

# Garrylaun Mine

## Proposed Closure, Restoration / Rehabilitation and Aftercare Management Plan (CRAMP)



November 2021

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Appendix 1. - IPCL Extract

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# Chapter 1 - Introduction

## 1.1 Background

Shanooon Resources Limited (SRL) is an Irish registered company which was formed in 2016. The company is actively prospecting for and plans to develop Zinc-Lead projects in the Irish Base Metal Province. The company currently holds three prospecting licences along the Rathdowney Trend which includes the now closed Galmoy mine. The company has an experienced management team (ex. Lisheen mine) with a proven track record in developing and operating base metal mines both in Ireland and overseas. SRL is well resourced and has access to the necessary skills and resources to develop and operate a mining project.

SRL intends to develop the Garrylaun mine, which will essentially be a recommencement of mining of zinc, lead and silver at the former Galmoy. Mining activities previously took place at the former Galmoy mine between 1997 and 2014, however, operations ceased on site prematurely and significant ore reserves remain underground. Based on the current economic and known mineral resources and mining reserves at Garrylaun, it is estimated that mining operations will be carried out over ca. 7 to 10 years from the recommencement of operations at the Site. The recommencement of mining and parallel continued mineral resource testing will identify any potential additional economic ore reserves that would extend the life of the proposed project. The project location is as per the figure below.

Galmoy mine operated under an Integrated Pollution Control Licence (IPCL) issued by the Environmental Protection Agency (EPA). The current iteration of the IPCL is P0517-02. Galmoy mine prepared and implemented an approved Closure, Restoration and Aftercare Management Plan (CRAMP). The Galmoy IPCL remains in force and the Galmoy site is in Aftercare. The Galmoy IPCL site boundary was reduced by Technical Amendment to reflect the restoration work that was completed by Galmoy mine. Mine closure is a complex process and can bring with it quite a lot of uncertainty, the experience of the successful Galmoy mine closure process is very significant in this regard. It is the intention of SRL to adopt a similar approach to all aspects of physical closure that were undertaken by Galmoy. This approach provides an element of certainty to SRL that the various aspects of closure will be successful. The Galmoy experience also provides the same element of certainty with respect to the cost of implementing the plan and indeed provides some of the material (for example SRL will stockpile and reuse the fill, extracted during reopening, to close the ventilation shafts and the decline).

## 1.2 CRAMP Structure

This section describes the structure adopted for the Garrylaun CRAMP. The structure comprises a series of separate components that are mostly presented as separate CRAMP chapters. Each chapter will cover a specific aspect of the mine closure process and although mine closure is an integrated process with many aspects overlapping, this structure supports a flexible approach for delivery of the plan and enables periodic review and revision of specific CRAMP components.

## **The principal components of the CRAMP structure are described below:**

### Chapter 1: Introduction and Terms of Reference

This chapter provides background information on the Garrylaun project and the site. It provides details on terms of reference, environmental impact management, schedule of activities, risk assessment and the success criteria. It sets out the legal framework under which the CRAMP was written and as such aims to demonstrate that the site is in compliance with all permits issued by the State.

### Chapter 2: Mine Rewatering

This chapter includes detail on the hydrological model that describes how the mine will rewater, and how long this can take. Traditionally a mine must create a model to predict the rate of groundwater recovery. And while SRL has completed a hydrological model for the project, the real-life experience of Galmoy mine can be used and is of great use to provide certainty with respect to all aspects of rewatering. This chapter will also examine the likely chemistry within the flooded areas, a plan to protect groundwater users and how to minimise the potential impact on the local rivers, and again this will draw heavy on the experience of Galmoy mine.

### Chapter 3: Site and Underground Decommissioning and Restoration

This chapter describes the physical decommissioning and final restoration scheme for the mine site following the cessation of mining operations. This includes the underground workings and the main surface operational complex of the mine. Consideration to the risk of, and monitoring of, surface subsidence is also considered in this chapter. The mine site area will be returned to a standard fit for industrial / commercial after use. This chapter also includes the surface water monitoring programme.

### Chapter 4: Financial Provisions

This chapter describes the financial measures, funds and mechanisms provided for the physical closure, restoration, and aftercare of the Garrylaun mine site.

The chapter provides the initial closure cost estimate and also details the annual review process, which is the overriding mechanism for the distribution of the mine closure funds once approval by the Regulatory Authorities is achieved.

### Chapter 5: Aftercare

This chapter describes the aftercare plan that will ensure a stable, long-term sustainable closure of the mine site following the closure and restoration phases.

### Chapter 6: Interested and Affected Parties

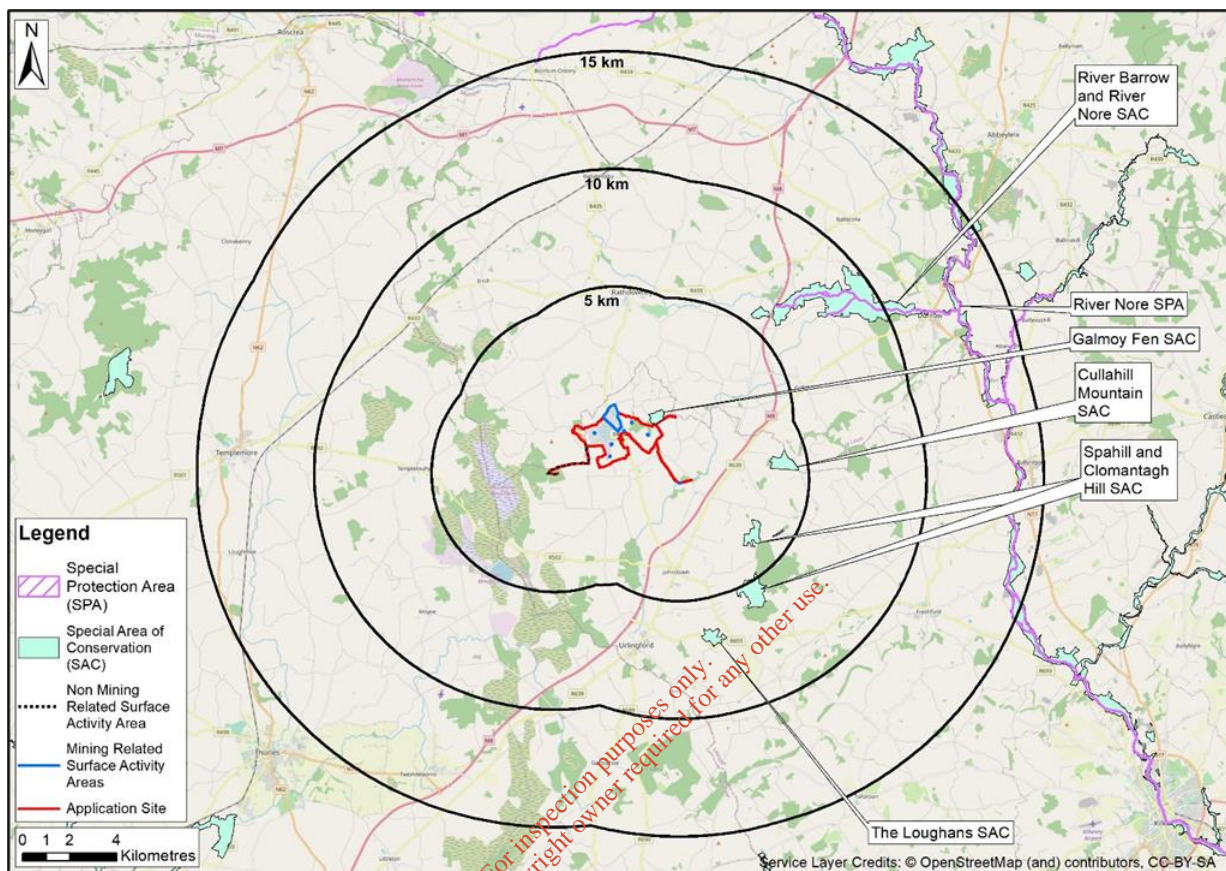
This chapter focuses on a review of the approach and general procedure that is adopted by the mine, demonstrating a socially responsible approach to mine closure.

### Chapter 7: Risks

This chapter focuses on a key risks that may impact on SRL's ability to implement a successful closure.

### 1.3 Site Location and Sensitive Receptors

The project is predominantly located in North Kilkenny close to the towns of Johnstown and Urlingford.



**Figure 1: Site location showing SACs, SPAs and pNHAs**

According to the National Parks and Wildlife Service's (NPWS) database of designated nature conservation areas, there are 5 SACs, 1 SPA and 10 pNHA within 15 km of the Site.

The project proposes to re-instate the former discharge point on the River Goul to discharge treated mine water. The River Goul is a tributary of the River Nore (via the River Erkina). The River Nore is a Special Protection Area (SPA) and it is also part of the River Nore and River Barrow Special Area of Conservation (SAC), both are Natura 2000 designations.

### 1.4 Overview of mining project

The project has in the order of ca. 2.6 Mt of ore in the mine reserve. The proposed extraction of ore will take place to a maximum depth of up to ca. 150 m bgl (below ground level). It is intended that the underground workings will initially be carried out within the currently known mining reserve footprint and use facilities as previously constructed (a number of which will require refurbishment), in addition to an ore sorting and materials handling system specifically designed for the Garrylaun Project. Once mechanically sorted the ore will be transported to an off-site processing plant overseas. The design of the proposed development will follow industry best practice and having regard to its underground design will adhere to the Mines and Quarries Act 1965 and all associated legislation.

The life of the mine (LOM) will depend on the final ore reserves that are identified. At this time, based on a mining rate of ca. 310,000 tonnes per year, with up to 210,000 tonnes per year of high grade sorted ore exported from Site. It is anticipated that the LOM will be completed in approximately 7 to 10 years, depending on what additional ore resources outside of the reserve our found during mining. Where possible progressive restoration will take place during the mine life, but the bulk of restoration works will commence at that time mining operations cease. Based on a 2022 start date, this means that mine closure could commence in ca. 2029.

Although it is expected that mine closure will occur in 2029 there are two other scenarios that need to be considered and they are an early closure or a later closure.

#### **1.4.1 Early Closure**

The risk associated with early closure for the Garrylaun project is deemed to be low risk for a number of reasons.

The mine life is already a relatively short mine life, in that it is only 7 years, while market conditions and other factors can change rapidly. It is believed unlikely that Garryluan will not achieve its mine life, and this is informed in part by the marketing strategy for the project, which will consider opportunities to 'forward sell' a portion of the future ore at an agreed price at the start of the project. Forward selling (or hedging) provides assurance to Garrylaun that even if there is a sudden drop in metal prices, the project will remain viable and be able to achieve its mine life.

In the unlikely event of an early closure the risk is further mitigated by the fact that the closure methodology will not change because of the early closure and as such the cost will not change (for example there is not a partially filled tailings dam that needs to be capped) and the costs will be fully provided for prior to commencement.

#### **1.4.2 Later or Delayed Closure**

The likelihood of a late closure is believed to be more likely than early closure as there is an expectation that SRL will be able to discover additional ore reserves at Garrylaun during the life of the mine.

Garrylaun will review its LOM each year and as such if there is to be an extension to the mine life this will be known well in advance of the extension (and delay to closure). The cost associated with a delayed mine closure is not deemed to be risk however, if it does mean that additional restoration is required (for example a new ventilation raise into a new orebody), the detail of this will be captured in the annual closure costs review and if required additional funds will be added to the closure fund to meet the revised figure. The cost inflation risk associated with a delay to mine closure will also be provided for in the annual closure review.

The risk associated with a later closure is not deemed to be a material risk.

### **1.5 CRAMP Objectives**

The closure objectives for the Garrylaun mine site is for SRL to work with stakeholders, both community and Statutory to ensure the interests of all are understood and met. SRL's primary objective is to leave behind a physically and chemically safe site, whilst leveraging infrastructural assets to facilitate sustainable replacement industry, and jobs, for the site after mining has ended.

## 1.6 Closure Vision

SRL management were instrumental in the development of the Bioeconomy Campus at the Lisheen mine site, and the vision is to achieve a similar outcome of the Garrylaun mine site. The plan is to maintain what infrastructure is of value to facilitating replacement industry on the site once the restoration is complete. Examples of such infrastructure is roadways, electrical substations, and buildings. Any infrastructure being retained will be cleaned to an appropriate level ensure it does not pose a risk into the future.

## 1.7 Legal Requirements

Mine closure is not an explicit reference in any of the Irish Statutory Instruments, but a number of statutory provisions are relevant to specific aspects of the closure process such as environmental protection, the regulation of waste management and the protection of valuable biodiversity.

The international context is principally defined by European Union Directives. All relevant EU Directives require delivery at member state level by transposition into national law through the creation of appropriate Statutory Instruments. Implementation of the Garrylaun mine CRAMP will be underpinned by an ongoing review of relevant national legislation from the Irish Statute Book. This will enable a clear understanding of legislative requirements that must be supported through CRAMP delivery. An example of legislation that is of relevance with respect to mine closure planning is SI No. 566/2009 - Waste Management (Management of Waste from the Extractive Industries) Regulations 2009.

To operate a mine in Ireland it is necessary to acquire three permits to operate, and they are:

- Planning Permission
- A State Mining Licence for privately owned mineral or a Lease for State owned minerals
- EPA Licence (either Industrial Emission - IE or Integrated Pollution Control - IPC)

Each of these three permits will contain specific conditions in relation to mine closure and will draw from various Statutory Instruments. The EPA has issued guidance documents to assist licenced sites to plan for environmental liabilities (including site closure).

Each of the three permissions must be received and held at the same time in order to operate a mine. The first permission that is required is a Planning Permission, on the basis that an application for the other two cannot be made without Planning Permission.

### 1.7.1 Planning Permission

The Garrylaun falls into the category of a development under The Planning and Development Act 2000 (as amended) and as such requires planning permission from the relevant Planning Authorities.

The main site is located within County Kilkenny and the majority of the underground operation is also located within Kilkenny. A small amount of the underground workings extends into County Laois, and the effect of dewatering will extend into County Laois. Therefore, planning applications will be made to both Planning Authorities.

