 (….not expected to be present permanently or prolonged in the potentially affected area) though see Q.5 below b) all items Yes – designed to all applicable standards. Refer text ES Section 13 and criteria used for design contained in KP Report.
Yes	The facility should not be treated as Category A on this count at this stage.
No	If you are not confident in certifying that your facility does not pose such a risk you should seek advice from a geotechnical specialist. Your WMP cannot be approved meantime
Notes	See Chapter 3 paragraphs 10-13

	Major Accident-Serious danger to the environment
Q5	**In the event of a structural failure or incorrect operation of any waste facility (whether or not classed as a significant hazard under the Quarries Regulations), is there a type of event where solid waste or slurry material could spill over the site boundary or onto an undisturbed area of the site. If so it would be useful if you could estimate the maximum reach of any spill or state a distance beyond which it certainly would not reach, taking into account the surrounding landform.**
	No – there is limited scope for possible localised slumping or erosion of the stack. Geotechnical analysis has not indicated slumping as a possible failure mode and any localised event would result in a slight flattening of the stack faces or sides from the existing 1:3 profile and is unlikely to extend for more than a few metres beyond the original slopes (Note: The maximum stack height is approximately 10m and stacks are designed to be 30m from existing watercourses). Drainage within the stack prevents any significant amounts of water being retained and thus there is little scope for any significant mobilisation of material in the stack. The stacks are encircled by appropriately sized catch drains which will retain any possible erosion. These catch drains similarly report to a suitably sized settlement pond.
Yes	Continue to Question 6
No	The facility does not qualify as Category A on this basis. If the preceding questions have been properly followed and the
Note	There is no question of probability of the failure
Q6	Are there any designated habitats might be affected by the spill
	Risk analysis: the source pathway receptor has provided NO pathway to the Tay River SAC (receptor).
Yes	Go to Question 7
No	Go to Question 7
Notes	This should certainly include any international or national designations. Local designations should be noted where known.
Q7	Is it predicted that the impact of a spill would exceed the criteria for serious danger to the environment in Decision 337/2009/EC
	(a) the intensity of the potential contaminant source strength is decreasing significantly within a short time;

	(b) the failure does not lead to any permanent or long-lasting environmental damage; (c) the affected environment can be restored through minor clean-up and restoration efforts.
	No. As per Q.5. Minor slupming and / or erosion of the stack surfaces are considered to be the only possible potential impacts to the environment. a) No contaminant source b) and c) Any potential erosion or slumping is likely to be minor in extent and should not exceed the design measures to contain such events. As such any potential release could be restored through minor clean up
Yes	If it is predicted (in the first instance) that these criteria would be exceeded you should confirm through a specific evaluation in the context of a source pathway-receptor**. In very clear circumstances this is expected to be a simple statement.**
No	The facility does not qualify as Category A on this count. If the preceding questions have been properly followed the facility will not be Category A
Notes	You should provide the reasoning behind your conclusion whether positive or negative. Where there is doubt you should undertake a specific evaluation following Decision 337/2009/EC. In the absence of any other information where waste is non-hazardous and there are no high sensitivity habitats such as those with ecological designations it will generally be reasonable to assume that impact would fall below the above criteria and would not amount to serious danger to the environment
Q8	**Is there any other risk of serious danger to the environment above the thresholds in Decision 337/2009/EC (i.e. those in Q7 above) which might result from incorrect operation such as unmitigated acid rock drainage?**
	No – tailings material is inert, see AMEC Appendices e: G ARD Assessment for classification. Waste rock is inert. See ES Appendix 4 AMEC Appendices e: G ARD Assessment for classification.
Yes	You should undertake a specific evaluation in the context of a source pathway-receptor chain to demonstrate whether or not the facility qualifies on this count.
No	The facility is not identified at this stage as Category A on this account

Notes	If the planning Authority or statutory consultees raise other significant considerations this aspect may need to be revisited. Impacts from extractive waste not already covered above (i.e. on account of hazard waste, dangerous substances or physical movement) are however likely to be limited especially where the extractive waste is inert. Acid rock drainage associated with surface coal mining is one possibility but this is addressed through the CAR regime and where backfill risk assessment has been carried out to SEPA's satisfaction this aspect will be addressed.
	Operators Conclusion
	NOT Category A

