CONCEPTUAL REHABILITATION AND CLOSURE PLAN FOR THE CURRAGHINALT GOLD PROJECT, COUNTY TYRONE, NORTHERN IRELAND

Prepared For

Dalradian Gold Limited

Report Prepared by

SRK Consulting (UK) Limited

UK06716

SRK Legal Entity:		SRK Consulting (UK) Limited
SRK Address:		5th Floor Churchill House 17 Churchill Way City and County of Cardiff, CF10 2HH Wales, United Kingdom.
Date:		November 2017
Project Number:		UK06716
SRK Project Director:	Rob Bowell	Corporate Consultant (Geochemistry)
SRK Project Manager:	Carl Williams	Senior Consultant (Environmental Engineering)
Client Legal Entity:		Dalradian Gold Limited
Client Address:		3 Killybrack Road Killybrack Business Park Omagh County Tyrone Northern Ireland, BT79 7DG

Table of Contents

List of Tables

List of Figures

List of Technical Appendices

SRK Consulting (UK) Limited
5th Floor Churchill House
17 Churchill Way
City and County of Cardiff
CF10 2HH, Wales
United Kingdom
E-mail: [redacted]
URL: www.srk.co.uk
Tel: + 44 (0) 2920 348 150
Fax: + 44 (0) 2920 348 199

CONCEPTUAL REHABILITATION AND CLOSURE PLAN FOR THE CURRAGHINALT GOLD PROJECT, COUNTY TYRONE, NORTHERN IRELAND

1 INTRODUCTION

1.1 Background

SRK Consulting (UK) Limited ("SRK") is an associate company of the international group holding company, SRK Consulting (Global) Limited (the "SRK Group"). Dalradian Gold Limited ("DGL, hereinafter also referred to as the "company" has requested SRK to prepare a conceptual rehabilitation and closure plan for the Curraghinalt Gold Project ("Curraghinalt" or the "project") located in Northern Ireland.

1.2 Scope of Work

This conceptual Rehabilitation and Closure Plan (RCP) has been prepared to support the Environmental Impact Assessment (EIA) for the project. This conceptual rehabilitation and closure plan can be used as a basis for developing the detailed closure, aftercare and surrender documentation required during the life of mine. The overall objective of the closure and rehabilitation of the mine site will be to ensure public safety and reclaim the land to a usable condition consistent with surrounding land use objectives.

In broad terms, once constructed, the project will comprise the following components:

- An underground mine, that will be accessed via a new decline;
- An existing adit;
- A crusher and covered stock pile;
- A mineral processing plant;
- A Mine Waste Facility (MWF) (also referred to as the Dry Stack Facility in various documents) for waste rock from the mine workings and tailings material from the process plant – varying proportions of the waste rock and tailings will be re-used in the workings as backfill that will be processed through a paste fill plant;
- Ancillary infrastructure and services required to support the activities (administrative buildings, maintenance workshop, warehouse facilities, parking, site roads, water supply, water treatment and telecommunications); and
- Connections, where technically feasible, to offsite infrastructure including the Northern Ireland road network, the electrical grid, along with the water supply networks in the area of the mine.
- Water treatment systems, including:
    - Waste water treatment plant;
    - Existing water treatment plant;
    - West Pond and East Ponds;

- Freshwater and Emergency Pond.

From the perspective of rehabilitation and closure, the principal components are considered to be:

- Underground mine including the decline, ventilation shafts, underground stopes, explosives magazine, underground paste backfill plant and associated pipework;
- Crusher and covered stock pile
- Process plant;
- Waste storage facilities, including the MWF;
- Mine and plant infrastructure including workshops, stores, change houses, site offices, fuel storage areas, generators, contractor laydown area, security post and laboratories
- Underground explosives storage areas;
- Access / service roads;
- Adit including associated infrastructure (buildings/containers);
- Sewage treatment plant(s);
- Powerlines and substation;
- Construction of a passive water treatment system at the existing surface infrastructure site replacing the existing active water treatment system and water lagoons;
- Construction of a passive water treatment system at the proposed infrastructure site making use of the water management ponds.
- Surface water management and treatment systems, including: existing active water treatment plant; west pond, east ponds and clean water pond;
- Diversion berms;
- Sound and visual mitigation berm;
- Fencing.

The overall layout of the project is shown in Figure 1-1. A more detailed plan view of the process plant area is shown in Figure 1-2.

This conceptual RCP provides an overview of:

- Legal requirements and other regulatory factors relevant to mine decommissioning and closure;
- Closure considerations;
- Closure assumptions;
- Site decommissioning and closure actions;
- Post closure monitoring;
- Closure cost estimate; and
- Closure opportunities.

The RCP is based on the project description collated by SRK based on the engineering design by JDS Energy & Mining Inc. (JDS) and environmental and social data collected as part of the environmental and social studies being undertaken for the project. The RCP will be reviewed, and updated with detailed closure planning documents as necessary during the life of mine.

The conceptual RCP is a supporting document to the environmental and social management plan presented in the Environmental Statement.