Planning applications will include all required aspects including EIAR and Appropriate Assessment Screening. On issuance the Planning Permission will contain many conditions that must be complied with, in particular with respect to the development and decommissioning of the operation.

### 1.7.2 A State Mining Licence / Lease

In order to extract scheduled minerals, as per the 1940 Minerals Development Act, a mine operator must have permission from the State. Permission can be one of two types; a Licence for privately owned mineral or a Lease for State owned minerals. The Licence / Lease will contain many conditions that must be complied with and will also detail the royalties that must be paid on the extracted minerals.

### 1.7.3 EPA Licence

It is anticipated that Garrylaun will be licensed by in IPC licence under the Environmental Protection Agency Act 1992 as amended under Section 90(2) of the said Acts for the following scheduled activity: Schedule 1.3 - The extraction and processing (including size reduction, grading, and heating) of minerals within the meaning of the Minerals Development Acts 1940 to 1999, where an activity involves -

(a) a metalliferous operation, or

(b) any other operation where either the level of extracted or processed minerals is greater than 200,000 tonnes per annum or the total operational yield is greater than 1,000,000 tonnes, and storage of related mineral waste.

Specifically in relation to the conditions for closure and financial provisions, it is anticipated that conditions in the Garrylaun IPCL will have similarities to the condition 12 of current licences that cover liabilities. An example of such conditions is included in Appendix 1 (taken from the Galmoy mine IPCL).

## 1.8 Non-Statutory Guidance

There are a number of sources of guidance on mine closure that have been reviewed by SRL and this process will continue throughout the life of the mine. Guidance includes:

- EPA Guidance:
  - Guidance on assessing and costing environmental liabilities – 2014
  - Guidance on assessing and costing environmental liabilities (Unit cost rates for verification) – 2014
  - Guidance on Financial Provision for Environmental Liabilities – 2015
  - EPA Approach to Environmental Liabilities and Financial Provision – 2019
- The International Council on Mining and Metals (ICMM) has developed a number of tools to assist in planning for mine closure. The most recent guidance is the 2020 CLOSURE MATURITY FRAMEWORK - Tool for Closure User Guide.

## 1.9 Domains

For the purposes of mine closure and site restoration the site is divided into domains, and each domain has its own closure goals. The mechanism by which closure goals will be achieved is explained in further chapters, the general success criteria for each domain are discussed in this section and more specific / detailed success criteria will be provided as the closure plan is developed during the life of the mine.

The closure domains for Garrylaun mine are:

### **1.9.1 Administration and Welfare Buildings**

Closure goal – clean and repurpose to a suitable sustainable reuse with the objective of providing sustainable employment into the future. Retain relevant infrastructure to support the site redevelopment (electrical infrastructure, selected roadways and carparks, water supply and water treatment (sewage not mine water). Any infrastructure being retained will be cleaned to an appropriate level ensure it does not pose a risk into the future.

### **1.9.2 Underground Workings**

Ensure adequate backfill has been placed to ensure geotechnical stability, if necessary, areas can be backfilled from surface post closure. Remove all harmful chemicals or materials. Remove all, non-hazardous, assets of value that can be recovered economically. Allow the mine to rewater by turning off dewatering pumps. Seal all entrances to the mine (shaft and decline) to make the area inaccessible to third parties. Carryout monitoring to demonstrate that all land above the mine is geotechnically sound. Carryout monitoring to demonstrate that and groundwater has been unaffected by mining and has returned to baseline conditions, with respect to elevation and water chemistry (agree specific target values).

### **1.9.3 Water Treatment Area**

All ponds, and water treatment plant and equipment that is of no benefit to any replacement industry will be removed and the footprint will be restored to an acceptable concentration with respect to residual metal concentrations or any other potential pollutant<sup>1</sup>.

### **1.9.4 Ore Handling Area and Infrastructure**

All ore handling plant and equipment will be removed, and the footprint will be restored to an acceptable standard with respect to residual metal concentrations or any other potential pollutant<sup>1</sup>.

### **1.9.5 Other Lands owned by SRL in and around the Garrylaun Mine Site**

All lands owned SRL will be risk assessed to ensure there is no risk remaining with respect to the activities that took place. Where necessary any contamination will be removed to ensure the area is at an acceptable standard with respect to residual metal concentrations or any other potential pollutant<sup>1</sup>.

### **1.9.6 Surface Water Discharges**

Infrastructure such as buried pipe will be assessed and will remain in place, provided they are not causing, or have potential to cause, any impact. The condition of the river downstream of the discharge will be assessed in conjunction with the Inland Fisheries Ireland (IFI), including an assessment of river sediments. If it is necessary to carry out any improvement works; these will be carried out by agreement with the IFI.

## **1.10 Success Criteria**

The Garrylaun mine closure strategy will be underpinned by a set of success criteria, and these will be used as a framework for validation of restoration performance.

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<sup>1</sup> Specific target values will be agreed as part of future iterations of the CRAMP document and will be established on a risk basis, the outcome of which will depend on the future use of the site. The process must use accepted soil concentration values for specific land use.

The criteria are to be agreed with Regulatory Authorities. They will be specific, measurable, achievable, realistic and time related (SMART), and will be used as indicators to determine whether closure objectives have been met. The achievement of these success criteria will be verified through a monitoring process and will subsequently lead to sign off and approval from Regulatory Authorities.

A copy of the success criteria will follow in future iterations of the CRAMP.

### 1.11 Mine Closure timeline

The physical works associated with mine site restoration (backfilling of the decline and shafts and demolition of structures etc.) are expected to be completed well within 2 years. This is based on the experience of the Lisheen Mine where all mining related infrastructure was demolished and the Mine was cleared and closed within two years (and this was during a time when tailings dam capping work was also taking place, which won't be taking place at Garrylaun – i.e. the focus at Garrylaun will be restoration of the main site and the underground workings).

As will be discussed in the water chapter there is a high level of confidence that the mine will be fully rewatered within two years, based on the experience of both Lisheen and Galmoy mine. Based on the experience of both these mines it is proposed that the aftercare period will be defined as a being for a minimum of 5 years. The proposed closure and aftercare timeline is as per Figure 2.

	Year 1 (post-closure)				Year 2 (post-closure)				Year 3 PC	Year 4 PC	Year 5 PC	Year 6 PC	Year 7 PC
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year 1 Aftercare	Year 2 Aftercare	Year 3 Aftercare	Year 4 Aftercare	Year 5 Aftercare
Coarse Ore Stockpile (TeePee)													
Remove Ore Sorter													
Remove Backfill Plant													
Demolish Minewater Treatment Plant													
Demolish Waste Water Treatment Plant													
Remove all buried services													
Demolish Administration Building													
Demolish Surface Workshops													
Demolish Labs													
Remove Fuel Storage													
Substation													
Roads / carparks / fencing													
Removal of potentially hazardous material from underground working areas													
Mine Decline / Portal													
Ventilation shafts													
Maintain safe working conditions in Mine													
Mobile Plant. Allowance for disposal of obsolete mobile plant.													
Reprofile site													
Environmental Monitoring													

Figure 2: Mine closure and Aftercare timeline

## Chapter 2 - Mine Re-watering

### 2.1 Introduction

In order to work safely in Garrylaun the mine will be dewatered completely, and this will result in a zone of influence that delineates the recharge catchment for the mine. Groundwater levels within the zone of influence will be lower than surrounding groundwater level outside the zone of influence, with the level dropping by a gradient that increases towards the mine workings. The predicted zone of influence for Garrylaun will be slightly larger than it was for Galmoy as the final underground workings footprint for Garrylaun will be slightly larger than the footprint was for Galmoy, due to mining in the K2 orebody and any other extensions beyond the previous Galmoy workings.

The predicted zone of influence is shown in the Figure 3 below.

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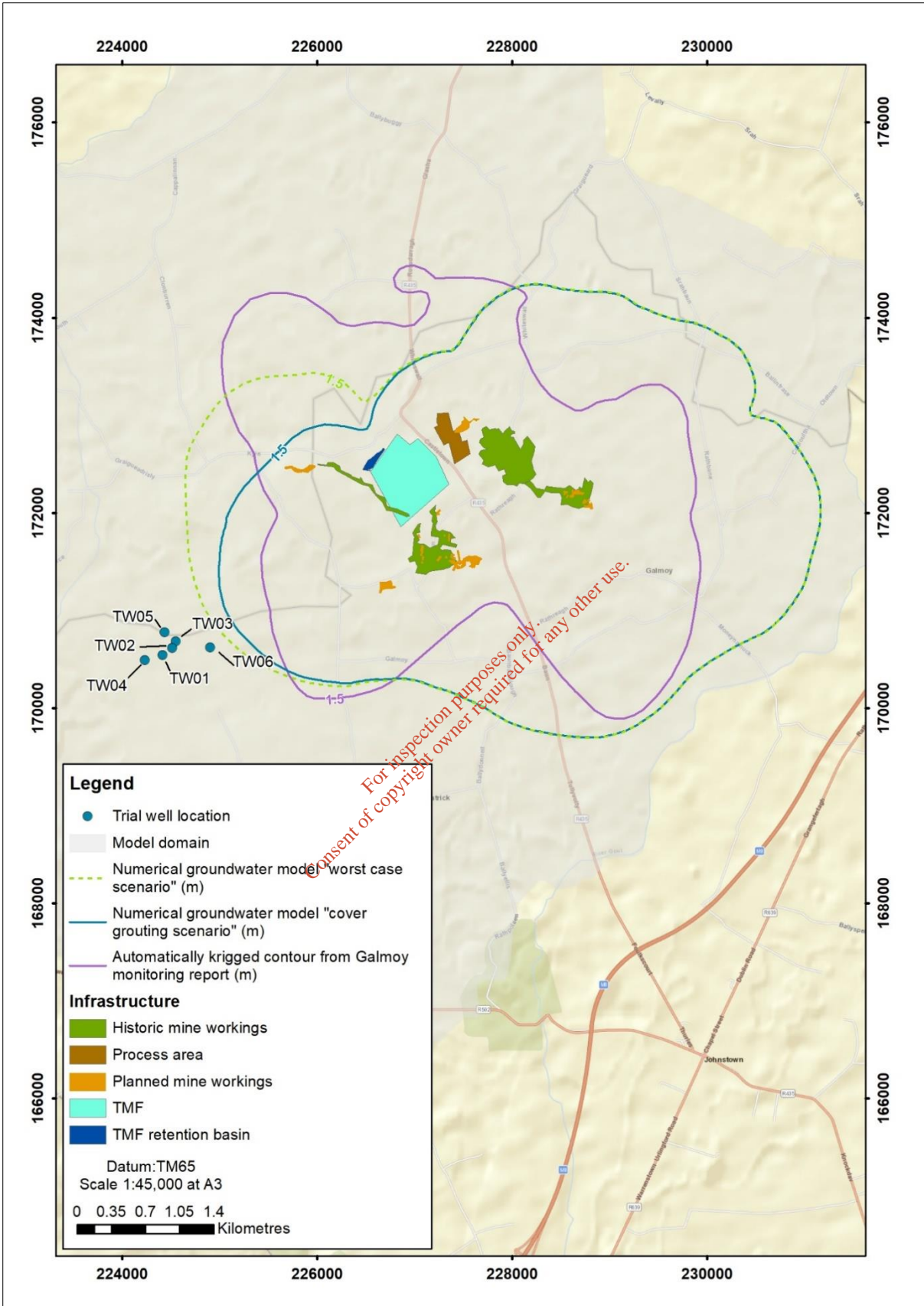


Figure 3: Estimated area of drawdown from previous mining at Galmoy and predicted drawdown resulting from future dewatering

When it comes to rewatering and recovery of groundwater in the region of the mine, there are two aspects to consider, and they are:

- How long will it take for baseline groundwater elevations to be achieved?
- How will rewatering potentially impact on the quality of groundwater around the mine?

## 2.2 How long will it take for Baseline Elevations to be Achieved?

Following the shutting off of the pumps the groundwater levels will begin to rise as the mine workings start to flood. The initial rate of recovery will be rapid and will then progressively decrease with time. As recovery progresses the rate of water level rise will become increasingly controlled by the varying amounts of rainfall and recharge.

During the initial recovery period the water level rise in the lower part of the individual mining zones may be independent. However, as the mining zones are interconnected the rising water level will equilibrate between the zones – the water level will be uniform over the entire mine area as the recovery will occur at the same rate.

The rewatering of both Lisheen and Galmoy is a good example of the uncertainty that can be associated with mine closure because the rewatering model did not correlate well with reality. It was initially predicted that it would be many years before both Lisheen<sup>2</sup> and Galmoy mine would be fully rewatered, in Lisheen's case the closure plan predicted up to 8 years. However, both mines experienced much more rapid groundwater level recovery once dewatering activities ceased, with rewatering being fully complete in less than 2 years. It was concluded that the groundwater storage component of the competent bedrock was close to zero. When water levels rebounded, most of the void space being replenished (re-watered) was within the workings themselves. The surrounding Waulsortian bedrock required little additional water to achieve full recovery. The recovery curves for both mines are shown in the figures below.

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<sup>2</sup> Towards the end of the mine life Galmoy mine used bulkheads to compartmentalise different orebodies and allow some partial rewatering to take place. It is therefore of use to include reference to the Lisheen mine rewatering timeline, as this was completed in one stage.