Annex 13.C WMP OBJECTIVES

Table 1	WMP OBJECTIVES- (APPLIES TO ALL PLANS)
(a)	**Reduction of waste production and harmfulness**
(a) (i)	How was the design and method for waste management chosen within the context of the mine or quarry process
	Reference ES Section 13 The deposit to be mined is a narrow, steeply dipping quartz vein. A portion of the resource would be amenable to extraction through surface methods though this was not considered as a result of the large amounts of mine rock that would be generated and require storage. Hence underground extraction is proposed with entrance using the existing (widened) tunnel, rather than developing a new tunnel more convenient and closer to the ore body – again to minimise mine rock generation. (The more logical entrance to the mine is located on the track to Ben Lui). The mining method selected is sub level open stoping on retreat. This particular method has been employed as it reduces the amount of mine rock developed to access the ore by driving extraction drives / tunnels on the vein. Mine rock is generated by the spiral ramp used to gain elevation in the resource. Mine rock not scheduled for immediate construction use in the TSF stacks will be stored in underground voids (Drawings 13.1 and 13.2 refer). Economic gold concentrations are measured in parts per million within the orebody. At Cononish, in common with other gold mines, gold is contained as fine particles, both in free form and associated with other minerals. Specifically at Cononish, 90% of gold particles are sub 100 micron (<0.1mm). The most commonly used process for extraction of gold involves the cyanidation of finely ground rock particles with gold being dissolved by cyanide and subsequently released for further processing. Test work in 1990, 1996 and 2009 has shown a high amenability to the cyanide processing route. **Use of cyanide (or mercury) however is NOT proposed at Cononish.** The alternative technique proposed involves the use of gravity and flotation. Test work indicates a recovery of 20 – 30% of gold through gravity processes, with the balance recovered through the flotation process which substantially removes most pyrite and base metal sulphides in the ore (reducing Fe, Pb, Zn and Cu concentrations in the tailings to be disposed of). As with cyanidation, the gravity flotation process requires the ore to be ground to p80 (80% particle size passing) 125 microns (0.125mm) in order to release both gold and individual mineral sulphide particles. Approximately 5% of the material is removed as either gold or ‘flotation concentrate’ with the balance of the material to be disposed of as ‘tailings’ in a suitably constructed facility, the Tailings Storage Facility (or ‘TSF’).

	Previously, the facility considered for Cononish was a typical valley type impoundment using the upstream construction method. This used natural topography to minimise the footprint of the facility and also in its upstream construction methodology, minimised the use of additional material for facility construction by using a part of the deposited material as the wall. A review of disposal methods in light of changing technology and further considerations of potential environmental impacts has resulted in a revised disposal methodology. Tailings are now proposed to be deposited in 'dry stack' facilities. Tailings are dewatered in the process plant and then transported by truck to the stack facility for tipping and compaction in sympathetically designed 'mounds'. Stacks are designed in approximate one year production increments so as to enable quicker restoration of areas disturbed by the facility. The new design obviates the diversion of the Eas Anie burn as previously required and uses mine rock as a basal drainage layer for the stacks. The material is classified as inert according to the regulations and is thus appropriate for use in construction
(a) (ii)	How might the extractive waste change in relation to an increase in surface area and exposure to conditions above ground (e.g. excess snow)?
	Reference ES Appendix 4e - AMEC appendices - Appendix G and sub Appendices A to G relating thereto Extractive waste has been classified as inert and consists largely of silica and is not predicted to undergo any changes once on surface. Testwork has indicated both the tailings and mine rock to be non-acid generating and to contain levels of base metals in common with the soil profile in the area. Dry stack facilities are proposed for tailings. Waste rock not used immediately in construction will be stored underground. Testwork on tailings is presented in ES Appendix 4e - Appendix G to AMEC Report Section 5.2.2 Mine rock was similarly tested and results are presented in ES Appendix 4e - Appendix G to AMEC Report Section 5.2.3 No adverse changes are predicted and no impact is anticipated due to snow
(a) (iii)	Has placing the waste back in the extraction void been considered?
	Mine rock generated by mining activities will be used to construct the required drainage layer for the stacks. Any waste rock not needed for immediate construction will be placed underground. Tailings may be deposited underground for a number of reasons including regional support of underground workings, through a requirement of the adopted mining method or to reduce the footprint of surface facilities for their impoundment. In the case of the first two reasons, either tailings with cement addition or de-slimed tailings (the fine faction removed for storage above ground) or dewatered tailings (if suitable) are generally used. As a result of the geometry of the ore deposit and