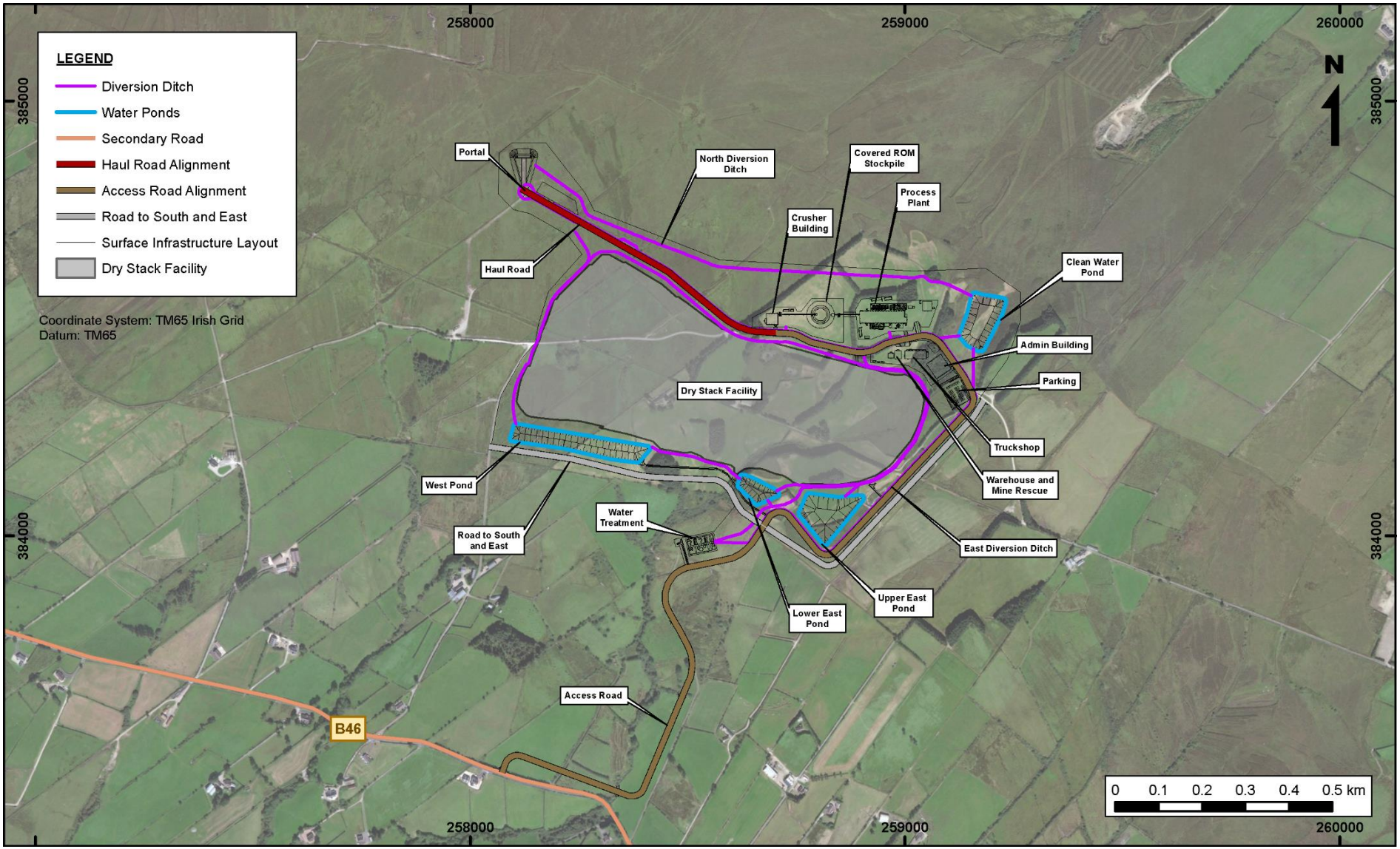


Figure 1-1: Location of main infrastructure site

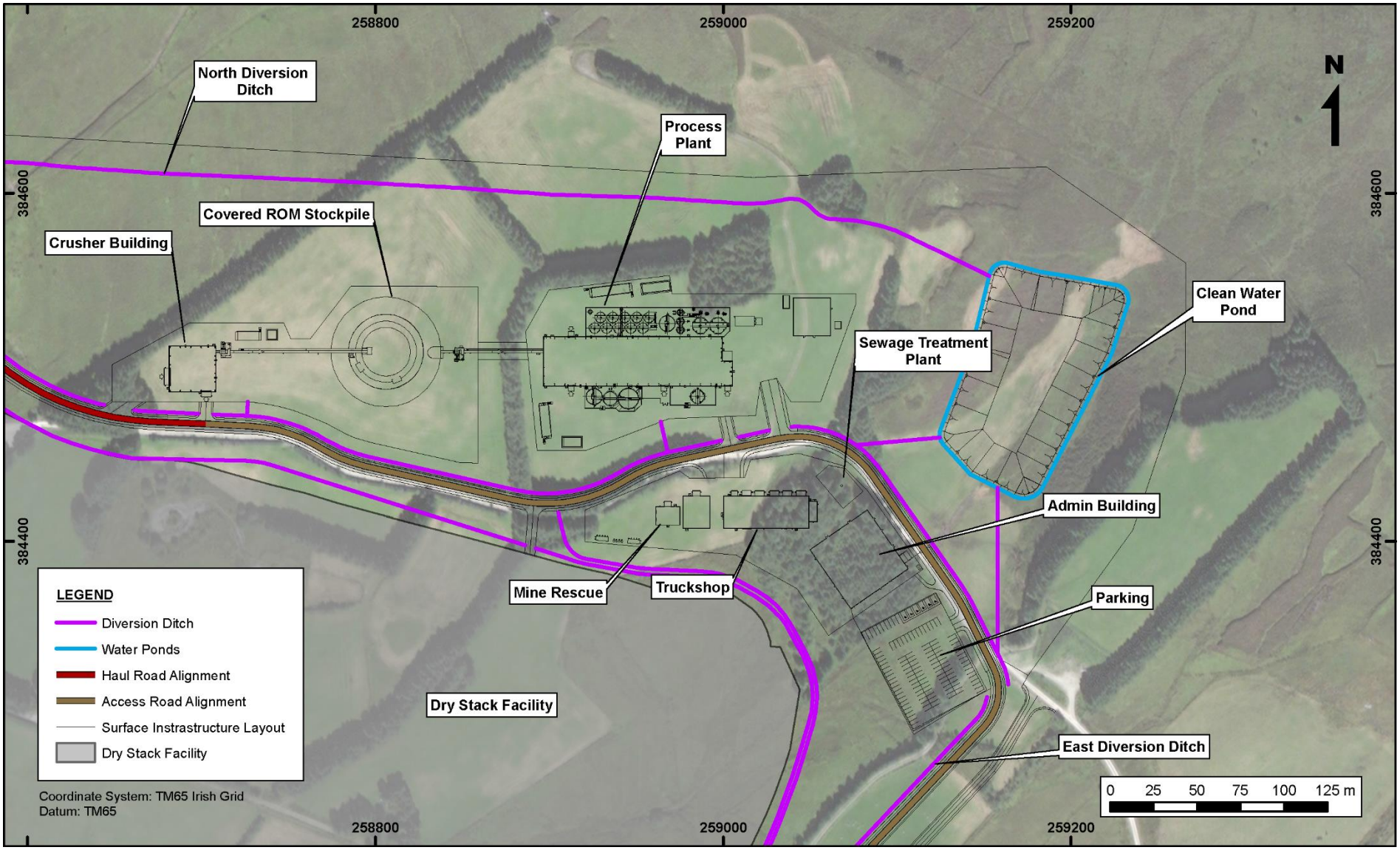


Figure 1-2: Plan view of the process plant area

2 LEGAL REQUIREMENTS AND OTHER REGULATORY FACTORS

This section describes the Northern Ireland requirements for closure planning, and other regulatory factors that have influenced the preparation of this RCP.

2.1 Northern Ireland Requirements

A mine waste management plan has been prepared for the project as required in terms of The Planning (Management of Waste from Extractive Industries) Regulations (Northern Ireland) 2015 ((Northern Ireland Department of the Environment, 2015)). These regulations transpose the EU Mining Waste Directive (2006/21/EC European Parliament and of the Council, 2006). The waste management plan was prepared by SRK (SRK Consulting (UK) Ltd, 2017) with input from JDS on the volumes and disposal methods of the waste produced. During the operation of the MWF the mine waste management plan methods and process will be followed. Closure requirements are covered in Regulations 8, 11 and 12 of the 2015/85 Regulations as detailed below:

"Financial guarantee

8.(1) No operations involving the management of extractive waste shall commence until a financial guarantee is provided by the operator to the council.

(2) The purpose of the financial guarantee shall be to ensure that—

(a) all conditions on the planning permission pertaining to the management of extractive waste, including after-closure conditions, are met; and

(b) there are funds readily available at any given time for the rehabilitation of the land affected by the waste facility, as described in the waste management plan.

Closure

11.(1) Closure of the waste facility shall not commence until the following requirements are satisfied—

(a) the conditions relating to the management of extractive waste are met; and

(b) an authorisation for closure notice is issued by the council.

(2) The waste facility shall not be regarded as closed until the council has issued a final closure notice.

After–closure

12. Following closure of the waste facility, where the council considers it necessary, and for as long as may be specified in a final closure notice—

(a) maintenance, monitoring, control and corrective measures shall be undertaken;

(b) the physical and chemical stability of the facility shall be controlled and any negative environmental effects shall be minimised in order to fulfil relevant environmental requirements as set out in Directives 2006/11/EC(a), 2006/118/EC(b) and 2000/60/EC(c), in particular with respect to surface and groundwater, by ensuring that—

(i) all the structures pertaining to the facility are monitored and conserved, with control and measuring apparatus always ready for use, and

(ii) where applicable, overflow channels and spillways are kept clean and free;

(c) the leachate generation potential, including contaminant content of the leachate, of the deposited waste shall be evaluated, and the water balance of the waste facility shall be determined;

(d) measures shall be taken to ensure—

(i) the prevention or minimisation of leachate generation and surface water or groundwater and soil from being contaminated by the waste, and

(ii) contaminated water and leachate from the waste facility shall be collected and treated to the appropriate standard required for their discharge;

(e) the council shall be notified of any events or developments likely to affect the stability of the waste facility and of any significant adverse environmental effects revealed by the after-closure and monitoring procedures and where applicable—

(i) the internal emergency plan shall be implemented,

(ii) any instructions from the council as to the corrective measures to be taken shall be followed, and

(iii) liability for the costs of implementing the internal emergency plan and taking the corrective measures shall rest with the operator;

(f) all monitoring results shall be reported to the council on the basis of aggregated data, at a frequency to be determined by it."

There is no specific requirement under the Northern Ireland legislation to prepare a site wide conceptual mine closure plan. As outlined above there is a requirement to prepare a plan for the closure of the mine waste storage facilities, however, as best practice and to assist in the preparation of the quantum of the financial guarantee a site wide conceptual RCP has been prepared. The closure and relinquishment of the process plant will be covered under a Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland, 2013) permit and these aspects are covered in detail in the PPC application (Wardell Armstrong, 2017).

2.2 Other Factors

There are numerous examples of closure practice worldwide and these along with local requirements and company standards will influence closure planning. The following factors have influenced the development of the RCP:

- DGL Corporate Standards;
- International Cyanide Management Code (ICMC, 2016);
- Good international industry practice; and
- Formal commitments to stakeholders.

2.2.1 Corporate Standards

The company's objectives include the aim: "Working to world class environmental standards. Submitting ourselves for additional inspections beyond what is legally required." The company has an Environmental Management Policy that states "the company is committed to minimize the company's environmental footprint by implementing environmentally responsible practices through all phases of the mining life cycle". They also "consider environmental practices to be a core element in the design and operation of all facilities, and are committed to allocating the resources and providing the training necessary to help achieve their stated objectives".

This RCP has therefore been prepared in accordance with good international industry practice in order to meet these objectives.

2.2.2 International Cyanide Management Code

Once operational, DGL have committed to becoming signatories of the International Cyanide Management Code (ICMC). As signatories to this code, DGL will adhere to the commitments outlined by the ICMC, including the following related to mine closure:

The code requires that certified gold mining operations plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife and livestock. Decommissioning includes decontamination of equipment, removal of residual cyanide reagents and installation of measures necessary for control or management of surface or ground water, such as pumping and treatment systems that would operate during the facility's closure period.

The code also requires that "certified gold mining operations establish an assurance mechanism capable of fully funding cyanide-related decommissioning activities. If the political jurisdiction in which the operation is located has financial assurance requirements, then the code accepts any financial instrument acceptable to the jurisdiction, as long as the amount is equal to or greater than the current estimated decommissioning cost". The financial guarantee under the NI legislation will supersede this requirement under the code.

2.2.3 Good International Industry Practice

International perspectives on good practice with respect to mine rehabilitation and closure are presented in numerous documents, with some of the most important being:

- Planning for Integrated Mine Closure: Toolkit, which is presented in the International Council on Mining and Metals' (ICMM's) Good Practice Website (ICMM, 2008);
- Mining for Closure: Policies, Practices and Guidelines for Sustainable Mining Practices and Closure of mines (United Nations Environment Programme, 2005);
- The Mining Association of Canada (MAC) Sustainable Mining Mine Closure Framework (MAC, 2008);
- The IFC and World Bank Environmental Health and Safety (EHS) Guidelines for Mining (IFC, 2007).
- These emphasise that mine closure planning should:
- Present a vision for closure, with clearly defined closure outcomes and completion criteria;
- Be an integral part of a project life cycle;
- Be undertaken early in the process of mine development, and in consultation with the regulating authority and other stakeholders prior to planning submission;
- Include financial provisions to ensure that there are sufficient funds available to complete the prescribed closure activities;
- Be regularly updated and refined to reflect changes in mine development and operational planning, as well as the environmental and social conditions and circumstances; and
- Include adjustments to closure funding arrangements to reflect any changes in mine closure requirements.

The guidelines also emphasise that RCPs should include social and economic considerations; any adverse socio-economic impacts should be minimised and socio-economic benefits should be maximised.

2.2.4 Formal Commitments to Stakeholders

Some specific commitments have been made to stakeholders to date with regards to the project closure, including: conducting progressive rehabilitation of the MWF; signing up to the International Cyanide Management Code; providing a financial assurance mechanism; and that the site will be rehabilitated and the land reclaimed in a way that is in keeping with the landscape and characteristics of the local area.

Closure of the operation has been discussed with stakeholders, including at the two public information events in November 2016; in particular, the communities surrounding the project. This allows DGL, to determine possible longer-term commitments that may be necessary to support the project's 'social license' to operate[1]. The issue of mine closure should be regularly revisited during the life of the mine, and changes in legislation and closure priorities incorporated into the detailed closure plan that will be developed before the mine ceases operations.

[1] A 'social license' to operate is maintaining ongoing approval amongst stakeholders (particularly local communities) so that project activities are not constrained by stakeholder actions.

3 CLOSURE CONSIDERATIONS

This section outlines the aspects to be considered in the overall management of the site during closure and post-closure phases of the project. These include, but are not limited to, the conditions likely to exist or influence decisions at the commencement of the closure phase. These include final land use and agreed specific closure objectives, existing environmental and social issues, stakeholder input, financial guarantee, retrenchment of employees and relinquishment opportunities.

3.1 Closure Objectives

In addition to the progressive rehabilitation of specific areas throughout the mine life, active closure and rehabilitation activities will take approximately twelve months from the end of processing operations. This will be followed by a period of approximately five years post-closure monitoring (exact timeframe to be agreed with the regulators based on monitoring results and rehabilitation progress) to demonstrate that the site has achieved the closure objectives agreed with NIEA and in accordance with relevant NI and EU legislation.

At the time of closure of the project, the mine areas should be reclaimed to a safe and environmentally sound condition consistent with closure commitments developed and contained within the Landscape Restoration Plan (LUC, 2017) (Appendix B) and planning application process. Specific closure commitments may be tied to the final land use for the project area.

For the current conceptual RCP the general objectives will be to:

- Reduce closure liability during operations through a concurrent rehabilitation program.
- Remove all redundant infrastructure
- Maintain worker health and safety throughout closure activities;
- Protect public health and safety;
- Reduce the visual impact of the facilities as far as practicable;
- Protect the SAC and ASSIs and wider environment;
- Demonstrate chemical stability compatible with site conditions;
- Demonstrate physical stability compatible with site conditions;
- Create a self-sustaining ecosystem compatible with site conditions;
- Minimise need for reclamation maintenance;
- Minimise negative impact on retrenched employees and local economy;
- Maintain community relations and positive community impacts.

3.2 Existing Environmental and Social Setting

3.3 Post-Mining Land Use

Wherever practical the site will be returned to farming land compatible with site conditions and the local environment. Specific closure commitments are linked to the final land use for the project area.