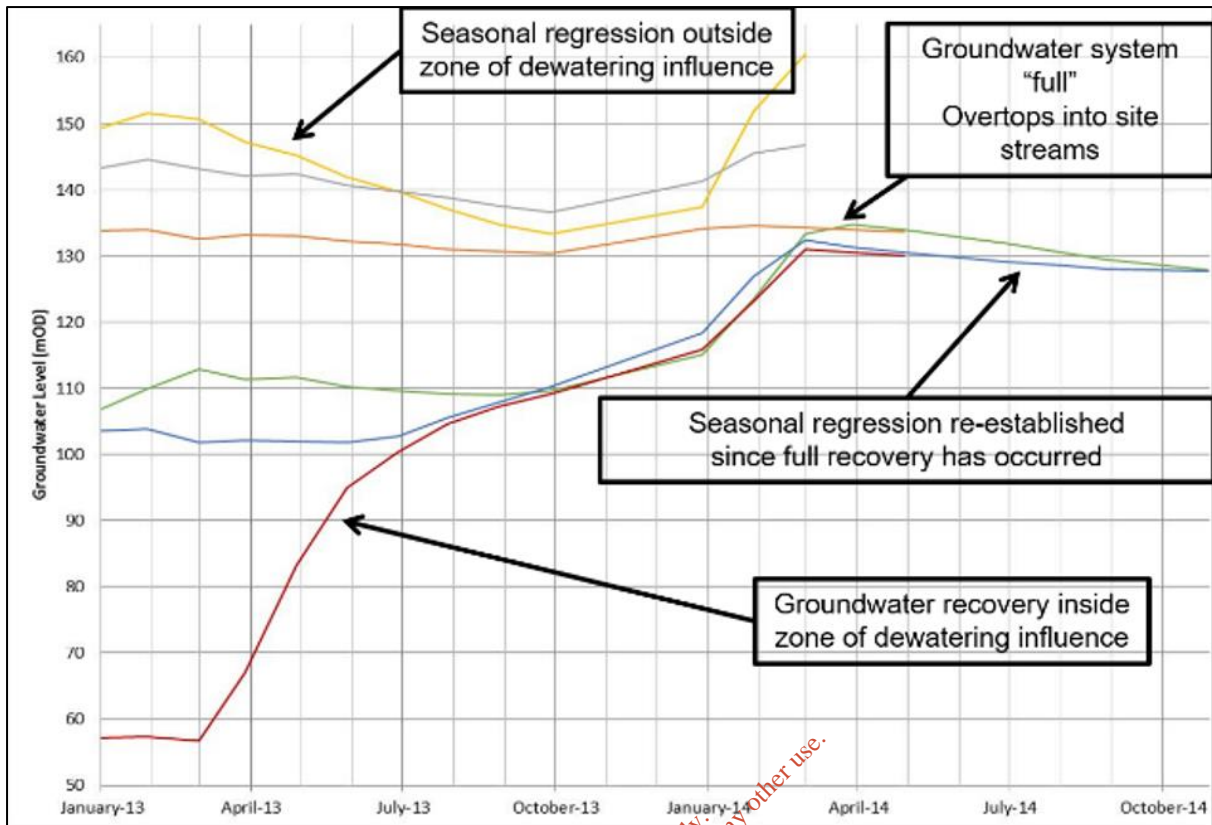


Figure 4: Galmoy mine rewatering

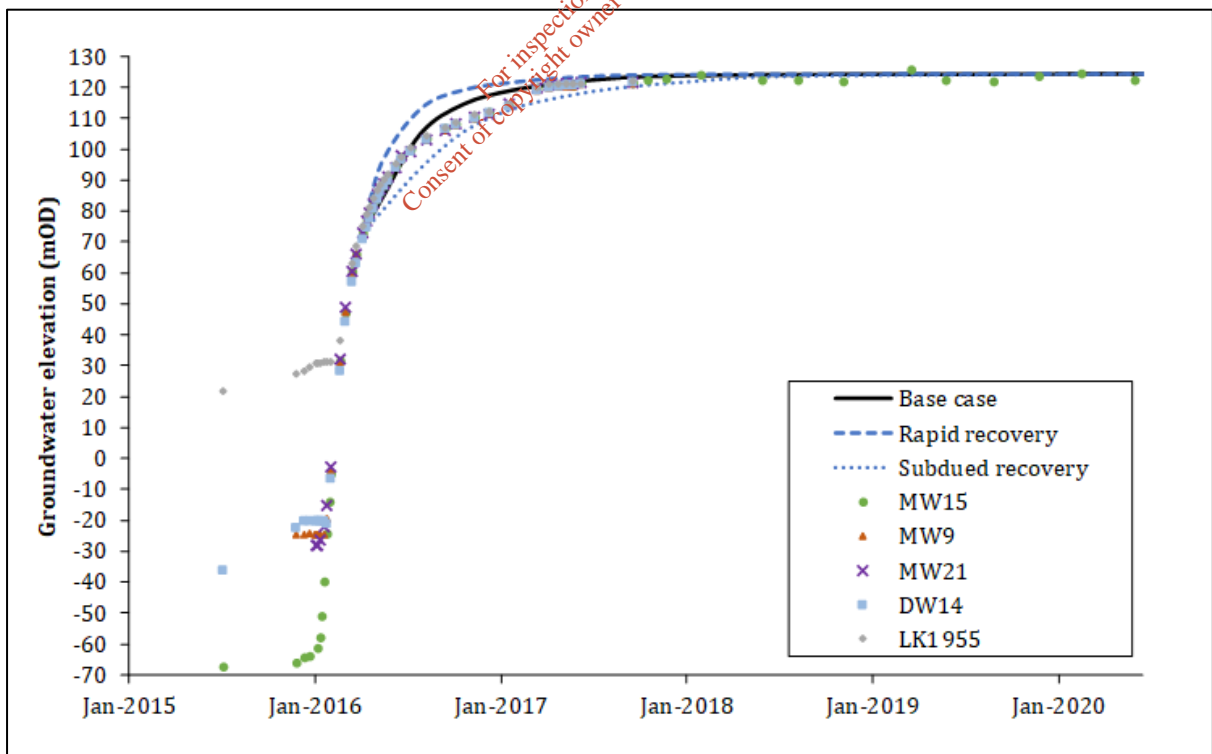


Figure 5: Lisheen mine rewatering

The final underground workings footprint for Garrylaun will be slightly larger than the footprint was for Galmoy, due to mining in the K2 orebody and any other extensions beyond the previous Galmoy

workings. However, this will not have a material change on zone of capture / influence and therefore it can be predicted with a great deal of confidence that rewatering of the Garrylaun will be fully complete within a two-year period.

Therefore, for the Garrylaun mine it will not be necessary to rely on a rewatering model as the real-life example at Galmoy mine can be used and there is a high level of confidence that rewatering will be complete inside two years of turning off the dewatering pumps.

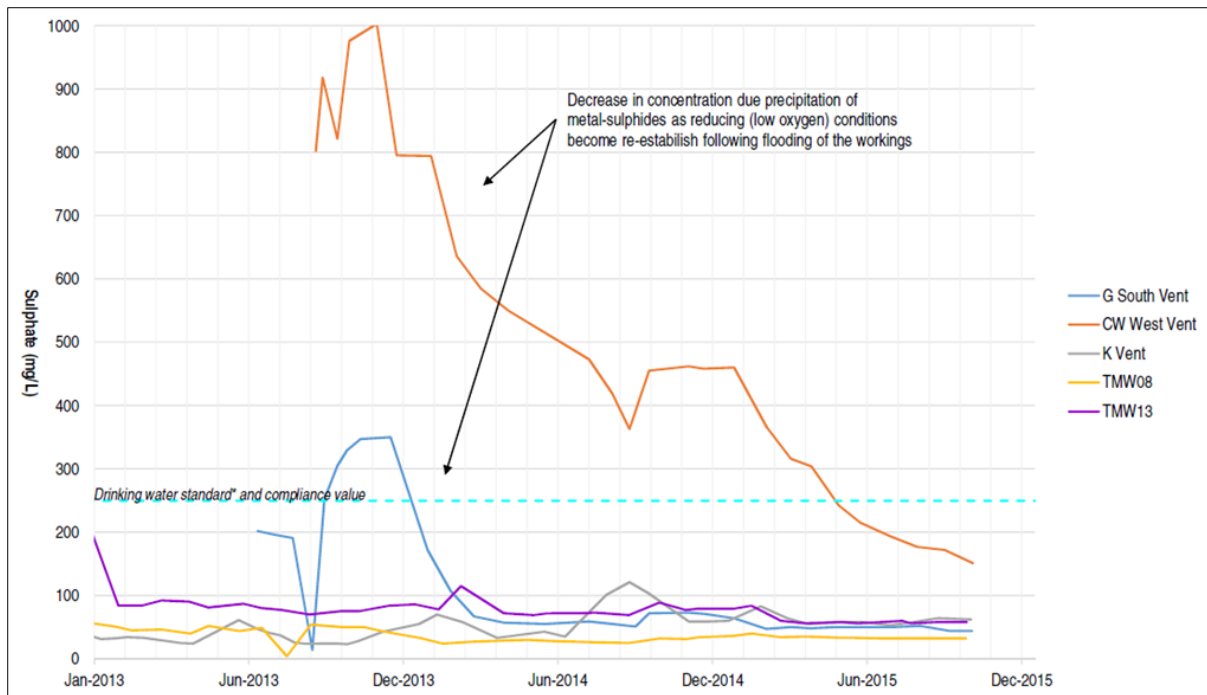
### **2.3 How will Rewatering Potentially Impact on the Quality of Groundwater around the Mine?**

During mining operations, when dewatering is taking place, there is an inward groundwater gradient towards the mine. This means that there will not be any groundwater pollution caused by mining operations. Groundwater within the zone of influence will be pumped from the mine workings to surface where it will be treated before discharge to surface water (the River Goul).

As discussed in Section 2.2 the real-life examples for Lisheen and Galmoy mines are extremely valuable for Garrylaun. The hydrogeology and geochemical models for both Lisheen and Galmoy predicted that the dense sulphate rich water in the mine will stratify and create a chemocline; whereby the mineralised water will remain at the elevation of the mine workings and less saline clean water, which recharges the mine is less dense and will in essence 'float' on top of this denser water. It was predicted that there would be very little groundwater movement at the depth of the mine workings and therefore minimal risk of mobilisation of any metal rich mineralised water. All the while the aquifer in the epikarst, which is found in the top c. 30 m below ground level will remain clean, good quality water.

It was further predicted that when rewatering is complete any solids in suspension within the workings will fall out of suspension in the calm water and as conditions become anoxic there will be precipitation of dissolved species out of solution and these precipitates will too settle and fall out of suspension. Therefore, the overall conclusion was that the shallow groundwater would be unaffected by rewatering of the mine and even the groundwater quality at depth would gradually improve over time.

The predictions of the model have been proven by post closure monitoring completed by Galmoy mine, as can be seen in the figure below, showing the trend for sulphate in the groundwater before, during and after mine closure. Additional information is provided in the water chapter of the EIAR.



**Figure 6: Sulphate concentration in the underground workings at Galmoy mine**

The Irish Water supply scheme is outside of the zone of influence and will be unaffected in any way by mine rewatering. Galmoy mine successfully operated a water supply scheme during the life of the mine to supply water to those people impacted by dewatering (and indeed to supply a large number of people unaffected by dewatering activities). The scheme developed by Irish water has been taken over by Irish Water and continues to operate successfully. While SRL is confident the scheme with its existing wells could provide sufficient water during the life of the Garrylaun mine, the company has agreed with Irish Water to provide additional back up wells further to the west of the mine, further from the dewatering activities, to provide additional assurance and comfort to Irish water.

### 2.3 Water Management during Closure

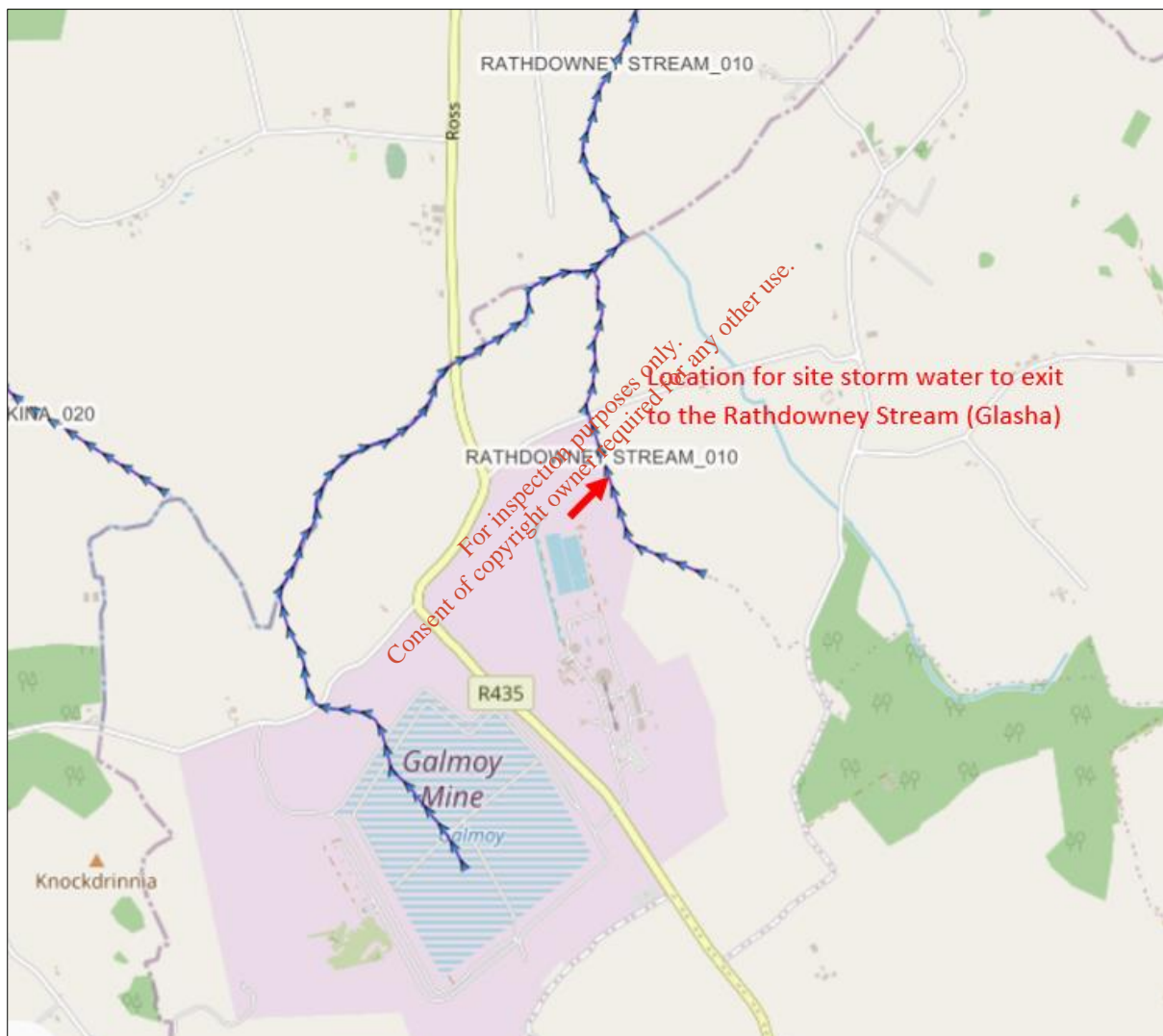
A detailed hydrology study has been carried out on the Garrylaun mine as part of the EIA process. There is a high level of confidence in the predicted water that the mine will make, and also the time it will take for the mine to rewater, given the history of the site and the information that is available from Galmoy mine.