	the mining method employed there is no regional support requirement or mining operational requirement for their underground deposition. The current predicted settled density of tailings is 1.6t/m3 or 60% that of in situ rock and as such, even with the use of thickened tailings, placed densities will not replicate in situ rock and thus it would not be possible to place all tailings generated underground and there would always be a requirement for the provision of a facility to store tailings permanently. As such a surface depositary is required. Tailings cannot be stored underground until a suitable void has been created and the retreat open stoping method and layout and sequencing does not readily facilitate the placing of tailings underground. The current mineable inventory stands at around 530,000t based on current underground design, layout and sequencing and provision is made for this quantity of material within the TSF ('stacks') on surface.
(a) (iv)	Has replacement or reuse of topsoil been considered?
	Reference ES Section 8 and ES Appendices 6 & 7 – Construction Method Statements and Decommissioning and Restoration Plan respectively Peat turves / soil / peaty soil are stripped and stored for concurrent restoration of works around the site. Deeper peat may be placed to regenerate boggy habitat or stored if required.
(a) (v)	What substances are used in mineral treatment and have less dangerous substances been considered?
	Reference ES Section 13 and ES Section 3.3.1.9 and 3.5.2and Annex 17 B As noted above, ore is amenable to cyanidation, however the selected process involves the use of gravity and flotation techniques. Potassium Amyl Xanthate (PAX) and Methyl Isobutyl Carbinol (MIBC) will be used as collector and frother respectively for the flotation process. A large proportion of these substances are carried over to the concentrate produced for off-site treatment. Both substances are degradable and in regular use within the EU and elsewhere. Predicted discharge concentrations are below PNEC levels proposed by SEPA. Any PAX remaining in the tailings will continue to degrade and catch and seepage drains will be closed 14 months after tipping has been discontinued on a stack.
(b)	**Recovery of waste : recycle, reuse, reclaim**
(b)	Has recovery of the extractive waste been considered by recycling, reusing or reclaiming the waste where environmentally sound?
	Whilst the waste is, as above, inert, the grading of the material, predominantly fine sand with some silt, limits its use. In addition, possible remnant trace sulphides, although inert, do not make it suitable for use in concrete. Some coarser factions of the tailings might have possible use as fill but would have to be transported off site resulting in a significant increase in the amount of traffic along the glen and probable extensive road and bridge upgrade to cater for frequency and size of vehicles.

	Tailings contain a high proportion of silica with possible use for glass making however, trace element impurities render it unsuitable (pers. com: Sibelco). As outlined in the objectives of the Waste Management Plan, the requirement for storage of waste has been minimised in the context of the deposit and its processing. Mine rock is used in the construction of the basal drainage layers of the stacks Further use has thus not been considered.
(c)	**Design for safe disposal of waste - short and long term**
(c) (i)	Is the facility designed to require minimal and if possible no monitoring, control or management when closed?
	Reference ES Appendix 3 KP Report and ES Section 13 Annexe B The principle of design of the TSF is the safe, stable and environmentally appropriate disposal of the mine wastes during and post-operation. The design for closure aims to achieve geotechnical and geochemical stability at an early stage. The design therefore includes a programme of monitoring and maintenance post-closure commensurate with good practice. As noted, stacks are in operation for about a year and the majority of the stacks can be 'closed' and restored during the operating life of the mine. Mine rock stored underground requires no monitoring
(c) (ii)	Is the facility designed to minimise long term effects such as release of pollutants to air or water?
	Reference ES Section 13 and ES Appendix 3 KP Report Section 7 The waste materials to be deposited in the TSF are classified as inert. The stacks are designed to contain these materials in a safe and stable condition. All releases to air and water are be controlled and monitored, initially by operational systems and on-going restoration, and post-closure by the form of restoration adopted. The waste rock to be deposited underground is inert. There are no potential pollutants.
(c) (iii)	Is any facility above original ground surface and if so is it designed to ensure long term geotechnical stability?
	Reference ES Section 13 and ES Appendix 3 KP Report Section 5 The waste storage facility is raised above the land surrounding the facility. The TSF has been designed in accordance with <u>both statutory requirements and with UK standards as required by the HSE</u> with suitable geotechnical input to ensure long term stability. Site investigation works and laboratory testing also inform as to the suitability of the proposed design and its location. The underground waste facility is contained.