At present, the plan is that the land will be restored to productive use for farming and/or heathlands. The chosen land use will aim to be consistent with the landscape character and scenic value of the Sperrin Mountains AONB. As can be seen from the Landscape Restoration Plan (LUC, 2017) in addition to returning the land to farming, several of the closure concepts

influence the site post closure land use, including:

- The retention of several ponds that can provide alternative ecological habitats;
- The seed mix used for the reseeding of the rehabilitated areas will be selected to ensure the revegetation is sustainable and in keeping with the ecology of the surrounding areas;
- Trees planted during the operational phase will be left in place post closure; and
- Wetlands will be constructed at the existing surface infrastructure area and in the upper and lower east ponds to treat the water emanating from the underground mine and the MWF respectively.

3.4 Environmental and Social Conditions Affecting Closure

3.4.1 Biophysical Issues

The following biophysical aspects have been considered while preparing the conceptual RCP for the project:

Topography: The Curraghinalt Project is located on the southern edge of the Sperrin Mountains, an upland region in Northern Ireland. The mine and infrastructure areas are located within an area comprising a topographic ridge that includes the high points of Mullydoo (325 m above ordnance datum – AOD), Crocknamoghil (335 m AOD) and Crockanboy Hill (287 m AOD). The ridge forms the drainage divide between the Owenkillew and Owenreagh Rivers, which originate in the upland areas of the Sperrin Mountains.

Climate**:** The climate of Northern Ireland is moderated by its proximity to the Atlantic Ocean, being generally mild and wet. On average the region has a warm summer period (June to September) with an average maximum temperature of 18.5°C in July and a cooler winter period (December to January) with an average minimum temperature of 1.2°C in February (UK Meteorological Office data). The average annual rainfall is 1,136 mm, with the wettest period between October and January and the driest period between April and July. On average October is the wettest month with 119.7 mm of rainfall (UK Meteorological Office data). The average hourly temperature recorded from the project meteorological station between February 2012 and September 2015 was 8.6°C, with a high of 26.6°C (July 2013) and a low of -5.5°C (March 2013). There were 76 days with an hourly temperature below 0°C recorded between February 2012 and September 2015 (excluding December 2012). Of these days, 13 had a daily average temperature of below 0°C. The coldest daily average temperature of -2.1°C was recorded in March 2013.

The maximum wind speed recorded at the project meteorological station was 21.4 m/s (19/03/2014) with an average wind speed of 4.1 m/s over the period of record. The highest average monthly wind speed was May 2013 (6.08 m/s) with September 2014 having the lowest (2.57 m/s); the dominant wind directions are from the west and south-east at the project site. The wind speed data is comparable to that of the data from the Lough Fea station, with average wind speeds at site being higher for most months. This is related to the relatively exposed location of the project site weather station.

The periods of heavy rainfall that occur throughout the wetter periods have the potential to cause soil erosion, particularly in exposed areas where vegetation has been removed and high velocity sheet flow or gully stormwater run-off could occur.

Protected Areas: There are a number of sensitive features in the project environment that will have to be taken into account in the detailed closure plan for the project:

- The project is located in the Sperrin Mountain Area of Outstanding Natural Beauty (AONB).
- The Owenkillew River has been designated as a Special Area of Conservation (SAC) that incorporates the Owenkillew River Area of Special Scientific Interest (ASSI) as well as Drumlea and Mullan Woods ASSI and Owenkillew and Glenelly Woods ASSI. The Owenreagh River is currently being considered as a proposed ASSI.
- Much of the higher ground across the ridge is covered with peat of varying thickness and quality, supporting blanket bog and wet heath habitats that are recognised as priority habitats in Northern Ireland and are also listed under Annex I of EU Habitats Directive.

The land overlying and surrounding the Curraghinalt deposit consists of small farm holdings and common land with multiple land owners. The farm land is predominantly used for sheep and cattle farming.

Visual: Based on the findings of the visual impact study, there are several key conclusions and concepts that have influenced the development of the RCP:

- The proposed infrastructure area is towards the southern edge of the Sperrin AONB.
- Receptors include: Local residents, mainly scattered farmsteads and small hamlets within the more immediate site context; recreational users, including people using cycle and walking routes, as well as hill walkers; and people travelling through the landscape on roads.

The phasing of the project is designed to allow progressive reclamation and rehabilitation of project components as construction and operation is undertaken and completed. This will ensure that bare, un-vegetated areas are kept to a minimum, and that stored topsoil and vegetation can be replaced on graded areas as operational activities are concluded in an area. The MWF has been designed so that the final landform will tie in with surrounding natural slopes of the adjacent ridge and Owenreagh valley. Re-profiling and regrading of the MWF, access roads and areas of hardstanding will be undertaken when no longer required as part of the operational phase; landscaping and revegetation of slopes will be undertaken to provide erosion resistant, sustainable landforms and to blend in aesthetically with the surrounding area.

3.4.2 Social Setting

This area is defined topographically by its location in the Sperrin Mountains and is sparsely populated and rural in nature. It is also defined by its location between the larger settlements of Omagh (c. 18.8 km to the southwest), Strabane (c. 25.5 km to the northwest) and Cookstown (c. 25.5 km to the southeast) to its western and southern boundaries which act as the principal service, retail and education centres for the wider Sperrins area. The nearest settlements are:

- Greencastle
- Rouskey
- Gortin
- Cranagh
- Mountfield
- Creggan
- Plumbridge
- Sperrin

According to the 2011 Census there were 2,350 people living within the Owenkillew Super Output Area (SOA), with a population density of 0.13 persons per ha. This population density can be seen to be well below the average for Northern Ireland (1.28) and below the average for the Omagh Local Government District (0.45) and the surrounding SOAs (0.28). The largest single socio-economic category within 5km of the project is NS-SeC 4 which refers to small employers and own account workers. At 20.1% the percentage of people in this group in the Owenkillew SOA is more than double than that for Northern Ireland (9.4%). This level is also considerably higher than the rate for the Omagh LGD (13.7%) and even for the surrounding SOAs (16.7%). The area within 5km of the project had an unemployment rate of 5.2% in 2011 which is similar to the Northern Ireland rate of 5.0%.

In addition to the amenity provided by the Sperrin ANOB and the settlements themselves, the principal tourist attractions in the vicinity of the project include: visitor / heritage centres; parks and nature walks; cycle routes and rivers and lakes.

Farming comprises a key component of the local economy and the predominant land use in the area. Data from the Agricultural Census 2015 indicates there were some 251 'farm holdings' within the Owenkillew SOA, covering some 10,920 ha with an estimated average size of 44 ha. The majority of these were categorised as rough grazing (98%).

In 2015 there were 933 people registered as being involved in farm related economic activity in the Owenkillew SOA. By far the largest category was agricultural labourers (397) followed by farmers (285).

3.5 Stakeholder Input

Stakeholders have made specific comments relating to the closure phase of the project, including: expediting the concurrent rehabilitation of the MWF; constructing and operating the mine with post closure land use in mind; incorporate community input into closure planning; consider incorporating recreational and tourism aspects in the post closure land use; ensure a financial guarantee is in place that is commensurate with the predicted closure costs; careful management of the post closure phase, particularly with respect to stability and integrity of abandonment aspects; post mining land use consultation with local stakeholders, including potential retention of mine buildings.

The company will continue to monitor and document any community concerns regarding planning for, and implementation of, closure strategies, objectives and activities throughout the life of the project in accordance with the company's stakeholder engagement process.

3.6 Financial Guarantee

A financial guarantee will be provided by DGL and secured by way of a Planning Agreement to ensure that all conditions on the planning permission pertaining to the management of extractive waste, including after-closure conditions, are met and there are funds readily available at any given time for the rehabilitation of the land affected by project infrastructure.

3.7 Employee Severance and Relocation

Employee severance provided for in the operational costs should include everyone except staff required for the closure stage. Employees who will not be required in the closure stage should be made redundant in accordance with a retrenchment plan that will be developed by the company. This plan will be prepared to meet NI legislative requirements and the designed close down of operations, and may include prior retraining. HR policies during the life of the mine will be developed to ensure that sustainable certifications and professional development are

integral to the HR training to assist employees in finding future work post-closure.

The personnel requirements will progressively decrease during the closure period. Once employees remaining on site as part of the closure team are no longer needed, they would also be made redundant in accordance with the policies applied to employees released at the end of the operational period.

4 CONCEPTUAL RCP

4.1 Design Criteria and Closure Assumptions

According to current requirements, site closure will be undertaken in accordance with PPG 6 'Working at Construction and Demolition Sites' and where possible the principles of the waste hierarchy will be applied to closure (as required by The Waste Regulations ((Northern Ireland, 2011)).

The project is currently at the design and permitting stage consequently, a number of assumptions about the closure, rehabilitation and reclamation approach for the site have been made. As the project moves through construction and into operation, the assumptions in this conceptual RCP can be confirmed or adjusted and future revisions of the RCP can reflect the improved knowledge base.

For the purposes of this report, SRK has assumed that wherever practicable the project site will be returned to pre-mining conditions. Some infrastructure may be required for a passive water treatment system.

The following general assumptions have been made in relation to closure planning:

- The mine life is 20-25 years depending on processing rate
- The duration of the decommissioning period (including completion of MWF re-profiling and revegetation) is one year.
- The duration of post-closure operating, monitoring and administration costs is currently estimated to be five years and will be dependent on the results of post closure monitoring.
- All mine related infrastructure will be removed and no facilities will be handed over for use by the local populace at closure. This provides a worst case scenario for cost purposes.
- Wherever possible soil and cover materials will be salvaged or re-used within the project area.
- Revegetation of areas will use a seed mix that is recommended by ecologists and community and will fit in with the local ecosystems.
- Infrastructure areas will be re-contoured wherever practicable in line with current landforms in the area.
- The majority of the non-mining wastes generated during operations will have been removed by contractors prior to the commencement of decommissioning and mine closure. Inert demolition and debris waste will be reused in rehabilitation activities (as appropriate), or recycled, recovered or disposed at an appropriate facility elsewhere (in descending order of preference). Non-hazardous and hazardous waste generated during decommissioning will be temporarily stored on site and disposed of in a licensed facility.
- Long-term water treatment may be required at the existing surface infrastructure site. A constructed wetland system is currently proposed downstream of the existing adit adjacent

to the existing waste rock store (WRS). This solution will be confirmed and/or adapted by hydrogeological and geochemical studies during the life of the mine.

- Similarly, long term water management will be required for seepage from the MWF as the material stabilises post closure. The proposed water management ponds will be reengineered to accommodate a passive water treatment system that will be tested and proven in the lead-up to mine closure
- The site roads will be reclaimed with the exception of public access routes (which will remain public roads throughout the project's life and after its closure) or routes required for ongoing maintenance/monitoring.
- Concrete plugs will be constructed underground at the interface between the fractured rock and the deeper competent rocks (currently predicted to be around 170m Below Ground Level (BGL)).
- There is no salvage value for any materials from the decommissioning of the infrastructure.
- The site power lines and substation are property of NIE and will remain in place.

4.2 Closure Actions

Based on the preliminary closure objectives, current industry standards, the current project description and the preliminary understanding of conditions at the site, the following initial concepts have been developed for the key project components.