Water quality monitoring will continue throughout the closure period and into aftercare. The schedule will be agreed with the EPA and will be detailed in the IPC Licence. The monitoring will continue until such time as the residual liabilities are reduced to the satisfaction of the Regulatory Authorities and to SRL.

#### 2.3.1 Cessation of Discharge to the Goul River

As soon as the mine workings have been cleared of all potentially hazardous material the underground pumps will be turned off and the zone of influence will begin to rewater, as described above. Once the underground pumps are turned off there will no longer be a requirement to discharge large volumes of water off the site.

The water ponds and treatment plant will be retained for a period of time while site restoration works are taking place, although the discharge to the Goul will be much reduced because water will arise from the site catchment only, plus welfare water. The Mine Water Treatment Plant (MWTP) will remain available to treat water as required (as water arising from the site may contain metal residue associated with restoration of the ore stockpile areas and the Teepee). Towards the end of the first year of closure works that water ponds and mine water treatment plant will be decommissioned (provided there is no sustainable reuse opportunity), and it is at this time that the discharge to the river Goul will cease. From this time onwards the surface water discharge from the site will be river Glasha. As the main industrial area of the site will be cleared of contaminated land it is anticipated that they storm water exiting the site to the Glasha will be of good quality. However, provision has been made to hire a containerised mobile water treatment plant in the event it is required.



**Figure 7: Surface water arrangements post mine closure (original image source from catchments.ie)**

### 2.3.2 Management of Site Water Runoff

All surface water runoff, treated foul water, will report to the north of the site where it will discharge passively via the surface water emission point to the Glasha. This emission point will be licensed by the EPA in the IPCL to be attained and will have emission limit values for various physiochemical parameters.

### 2.3.3 Assessment of River

Assessment of the Glasha and the Goul river will be a part of Garrylaun's Environmental Management Programme and will include monitoring of surface water quality, sediment, and macroinvertebrates. On cessation of mining this river assessment work will continue until such time as agreed with the Statutory Authorities. A risk assessment will be carried out to determine if the river requires removal of any sedimentation relating to mining operations. This work, if required, would be carried out in conjunction with the Inland Fisheries Ireland (IFI). If it is necessary to carry out any improvement works; these will be carried out by agreement with the IFI. A copy of the baseline assessment of the Goul river is provided in Appendix 2.

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## Chapter 3 - Mine site and underground decommissioning

### 3.1 Introduction

This Chapter of the CRAMP describes the physical decommissioning and restoration of the mine site to a standard suitable for industrial / commercial land after use. It also includes the decommissioning of the underground mine following the cessation of mining operations.

The programme includes decommissioning of underground and surface plant, equipment, services, and all associated elements within and backfilling of the mine along with monitoring structural stability.

The following figures provides an overview of the mine site, the underground workings, and the layout of buildings and infrastructure on the site.

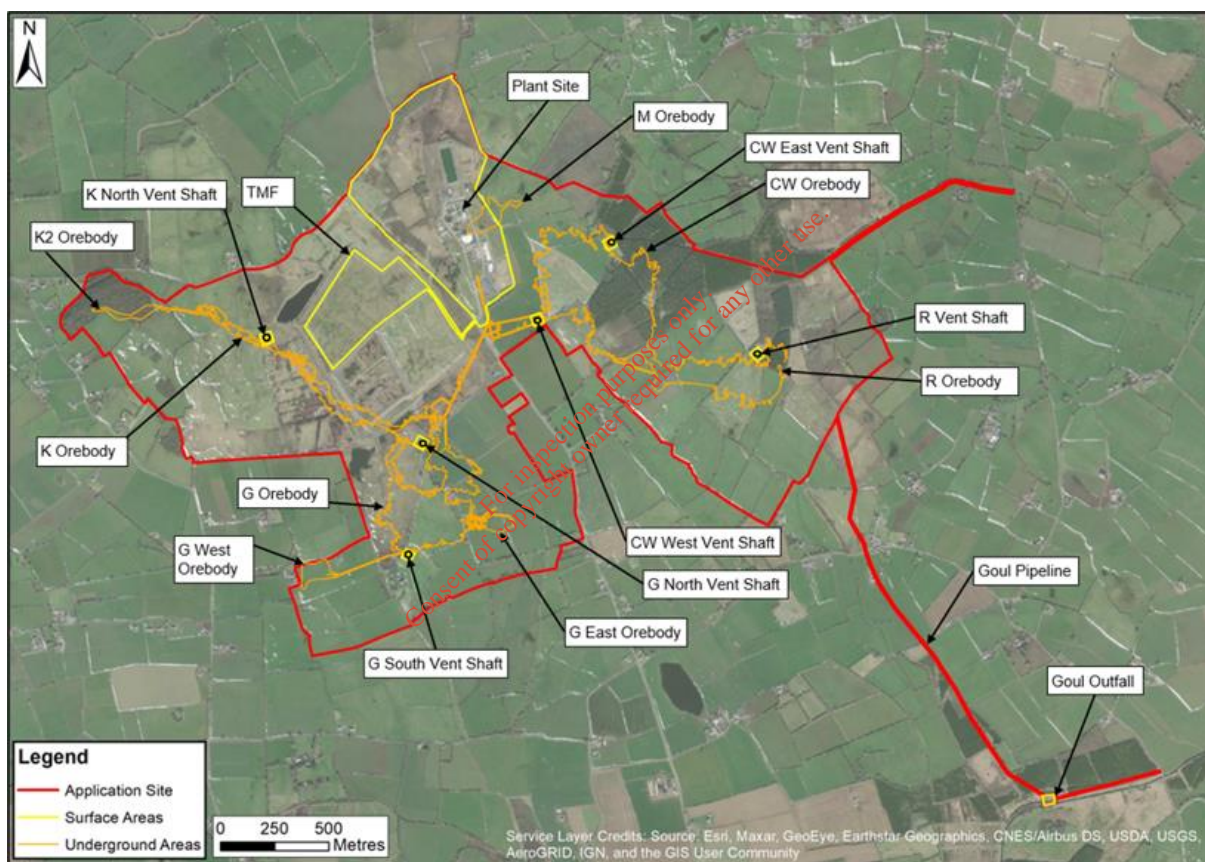


Figure 8: Site layout (including underground orebodies)

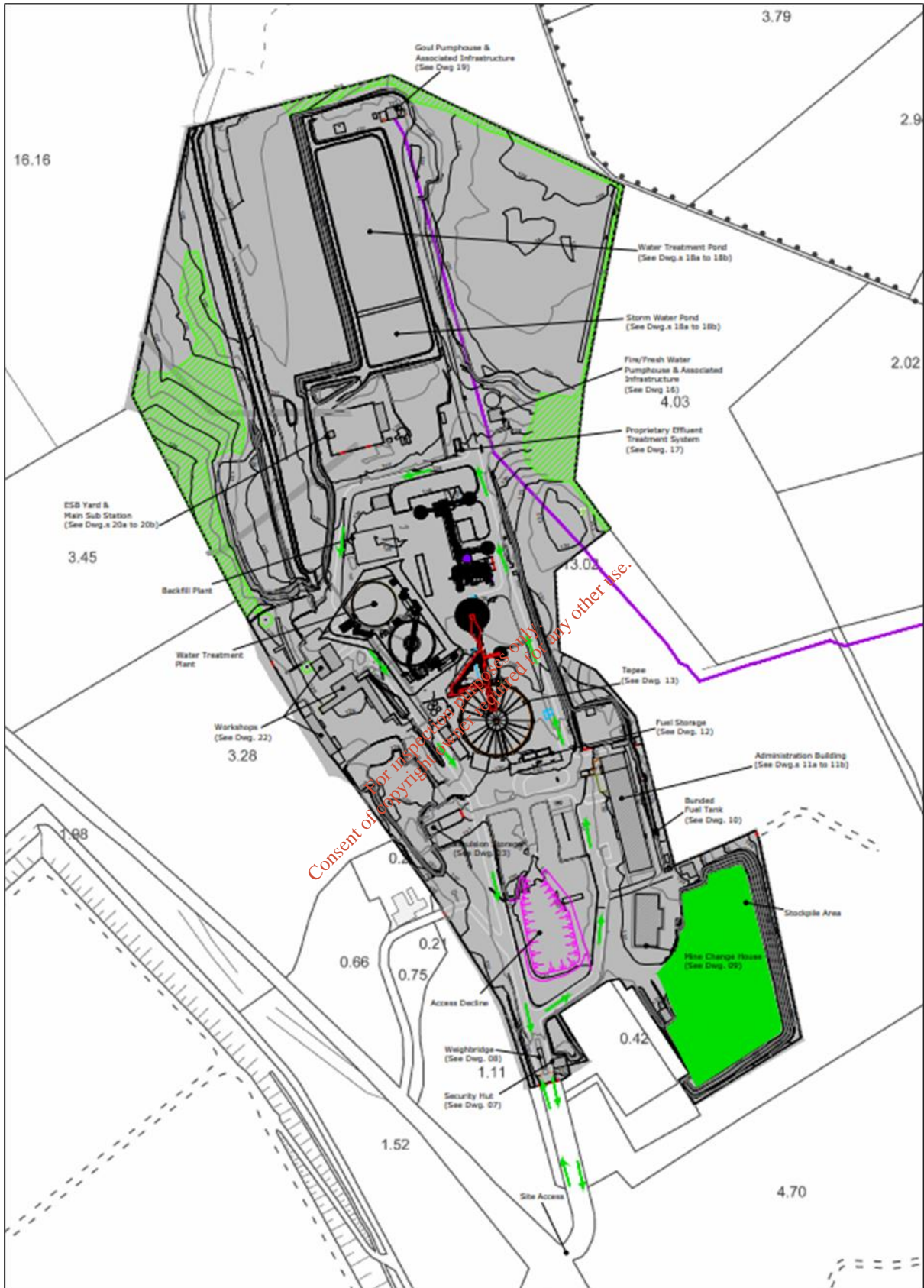


Figure 9: Site infrastructure layout

## **3.2 Surface Decommissioning**

### **3.2.1 Retention of Surface Buildings for Appropriate Secondary Use**

The prospect of future sustainable development will mean that some buildings and associated infrastructure will be retained on the mine site for secondary use. The administration building, workshops, electrical substation, and the large parking facility on site will also be retained for future industrial use. Any infrastructure being retained will be cleaned to an appropriate level ensure it does not pose a risk into the future. The retention of buildings is inline with the EPA 2014 Guidance on Assessing and Costing Environmental Liabilities, where it is stated *'Operators should make it clear in their closure plans what the specific intentions are towards the decommissioning and decontamination of plant and equipment and whether removal and disposal of these items is required. Similarly, there may be no need to demolish and remove buildings'*.

### **3.2.2 Demolition or Dismantling of Surface Buildings and Structures**

Redundant surface buildings, structures and fixed plant including tanks and pipes will be selected for either demolition or dismantling for sale through the asset disposal process. The site will be returned to suitable land for future industrial / commercial after use by recovering any soil, subsoil or any waste materials that may result in environmental pollution. Assessment and validation by suitably qualified persons will be obtained to demonstrate all residual material has been removed to predetermined guideline levels.

Prior to demolition or dismantling, all services connected to buildings and other structures will be disconnected and removed.

Structural steelwork, all other steel items and metal cladding will be sold through the asset disposal process. Mass concrete will be crushed and separated from reinforcement, this crushed material may be used as backfill support in the underground workings or will be disposed of offsite using a licensed waste contractor.

Items selected for demolition or dismantling for sale will be decommissioned, cleaned, decontaminated (if necessary) and either demolished and removed from the site if necessary, by appropriately licensed contractors or dismantled into containers for ease of transport.

Any wastewater that might arise from the decontamination process will be treated prior to discharge under conditions of the IPCL. In the event that waste oils and sludges arise for the decontamination process then these will be disposed by licensed waste contractors.

Demolition and dismantling will be carried out by specialists whose contract terms will require strict operation within the relevant quality, safety, and environmental standards.

### **3.2.3 Removal of Infrastructure and Services**

In line with the mine closure vision for Galmoy mine, only infrastructure that either poses a safety / environmental risk or does not have an option for retention for sustainable reuse will be demolished and removed. Infrastructure that can be retained for sustainable reuse will be cleaned to facilitate repurposing and reuse.

### **3.2.3.1 Roads, Hard standings, and Car Park**

The current access road will be retained as the primary access route into the restored mine site. Sufficient parts of the internal network would be retained to provide access to the retained buildings. Other site roads and hard standings in the mine site area will be removed to formation level and the construction material crushed and removed by licensed water contractor or reused as backfill support in the underground workings. Uncontaminated hard standings will be similarly treated. Material containing base metals and substances involved in processing may be used for backfill support in the underground workings or will be disposed of by licensed waste contractor. Surplus decontaminated material may be used for re-profiling the brown field site or for landscape features.

### **3.2.3.2 Fuelling Depot and Oil Storage Facilities**

This will entail the removal of tanks and their associated distribution systems all of which will be carefully drained, desludged and flushed by specialist contractors who will be responsible for the disposal of oils. Contaminated materials will be removed from site. Uncontaminated concrete may be used for backfill support in the underground workings or will be disposed of by licensed waste contractor.

### **3.2.3.3 Water Treatment Facilities**

All process sludge from the Conditioning Ponds will be dewatered and reused as a component of cemented rock fill (CRF) to be used for ground support in the underground workings or will be disposed of by licensed waste contractor. Pond liners will be removed and disposed of by licensed waste contractors. All concrete structures associated with the water ponds will be decommissioned and demolished and this material may also be used for backfill support in the underground workings or will be disposed of by licensed waste contractor.