14 SUMMARY OF IMPACTS

14.1 Summary of Environmental Impacts and Benefits

The main findings of the ES are summarised below:

14.1.1 Landscape and Visual

Effects on the landscape resource

Direct and indirect effects on the landscape resource have been considered. Direct effects are localised and **major** during construction and decommissioning. In the wider scale context they are assessed as **minor.** Operational effects are also assessed as **major** up to around 1km from the mine site. At greater distance effects diminish with distance to no effect. Effects on the wider landscape character are not considered to be significant. No significant effects are predicted in association with the car park or bridge.

Effects on visual amenity

Ice climbers have the closest and elevated views. The development gives rise to localised **major** effects upon visual amenity affecting few people. During operations this is restricted to those closest to the site, approaching the site on the Ben Lui track and with elevated views from near the Eas Anie. Hill walkers on the slopes surrounding the site will experience localised **moderate** effects with the exception of Meall Odhar where effects are considered to be **major** during site establishment works. In the vicinity of Ben Lui effects are assessed as **minor**. At greater distances from locations where views may be had of the development, the effects are **minor**. There is no noticeable effect on views from the West Highland Way.

Mitigation by design

Design development has enabled mitigation of potential effects through an iterative design process, which has always had a view towards the end product when operations are completed. This is improved when considered against the planning baseline, removing the TMF landform and the Allt Eas Anie diversion.

The phasing of the works is designed so that progressive restoration of finished areas can occur; again this is further enhanced in comparison to the currently permitted scheme. Bare un-vegetated areas can be kept to a minimum, and soils and vegetation may be generally replaced immediately for restoration, minimising storage requirements.

All processing plant is contained within a single building, minimising “clutter”. The building colour and surface treatment will ensure that it blends with surrounding land cover colouring. Light emissions from within and lighting around the building are controlled. Shuttering will prevent light emissions from the building. There will be no use of external lighting other than in the event of a security incident.

Construction Method Statements

All measures will be detailed in the statements for the various site activities and will be supervised by a Clerk of Works.

Restoration

Restoration will be undertaken progressively and monitored as the site develops to ensure successful outcomes. Further measures include wider scale planting, and fencing to prevent grazing, to help mitigate adverse effects during the period of mine operation and progressive restoration, as well as improvement of the landscape of Glen Cononish in the longer term through a Greater Cononish Glen Management Plan, proposed by the Applicant.

Commitment to key landscape and visual mitigation measures

Key landscape and visual mitigation measures have been identified. The applicant is committed to implementing these.

- Supervision by Landscape Clerk of Works
- External clutter will be reduced by boxing in development components and containing them within a simple building with clean lines. Low level clutter

around the processing and plant building will be screened by a vegetated earth bund. Minibuses bringing workers to the mine will park behind this mound

- One building is proposed, rather than as several disparate buildings
- Cut and fill has been kept to the minimum required to form the necessary platform area, and the siting of the new platform responds to the location and alignment of the existing mine entrance platform
- All works have been designed to achieve a materials balance and so rock/peat/earth etc. will not need to be imported or exported from the site
- Muted greens, greys and browns will be used for the colour of external surfaces, which will blend into the countryside and which do not stand out when viewed from a distance
- Non reflective surfaces will be used
- Windows will be minimised, will be west facing (i.e. into the hillside of Beinn Chuirn), and shall be shuttered to prevent light spill
- Construction vehicles will not track across undisturbed areas of moorland outside their defined working area and access corridor
- Materials and machinery will be stored tidily during the works. Machinery will not be left in place for longer than required for construction purposes, in order to minimise its impact in views
- Lighting of compounds and works sites will be restricted to agreed working hours and that which is necessary for security
- The contractors' compound and storage areas will be located away from visible areas as far as possible, and will utilise the existing mine platform and working area so as to avoid additional unnecessary disturbance
- Peat turves, topsoil and the seedbank within it will be carefully stripped from all construction areas. Soils, soil forming materials including mineral soils and till, divots and mulch will be stored, as necessary, in areas where it will not be disturbed or tracked upon, in low uncompacted mounds. Where turf is not placed directly for restoration of the landscaped bund it will be stored separately and not stacked. Soft materials will be used to grade slopes prior to promotion of natural recolonisation of vegetation