4.2.1 Mine Area

The rehabilitation and restoration plan for the main infrastructure area can be found in Figure B1 of Appendix B.

- Underground openings will be plugged and secured, and underground workings will be allowed to flood. Any potentially reactive waste rock used for backfill of the underground workings will be submerged to minimise future oxidation and metal release by significantly decreasing oxygen ingress into the workings.
- Seal the main decline (ramp) from the surface;
- Close off but allow water to drain from the existing exploration adit to the passive mine water treatment plant;
- There will be three ventilation raises that will be filled and capped with reinforced concrete;
- Remove all underground infrastructure including refuge stations, small underground fuelling / service maintenance facilities, ventilation equipment, dewatering pumps and major piping;
- Remove the storage areas and magazines;
- Backfill will be used in the workings to provide support in mined-out areas. Backfilled materials will include waste rock and cemented tailings as a paste back fill; and
- Remove underground paste backfill process plant and associated steel pipework.

For the purposes of cost estimation, the workings will be progressively backfilled over the LoM period, hence the backfilling costs are covered in the mining operating costs and do not feature in the closure cost estimate.

4.2.2 Existing surface infrastructure site

During the operational phase (and covered under the operational LoM costs), this area will need to be closed off according to the following general processes, the rehabilitation and restoration plan for this area can be found in Figure B2 of Appendix B:

- Remove equipment, stores and inventory;
- Decontaminate buildings, equipment, and surrounding soils;
- Remove equipment and salvage materials for reuse/recycling/disposal;
- Demolish/salvage/reuse buildings;
- Remove any infrastructure including piping and electrical;
- Break walls and shallow foundations to grade and cover with up to 0.5 m of soil;
- Place cover and/or growth media material where necessary, in particular the current WRS;
- Rip cleared areas and revegetate; and
- Construction of a passive mine water treatment system, consisting of ponds and a constructed wetland.

4.2.3 Service Roads

The non-public roads and associated haul road berm (totalling approximately 55,000 m^2) will be closed by ripping and regrading the road corridors to an average depth of 1 m using a dozer. The road footprints will be revegetated using the seed mix as proposed by the ecologist and in consultation with regulators. Roads that are required for post closure uses (for example security or monitoring) will not be decommissioned.

4.2.4 Processing Facilities, Infrastructure and Yard Areas

The processing plant, support buildings, maintenance workshop and yard areas will be removed at closure according to the following processes:

- Remove equipment, stores and inventory;
- Decontaminate buildings, equipment, and surrounding soils;
- Remove equipment and salvage materials for reuse/recycling/disposal;
- Demolish buildings that have no salvage value;
- Remove any surface distribution infrastructure including piping and electrical;
- Break walls and shallow foundations to grade and cover with up to 0.5 m of soil;
- Place cover and/or growth media material where necessary; and
- Rip cleared areas and revegetate.
- Prior to closure, the inventory of supplies and materials at the site will be reduced to minimise the amount of surplus inventory at the time of closure. The remaining materials will be removed from the site for disposal or resale, as appropriate.

4.2.5 Mine Waste Facility (MWF)

The MWF is designed to be built from the bottom up by placing material at its natural angle of repose in 3 m lifts. The toe of each subsequent lift would be set back 9 m from the crest of the previous lift, resulting in an overall angle of 3:1V. The MWF is planned to have an ultimate crest elevation of 283 masl. As the MWF will be sequenced as outlined in the Project Description in the Environmental Statement (SRK, 2017), reclamation will be an ongoing process as the side slopes are developed and each phase is completed. The main closure features of the MWF will

consist of the following:

- The external face of the facility, which will consist of non-mineralised waste rock, will be covered with a fine grained rock fill if required and then overlain by 0.3 m of tailings blended with bentonite and/or imported or in-situ clay to reduce meteoric infiltration and finally a soil layer suitable for establishing a vegetative cover will remove non-contact runoff efficiently from the facility. These cover concepts may change depending on the results of laboratory field work and field tests on vegetation establishment trials.
- The water quality associated with runoff and drainage from the facility will be monitored for a number of years post closure (as appropriate and to the satisfaction of the Northern Ireland Environment Agency).
- The lower and upper east ponds will be converted into passive water treatment plants designed to ensure that the water discharged from the MWF into the Pollanroe Burn is compliant with drinking water quality.

4.2.6 Topsoil and Peat Management

Peat from initial stripping operations during construction will be used to cover diversion and waste rock berms then anything additional will be left in a topsoil and peat stockpile. As the activity is for concurrent rehabilitation, the costs will be captured in the overall mine OPEX. The peat has different storage properties compared to topsoil and hence will be managed as stipulated in the Peat Management Plan.

4.2.7 Water-related Infrastructure

A general schematic of the local watercourses draining the project site is provided in Figure 4-1.

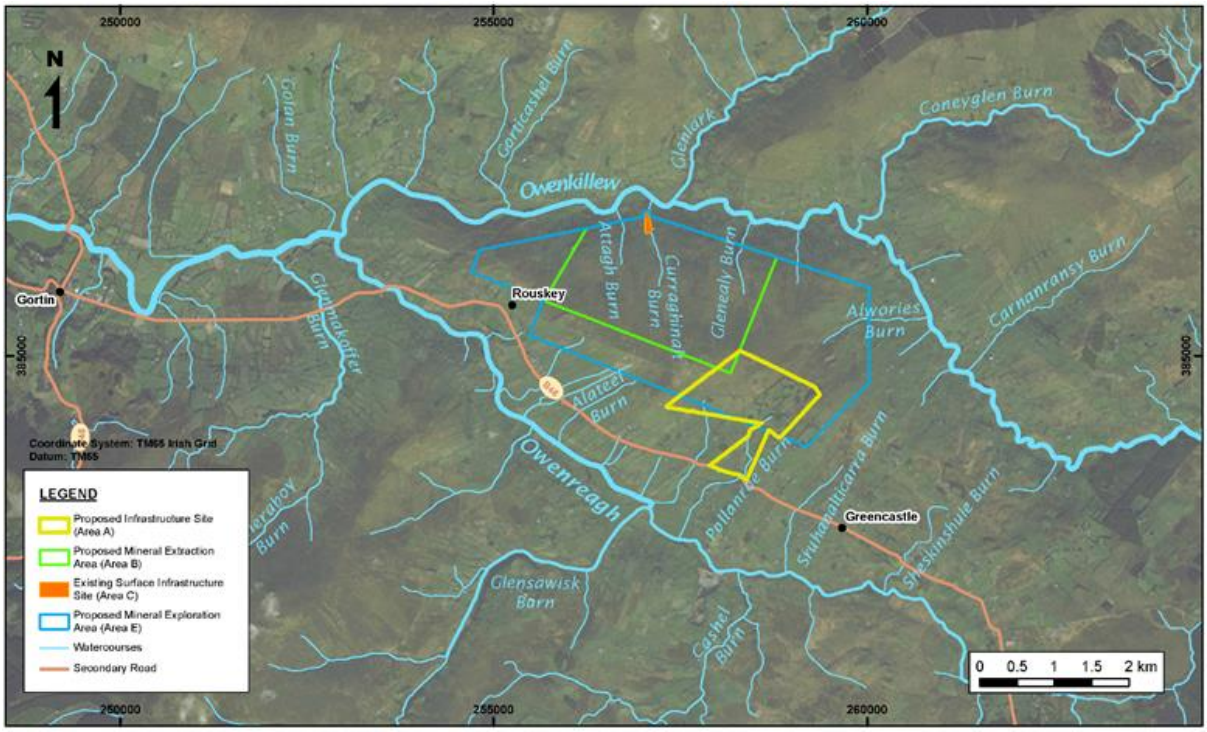


Figure 4-1: Mine site area showing water courses draining the project site

During closure as areas are successfully rehabilitated the requirement for the continued functioning of the active water treatment plant will be assessed through monitoring of the water quality that contacts the plant site area and the east and west catchments. When water quality monitoring results show acceptable target values are met, the active water treatment system will be decommissioned and removed.

At closure the requirement for each of the existing berms and ponds will be assessed and removed or decommissioned as appropriate. A passive water treatment system will be required at the proposed infrastructure site and the water management ponds will be used in the construction of this passive treatment system. A passive water treatment system will also be constructed in the existing surface infrastructure site to treat groundwater from underground operations post closure (once groundwater levels naturally return to pre-mining conditions).

DGL has already developed and operates a dedicated Water Treatment Plant at the existing infrastructure site that will require decommissioning. It is anticipated that this will take place during the active closure phase if the water emanating from the mine and rehabilitated WRS meets the discharge criteria. In the longer term a passive treatment system is proposed to be employed to produce the required quality of discharge water. Closure of these water management facilities will include:

- Remove equipment, stores and inventory;
- Decontaminate buildings, equipment, and surrounding soils;
- Remove equipment and salvage materials for reuse/recycling/disposal;
- Remove buildings;
- Remove any infrastructure including piping and electrical;
- Break walls and shallow foundations to grade and cover with up to 0.5m of soil;
- Place cover and/or growth media material where necessary; and
- Rip cleared areas and revegetate.

Underground dewatering infrastructure will include water collection sumps, dewatering pumps, and piping to direct the water to the surface for treatment at the dedicated water treatment facility. All materials will be collected as part of the closure of the mine area (Section 4.2.1).

At closure, above-ground water supply infrastructure will be removed, with the exception of potable water systems required during the closure activities. Where water distribution pipelines are buried, they will remain following closure but be decommissioned (capped in place) unless there is an alternative use for them.

4.2.8 Waste Management

Sewage

Sewage will be treated by a membrane bioreactor (MBR) plant housed in shop-assembled containers prior to shipment to site. A sludge drying system is also provided in a separate container. The dewatered sludge will be transported off-site to a local plant. The estimated quantity of sewage sludge is approximately 12 m^3/day.

The on-site sewage system will be maintained during the closure period while staff remain onsite. Once decommissioned the treatment plant and recirculation system will be drained, cleaned, dismantled and disposed of or recycled at an appropriate facility. The concrete foundation slabs will be demolished and the footprint area ripped and regraded for revegetation.

Other Non-Mining Waste

Non-hazardous waste will be disposed of offsite using approved disposal routes and using approved disposal transport companies. Wherever possible the waste hierarchy of reduce, reuse, recycle will be employed minimising waste to landfill. Hazardous waste (such as batteries and residual chemical reagents) will be transported offsite to appropriate facilities.

Recyclable waste will be transported to local off-site recycling facilities for appropriate processing. Non-hazardous waste that is not suitable for recycling will be collected and transported by a registered waste carrier for disposal (including to landfill facilities within Northern Ireland).

The site waste management plan and processes will be adhered during the decommissioning and post closure phases. Any temporary waste facilities or chemical stores will be left as empty as practicable at the end of the operational phase to minimise the amount of waste disposal required post closure.