The Goul pipeline is a valuable asset for the site to facilitate redevelopment, as replacement industries may have an effluent discharge that needs to be discharged to surface water. It is also considered too disruptive to local landowners to remove the pipe. Sediment from the Goul diffuser will be removed and taken to site for dewatering. This dewatered sediment may be used with CRF for backfill support in the underground workings or will be disposed of by licensed waste contractor.

### **3.2.4 Dewatering System**

Any dewatering wells used to aid dewatering will be backfilled with clean limestone chippings to within 10m of the surface and the top filled with a cement grout plug to prevent the ingress of surface water. All redundant plant and structures will be removed as described above.

### **3.2.5 Buried Services**

Any buried services that are required for the wind farm or for potential secondary use upon cessation of the mining operations will be left in-situ. All other buried services which are not required post closure above plough level, (c. 300 mm), will be removed. All other buried services which are below plough level and not required, will be left in place as to remove them would potentially have adverse disruptive effects on the land. Buried services such as drains that are being retained for sustainable reuse will be cleaned to facilitate repurposing and reuse.

### **3.2.6 Chemicals**

All unused chemicals will be returned to suppliers, sold, or disposed of as waste to licensed waste disposal companies. All residual waste remaining on the site will be disposed of to licensed waste disposal companies.

The table below lists the key chemicals and reagents that will be used by Garrylaun and the estimated quantities that may remain when operations cease.

#### Fuels / Lubricants / Reagents / Other

Hydrated Lime	c. 50 tonnes
Cement / Binder	c. 50 tonnes
Sodium aluminosilicate hydrate (N-A-S-H)	c. 2 tonnes
Poly Aluminium Chloride	c. 10 tonnes
Poly electrolyte	c. 2 tonnes
Diesel (Green / Regular)	c. 40,000 litres
Hydraulic Oil	c. 10,000 litres
Brake Fluid	c. 1,000 litres
Engine Oil	c. 1,000 litres
Other Lubricants/greases Drums	c. 1,000 litres
Heating Oil	c. 10,000 litres
Waste Oils	c. 5,000 litres

**Figure 10: Table of likely types and quantities of Fuels / Lubricants / Reagents / Other to be disposed of at mine closure**

#### Laboratory Chemicals

Nitric Acid	c. 10 litres
Hydrochloric Acid	c. 10 litres
ICP Standard Solutions	c. 2 litres
Buffer Solutions	c. 10 litres
Acetone	c. 10 litres
Nessler Reagent	< 1 litre
IC Eluent	c. 2 litres
COD vials	< 1 litre
Waste	c. 2 litres

**Figure 11: Quantities of Laboratory chemicals to be disposed of at mine closure**

Explosives will be handled by and provided by a third party, Irish Industrial Explosives (IIE), who own an explosives magazine less than 1 km from the site. IIE will be responsible for maintaining and managing their own stocks. Detailed Statutory controls are in place with respect to the storage, handling, and accountability of all explosive material in the country and this will be complied with at all times by Garrylaun during operation and as part of the closure process, after which time no further explosives will be on site. The explosives will be stored in a dedicated bunker close to Galmoym that owned by a third-party explosives company.

#### 3.2.7 Contaminated Land

It is SRL's intention to operate to a very high standard and prevent any ground contamination from occurring. However, it is recognised that there is a risk of contamination, which can arise from various sources, including the use of stockpiles and simply the contamination caused by mining vehicle's tyres (despite the use of wheel washes etc).

A detailed risk assessment will be completed to determine contaminated areas across the whole site. Target values for the concentration of key parameters will be established as part of the closure implementation programme and this detail will appear in subsequent CRAMP documents to be generated during the life of the mine and agreed with Statutory Authorities.

Of particular importance is a full a site characterisation that must be completed after all operations are completed as it will represent the final required ground restoration requirement. It will be possible to map ground contamination status during the life of the operation and indeed remediation will be completed as and when required during operations to minimise risk. However, the final full site characterisation is an important process to ensure a full and final scope of land restoration is known.

The site characterisation is made up of two elements, the first is the measurement (sampling and analyses) and the second is defining and agreeing what the post restoration concentrations are to be.

There are various standards with respect to soil contamination that can be used to determine the post restoration concentrations, these include those developed by the United Kingdom Environment Agency contaminated land guidance referred to as CLEA, and the Dutch Government, known as the Dutch Guidelines. The UK CLEA guidelines have a published scientific basis and their use is therefore often considered 'good practice' in the assessment of contaminated land.

Category 4 Screening Levels (C4SLs) from the CLEA guidance consist of cautious estimates of contaminant concentrations in soil that are still considered to present an acceptable level of risk. These guidance values give different ranges for different end uses of the land, obviously the risk and exposure pathways are dependent on the future uses of the land.

The table below is taken from the Appendix H of the DERFA research project SP1010 and provides provisional C4SLs for lead.

Land-Use	pC4SL (mg/kg)
Residential (with consumption of homegrown produce)	82 – 210
Residential (without consumption of homegrown produce)	130 – 330
Allotments	30 – 84
Commercial	1100 – 6000
POS <sub>resi</sub>	270 – 760
POS <sub>park</sub>	580 – 1400

**Figure 12: C4SLs for lead, extracted from Appendix H of the DERFA research project SP1010**

The C4SL is based on the land use, as this is a key factor with respect to risk. For example, if the soil is used for growing food, it will be necessary to have a lower concentration of lead, than if the soil is used for residential or commercial.

A full list of target values for all parameters of interest will be developed and agreed with the Regulatory Authorities as part of the site characterisation risk assessment process and will take into consideration the plan for the site post implementation of the closure plan. In order to achieve the

agreed target values, it is likely that Shanoon will be required to remove some 'contaminated land' and this will be removed in agreement with, and with approval from, the EPA. Opportunities may arise for the reuse of some material for geotechnical support within the mine.

### **3.2.7 Mobile Plant**

Any mobile plant associated with surface operations will be sold as part of an asset disposal process. The full list of surface mobile plant is not known with certainty at this time, but it is known that it will not be significant. Surface mobile plant will include:

- Front end loader – No. 1
- Tractor and trailer – No. 1
- 4X4 Jeep – No. 2
- Excavator – No. 1

Surface mobile plant will be used during the closure process and as such will most likely not be disposed until the very end of the process.

### **3.3 Underground Decommissioning**

Decommissioning of the underground facilities will be completed once mining operations ceased. Items that could pose a risk to the environment will be removed, any remaining backfill work will be completed, and preparations will be made to rewater the mine.

Fixed and mobile underground assets of value, and not required for underground withdrawal purposes, will be brought to the surface to be sold as part of Asset Disposal Process. The objective for SRL is to remove the maximum quantity of all material from the mine; however, it will not be possible to remove all material because of the retreat process and the infrastructure required for same (e.g. it will not be possible to remove all pumps and cables as there will be dewatering activities up until the end).

Any plant, equipment, tanks, and fuel containers remaining underground will be drained down of all oils and fuels and stripped of any hazardous components.

A procedure will be developed whereby appropriate personnel will be made responsible for signing off each area underground as having hazardous materials removed, this will include relevant Shift Bosses, Mine Captains, the Mine Manager, and a representative from the Environmental Department.

#### **3.3.1 Ventilation Shafts**

The Garrylaun mine will have six ventilation shafts, and all will be backfilled as part of the mine closure plan.



**Figure 13: Ventilation shafts**

All vents will be stripped of infrastructure not required for post closure monitoring. The material needed to fill the shafts will be sourced from stockpiles of fill material that will be removed from the shafts during the mine the reopening process. This fill from the shafts will be transported to the mine site and stored in secure stockpiles on site until needed.

A concrete lintel will be installed at the top of the plugged ventilation shaft, similar to the lintels installed by Galmoy mine

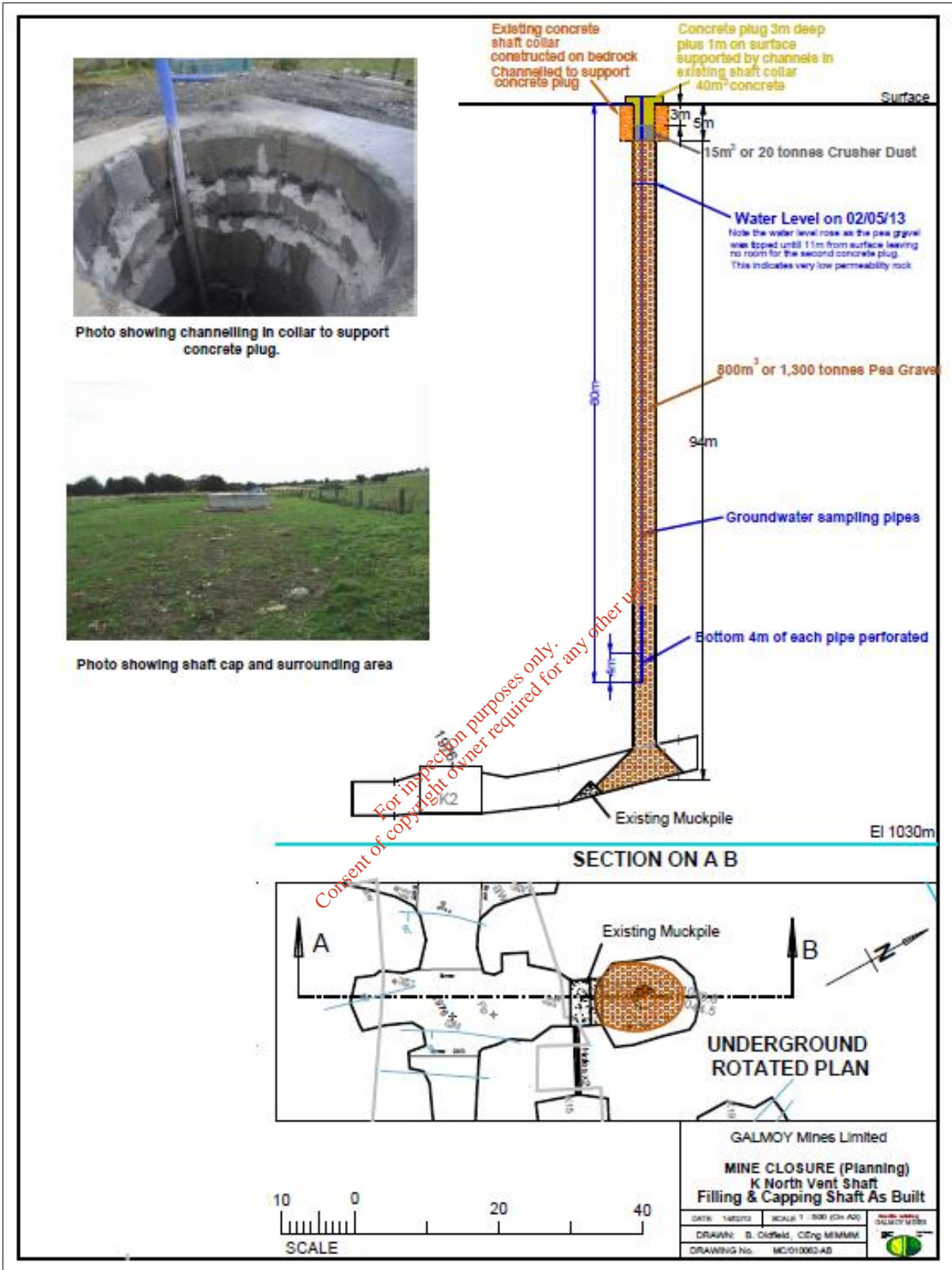


Figure 14: As built detail for backfilled shaft at Galmoy mine

### 3.3.2 Decline

Similar to the ventilation shafts, the decline into the mine will be cleared of fill as part of the reopening process and this fill will be retained by SRL in order to provide material to refill the decline again when mining is complete. The material will be stored in a secure stockpile to the rear of the change house.

All structures and services in the decline will be removed where practicable. All potentially hazardous components will be removed.

The decline will be plugged with a composite of rock fill and concrete grout to ensure a tight fill. The plug will extend to a vector distance of 200 m down the decline, which is sufficient to ensure adequate geotechnical support. This is the same as the approach that was taken by Galmoy, which worked very successfully. The decline will be filled as outlined in the figure below:

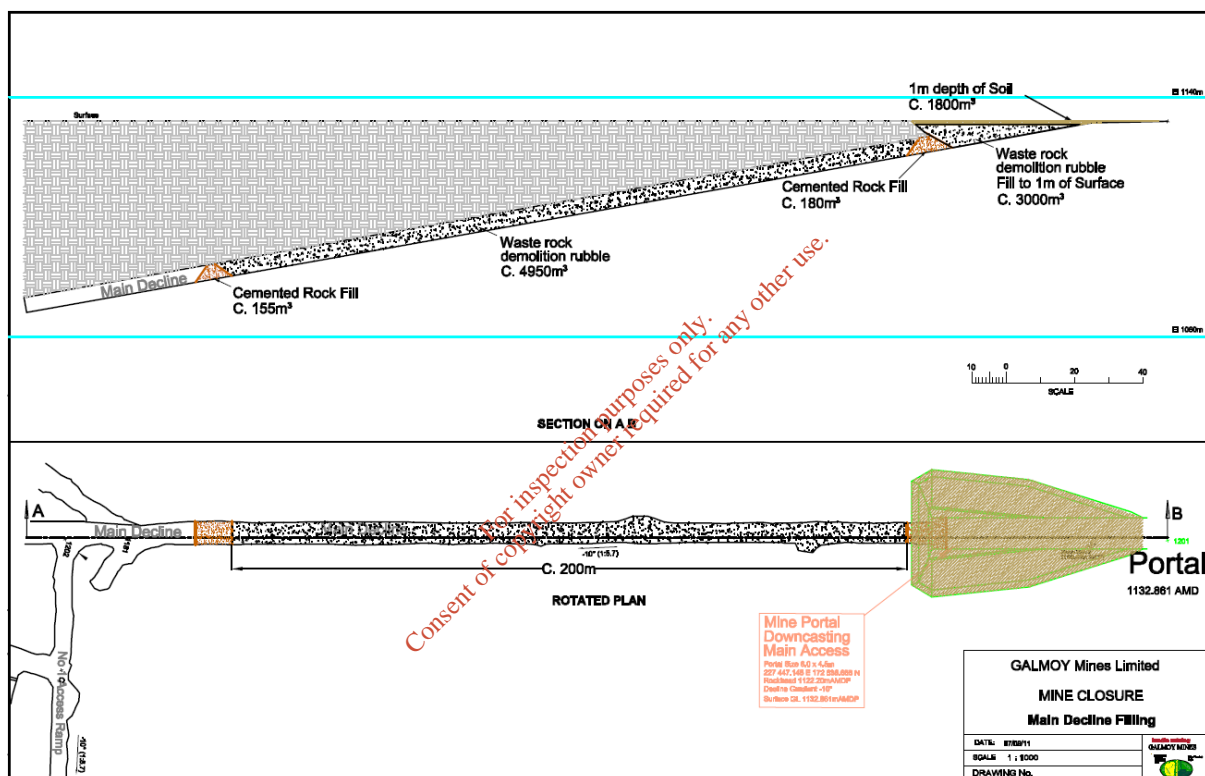


Figure 15: Section and plan view of decline backfill design used by Galmoy mine

### 3.3.3 Backfill / Structural Stability and Support

The Garrylaun mine will operate to the specification of a Ground Control Management Plan (GCMP), which will detail all support that must be placed into the workings to ensure there is adequate ground support and surface subsidence risk is managed. Details of the GCMP can be found in Chapter 7 of the EIAR accompanying the 2021 Planning Application.