- Regular looking engineered profiles will be avoided, and irregular concave and convex slopes mimicking existing contours, which match with the scale of the existing hillslopes, will be created as far as possible
- Long-term visibly man-made rock slope reinforcement such as gabions, concrete or wire mesh will not be used: slopes will be designed and engineered so that such measures are not required or can be entirely covered with peat turves and revegetated. Any reinforcement which is required will use geotextiles, of natural material, e.g. geojute
- Localised areas of existing scarred track sides, slopes and tie-ins will be graded and peat topsoil/turves will be placed on gently sloping cutting slopes and track verges to encourage regeneration of vegetation
- Seeding will be undertaken using locally native species appropriate to their location, and to tie in with adjacent vegetation types, only where considered appropriate and essential to prevent erosion
- Some planting of native woodland may be undertaken at this early stage
- On completion of construction, all remaining construction materials and equipment will be removed from the site, and temporary compounds/laydown areas removed and restored to a natural appearance
- Dry-stack areas will be constructed sequentially and subject to progressive reclamation and re-vegetation during the medium-term operational period. The 10 dry-stack areas will be shaped and graded so that the ultimate finished landform will tie in with the existing generally hummocky landscape of the mine area, and engineered profiles will be avoided
- Each stack will be restored as soon as it is complete, using soil and turves stripped from the subsequent stack area, and augmented with seeding and planting as necessary. Native tree planting will be established to form naturalistic clumps around the lower slopes of each stack, in line with the agreed landscape management plans
- Lighting will be carefully enclosed within the building so as not to contribute to light pollution/ light spillage off site/ glare to the sky. Skylights will face the mountain and will not be visible from Glen Cononish. Shutters will be used

during darkness. There will be minimal security lighting in external areas (sensors will be used to ensure it does not get left on)

- Vehicular access to the mine will be minimised. Workers will park cars in the extended car park near Dalrigh and will travel to the mine by minibus
- The mine and the surrounding area will be maintained in a clean and uncluttered state: a site Environmental Management Plan will be implemented which will include landscape and habitat management
- All defunct machinery, materials, and man-made objects will be removed from the area
- All cutting and embankment slopes will be graded to tie in with existing natural slopes, and no sharp edges will be left, except where minor rock or scree faces may be considered appropriate
- In re-grading the mine and building platforms and associated slopes, and completion of dry-stack areas, layers of topsoil, peat and peat turves will be replaced in the correct stratigraphic order
- After the re-grading of the building platform and the existing mine platform, and completion of the dry-stack areas, remaining vegetation will be established. Target establishment of native woodland/scrub is shown on Figures 6iii and 6iv
- Any remaining boulders and rocks will be distributed in a naturalistic way

14.1.2 Surface and Ground Water

The scheme shall have no effect on natural overland drainage. The removal of the requirement for a stream diversion, as in the currently permitted development, is a significant improvement against the planning baseline.

The greatest potential for effects relates to the pollution of surface water; this shall be strictly controlled through appropriate construction methods and management procedures, satisfying the requirements of relevant legislation including the Management of Extractive Waste (Scotland) Regulations 2010. SEPA has been fully consulted with respect to the quality and control of the discharge from the site to the

River Cononish. Operations shall be undertaken in full compliance with the necessary CAR licence(s).

Prime consideration has been given to the nearby internationally designated site of the River Tay Special Area of Conservation.

Mitigation includes:

- Appropriate design of site drainage system, including settlement pond
- Discharge controlled via linked gauging
- General 30m buffer from controlled watercourses
- Risk assessments will be undertaken and List I substances identified (List I, oils, fuels and hydraulic fluids only; List II, no substances identified)
- All deliveries of oils and fuels shall be supervised
- All storage tanks shall be located within impermeable bunded containment of minimum capacity 110% of the tank or 125% if more than one tank is situated within the containment area (as recommended in SEPA Guidelines, GPP2, Above Ground Oil Storage Tanks, and in accordance with the Oil Storage Regulations, 2006)
- Any valve, filter, sight gauge, vent pipe or other ancillary equipment shall be situated within the containment area
- Waste oil shall not be stored on site and shall be removed to dedicated storage or disposal facilities
- Management procedures and physical measures shall be put in place to deal with spillages
- Maintenance procedures and checks shall ensure minimisation of leakage of fuels or oils from plant
- Refuelling and servicing shall be undertaken in a designated area or with adequate precautions in place, e.g. dedicated impermeable surface with lipped edges to contain contaminants
- Where vehicle maintenance is necessary in the field due to breakdown adequate precautions shall be taken to contain contaminants e.g. spill trays