4.2.9 Fuel storage and dispensing

Fuel dispensing equipment for mining, plant services, and freight vehicles will be located adjacent to the fuel tank bund and the fuelling area will drain into the bund. There will be two twenty-five thousand litre tanks double lined which will provide fuel for 4-5 days of operations. Refuelling of the main fuel storage tanks will be provided by an offsite contractor. The fuel tanks area will be provided with standard instrumentation and controls to monitor and safely manage the inventory in the tanks.

Fuel storage and dispensing facilities will be closed at the cessation of operations unless required for specific activities during closure. Closure of these facilities will include:

- Removal of remaining fuel inventory;
- Decontamination of equipment including tanks, piping and dispensing equipment;
- Removal of equipment and storage tanks, salvage materials for reuse/recycling/disposal;
- Removal of concrete pad used as the dispensing areas to grade and cover with up to 0.5 m of soil;
- Sampling of soils beneath and surrounding the facility; and
- Classifying and removal of any contaminated soils identified to treatment or disposal in a licensed facility. An allowance has been made in the cost closure estimate to dispose of a quantity of hazardous waste.
- Place cover and/or growth media material where necessary; and
- Rip cleared areas and revegetate.

Near the end of the closure period, after the primary earthworks have been completed, the fuel storage and dispensing facilities used during closure will be decommissioned in the manner described above. It is assumed the fuel inventory required for closure will have been utilised during the closure activities.

4.2.10 Explosives Storage Area

An explosives storage magazine is planned underground between the 110-120 EL level. This will be removed as part of the mine closure actions (Section 4.2.1). The majority of the explosives will be used during the operational phase; the residual explosives left after mining operations cease will be disposed of or issued to a certified third party with agreement from the relevant authority.

4.2.11 Berms

The various berms that have been constructed to reduce visual and/or sound impacts (for example the haul road berm) will be removed after the roads have been removed and rehabilitated. The inert rock that is removed from the berms will be used for recontouring and rehabilitation activities.

The requirement of the diversion berms constructed for water management around the facilities will be assessed and once the berms are no longer required they will be removed. The areas will be re-contoured and revegetated to satisfy the post closure objectives and to minimise visual impact.

4.2.12 Powerlines

Off-site power infrastructure

Power will be supplied to the site by connecting to the national high voltage electricity grid. A new 33kV power line from the Strabane 110/33kV substation will be developed by Northern Ireland Electricity Networks (NIE) to supply power to the site. The NIE distribution system for the mine will also include the switchgear and circuit breakers necessary to receive the power at site and new switchgear and circuit breakers at the 110/33kV main substation in Strabane. The powerlines will remain in place at closure and will be the responsibility of NIE.

On-site power infrastructure

A 33 kV main substation will be constructed immediately adjacent to the process plant to transform the electrical power from 33kV to 3.3kV for distribution around the site. There would be two substation transformers each with a capacity of 10 MVA that reduces voltage to 3.3 kV for on-site distribution.

Additionally, a 1.2 MW emergency generator will be located on-site to supply power for essential mine area loads during potential power outages, primarily to sustain the agitating processes (for example mixers in reaction vessels), pumping and ventilation in critical areas. The generator will be removed from site once the essential activities are no longer required; however, the electrical substation is an infrastructure asset and will be left in place post-closure, owned by the utility.

4.2.13 Fencing and Erosion Controls

A 2.2 m high security fence will be constructed around the entire boundary of development. Silt fences constructed of a geosynthetic material stretched across and attached to supporting posts are proposed along the perimeter and on the upgradient side of areas that need to be protected from siltation and runoff. Fibre rolls consisting of bundled straw or natural fibre wrapped in photodegradable open weave plastic netting may be used as a grade break to reduce erosion potential and to provide sediment control.

Erosion controls that are no longer required will be removed off site, controls that are still required will remain in place and fall under the care and maintenance program for the post

closure phase. Sustainable solutions will be sought for each of the control measures that are required to stay in place. Fencing in the mine and processing area will be removed on completion of decommissioning and revegetation and once residual risks are removed. Fencing will be retained around buildings and infrastructure specifically required for post-closure activities such as the water management infrastructure and power supply facilities. Where existing fences cannot be modified to enclose the post-closure facilities, new fences will be erected.

4.3 Social Closure

Further information will be gathered during future reviews of this RCP to enable appropriate social management measures for the closure and post-closure phases of mine life to be defined. In the next version of the mine closure plan, particularly after the mine has been established and the socio economic influences are realised, more information should be provided with respect to proposed measures such as commitments to develop re-training plans and alternative livelihood opportunities post-closure.

4.4 Post-closure Monitoring and Maintenance

In line with Part 12 of The Planning (Management of Waste from Extractive Industries) Regulations (Northern Ireland) 2015, several aspects of the closure site will need to be monitored on an ongoing basis and will require care and maintenance, these will include:

- Groundwater monitoring piezometers (installed in addition to the operational network if deemed required) - groundwater quality sampling;
- Surface water quality sampling associated with agreed discharge consent criteria and locations;
- Local wells;
- Annual visual inspection of the MWF, berms, other facilities as required by The Mines Regulations (Northern Ireland, 2015);
- Revegetation care and maintenance.

In addition to the above activities, one-off assessments may be required before the site can be relinquished and finally closed. These could include for example biodiversity surveys or visual impact assessments.

Water quality monitoring will be required after closure to ensure the effectiveness of the closure approach. At a minimum, the post closure monitoring period is expected to last five years, with the frequency of monitoring decreasing over this period as follows:

- Monthly monitoring for the first six months;
- Quarterly monitoring for the next eighteen months;
- Annual monitoring for years three;
- Additional annual monitoring if required to ensure closure objectives have been met.
- Post closure monitoring would include the following as a minimum on the same frequency as the water quality monitoring:
- Monitoring of rivers in line with the discharge consent criteria;
- Visual inspections of rehabilitated areas to ensure the site remains stable and free of significant erosion;

- Monitoring the performance of re-planted vegetation and where necessary replanting, re-contouring, altering the seed mix as required etc.

Additional monitoring options, will be considered during future reviews of this RCP

Roads required for monitoring will be maintained during the post-closure monitoring period then subsequently reclaimed.

Records of monitoring and maintenance activities will be kept by the company at an appropriate location for use in planning, budget control, regulatory compliance, and permitting during the post-closure phase.

5 CLOSURE COST ESTIMATE

The closure cost estimate has been developed in conjunction with JDS. The overall closure objectives and closure concepts for each of the facilities was developed by SRK, the costs for implementing each of the concepts was developed by JDS using the rates and economic models that were established for the JDS feasibility study. SRK assisted JDS with the costings for the passive water treatment systems; MWF cover; and the ongoing monitoring and maintenance.

5.1 Closure Cost Rates

The cost rates used in the conceptual closure plan cost estimate are categorised primarily as the following:

- Labour;
- Equipment; and
- Materials.

The disposal of site materials will follow the waste hierarchy and (if required) final disposal is assumed to be within 15 miles of the site, the exact tipping fee and waste acceptance criteria will be developed once the volume and types of surplus material (i.e. at end of Life of Mine) has been established, an amount is currently estimated in the closure cost for the quantum of hazardous and non-hazardous material requiring reuse/recycling/recovery/disposal. In-country labour and fuel rates have been assumed, which are valid as of August 2016. An exchange rate of 1.20 USD:GBP has been used in the cost model, these values should be updated with each revision of the RCP.

5.2 Key Cost Assumptions

In addition to the closure assumptions listed in Section 4.1, the following assumptions apply to the closure cost:

A closure cost schedule is provided in “Cost Schedule.” Schedule 5-1

- Cost calculations assume closure at end of mine life of 20-25 years
- No salvage value is taken into account.
- No discount rates have been applied.
- The active reclamation and closure period is estimated to last approximately six years, one year active reclamation and five years post closure monitoring.
- A closure crew and security will be on site during the active closure period.

- Some of the equipment required for reclamation and closure operations may not be available during operations and therefore will require rental and mobilisation and demobilisation.
- Buildings will be decontaminated where appropriate.
- Wells and boreholes no longer required post closure (groundwater, monitoring, etc.) will also be decommissioned.
- Nominal closure planning costs are provided ("Closure Planning").
- Nominal quantities of wastes (solid, hazardous, and hydrocarbon-contaminated soils) have been included ("Waste Disposal").
- No costs have been included for social closure measures as these have not yet been developed.

5.3 Closure Costs

In accordance with the assumptions listed above, the total direct closure costs for the project are estimated at US$ 13.8 million. With add-ons such as engineering, design, and construction plans, contingency, insurance, and contractor profit, the grand total is approximately US$ 15.95 million. A summary of this cost is provided in Table 5-1 and a full breakdown of the closure cost is provided in Appendix A.

Table 5-1: Summary closure costs

Line Item	Cost (USD Millions)
Earthwork and re-contouring	0.5
Revegetation and stabilisation	0.25
MWF Covering	2.8
Water Management	2.0
Decontamination and waste disposal	3.5
Structure, Equipment and Facility Removal, and Misc.	2.2
Monitoring and Reporting	1.6
Construction Management & Support	0.5
Closure Planning, G&A, Human Resources	0.5
Subtotal Operational & Maintenance Costs	13.8
Contingency	2.1
Grand Total	15.95

6 OPPORTUNITIES

This plan and associated costs assume that all equipment and infrastructure will be demolished and reused/recycled/recovered/disposed of offsite. No scrappage value recovery or reuse has been assumed in the costings. Some of the infrastructure constructed for the project could continue to provide benefits for the community if left in place (repurposed) once the mining operations have ceased. In addition to providing value to local communities or facilitating future industrial development in the region, the transfer of certain facilities would reduce the overall cost of decommissioning for the company and may reduce the residual liability of the project post closure.

Although no formal discussions have been held with stakeholders regarding transfer of these facilities, DGL will continue to conduct stakeholder discussions to identify infrastructure with potential for beneficial future use and that could be transferred to the council or other third parties, this would be dependent on further negotiations that would be required to modify the Restoration Masterplan.

SRK notes that until agreements are in place with the relevant regulators and local stakeholders, the above items should be regarded as an opportunity only and the closure costs will only be modified in future versions of the RCP once the agreements have been put in place.

7 CONCLUSIONS AND RECOMMENDATIONS

This conceptual RCP has been provided for the Curraghinalt project to outline DGL's obligations, the aspects of the project to be considered in closure management planning, the approaches to closure and the post closure maintenance and monitoring requirements. The plan has also been provided to help determine a cost estimate for the closure of the site.

While the proposed closure approach is considered capable of achieving long term stability based on the assumed land use, there are a number of assumptions that will be addressed in subsequent versions of the RCP and more detailed information becomes available.

The project's RCP should be updated on an at least a three-yearly basis throughout the mine's planning phases and operational life, with the final plan prepared at least three years prior to planned cessation of operations. This will allow sufficient time for detailed discussions with government, other stakeholders and closure engineers, and plans to be prepared in good time before closure commences.

For and on behalf of SRK Consulting (UK) Limited

Carl Williams
Senior Environmental Engineer
SRK Consulting (UK) Limited

Rob Bowell
Corporate Consultant (Geochemistry)
SRK Consulting (UK) Limited

8 REFERENCES

2006/21/EC European Parliament and of the Council. (2006). Management of Waste from extractive industries and ammending Directive 2004/35/EC. *Official Journal of the European Union*.