Rock, cemented rock and backfill paste will all be used for structural support within the mine (in addition to concreting, bolting and mesh for localised support).

The backfill is referred to as a 'paste' as it is a wet material, with a similar consistency to pumped concrete and in many ways, it is very similar to concrete. The backfill plant will consist of storage tanks, silos, and a cement addition system. As with concrete, the cement (or other binder) only forms

a small fraction of the concrete the bulk of the concrete is made up of a coarse aggregate (e.g. sand). Mines typically use Mine tailings as the coarse constituent of their backfill paste, but as there is no processing of ore taking place on site at Garrylaun there are no tailings being produced. A number of options were considered by Garrylaun and the favoured option is to crush the waste ore and use this as the 'sand like' material in the backfill paste. A detailed Quality Assurance programme will be in place to ensure the backfill is generating the required strength and that the areas being backfilled are being tight filled (to the roof of the void) in accordance with the GCMP.

The paste will be pumped underground and directed to mined out areas where it will be used to fill or "backfill" voids. This process is an integral part of the mining operations. It provides support to areas that have been mined out, which is a control to minimise the risk of surface subsidence. Monitoring for settlement will take place during the life of the mine and will continue into the aftercare period until sufficient data is collated to warrant a cessation of monitoring.

Waste rock is rock that has very low or no metal content and is not suitable for processing. This material will be separated from the ore stream and also used underground to fill voids and to provide localised support.

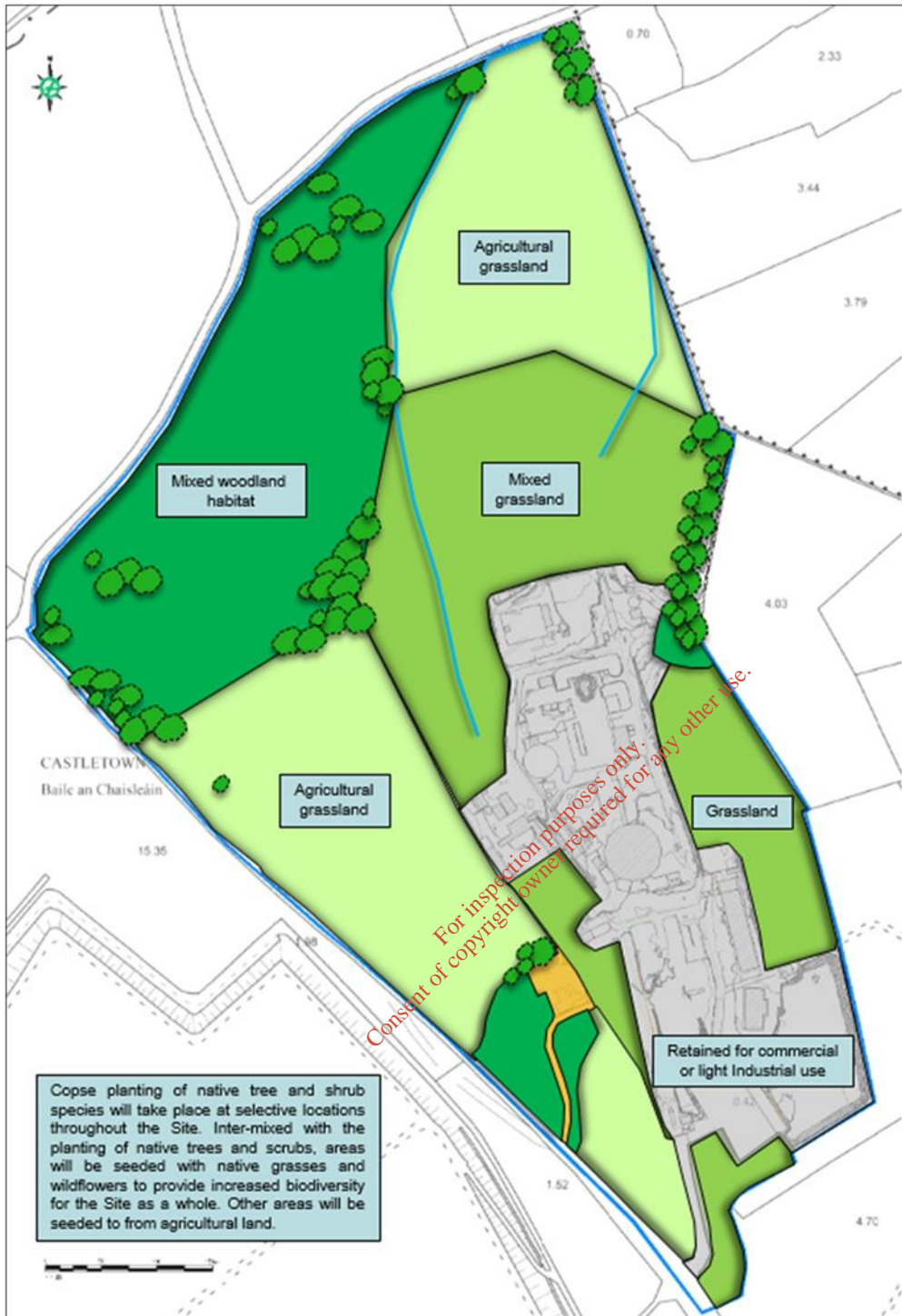
The GCMP is a live document and subject to revision when the mine is operational. The exact detail of backfill will be developed for each working area as mining progresses. The detail of the backfill plan for each working area will be prepared by the mining department and will have an appropriate level of sign off and approval from various levels up the Mine Manager. Garrylaun will also be required to review the overall backfill plan with the Mines Inspector representing the Department of Environment, Climate and Communications on a regular basis. The Mine's Inspector will visit the mine and review backfilling at least twice per year.

#### **3.3.4 Mobile Plant**

Any mobile plant owned by SRL will be removed and disposed of by the asset disposal process or scrapped if at end of life. It is the plan to use a contract mining company to carry out the mining and development work. The majority of the mining fleet will be owned and maintained by the third-party mining contractor who, who will remove all plant from site on completion of mining.

### **3.4 Post Closure Site Layout**

On completion of the site restoration a small amount of reprofiling will be completed, if required. No topsoiling will be completed as this work would only need to be undone for redeveloping the site. The site will therefore be left in a clean, geotechnically and chemically stable brown field site ready for redevelopment.



**Figure 16: Proposed Restoration Plan for the Plant Site**

### 3.5 Port Facilities

SRL will truck ore to a dedicated Belview Port in Kilkenny. These activities will be managed by permits and permissions held by the Port and are outside the scope of the IPCL and the Planning Permission for the Garrylaun mine.

The commercial agreement between SRL and the Port will include a consideration for the cessation of operations and steps that must be taken to carry out any restoration or cleaning at the Port to ensure the Port is in compliance with its permission.

## CHAPTER 4 - Financial Provision

### 4.1 Introduction

SRL intends to implement its mine closure plan in line with the detail provided in this document and a cost estimate has been determined on this basis. Planning for mine closure is an iterative process and requires ongoing review during the life of the mine to account for the progress of the mining production, developments in the industry with respect to mine closure and potential environmental impact, and changes to rates or assumptions with respect to costs. The closure costs estimate will be reviewed on an annual basis to ensure adequate financial assurance is in place. Aftercare costs have also been calculated and provided for and are covered in chapter 6.

A summary of the overall Mine Closure Estimate is outlined below and full details of the estimate are included in Appendix 2. Prior to the starting of development works SRL will demonstrate to the relevant Regulatory Authorities that an adequate financial provision is in place to meet the closure liability. The financial provision will be a combination of cash held in ESCROW with authorised signatures required from each of the Regulatory Authorities in order to withdraw funds. The bonds will be collateralised over the life of the project so that by the time of mine closure the fund will be a cash fund held in ESCROW.

The mechanism by which funds are drawn down from the ESCROW to pay for closure works will be subject to an agreement to be reached between SRL and the Statutory Authorities. There is recent experience with both Lisheen and Galmoy where such agreements were put in place and worked well during closure works and continue to work well now both mines are in aftercare.

### 4.2 Cost of Physical Closure

A summary of the overall Mine Closure Estimate is outlined in the table below and full details of the revised estimate are included in Appendix 2.

#### Closure Cost Estimate

	<b>Activity area</b>	<b>Total</b>
1	Surface	596,000
2	Underground	624,500
3	Administrative Support / Other	1,670,000
	<b>Total</b>	<b>2,890,500</b>
	Contingency at 25%	722,625
	<b>Grand Total</b>	<b>3,613,125</b>

Figure 17: Closure cost estimate

### 4.3 Drawdown Mechanism

SRL management has experience in implementing a mine closure programme and in particular have experience in how the process is cash flowed. SRL will draft and agree a 'Mine Closure and Restoration Agreement' with the Regulatory Authorities within 12 months of the development commencing. This agreement will provide the mechanism for the release of funds, subject to the validation of works and

will ultimately set out the pathway for SRL to demonstrate that the closure plan has been fully implemented, which will trigger the issuance of a Mine Closure Completion Certificate and a transition into Aftercare.

#### **4.4 Review and Updating**

SRL will review the mine closure estimate each year as part of an annual review to ensure the plan remains valid and there are sufficient funds in place to implement the plan.

#### **4.5 Risks**

The annual review process will provide assurance against risk. The review will consider the scope of mine closure and current projected timelines. It will also consider developments within the industry and learnings with respect to mine closure and management of closure risk, as well as market conditions and inflationary pressures with respect to costings.

The annual review process is carried out by SRL but in consultation with the Regulatory Authorities and as such the Authorities have an opportunity to request adjustments if desired.

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## CHAPTER 5 - Aftercare Plan

### 5.1 Introduction

The CRAMP has been designed and is being implemented to minimise and where possible eliminate the risk associated with the site post closure. SRL is not processing ore on site and as such is not producing mine tailings. This is a very important consideration with respect to the aftercare plan. The storage of mine tailings in a Tailings Management Facility (TMF) is therefore a residual liability that does not need to be considered by SRL. For the recently closed Irish Mines (Galmoy Mine and Lisheen Mine) both IPCL licence boundaries have been reduced to the footprint of the respective tailings dams and the aftercare plans are now focused on managing the residual risk associated with the storage of mine tailings.

The objective of the SRL aftercare plan is to carry out monitoring over a defined period of time to provide information to the Regulatory Authorities that may be used to demonstrate that the site is stable, which will lead to the surrender of the IPC licence. The SRL aftercare plan is a proposed timeline and budgeted accordingly. However, it is recognised that this is performance based and licence surrender will only be achieved if the monitoring results demonstrate that the site is stable and residual risk has been managed adequately.

Based on the experience of both Lisheen and Galmoy mine (in particular with respect to mine rewatering time), it is proposed that the aftercare period will be defined as a being for a minimum of 5 years. On completion of mining, the underground workings will be kept open for a period of time to allow the removal of any hazardous material and remove any assets of value. This period is expected to be a maximum of 4 weeks. On completion of underground restoration, the dewatering pumps will be turned off and rewatering will commence, it is known that this will take no more than 2 years based on the performance of Galmoy and Lisheen, further information on this can be found in Chapter 7 of the EIAR. SRL is allowing for an additional 5 years of monitoring in an aftercare period after which time it is expected there will be sufficient data to support a surrender of the IPCL.

The aftercare plan will be reviewed annually and updated as required.

### 5.2 Monitoring Programme

The monitoring plan includes water quality of both surface and ground water as well as regional stability to manage the subsidence risk.

The monitoring programme will reflect the monitoring programme that was in place during operations and during mine closure activities. The frequency and number of parameters will reduce as aftercare progresses and it is demonstrated that risk is reducing.

All monitoring will be contracted out to contract laboratories and co-ordinated by SRL.

### 5.3 Financial Provisions

An estimate of aftercare costs has been completed and a summary is outlined below. Prior to the starting of development works SRL will demonstrate to the relevant Regulatory Authorities that an adequate financial provision in place to meet the aftercare liability. The financial provision will be a combination of cash held in ESCROW with authorised signatures required from each of the Regulatory

Authorities in order to withdraw funds. The bonds will be collateralised over the life of the project so that by the time of aftercare the fund will be a cash fund held in ESCROW.

A charge in favour of the Regulatory Authorities, or the lead Agency representing the Authorities, will be put in place to provide additional assurance. Therefore in the event of an insolvency or liquidation of the company the closure funds would be beyond the reach of the liquidation process and can be drawn down by the Regulatory Authorities.