- Absorbent material, including oil absorbent material, will be available on site to mop up spillages. This will be in the form of oil booms and pads, and for smaller spillages quantities of proprietary absorbent materials. Sandbags will also be readily available for use to prevent spread of spillages and create dams if necessary. A water supply and pump will be maintained and readily available for use
- Where it is considered that an oil/fuel spillage may have soaked into the ground, the contaminated ground shall be excavated and removed from site by a licensed waste carrier to a suitable landfill facility
- The emergency contact telephone number of a specialist oil pollution control company shall be displayed on site
- Sub contractors shall be made aware both at contract stage and through site induction procedures of the proximity of the River Tay SAC (i.e. the River Cononish at this location) and of the guidelines for the handling of oils and fuels and of the spillage procedures at the site

14.1.3 Ecology

The sensitivities identified include internationally designated species (otter, bat) in the vicinity and internationally designated sites (Ben Lui and River Tay SACs) adjacent to the proposed development. The UKBAP includes wet heath, mire and acid grassland as well as running water. The site vegetation contains elements of species representative of these habitats. These occur within a mosaic including acid grassland.

A licence to disturb bats is in place. There shall be no direct impact on otter and habitat impacts in relation to their foraging resource are assessed as being minor in relation to the wider habitat available.

The temporary loss of the habitat mosaic will be mitigated by the proposed restoration and by the measures proposed to enhance habitat and biodiversity in the environs of the site and in Cononish Glen.

The River Tay SAC was identified at scoping as being potentially the most sensitive habitat. The potential impacts relate to pollution of the water course and this is fully addressed through the appropriate construction methods and management procedures proposed.

Mitigation includes:

- Supervision by an Ecological Clerk of Works
- Avoid unnecessary disturbance, restricting access to defined areas
- Progressive restoration
- Appropriate management of turf, mulch, soils and peat
- Control of weeds, as necessary
- Enhancement of woodland and mire habitats
- Continuing survey for bats, birds, otters
- Control of vehicle speed
- General 30m stand off from watercourses
- Appropriate control of potential pollutants including sediment
- Implementation of the site dust management strategy
- Appropriately placed and specified fencing.

Short term **minor-moderate** impacts will reduce over the life of the development. Long term effects associated with restoration and the implementation of the GCGMP are assessed as **beneficial.**

14.1.4 Noise

Noise levels due to initial construction and on-going mine production/processing activities can be controlled to meet current guidance with respect to noise at residential properties and open spaces used for recreation.

Mitigation measures include:

- The strategic location and layout of the process plant and building
- The use of acoustically clad processing plant building

- The formation of a landscaped bund to maximise the effect of screening
- The reduction in construction activity vs the currently permitted scheme
- Vehicle reversing alarms shall automatically adjust to operate at a pre-determined level above the prevailing ambient noise level
- All plant shall be properly maintained to ensure the integrity of silencers, lubrication of bearings etc
- Plant noise levels shall be checked on arrival on site and periodically thereafter
- All openings of the processing building, including windows and doors, should be kept closed whenever possible
- The plant feed hopper should be lined with rubber to reduce the potential of impact noise generated by material hitting the sides
- Vents, louvers and openings should be considered in relation to noise break out, ensuring sound attenuating vents are used where appropriate
- Residents at Cononish Farm should be informed in advance of any operations within the vicinity of the property that could potentially cause disturbance.
- Noise complaint procedure shall be implemented
- No construction activities should take place within 350m of Cononish Farm during the period 0600 – 0700 hrs.

14.1.5 Air Quality

A full Dust Management Strategy has been proposed which includes dust suppression and the cessation of construction operations if necessary during adverse weather conditions. Ore processing operations are fully contained within the process plant building and are subject to regulatory control by SEPA under the EPA. The potential for a significant impact due to dust emission from the site is assessed as negligible and it is unlikely that there shall be any reduction in air quality.

Control measures include:

- Dust collection systems within the processing plant building shall be serviced and inspected on a regular basis
- An adequate supply of water shall be made available for dust suppression

- All vehicles used for the movement of materials within the site shall be equipped with exhausts pointing away from the ground
- All relevant heavy plant shall be fitted with radiator fan deflector plates
- If, in extreme adverse conditions the aforementioned measures are not adequate, the following action shall be taken:

  (a) Restriction on the speed of vehicles on site;