Hydrobiology Pty Ltd. (2012). *Sintoukola Potash - Marine Environmental Baseline Assessments: Reconnaissance Report.*

ICMC. (2016). *Implementation Guidance*. Retrieved September 10, 2016, from Cyanide Code: http://www.cyanidecode.org/become-signatory/implementation-guidance

ICMM. (2008). *Closure planning*. Retrieved 10 1, 2016, from ICMM: https://www.icmm.com/en-gb/environment/mine-closure/planning-for-integrated-mining-closure

IFC. (2007). *The IFC and World Bank Environmental Health and Safety (EHS) Guidelines for Mining .*

MAC. (2008, 11 19). *Mine Closure Framework*. Retrieved 10 10, 2016, from Canadian Mining Association: http://mining.ca/sites/default/files/documents/TSM_Mine_Closure_Framework.pdf

Northern Ireland. (2011). *The Waste Regulations 2011.* Retrieved January 25, 2017, from Legislation.gov.uk: http://www.legislation.gov.uk/nisr/2011/127/regulation/1/made

Northern Ireland. (2013). *The Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) 2013.*

Northern Ireland Department of the Environment. (2015). The Planning (Management of Waste from Extractive Industries) Regulations (Northern Ireland) 2015. NIDOE.

SRK. (2017). *Environmental Statement.*

SRK Consulting (UK) Ltd. (2017). *Curraghinalt Mine Waste Management Plan.* Cardiff: SRK.

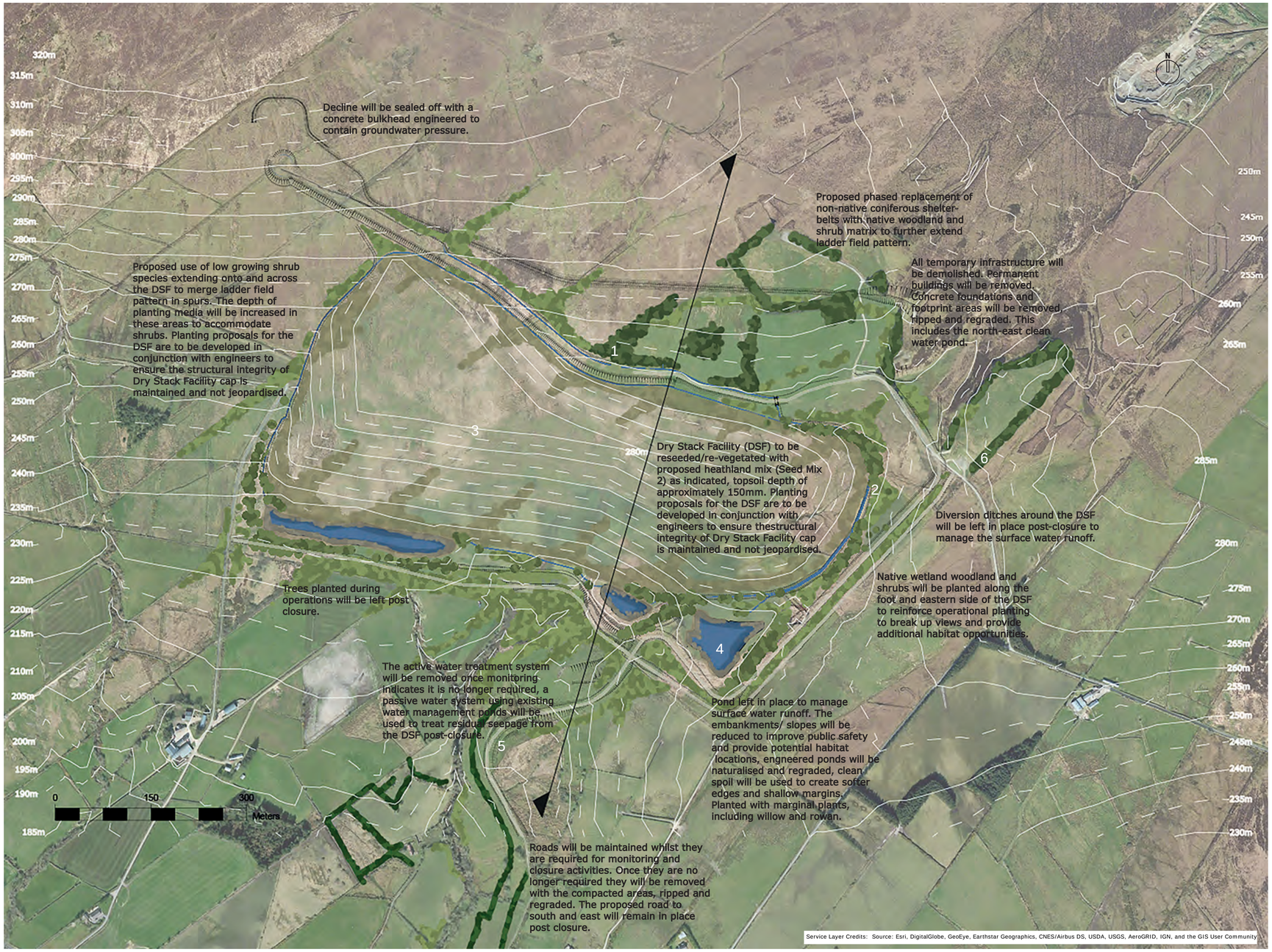
United Nations Environment Programme. (2005). • *Mining for Closure: Policies, Practices and Guidelines for Sustainable Mining Practices and Closure of mines.* UNEP.

APPENDIX
A CONCEPTUAL CLOSURE COST ESTIMATE

Dalradian Resources
Curraghinalt Project, 2016 Feasibility Study
Post Operations Closure, Reclamation, and Monitoring Cost Estimate (EA Case)