A summary of the Aftercare cost is outlined in the table below:

<b>Aftercare Management Plan Costs</b>	<b>Total</b>	<b>year 1</b>	<b>year 2</b>	<b>year 3</b>	<b>year 4</b>	<b>year 5</b>
Subtotal Monitoring	68,526	18,406	15,338	12,938	12,938	8,905
External Consultants reports, EPA fees, insurance and Maintenance	142,500	41,000	28,500	26,000	26,000	21,000
<b>Total</b>	<b>211,026</b>	<b>59,406</b>	<b>43,838</b>	<b>38,938</b>	<b>38,938</b>	<b>29,905</b>
<b>Contingency at 10%</b>	<b>21,103</b>	<b>5,941</b>	<b>4,384</b>	<b>3,894</b>	<b>3,894</b>	<b>2,991</b>
<b>Grand Total</b>	<b>232,129</b>	<b>65,347</b>	<b>48,222</b>	<b>42,832</b>	<b>42,832</b>	<b>32,896</b>

Figure 18: Aftercare cost estimate

## 5.4 Drawdown Mechanism

Similar to Chapter 4, SRL management has experience in implementing an aftercare programme and will agree a mechanism with the Regulatory Authorities at an appropriate time (within the closure period at the latest). This mechanism will mirror the mine closure agreement and will provide the mechanism for the release of funds, subject to the validation of works.

## 5.5 Review and Updating

SRL will review the aftercare estimate each year as part of an annual review to ensure the plan remains valid and there are sufficient funds in place to implement the plan.

## 5.6 Risks

The risks regarding aftercare are similar to closure but not as great. Although there is great certainty in the Garrylaun closure plan (as it mirrors work completed by Galmoy), it is the case that there is less risk associated with aftercare costs as there are no works taking place other than monitoring and the opportunity for overrun or incorrect budgeting is less. The with annual review process is also there to provide assurance for what risk is there.

Probably the greatest risk is that there is a delay in the mine achieving steady state, which allows the period to end after five years. While this is a risk, this is believed to be a manageable risk as five years (7 years post completion of mining) is a very long period of time. The monitoring data at Lisheen and particularly Galmoy, which is closed longer, is proving very good stable data. An added factor that reduces risk for SRL is that there is no complexity associated with a tailing's management facility.

## CHAPTER 6 - Interested and Affected Parties

### 6.1 Introduction

Closure of the mine will affect a significant number of people, which presents the mine with a complex social accountability challenge. This chapter of the Garrylaun CRAMP describes the general approach to managing the potential social consequences of mine closure.

The Garrylaun mine is planned to open in the wake of the closure of two mining operations in the locality (Lisheen and Galmoy mines). Many of the employees and suppliers that will work for at the Garrylaun mine will have worked with Lisheen and / or Galmoy and as such will have gone through the mine closure process in the recent past and will have some idea of what to expect and how to prepare.

The bulk of management team at SRL / Garrylaun are ex Lisheen and were responsible for the successful mine closure planning and execution for that operation. The Lisheen mine is considered to be a fine example of responsible mine closure and in particular the social aspect of closing the Lisheen mine was very well received. The Garrylaun mine will adopt similar strategies and processes to those that were used successfully at Lisheen mine.

A Stakeholder Management Plan will be developed and used throughout the course of the mine's life.

### 6.2 Stakeholders

A list of the key stakeholders and their concerns is provided in the table below:

Stakeholders	Key Concerns
Ocean Partners and other project investors	Interested to ensure successful mine operation, sustainability, and successful mine closure implementation
Customers including Huta Cynku / Boleslaw (Poland).	Interested to ensure successful mine operation to support processing operation and support associated local economy and jobs. Ensure sustainability during mining operations and successful mine closure implementation
Government and Regulatory Bodies including: <ul style="list-style-type: none"> <li>• The EPA</li> <li>• The Department of Environment, Climate and Communications.</li> <li>• Kilkenny County Council</li> <li>• Laois County Council</li> </ul>	Regulatory Compliances, Safety, Health Environmental and Closure performance

Stakeholders	Key Concerns
<ul style="list-style-type: none"> <li>Inland Fisheries Ireland</li> <li>The Health and Safety Authority</li> </ul>	
Employees	Preparing for closure and Health and Safety
The local community including: <ul style="list-style-type: none"> <li>The immediate (&lt;5km radius).</li> <li>The greater local community (&lt;40km radius).</li> </ul>	Mine closure Environmental performance Employment Community Welfare & Relations
Contractors and Suppliers	Policies, practices, and wind down of the operation

Figure 19: List of key stakeholders

### 6.2.1 Project Investors

Project Investors are bound by Corporate Governance and Corporate Social Responsibility and must be able to demonstrate that they are investing in responsible sustainable projects. Investors are interested to ensure successful mine operation with no negative impacts on people or the environment, and assurance that a successful mine closure programme will be implemented.

### 6.2.2 Customers

Corporate Social Responsibility extends throughout the full supply chain. It is not enough for customers to ensure they run a responsible business they must also ensure that they do buy from responsible operations. For the Garrylaun project a key is Huta Cynku / Boleslaw a mining project based in Poland. This project requires additional ore to maintain its viability, therefore the Garrylaun will indirectly support jobs and the local economy associated with the Huta Cynku / Boleslaw project.

### 6.2.3 Regulatory Authorities

SRL intends to establish a Mine Environmental Monitoring Committee, which is to be made up of the three Regulatory (permitting) Authorities and the Inland Fisheries Ireland. It is the intention that this committee will meet on a quarterly basis. During the meetings SRL will provide an update to all parties on the environmental performance. This forum will also be used to provide any updates on mine closure planning. The committee would meet on a quarterly basis (unless otherwise agreed) and minutes for all meetings would be issued. The meeting also provides an opportunity for the relevant parties to visit and areas of the site or aspects of the operation that might be of relevance.

### 6.2.4 Employees

A number of different mechanisms will be used to keep staff informed of the status of the company and this will include planning for mine closure. Passive means such as emails, notice boards and newsletters will be used as well as active communication from line management to their team. A monthly communication meeting will take place each month when the management team will meet

in person will all employees and provide an update on the status of the company and the life of the mine.

Each year the company will produce a Life of Mine report which identifies the mineral resource and reserve and projects the rate of mining required to adequately work the orebody. As such there will always be a good understanding of what the life of the mine is and when the mine is likely to close. While market conditions are a factor, SRL will plan to hedge sufficient sales to ensure the complete life of mine is achieved. At Lisheen mine it was possible for management to give a commitment that all employees will get a minimum of 2 months' notice and the same approach is to be adopted by SRL.

#### **6.2.4.1 Outplacement Programme**

Having an understanding of when the operations are going to cease gives management the opportunity to implement programmes well in advance of the closure date to help employees prepare for closure and to assist them with the transition into new employment.

Lisheen mine developed an Outplacement Programme, which was a comprehensive programme prepared with the assistance of employee unions and external consultants as well as Lisheen mine's management. The emphasis of the programme was to ensure employee wellbeing throughout the closure period by helping employees prepare for the future. It covered how to cope with the transition and how to plan for the future. A significant amount of up skilling and training was made available to employees from ticket conversion for mobile plant to soft skills such as CV preparation and job interview techniques.

SRL intends to adopt a similar approach to prepare Garrylaun employees for mine closure. Ensuring that employees have adequate and fair retraining is also very important to help for those few weeks and months that an employee may be between employment. Lisheen mine engaged with employees and employees' representative bodies to agree the mechanism for severance packages for all employees a number of years in advance of the mine closing and it is SRL's intention to adopt a similar approach and have this agreed from the outset so no employee is in any doubt about where they will stand when the mine closes.

#### **6.2.5 Local Community**

It is SRL's intention to establish a Community Engagement forum prior to the development of the mine. This forum will provide a means for the mine to communicate all relevant information and will also be used to share the plans for mine closure and indeed communicate the progress of mine closure implementation when that time comes.

It is planned that meeting between the community and mine management will take place either biannually or quarterly basis. The experience at Lisheen was that prior to closure and in the early stages of closure there was value in increasing the frequency and a similar approach will be adopted. At Lisheen in the run up to, and early stages of, mine closure community meeting took place on a monthly basis.

In addition to reassurance regarding the environmental controls in place to ensure a safe restoration of the site the community at Lisheen had a strong interest in the potential after use of the site and the possibility of future business and jobs on the Lisheen site. Partly in response to this feedback from the community Lisheen mine established a Task Force for jobs some two years prior to closure, with a

core function of attracting new businesses to the site, which is yielding very positive results. SRL intends to adopt a similar approach.

#### **6.2.6 Irish Water**

Irish Water has been a key stakeholder for SRL during the permitting stage of the project. It has been necessary to develop a replacement water supply boreholes to provide additional assurance to Irish Water.

Irish Water will remain a key stakeholder throughout the life of the mine and during the closure process and will be kept informed at all times by SRL in relation to timings.

#### **6.2.7 The Port Company**

SRL will be an important part of the business of the Belview Port of choice, and as such SRL will keep the Port fully aware of the status of operations. The Port will have a dedicated facility for the temporary storage of ore and upon closure, the facility will be cleaned and restored by suitably licensed contractors to the satisfaction of the Port Authorities and SRL. An agreement will be in place as part of the contract between the Port and SRL to ensure it is clear where the responsibilities and cost lie.

#### **6.2.8 Contractors & Suppliers**

As a large industrial site it is expected that SRL will have an extensive network of contractors and suppliers that support mining operations, ranging from the supply of goods and materials to the provision of technical and professional services. Mine closure has potential implications for the performance of these organisations through the loss of an important customer and client. SRL will ensure that all suppliers and contractors are kept informed about plans for progressive mine closure.

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## Chapter 7 - Risks

This chapter will consider the key risks that are applicable to mine closure and aftercare. A number of these, in particular with respect to finance, have already been covered in the document.

### 7.1 Engineering Detail / Certainty

There is a considerable amount of confidence in the engineering detail of the Garrylaun mine closure plan as many of the key aspects (rewatering of the mine, closure of the decline and shafts) will be as they were for Galmoy.

### 7.2 Technical Knowledge

SRL is made up of and has retained many of the key personnel from the Lisheen and Galmoy mines for the development of the project and the majority of these people will continue to be retained either as consultants or as fulltime employees at Garrylaun when the project commences.

SRL has also used the key consulting firms that worked with both Lisheen mine and Galmoy mine (for example Golder Associates and Piteau Associates) to develop the project, and SRL plans to retain these consultants when the project commences.

### 7.3 Cost Inflation

Inflation risk is covered in chapters 4 and 5. This risk is managed by the annual review process, which ensures that there is adequate funding in place at all times, even if this means that SRL must top up the fund to meet inflationary pressures.

### 7.4 Financial Assurance / Security of Funds

Financial Assurance is covered in chapters 4 and 5. A cost estimate has been produced for both closure and aftercare and appropriate financial assurance will be put in place to meet this cost. Funds will be protected by ensuring that cash is held in ESCROW with authorised signatures required from each of the Regulatory Authorities in order to withdraw funds.

Funds will only be held in low-risk interest bearing accounts (i.e. they will not be used for investment or speculation).

It is SRL's plan to ensure that funds will only be held in financial institutions regulated by the Irish Financial Regulator. SRL will maintain this position unless advised otherwise by the Regulatory Authorities.

### 7.5 Loss of Expertise / People / Resources before or during the Closure Process

#### Employees

- A severance package will be in place to incentivise people to remain with the company until such time as they receive their redundancy notice. If an employee leaves without receiving their redundancy notice they will not receive any severance or outplacement benefits.
- SRL will have an agreement in place with employees that redundancy will be on a last in first out basis, all skills being equal. In other words, in the event of a phased redundancy of staff and employee may not take early redundancy if they have skills that are required and not covered by others remaining.

#### Consultants

- The key consultancies used by SRL are typically large companies with many employees and crucially a number of employees who have worked on the Garrylaun project, therefore in the

event of an employee leaving the consultancy or retiring, there will be corporate knowledge within the company to continue providing the service.

#### **Laboratory**

- While the environmental laboratory will close during the closure / aftercare period, this does not represent a risk as third-party contractors can supply this service.

#### **Data / Information**

- All data will be backed up. Hard copies of information will be securely stored off site for an agreed period of time.

### **7.6 Early / Delayed Closure**

It is deemed unlikely due to the marketing plan and the short mine life and in the unlikely event that it was to occur, the financial assurance will be in place to meet the closure liability.

Delayed closure is equally not considered a risk as it does not change the closure cost and even if it did (a new vent shaft associated with additional ore body) the closure fund can be topped up during the annual review process.

### **7.7 Change to Legislation**

Ireland has adopted and enforced all relevant legislation and there is no pending environmental or mining related legislation, that SRL is aware of, that could introduce new challenges to the mine closure process.

It is believed that the Irish Regulatory Authorities already take a strict approach with respect to the implementation of Irish and EU legislation so it is not expected that there will be any need to change closure goals or success criteria before or during the closure process.

### **7.8 Failure to find a Replacement Industry to take over the Restored Site Post Implementation of the Closure Plan**

SRL recognises that there have been isolated incidents in Ireland when mine sites were abandoned and allowed to fall into ruin and become eyesores and hazards to the environment and health. However, SRL are confident that this is not a material risk for the Garrylaun site.

- The site will be restored to the highest standard where all material of a potentially hazardous nature will be left behind. The only things that will remain will be infrastructure that has a value commercially (e.g. power infrastructure, the admin building as well as roads and car parks).
- Lisheen mine's development into the National Bioeconomy Campus is an example of how a modern closed Irish mine can be reimaged and redeveloped. Galmoy mine was itself taken over by a commercial concern and even certain old mine sites in Ireland that might be considered legacy sites have attracted significant commercial interest post closure (even when the same standards of site restoration were not achieved – example the power plant and galvanising plant and Tynagh Mine, which also has other commercial interest at this time).
- The Galmoy site is a valuable site by any measure. To name just some of the value that the site offers.
  - It is well served by the national road network.
  - It has a good utilities supply including water, power, and telecommunications.
  - It has established emission points to surface water and over 20 years of baseline.

- It has good infrastructure including roads, carpark, and buildings.
  - It is close to urban centres including Kilkenny and Dublin.
- A recent valuation of the site completed by SRL confirms the understanding the company has regarding the sites value and redevelopment potential.