  (b) Temporary cessation of activities giving rise to concern.
- The site manager will be the responsible person for ensuring that the dust management strategy is enforced. In his absence, a suitable competent person will be nominated
- Regular visual inspections of dust conditions will be undertaken by site staff. The frequency of inspections will be determined daily, in accordance with prevailing conditions
- Regular visual assessments of dust emissions will be made daily by site supervisory staff and remedial actions initiated as necessary. The results of such monitoring will be recorded in a daily log book
- Site management will give attention to advance weather forecasts and organise dust management requirements accordingly
- In the event of a complaint concerning dust emission, the site manager shall immediately undertake an investigation and instigate any necessary remedial action

14.1.6 Blasting

All vibration shall be within those levels recommended as being satisfactory for blast induced vibration within PAN 50 Annex D. When the ice climb is in condition, restrictions on blasting will apply to ensure continued recreational use.

14.1.7 Traffic

Assessment has demonstrated that the A82(T) is currently operating within accepted capacity and, allowing for future traffic movement growth, can comfortably accommodate the proposed vehicle movements over the duration of the development. Mine vehicle movements on the private Cononish Glen track are low. As some 235m of the West Highland Way near Dalrigh follows the access track, a Code of Practice for drivers will embody awareness of and priority for walkers. No significant impacts are anticipated in respect of traffic associated with the proposed development.

Mitigation includes:

- Access upgrade
- Road condition surveys
- Traffic Management Plan
- WHW enhancements relating to standoff areas and improved visibility on the new Crom Allt Bridge approach
- Drivers' Code of Practice
    8. All hauliers using the site will be issued with a copy of the Code of Practice and will be required by contract to adhere to the Code.
    9. No lorry shall enter or leave the site before 0700 or after 1900 Monday to Friday.
    10. A speed limit of 15mph will apply on all access routes.
    11. Concentrate despatched from site shall be securely covered.
    12. Drivers should have due regard for other road users and be vigilant for potential overtaking vehicles when accessing/leaving the site.
    13. All drivers, at all times, will:
        - Drive at a speed appropriate to the conditions of the road;
        - Avoid the need for adverse braking;
        - Practice the utmost courtesy when encountering other vehicles or pedestrians;
        - Be prepared to stop and give way to other road users;
        - Slow down considerably when cyclists, pedestrians or equestrians are on the access routes; and
        - Keep off verges.

14. Drivers failing to adhere to the Code of Practice will be given a written warning. Drivers who persistently breach the Code will be refused access to the site.

14.1.8 Cultural Heritage

Any currently unknown remains of historic mining at Eas Anie may be impacted on by the proposal. Mitigation is proposed by monitoring and recording any identified structure during surface development. The Tacksman's Cottage, a B listed building at Cononish Farm, shall experience a short term **moderate** impact on setting which will reduce once vegetation is established on the TMF and native woodland planting around it established. Mitigation is by way of a Written Scheme of Investigation (Appendix 9 refers).

14.1.9 Recreational Access

There shall be no restriction on access to existing informal paths or identified core paths in the area. Potential impacts have been identified in relation to recreational users, this relates primarily to temporary disturbance during construction or effects on views during the life of the mine development. In the long term there will be no effect on recreational amenity.

Mitigation includes:

- Signage
- Provision of additional car parking (initially Sundays and Bank Holidays but then retained in perpetuity)
- Provision of informal routes around the mine site (exclusion) area
- Provision of a new bridge over the Crom Allt avoiding any use of the existing bridge by mine traffic
- WHW enhancements relating to standoff areas and improved visibility on the new Crom Allt Bridge approach
- Restrictions on blasting to mitigate effects on the Eas Anie ice climb

14.2 Overview

There is a 'planning balance' to be struck between the potential environmental impacts associated with the proposed scheme (including any mitigation) and the potential socio-economic benefits from the gold mine. This is the basis for the decision the planning authority must reach in determining this application. From the findings of the EIA as presented in this ES it is considered that there are no planning or environmental considerations which would give rise to reasons for refusal.

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GLOSSARY

Appropriate Assessment (AA)

This is an assessment carried out under Regulation 48 of the Habitats Regulations.

Avoidance

See mitigation.

Baseline conditions

The existing conditions and/or conditions in the absence of the proposal .

Biodiversity

The biological diversity of the earth's living resources. The total range of variability among systems and organisms and the structural and functional relationships within and between these different levels.

Compensation

See Offset Mitigation.

Competent authority

Is the authority which determines the application for a consent, permission, licence or other authorisation to proceed with a development. In planning terms the Authority responsible for determining an application for planning consent. In terms of the Habitats Regulations, 'competent authority' includes any Minister, government department, public or statutory undertaker, public body of any description or person holding a public office.