WBS	DESCRIPTION	NOTES	UNIT OF MEASURE	QTY	LABOUR					MATERIALS		EQUIPMENT		EQUIP. USAGE		OTHER		TOTAL COST	
WBS	DESCRIPTION				UNIT MAN-HOURS	PROD FACT	TOTAL MAN-HOURS	LABOUR UNIT COST	LABOUR TOTAL COST	MATERIAL UNIT COST	MATERIAL TOTAL COST	EQUIPMENT UNIT COST	EQUIPMENT TOTAL COST	USAGE UNIT COST	USAGE TOTAL COST	OTHER UNIT COST	OTHER TOTAL COST	TOTAL CAPITAL UNIT COST	TOTAL CAPITAL COST
C000	**CLOSURE & RECLAIM**																		
C101	**UNDERGROUND MINING**																		
C101	**DECLINE/ADIT AND VENTILATION SHAFT PLUGS/CAPS**				-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C101	HYDROLOGY INVESTIGATION/REPORT		LOT	1.0	400.0	1.00	400.00	$ 125.00	$ 50,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 200,000.00	$ 200,000	250,000.00	$ 250,000
C101	LONG TERM EVALUATION/REPORT		LOT	1.0	400.0	1.00	400.00	$ 125.00	$ 50,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 25,000.00	$ 25,000	75,000.00	$ 75,000
C101	DETAILED DESIGN		LOT	1.0	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 25,000.00	$ 25,000	25,000.00	$ 25,000
C101	CONSTRUCTION	BASED ON (4) 4.5X4.5X1M PLUGS	LOT	1.0	2,000.0	1.00	2,000.00	$ 55.22	$ 110,440	$ 50,000.00	$ 50,000	$ -	$ -	$ -	$ -	$ -	$ -	160,440.00	$ 160,440
C101	QUALITY ASSURANCE		LOT	1.0	1,500.0	1.00	1,500.00	$ 100.00	$ 150,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	150,000.00	$ 150,000
C101	**UNDERGROUND STOPES**				-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C101	FILL UNDERGROUND STOPES	INCLUDED IN MINING OPEX, STOPES ARE BACKFILLED DURING MINE OPERATION	LOT	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C101	**PASTE PLANT**				-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C101	REMOVAL OF PLANT, UTILITIES, & DIST. PIPING		LOT	1.0	6,000.0	1.00	6,000.00	$ 63.64	$ 381,840	$ -	$ -	$ -	$ -	$ 90,000.00	$ 90,000	$ -	$ -	471,840.00	$ 471,840
C102	**PROCESS PLANT**																		
C102	**PLANT AREA DEMOLITION & DISPOSAL**			-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C102	SPECIALIZED CLEANING OF TANKAGE, ETC	ALLOWANCE FOR STEAM CLEANING, ETC. OF TANKAGE	HRS	3,000.0	1.0	1.00	3,000.00	$ 50.00	$ 150,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	50.00	$ 150,000
C102	DEMOLITION & LOADING - CRUSHING AREA	ALL NON-SALVAGED CONCRETE, BUILDINGS, EQUIPMENT, AND MATERIALS	TONNE	2,556.0	0.8	1.00	2,042.76	$ 50.59	$ 103,347	$ -	$ -	$ -	$ -	$ 62.14	$ 158,834	$ 10.26	$ 26,218	112.83	$ 288,399
C102	DEMOLITION & LOADING - PLANT AREA	ALL NON-SALVAGED CONCRETE, BUILDINGS, EQUIPMENT, AND MATERIALS	TONNE	8,062.2	0.8	1.00	6,443.26	$ 50.59	$ 325,975	$ -	$ -	$ -	$ -	$ 62.14	$ 500,993	$ 10.26	$ 82,697	112.83	$ 909,665
C102	DEMOLITION & LOADING - SITE INFRASTRUCTURE	ALL NON-SALVAGED CONCRETE, BUILDINGS, EQUIPMENT, AND MATERIALS	TONNE	1,980.7	0.8	1.00	1,582.98	$ 50.59	$ 80,086	$ -	$ -	$ -	$ -	$ 62.14	$ 123,084	$ 10.26	$ 20,317	112.83	$ 223,487
C102	SOLID WASTE HAULAGE AND DISPOSAL	ASSUME HAUL ALL MATERIALS & EQUIPMENT OFF-SITE	TONNE	12,598.9	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 260.00	$ 3,275,708	260.00	$ 3,275,708
C102	HAZARDOUS WASTE DISPOSAL	ALLOWANCE	LOT	1.0	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 200,000.00	$ 200,000	200,000.00	$ 200,000
C102	**PLANT SITE REGRADING**				-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C102	REMOVAL OF ASPHALT		M2	28,601.0	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.68	$ 76,549	2.68	$ 76,549
C102	PLANT SITE REGRADING		M2	28,601.0	0.0	1.00	600.52	$ 50.60	$ 30,387	$ -	$ -	$ -	$ -	$ 2.30	$ 65,902	$ 0.34	$ 9,629	3.70	$ 105,917
C102	**ACCESS ROADS**			-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C102	REMOVAL OF ASPHALT		M2	33,750.0	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.68	$ 90,330	2.68	$ 90,330
C102	RIP AND REGRADE ROADS		M2	66,129.0	0.0	1.00	1,388.48	$ 50.60	$ 70,258	$ -	$ -	$ -	$ -	$ 2.30	$ 152,373	$ 0.34	$ 22,263	3.70	$ 244,893
C102	RIP AND REGRADE HAUL ROAD AND WASTE ROCK BERM		M2	31,688.0	0.0	1.00	665.34	$ 50.60	$ 33,666	$ -	$ -	$ -	$ -	$ 2.30	$ 73,015	$ 0.34	$ 10,668	3.70	$ 117,349
C102	**STORAGE CONTAINERS & WAREHOUSES**			-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C102	REMOVE FROM SITE AND SALVAGE	INCL IN PLANT AND INFRASTRUCUTRE AREAS ABOVE		-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C103	**EXPLORATION ADIT**																		
C103	EXPLORATION ADIT CLOSURE	LEFT IN PLACE, BAT GATE INSTALLED, OUTLET OF UG WATER TO WTP	LOT	1.0	160.0	1.00	160.00	$ 50.60	$ 8,096	$ 20,000.00	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	28,096.00	$ 28,096
C104	**POWERLINES & SUBSTATION**																		
C104	SITE POWERLINE	LEFT IN PLACE (RESPONSIBILITY OF NIE)		-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C104	SUBSTATION	LEFT IN PLACE (RESPONSIBILITY OF NIE)		-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C105	**TAILING STORAGE FACILITY**																		
C105	**TAILING STORAGE FACILITY CLOSURE COVER**				-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C105	30 CM BENTONITE CLAY BARRIER		M3	83,598	0.0	1.00	-		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 24.81	$ 2,073,848	24.81	$ 2,073,848
C105	75 CM MIXED GROWTH MEDIA SOIL / TOPSOIL		M3	208,994	0.0	1.00	-		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.82	$ 589,153	2.82	$ 589,153
C105	REVEGITATION		M2	278,659	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.50	$ 139,330	0.50	$ 139,330
C106	**WATER TREATMENT & CONTROL**																		
C106	**PASSIVE WATER TREATMENT**			-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C106	PASSIVE WATER TREATMENT SYSTEM DESIGN		LOT	2.0	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 100,000	$ 200,000	100,000.00	$ 200,000
C106	PASSIVE WATER TREATMENT SYSTEM CONSTRUCTION		LOT	2.0	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 750,000.00	$ 1,500,000	750,000.00	$ 1,500,000
C106	PASSIVE WATER TREATMENT SYSTEM OPERATION/MAINTENANCE		YEAR	5.0	192.0	1.00	960.00	$ 75.00	$ 72,000	$ -	$ -	$ -	$ -	$ -	$ -		$ -	14,400.00	$ 72,000
C106	**OPERATIONS WATER TREATMENT PLANT**			-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C106	FACILITY DEMOLITION & DISPOSAL	INCLUDED IN AREA C102 (INFRASTRUCTURE)	TONNE	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C106	RIP AND REGRADE FOOTPRINT		M2	28,601.0	0.0	1.00	600.52	$ 50.60	$ 30,387	$ -	$ -	$ -	$ -	$ 2.30	$ 65,902	$ 0.34	$ 9,629	3.70	$ 105,917
C106	**WATER TREATMENT PONDS**			-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C106	REMOVAL OF PONDS & REGRADING OF AREA	LEFT IN PLACE AS PART OF PASSIVE TREATMENT SYSTEM	M2	-	0.0	1.00	-	$ 50.60	$ -	$ -	$ -	$ -	$ -	$ 2.30	$ -	$ 0.34	$ -	-	$ -
C106	**FRESH WATER & EMERGENCY PONDS**			-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C106	REMOVAL OF PONDS & REGRADING OF AREA		M2	34,441.0	0.0	1.00	723.14	$ 50.60	$ 36,591	$ -	$ -	$ -	$ -	$ 2.30	$ 79,358	$ 0.34	$ 11,595	3.70	$ 127,544
C107	**MONITORING ACTIVITIES**																		
C107	**POST CLOSURE SITE MONITORING & MAINTENANCE**				-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C107	GROUNDWATER MONITORING PIEZOMETERS		LOT	1.0	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 100,000.00	$ 100,000	100,000.00	$ 100,000
C107	**POST CLOSURE SITE MONITORING & MAINTENANCE**				-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
C107	HYDRO MONITORING	15 ROUNDS OF WQ SAMPLING, AND BH/RIVER LEVEL CHECKS	YEAR	5.0	240.0	1.00	1,200.00	$ 75.00	$ 90,000	$ -	$ -	$ 1,000.00	$ 5,000	$ -	$ -	$ 15,000.00	$ 75,000	34,000.00	$ 170,000
C107	BIOLOGICAL MONITORING	15 SITE INSPECTIONS, SUMMER AND WINTER	YEAR	5.0	240.0	1.00	1,200.00	$ 75.00	$ 90,000	$ -	$ -	$ 5,000.00	$ 25,000	$ -	$ -		$ -	23,000.00	$ 115,000
C107	STRUCTURAL MONITORING	VISUAL INSPECTIONS ONLY. ONE EXCEPTIONAL INVESTIGATION ALLOWED FOR.	YEAR	5.0	120.0	1.00	600.00	$ 200.00	$ 120,000	$ -	$ -	$ 20,000.00	$ 100,000	$ -	$ -		$ -	44,000.00	$ 220,000
C107	MISC. MONITORING & REPORTING	REPORT TO AUTHORITIES FOR EACH ROUND OF MONITORING AND A FINAL REPORT.	YEAR	5.0	312.8	1.00	1,564.00	$ 150.00	$ 234,600	$ -	$ -	$ -	$ -	$ -	$ -	$ 50,000.00	$ 250,000	96,920.00	$ 484,600
C107	ONGOING MAINTENANCE		YEAR	5.0	800.0	1.00	4,000.00	$ 50.00	$ 200,000	$ 10,000.00	$ 50,000	$ -	$ -	$ 50,000.00	$ 250,000	$ -	$ -	100,000.00	$ 500,000
C108	**DIVERSION BERMS**																		
C108	REMOVAL OF WEST BERM		M2	2,353.0	0.0	1.00	49.40	$ 50.60	$ 2,500	$ -	$ -	$ -	$ -	$ 2.30	$ 5,422	$ 0.34	$ 792	3.70	$ 8,714
C108	REMOVAL OF EAST BERM	LEFT IN PLACE	M2	-	0.0	1.00	-	$ 50.60	$ -	$ -	$ -	$ -	$ -	$ 2.30	$ -	$ 0.34	$ -	-	$ -
C108	REMOVAL OF NORTH BERM	LEFT IN PLACE	M2	-	0.0	1.00	-	$ 50.60	$ -	$ -	$ -	$ -	$ -	$ 2.30	$ -	$ 0.34	$ -	-	$ -
C108	CONSTRUCTION OF NEW BERM		M3	2,500.0	0.1	1.00	144.52	$ 49.10	$ 7,096	$ -	$ -	$ -	$ -	$ 6.62	$ 16,550	$ -	$ -	9.46	$ 23,646
C109	**FENCING**																		
C109	REMOVAL OF SITE FENCING	10% OF INSTALLATION COST	M	4,200.0	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 30.00	$ 126,000	30.00	$ 126,000
C110	**RE-VEGITATION (EXCL. TSF)**																		
C110	SEEDING - YEAR 1	PLANT SITE AREA	HA	29.6	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,000.00	$ 29,646	1,000.00	$ 29,646
C110	SEEDING - YEAR 2	50% OF YEAR 1	HA	14.8	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,000.00	$ 14,823	1,000.00	$ 14,823
C110	SEEDING - YEAR 3	50% OF YEAR 2	HA	7.4	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,000.00	$ 7,411	1,000.00	$ 7,411
C110	SEEDING - YEAR 4	50% OF YEAR 3	HA	3.7	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,000.00	$ 3,706	1,000.00	$ 3,706
C110	SEEDING - YEAR 5	50% OF YEAR 4	HA	1.9	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,000.00	$ 1,853	1,000.00	$ 1,853
C110	REVEGETATION - YEAR 1	PLANT SITE AREA	HA	29.6	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,000.00	$ 88,938	3,000.00	$ 88,938
C110	REVEGETATION - YEAR 2	50% OF YEAR 1	HA	14.8	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,000.00	$ 44,469	3,000.00	$ 44,469
C110	REVEGETATION - YEAR 3	50% OF YEAR 2	HA	7.4	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,000.00	$ 22,234	3,000.00	$ 22,234
C110	REVEGETATION - YEAR 4	50% OF YEAR 3	HA	3.7	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,000.00	$ 11,117	3,000.00	$ 11,117
C110	REVEGETATION - YEAR 5	50% OF YEAR 4	HA	1.9	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,000.00	$ 5,559	3,000.00	$ 5,559
C111	**WASTE ROCK DUMP - EXPLORATION AREA**																		
C111	WASTE ROCK DUMP - EXPLORATION AREA	CLOSED DURING OPERATIONS - COVERED UNDER OPEX		-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-	$ -
9000	**OWNERS COSTS**																		
9400	**OWNERS PROJECT MANAGEMENT**																		
9400	CLOSURE MANAGER	12 MONTHS, FULL TIME	HRS	2,580	1.00	1.00	2,580.00	$ 37.28	$ 96,182	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	37.28	$ 96,182
9400	CLOSURE SUPERINTENDENT	12 MONTHS, FULL TIME	HRS	2,580	1.00	1.00	2,580.00	$ 33.05	$ 85,269	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	33.05	$ 85,269
9400	ENVIRONMENTAL TECH	12 MONTHS, FULL TIME	HRS	2,580	1.00	1.00	2,580.00	$ 20.32	$ 52,426	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	20.32	$ 52,426
9900	**CONTINGENCY**																		
9910	**CONTINGENCY**																		
9910	PROJECT CONTINGENCY		%	0.15	-	-	6,744.74	$ -	$ 399,172	$ 120,000.00	$ 18,000	$ 130,000.00	$ 19,500	$ 1,581,431.88	$ 237,215	$ 9,369,480.66	$ 1,405,422	13,862,057.47	$ 2,079,309
							51,710		**$ 3,060,317**		**$ 138,000**		**$ 149,500**		**$ 1,818,647**		**$ 10,774,903**		**$ 15,941,366**