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# Appendix 1

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## Condition 12. Financial Charges and Provisions

### 12.1 Agency Charges

- 12.1.1 The licensee shall pay to the Agency an annual contribution of €22,372.30 or such sum as the Agency from time to time determines, having regard to variations in the extent of reporting, auditing, inspection, sampling and analysis or other functions carried out by the Agency, towards the cost of monitoring the activity as the Agency considers necessary for the performance of its functions under the Environmental Protection Agency Acts 1992 to 2013. The first payment shall be a pro-rata amount for the period from the date of grant of this licence to the 31<sup>st</sup> day of December, and shall be paid to the Agency within one month from the date of grant of the licence. In subsequent years the licensee shall pay to the Agency such revised annual contribution as the Agency shall from time to time consider necessary to enable performance by the Agency of its relevant functions under the Environmental Protection Agency Acts 1992 to 2013, and all such payments shall be made within one month of the date upon which demanded by the Agency.
- 12.1.2 In the event that the frequency or extent of monitoring or other functions carried out by the Agency needs to be increased, the licensee shall contribute such sums as determined by the Agency to defray its costs in regard to items not covered by the said annual contribution.

### 12.2 Environmental Liabilities

- 12.2.1 The licensee shall as part of the AER, provide an annual statement as to the measures taken or adopted at the site in relation to the prevention of environmental damage, and the financial provisions in place in relation to the underwriting of costs for remedial actions following anticipated occurrences (including closure) or accidents/incidents, as may be associated with the carrying on of the activity.
- 12.2.2 The licensee shall arrange for the completion by an independent and appropriate qualified consultant, of a comprehensive and fully costed Environmental Liabilities Risk Assessment (ELRA) which addresses the liabilities from past and present activities. The assessment shall include those liabilities and costs identified in Condition 10 for execution of the plan for Mine Closure and Aftercare. A report on this assessment shall be submitted to the Agency for agreement. The ELRA shall be reviewed as necessary to reflect any significant change on site, and in any case every three years following initial agreement. Review results are to be notified as part of the AER.
- 12.2.3 As part of the measures identified in Condition 12.2.1, the licensee shall, to the satisfaction of the Agency, make financial provision to cover any liabilities associated with the operation (including closure, restoration and aftercare). The amount of indemnity held shall be reviewed and revised as necessary, but at least annually. Proof of renewal or revision of such financial indemnity shall be included in the annual 'Statement of Measures' report identified in Condition 12.2.1.
- 12.2.4 The licensee shall revise the cost of closure, restoration and aftercare annually and any adjustments shall be reflected in the financial provision made under Condition 12.2.3.
- 12.2.5 The licensee shall have regard to the Environmental Protection Agency Guidance on Environmental Liability Risk Assessment, Decommissioning Management Plans and Financial Provision when implementing Conditions 12.2.2 and 12.2.3 above.

### 12.3 Financial provision for the Mine Closure Plan

- 12.3.1 The licensee shall maintain, to the satisfaction of the Agency, financial provision for the implementation of the Mine Closure Plan (as required by Condition 10.2). The size and type of financial provision and the means of its release/recovery shall be as agreed by the Agency. The means by which the Agency can directly access the financial provision shall be as agreed by the Agency. The financial provision shall not be utilised unless agreed by the Agency. The financial provision shall only be utilised for the implementation of the Mine Closure Plan alone unless otherwise agreed by the

Agency. Any proposed changes or amendments to the type or size of the financial provision shall be agreed by the Agency prior to implementation.

- 12.3.2 The licensee shall notify the Local Authority and the Department of Communications, Energy and Natural Resources of any changes or amendments to the Financial Provision.
- 12.3.3 The size of the financial provision shall, where appropriate, be calculated in accordance with the requirements of regulation 14 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009, and of Commission Decision 2009/335/EC, or as otherwise directed by the Agency.
- 12.3.4 The financial provision shall be maintained in an amount always sufficient to underwrite the current Mine Closure Plan. The licensee shall on an annual basis provide written evidence to assure the Agency that the licensee is at all times financially capable of complying with the mine closure provisions of Condition 10.2.
- 12.3.5 The licensee shall by the process laid out in Condition 10.2.2 review the cost of the Mine Closure Plan annually, or as otherwise agreed by the Agency. Any necessary adjustments to the financial provision shall, within two weeks of the review, be forwarded for agreement by the Agency. No adjustment to the financial provision shall be effected unless agreed by the Agency. Any adjustment agreed by the Agency shall be effected within four weeks of said written agreement.
- 12.4 Financial provision for the Aftercare Plan
- 12.4.1 The licensee shall establish, to the satisfaction of the Agency, financial provision for the implementation of the Aftercare Plan (as required by Condition 10.3). The size and type of financial provision, the means of its release/recovery and the means by which the Agency shall have direct access to the financial provision shall be agreed by the Agency prior to its establishment. The financial provision shall not be utilised unless agreed by the Agency. The financial provision shall only be utilised for the implementation of the Aftercare Plan unless otherwise agreed by the Agency. Any proposed change or amendment to the type or size of the financial provision shall be agreed by the Agency prior to implementation.
- 12.4.2 The size of the financial provision shall, where appropriate, be calculated in accordance with the requirements of regulation 14 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009, and of Commission Decision 2009/335/EC, or as otherwise directed by the Agency.
- 12.4.3 The financial provision shall be maintained in an amount always sufficient to underwrite the current Aftercare Plan. The licensee shall on an annual basis provide written evidence to assure the Agency that the licensee is at all times financially capable of complying with the aftercare provisions of Condition 10.3.
- 12.4.4 The licensee shall by the process laid out in Condition 10.3.4 review the cost of the Aftercare Plan annually or as otherwise agreed by the Agency. Any necessary adjustments to the financial provision shall, within two weeks of the review, be forwarded for agreement by the Agency. No adjustment to the financial provision shall be effected unless agreed by the Agency. Any adjustment agreed by the Agency shall be effected within four weeks of said written agreement.
- 12.5 Unless otherwise agreed by the Agency any revision to the financial provision for the Mine Closure or Aftercare Plan shall be calculated using the following formula:

$$RCAC = (ECAC \times WPI) + CiCC$$

Where:

- RCAC = Revised closure/aftercare cost
- ECAC = Existing closure/aftercare cost
- WPI = Appropriate Wholesale Price Index [Capital Goods Building and Construction (ie Materials & Wages) Index], as published by the Central Statistics Office, for the year since last closure cost calculation/revision.

CiCC = Change in compliance costs as a result of change in site conditions, changes in law, regulations, Regulatory authority charges, or other significant changes.

- 12.6 Any revision to either of the financial provisions for the Mine Closure Plan or Aftercare Plan shall, where appropriate, be in accordance with regulation 14 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009, Commission Decision 2009/335/EC, or as otherwise directed by the Agency. The revised financial provisions shall be maintained in amounts always sufficient to underwrite the current Mine Closure Plan and Aftercare Plan.

**Reason:** *To provide for adequate financing for monitoring and financial provisions for measures to protect the environment.*

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# Appendix 2

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## Garrylaun Mine Closure Estimate June 21

		Comments	Quantity	Unit	Rate €	Total
<b>1</b>	<b>Surface</b>					
1.1	Coarse Ore Stockpile (TeePee)	All underground feeders have been removed. Demolition is above ground structure only.				102,000
	Demolition of structure		1	each	80,000	
	Disposal of material		1	each	20,000	
	Crusher (disposal cost if not sold)		1	each	2,000	
1.2	Ore Sorter					
	Containerised unit	Disposal cost if not sold	1	each	5,000	5,000
1.3	Backfill Plant					
	Containerised unit (removal from site cost)	Disposal cost if not sold	1	each	10,000	10,000
1.4	Minewater Treatment Plant					70,000
	Superstructure		1	each	20,000	
	Tanks & vessels		1	each	30,000	
	Foundations and bund walls		1	each	20,000	
1.5	Waste Water Treatment Plant	To be retained for post mine closure site redevelopment.	1	each	0	0
1.6	Buried Services					75,000
	Foul water lines	Lines that serve Admin building will be retained for post mine closure site redevelopment.	1	each	20,000	
	Stormwater lines	Certain lines will be retained for post mine closure site redevelopment. Only lines associated with mining to be removed.	1	each	20,000	
	Manholes and Gullies	Only items associated with mining infrastructure to be removed.	1	each	5,000	
	Firewater lines	To be retained for post mine closure site redevelopment.	1	each	0	
	Mine water lines		1	each	10,000	
	Lighting	Only items associated with mining infrastructure to be removed.	1	each	10,000	
	Potable water supply	To be retained for post mine closure site redevelopment.	1	each	0	
	Power Lines (other than those removed with other works).	Only items associated with mining infrastructure to be removed.	1	each	10,000	
1.7	Removal of contaminated soil	Where possible soil with metal will be used for backfill support (when mine workings are still open), alternatively material will be transported to suitable landfill (for example operational tailings dam in country). Contaminated material will be disposed of by licensed contractor.			75,000	75,000
1.8	Contour land and topsoil	Reuse stockpiled material (reprofile).			50,000	50,000
1.9	Goul Pipe	Goul pipe to remain, plugged at both ends)				40,000
	Pumphouse		1	each	25,000	
	Diffuser at Goul		1	each	15,000	
1.10	Administration & Workshop Building - Demolition.	To be retained for post mine closure site redevelopment.	1	each	0	0
	Environmental (disposal of obsolete chemicals)		1	each	5,000	5,000
	Analytical (disposal of obsolete chemicals)		1	each	5,000	5,000
	Removal of hazardous material		1	each	5,000	5,000
1.11	Fuel Storage tank removal		1	each	5,000	5,000
1.12	Substation	To be decommissioned by ESB				
1.13	Roads / carparks / fencing	Majority of roads / carparks / fencing to be retained for post mine closure site redevelopment. Some removal may be required to the North of the site.	1	each	15,000	15,000
1.14	Water Conditioning Pond	Removal of pond, disposal of liner.	1	each	30,000	30,000
1.15	Firewater ring main and pump house	To be retained for post mine closure site redevelopment.	1	each	0	0
1.16	Gatehouse and weighbridge	To be retained for post mine closure site redevelopment.	1	each	0	0
1.17	Site	Cleaning of plant / drains that are to remain on site post mine closure for site redevelopment.	1	each	25,000	25,000
1.18	Glasha mobile temporary water treatemnt (if required)	Provision to hire a containerised water treatemnt solution, if required to treat water exiting the site to the Glasha during decmmissioning of MWTP and ponds.	6	week	9,000	54,000
1.19	Provision for improvement works on the river Goul (if required)	Removal of any sedimentation relating to mining operations or any other work, if required, as per assesemnt in conjunction with the Inland Fisheries Ireland (IFI).	1	each	25,000	25,000
	<b>Subtotal</b>					<b>596,000</b>

<b>2</b>	<b>Underground</b>					
2.1	Removal of potentially hazardous material from underground working areas	Labour and equipment (maintenance and fuel). Crew of 5 people for up to 4 weeks post cessation of mining. This will be an ongoing activity as the end of the mine approaches and areas where mining is finished will be cleared immediately.	1	each	40,000	40,000
2.2	Mine Decline / Portal	Labour and equipment (maintenance and fuel). Crew of 5 people for up to 6 months. Material extracted from decline during development will be reused to decline at closure.	1	each		195,000
	Construct barricade at c. 200m vector distance down decline		1	each	25,000	
	Backfill with material stockpiled from reopening of decline. Volume is from the barricade to surface		1	each	120,000	
	Construct barricade at portal		1	each	25,000	
	Infill portal area, rock and topsoil		1	each	25,000	
2.3	Ventilation shafts					
	Infill ventilation void spaces and cap with concrete lintels	Material extracted from shafts during development will be reused to fill shafts at closure.	6	each	40,000	240,000
2.4	Recover infrastructure of potential value (e.g. electrical infrastructure)	Subject to dewatering and ventilation ongoing requirements up to rewatering date. Labour and equipment (maintenance and fuel). Crew of 5 people for up to 1 months.	1	each	40,000	40,000
2.5	Maintain safe working conditions in Mine					
	Ventilation	One month power to maintain clean are in working areas (mobile blower with diesel generator will be used for decline).	1	each	20,000	20,000
	Dewatering, including water treatment.	One month of water pumping and treatment.	1	each	75,000	75,000
2.6	Mobile Plant. Allowance for disposal of obsolete mobile plant.		5	each	500	2,500
2.7	Subsidence monitoring	Quarterly (2 years)	8	each	1,500	12,000
	<b>Subtotal</b>					<b>624,500</b>

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<b>3</b>	<b>Administrative Support / Other</b>					
3.1	Environmental Team	12 people first six months (270k) 6 people for additional six months (270k) 3 people for final year (135k)	1	each	675,000	675,000
3.2	Financial staff (Procurement / Asset Disposal)	3 people first year (135k) 2 people second year (90k) 1 person final year (45k)	1	each	270,000	270,000
3.3	Power (Admin and site)		24	month	2,500	60,000
3.4	EPA Licence Fees	two years of IPCL fees estimated at €29k	2	each	29,000	58,000
3.5	Local Authority Rates		2	each	100,000	200,000
3.6	Insurance		2	each	10,000	20,000
3.7	Environmental testing	Environmental Laboratory will be operational for the initial phase of closure (with associated running costs, reagents, calibration). On closure of the environmental laboratory the testing will be outsourced to a commercial laboratory.	2	each	40,000	80,000
3.8	Consultants fees	Specialist reports, for example in relation to groundwater recovery.	5	each	15,000	75,000
3.9	Consumables (including PPE etc)		1	each	2,000	2,000
3.10	IT support		1	each	5,000	5,000
3.11	Data / Information secure storage		1	each	5,000	5,000
3.12	Waste disposal					
	General scrap		1	each	30,000	30,000
	Waste tyres		1	each	40,000	40,000
	Concrete CDW	Where possible clean construction demolition waste (concrete) will be used for infill. Where this is not possible it will be necessary to dispose of using a licensed waste contractor.	15,000	m3	10	150,000
	<b>Subtotal</b>					<b>1,670,000</b>
	<b>Total</b>					<b>2,890,500</b>
	<b>Contingency at 25%</b>					<b>722,625</b>
	<b>Grand Total</b>					<b>3,613,125</b>

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