Construction Method Statement (CMS)

Documentation detailing the manner in which works are undertaken, embodying mitigation measures.

Crown Estate

Assets held by Her Majesty the Queen, as Monarch and certain other royal land and all Government held land, for example land held by the Ministry of Defence and land owned by the Scottish Ministers including prisons, Trunk Roads and Motorways. The Crown Estate belongs to the reigning monarch 'in right of The Crown', that is, it is inherent with the accession to the throne. But it is not the private property of the monarch – it cannot be sold by the monarch, nor do revenues from it belong to the sovereign. Also see Mines Royal.

Ecological Clerk of Works (ECoW)

On site supervisor controlling protection of habitats during site works.

Effect

Impact of a proposal on the environmental resource.

Environment

"All but one's self"; the environment includes all aspects of the living and non-living world.

Environmental Impact Assessment (EIA)

This is an assessment carried out under the EIA Regulations. The **Iterative** process of evaluation of potential environmental effects of a development, including design, consultation, mitigation and reporting through an **Environmental Statement**.

Greater Cononish Glen Management Plan

A Landscape and Habitat Management Plan for the greater Cononish Glen area.

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Environmental statement (ES)

Is the report produced to document the EIA process and submitted with the application for consent or other authorisation required. The EIA Regulations define it further.

EIA Regulations

The UK statutory instruments that are designed to meet the requirements of Council Directive 85/337/EEC on the Assessment of the effects of certain public and private projects on the environment, as amended by Council Directive 97/11/EC.

Enhancement

A new benefit to biodiversity, unrelated to any negative impact.

Fragility

The degree of sensitivity of habitats, communities and species to environmental change.

Habitat

The place and environmental conditions in which a particular plant or animal lives. Often defined on the basis of major assemblages of plants found together.

Impact

The way in which a receptor/resource is affected by a project.

Integrity

The coherence of a feature's structure and function across its whole area that enables it to sustain its functionality.

GLOSSARY

Iterative

A process of feedback, repeated until the best solution has been found. The process of assessment and reassessment until the best environmental fit is achieved.

Mines Royal

Gold and silver are Mines Royal, which in most cases belong to the Crown and are managed by The Crown Estate. The Crown Estate's permission is needed to take away Crown gold in any form.

Mitigation

Measures taken to minimise negative impacts. Mitigation may be 'embedded' i.e. Mitigation by Design or by additional measures. Mitigation may include: avoidance (of sensitive areas or sensitive times); reduction (through operational controls or screening for example) or compensation (Offset Mitigation).

Niche

The 'space' or 'ecological role' occupied by a species and the resources used by a species. Conceptually the niche is multidimensional and each resource (food, time of feeding, etc.) and each abiotic factor (salinity, temperature, etc.) can be considered to be a dimension of the niche.

Offset Mitigation

Measures taken to make up for the loss of, or permanent damage to, environmental resources through the provision of, or improvement to, replacement areas.

PMF

Probable Maximum Flood; In Scotland the 1-5 million year storm event

PNEC

Probable no effect concentration. Concentration that causes no adverse effect.

GLOSSARY

Rarity

A measure of relative abundance.

Receptor

Any defined feature (e.g. human beings) that is sensitive to or has the potential to be affected by an impact.

Recirculation Pond

Collector of drainage from the TMF prior to recirculation to the process plant or discharge to the River Cononish.

Resource

Any ecological or other environmental component affected by an impact.

Restoration

The re-establishment of a damaged or degraded system or habitat to a close approximation of its pre-degraded condition.

Restoration Group

A liaison group comprising representatives from Scotgold (including an Ecological Clerk of Works), the landowner, the Park Authority, SNH and the Crown Estates

Scale

The level or geographic context for evaluation.

Scoping

Determination of the extent of an assessment, usually through consultation.

Screening

Determination by the Competent Authority of whether or not an EIA is necessary.

Sensitivity

The level of robustness or responsiveness to an impact. This relates in part to the value of a resource and its replaceability.

Tailings Management Facility (TMF)

The above ground containment for the fine (quartz) waste arisings from the gold extraction process.

Zone of Theoretical Visibility (ZTV)

The area(s) from which the proposal may theoretically be visible, not taking any screening effects of buildings or vegetation into account.

Adapted from: IEEM EcIA guidance; SNH EA guidance; and the IEMA.