APPENDIX
B REHABILITATION AND RESTORATION PLANS

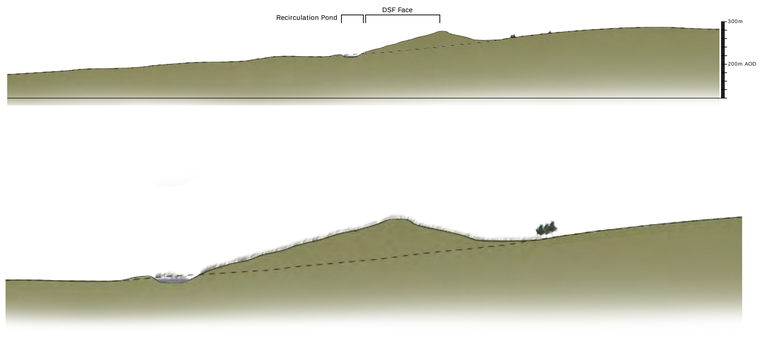


Schedule: Proposed Planting

Species		% Mix	Height	Root Condition	Density
Woodland					
Sorbus aucuparia	Rowan	15	40-60cm	Bare root	1 per 2m^2
Sorbus aria	Whitebeam	15	40-60cm	Bare root	
Ulumus glabra	Wych Elm	10	40-60cm	Bare root	
Prunus avium	Wild Cherry	10	40-60cm	Bare root	
Ilex aquifolium	Common Holly	5	40-60cm	3L Pot	
Shrub/Understory					
Calluna vulgaris	Heather	5	40-60cm	Bare root	1 per 2m^2
Corylus avellana	Hazel	10	40-60cm	Bare root	
Empetrum nigrum	Crowberry	5	40-60cm	Bare root	
Lonicera periclymenum	Honeysuckle	5	40-60cm	Bare root	
Myrica gale	Bog Myrtle	5	10-20cm	3L Pot	
Vaccinium myrtillus	Bilberry	5	10-20cm	3L Pot	
Viburnum opulus	Guelder Rose	10	40-60cm	3L Pot	
Total		100%			

Species		% Mix	Height	Root Condition	Density
Woodland					
Alnus glutinosa	Alder	40	40-60cm	Bare root	Trees and shrub groupings will take account of local conditions, in relation to species, mix and size of groups.
Betula pubescens	Downy Birch	30	40-60cm	Bare root	
Salix caprea	Willow	10	40-60cm	Bare root	
Shrub/understory					
Salix aurita	Eared Willow	10	40-60cm	Bare root	Trees and shrub groupings will take account of local conditions, in relation to species, mix and size of groups.
Crataegus monogyna	Hawthorn	10	40-60cm	Bare root	

Species		% Mix	Height	Root Condition	Density
Seed Mix 1 - RE11 Heath Scrub Land					
Festuca ovina	Sheeps Fescue	50	n/a	seed	Sowing Rate 5g/m^2
Festuca rubra ssp lotoralis	Slender Creeping Red Fescue	25	n/a	seed	
Deschampsia flexuosa	Wavy Hair-Grass	15	n/a	seed	
Agrostis capillaris	Browntop Bent	5	n/a	seed	
Anthoxanthum odoratum	Sweet Vernal	5	n/a	seed	
Total		100%			
Seed Mix 2 - RE 7 Acid Sub Mountain Restoration					
Festuca ovina	Sheeps Fescue	30	n/a	seed	Sowing Rate 5g/m^2
Festuca rubra	Slender Creeping Red Fescue	25	n/a	seed	
Cynosurus cristatus	Crested Dogstail	6.5	n/a	seed	
Agrostis capillaris	Browntop Bent	7	n/a	seed	
Holcus lanatus	Yorkshire Fog	7	n/a	seed	
POA pratensis	Smooth Stalked Meadow Grass	7	n/a	seed	
Galium verum	Lady's Bedstraw	3	n/a	seed	
Anthoxanthum odoratum	Sweet Vernal	2.5	n/a	seed	
Plantago lanceolata	Ribwort Plantain	2	n/a	seed	
Ranunculus acris	Meadow Buttercup	2	n/a	seed	
Ranunculus repens	Creeping Buttercup	2	n/a	seed	
Rumex acetosa	Common Sorrel	2	n/a	seed	
Trifolium repens	White Clover	2	n/a	seed	
Achillea millefolium	Yarrow	1	n/a	seed	
Briza media	Quaking Grass	1	n/a	seed	
Calluna vulgaris	Heather	1	n/a	seed	
Prunella vulgaris	Self-Heal	1	n/a	seed	
Conopodium majus	Pignut	0.5	n/a	seed	
Lotus corniculatus	Birdsfoot Trefoil	0.4	n/a	seed	
Galium saxatile	Heath Bedstraw	0.1	n/a	seed	
Total		100%			




1. Proposed copse woodland.


2. Wet woodland to tie in with existing plant species and enhance habitat opportunities.


3. Regeneration of DSF surface with upland heathland vegetation.


4. Naturalisation of recirculation ponds.


5. Retention of access track until post closure, then alowed to naturalise.


6. Proposed phased removal of conifer vegetation to be replaced by native woodland and shrub species.

Planting:

Planting proposals for the DSF are to be developed in conjunction with engineers to ensure the structural integrity of Dry Stack Facility cap is maintained and not jeopardised. This drawing should be read in conjunction with Hoy Dorman drawing 2016021-P-CIV-004 General Site Layout Plan and all other engineering drawings.

Proposed planting to comprise species of local provenance stock from Northern Ireland informed by site conditions, and the Design Guide for Rural Northern Ireland (1994). All tree and shrub planting to comply with BS3936 Specification for trees and shrubs.

All bare-rooted plants to be planted during the period November to April. Bare-rooted plants should be delivered with roots covered and kept moist, preferably in dark plastic bags. If planting is not possible straight away, bare-rooted plants to be stored on site within a sheltered, cool area, protected from sunlight and frost. If plants need to be stored on site for more than a few days, they should be 'heeled' into spare land with roots covered by soil.

Plants to be notch planted into existing soil in a random pattern with no straight lines. Plants should be planted in single species groups of 5 - 10 plants. Immediately after planting trees, cut back any damaged, dead or diseased branches and remove weak, thin or malformed growth. Plant species, sizes, and planting density are in the Schedule: Proposed Planting.

Landscape Restoration Objectives:

The overall aim of restoration is to tie the site back into the existing landscape, to reflect its character, topography, structure and the existing species composition, and where possible to improve upon the current situation. Specifically: buildings and structures will be removed, returning the landscape to a rural appearance; engineered slopes will be graded so that they tie into the natural topography; the wetlands will remain and will be naturalised; the DSF will be recolonised with locally appropriate grass and acid heath species; and native woodland species will replace the existing conifer belts, which presently act as detractors in the landscape. Where possible, tree and hedgerow planting will be aligned to reflect the orientation of the characteristic 'ladder fields'. Access tracks which remain will be allowed to soften so that they have the appearance of the existing farm tracks.

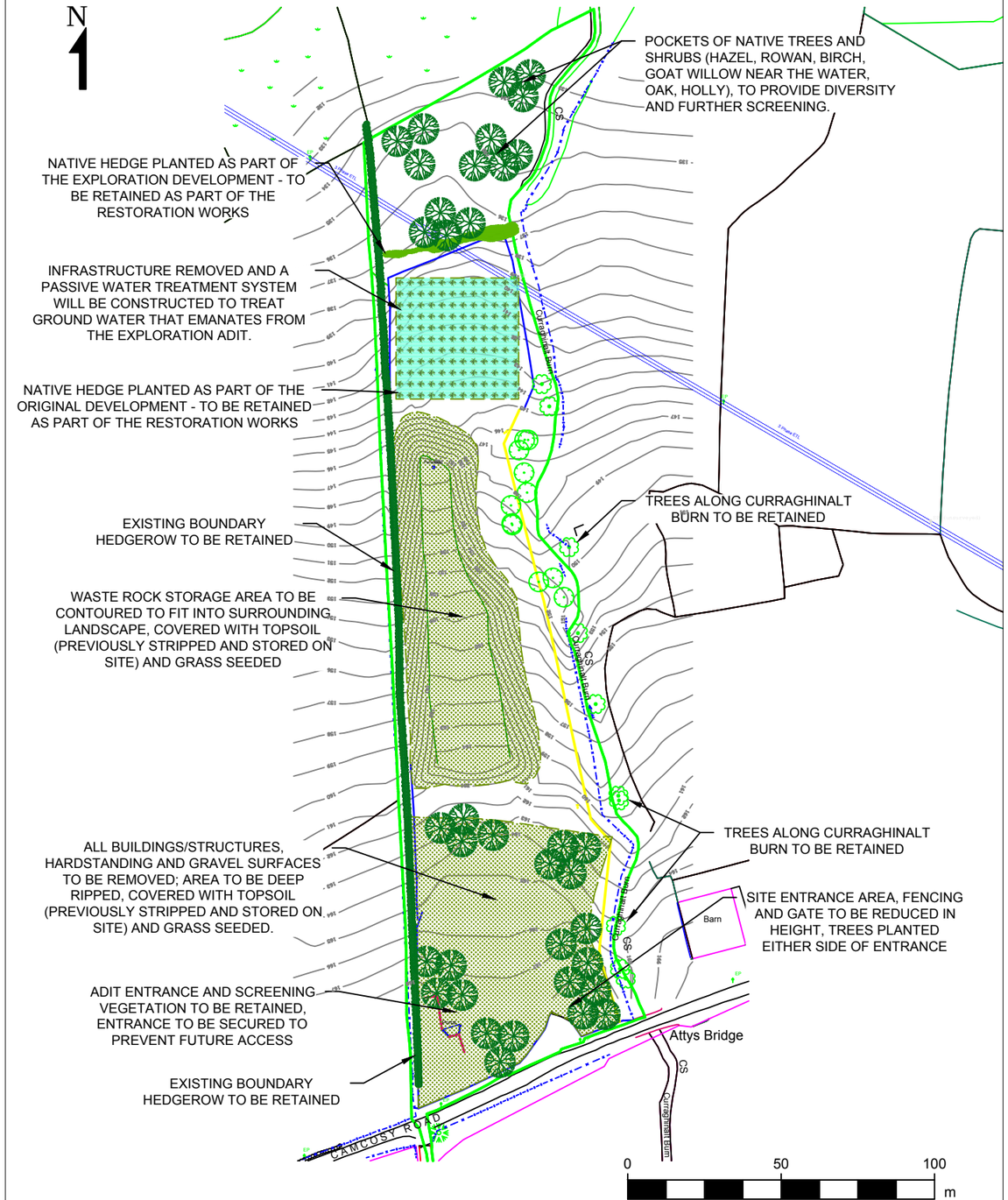
It should be noted that planting which is proposed outside the red-line planning application boundary to tie into existing vegetation will require agreement with respective landowners. If this planting is not progressed then this plating will be possible.

Iss	Date	Issue Notes	Drawn	Checked	Approved
C	OCT 2017	Third Issue	GC	DW	DW

LUC
37 Otago Street
Glasgow, G12 8JJ
T: 0141 334 9595
F: 0141 334 7789
glasgow@landuse.co.uk
www.landuse.co.uk

Project	**Curraghinalt Project County Tyrone Northern Ireland**
Client	**Dalradian Gold Limited**
Title	**Landscape Restoration Plan**
Scale	**A1 As Shown**
Status	**Issue C**
Job No.	**6335**
Drawing No.	**6335_003**
Issue	**C**

Do not scale from this drawing.



JULY 2017	U6193	CURRAGHINALT GOLD ESIA	
srk consulting		Master Restoration Plan Existing Adit Area	

P:\U6193 Curraghinalt Gold ESIA\Project\CAD\03ProcessedWorkspace\AdieSiteClosurePlan_20170720.dwg