

Environmental Impact Assessment Scoping Report

Saint-Gobain Construction Products (Ireland) Limited





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1 Introduction

1.1 Context

Saint-Gobain Construction Products (Ireland) Limited (here after referred to as the 'Applicant') ,a wholly owned subsidiary of Saint-Gobain own and operate the Drummond underground mine and Knocknacran open –pit mine located in Co. Monaghan (hereafter referred to as the 'mine site'). Both mines are existing gypsum mines. The company are one of the predominant manufactures and suppliers of gypsum related materials in Ireland and also supply plaster, plaster board and dry-lining systems to the Irish construction industry. The company's Knocknacran open – pit mine has been in operation since 1989 while Drummond underground mine has been in operation since 2004.

The gypsum extracted from the mine site is used to supply a factory located near Kingscourt. The factory produces plaster and plasterboard and is owned by Saint-Gobain. Both the mine site and the factory (see Appendix A Figure 1) are covered by Industrial Emissions License (IEL) No. P0519-03, dated July 2015.

The existing IEL covers the following activities:

- Class 1.3 - the extraction and processing of minerals;
- Class 11.1 - the recovery and disposal of waste in a facility; and
- Class 11.5 - landfill.

Following a recent alteration in the existing water management procedure at the Drummond mine site the Applicant are applying for a review of their existing IEL No. P0519-03. This IEL review applies to the mine site operations only and will seek to increase the current compliance limit value for sulphate at Compliance Point CP-1 (282041E 298746N; see Appendix A Figure 2) in the River Bursk from the current level of 200 mg/l to 1,250 mg/l. Once complete the EIAR will accompany the license review application. This report and the EIAR will not take into consideration any other aspects of the license outside of an increase in sulphate as these are expected to remain unchanged and will not form part of the license review, except where relevant cumulative effects are noted.

1.2 The Need for the Proposed License Amendment

Following the unexpected ingress of water into Drummond mine in June 2018 and the subsidence of the decommissioned Drumgoosat mine in September 2018, there was a change in the water management procedure at the mine site for water which had come in contact with gypsum. Prior to the unexpected ingress, excess water from the Drummond mine site was temporarily diverted to Drumgoosat mine for storage. It was decided following the subsidence at the decommissioned Drumgoosat mine that water storage could no longer occur at this location as part of the sites water management procedure.

As part of the previous water management procedure, water was stored and released to the River Bursk when flow conditions facilitated dilution at the downstream compliance point CP-1. This in effect allowed the concentration of sulphate at Compliance Point CP1 to be managed to a limit of 200 mg/l. As water can no longer be stored and discharged, all discharge is now released to the River Bursk as it arises. As the capacity of the River Bursk to dilute sulphate is reduced at certain times of the year this can result in higher concentrations of sulphate at Compliance Point CP1 at certain times of the year. However, it is noted that the annual sulphate loading to the river has not increased.

To facilitate discharge of mine water from the mine site a review of the IEL (Reg No. P0519-03) is required to obtain an increased emission limit value (ELV) for sulphate at Compliance Point CP1 from 200 mg/L to 1,250 mg/L (here after referred to as the Proposed License Amendment).

2 Environmental Impact Assessment

2.1 Background to the EIA Scoping Report

The Applicant has appointed AECOM to carry out an Environmental Impact Assessment (EIA) and prepare an Environmental Impact Assessment Report (EIAR) to accompany an IEL review application for the mine site. The site currently holds an IEL (Reg No. P0519-03) issued by the Environmental Protection Agency (EPA) for mineral extraction and waste recovery. The IEL review looks to obtain an increased emission limit value (ELV) for sulphate at Compliance Point CP1, required due to a change in the water management procedure for the mine site.

As part of the Environmental Protection Agency (EPA) consideration of the IEL application review for the Site in accordance with Section 83(2A) of the EPA Act 1992, as amended. The EPA determined an Environmental Impact Assessment (EIA) is required as the “*activity constitutes a project to which the EIA Directive applies and is likely to give rise to significant effects on the environment by virtue of its nature, size and location.*”

An EIAR was carried out in 2017 to support an application to continue operations at the existing gypsum mine on site. The EIAR included a range of background information and assessments within the mine site boundary. This information as well as information produced for an IEL review in 2019 was drawn upon within this report.

2.2 The Need for Environmental Impact Assessment

EIA is the process for assessing the effects (both beneficial and adverse) from a project on the environment. An EIA is required for certain classes of project defined in the relevant legislation which transposes the EIA Directive 2011/92/EU (as amended by Directive 2014/52/EU). Where a project falls into one of these classes and exceeds a related size threshold (also defined in the legislation) an EIA is required. Where the project is below the threshold an EIA may still be required if there is the potential for significant environmental effects and this potential is assessed in relation to criteria set out in Annex III of the EIA Directive. The determination of whether an EIA is required is known as screening and is normally the first stage of the EIA process (shown in Figure 2-1).

In general, the EIA process runs in parallel with the design of a development, facilitating the feedback of environmental information into the design process. If the anticipated effects are unacceptable, design measures or other relevant mitigation measures can be taken to reduce or avoid those effects. The EIAR is the document which records the details of the assessments undertaken to identify the likely significant effects of a development on the receiving environment.

This EIAR Scoping Report provides a starting point for the environmental assessment and identifies the potentially significant environmental effects that may result from operation of the Proposed License Amendment, and the method by which these effects will be assessed. Following on from scoping an EIAR will be prepared. This will include a review of the environmental baseline to determine the status of the existing environment, prediction of impacts and effects arising from the proposed development and an evaluation of their significance. Mitigation measures designed to avoid or reduce any significant adverse effects will be proposed in the EIAR where appropriate. The function of this EIAR is to allow the EPA to understand the likely significant residual effects of a proposed development on the environment.

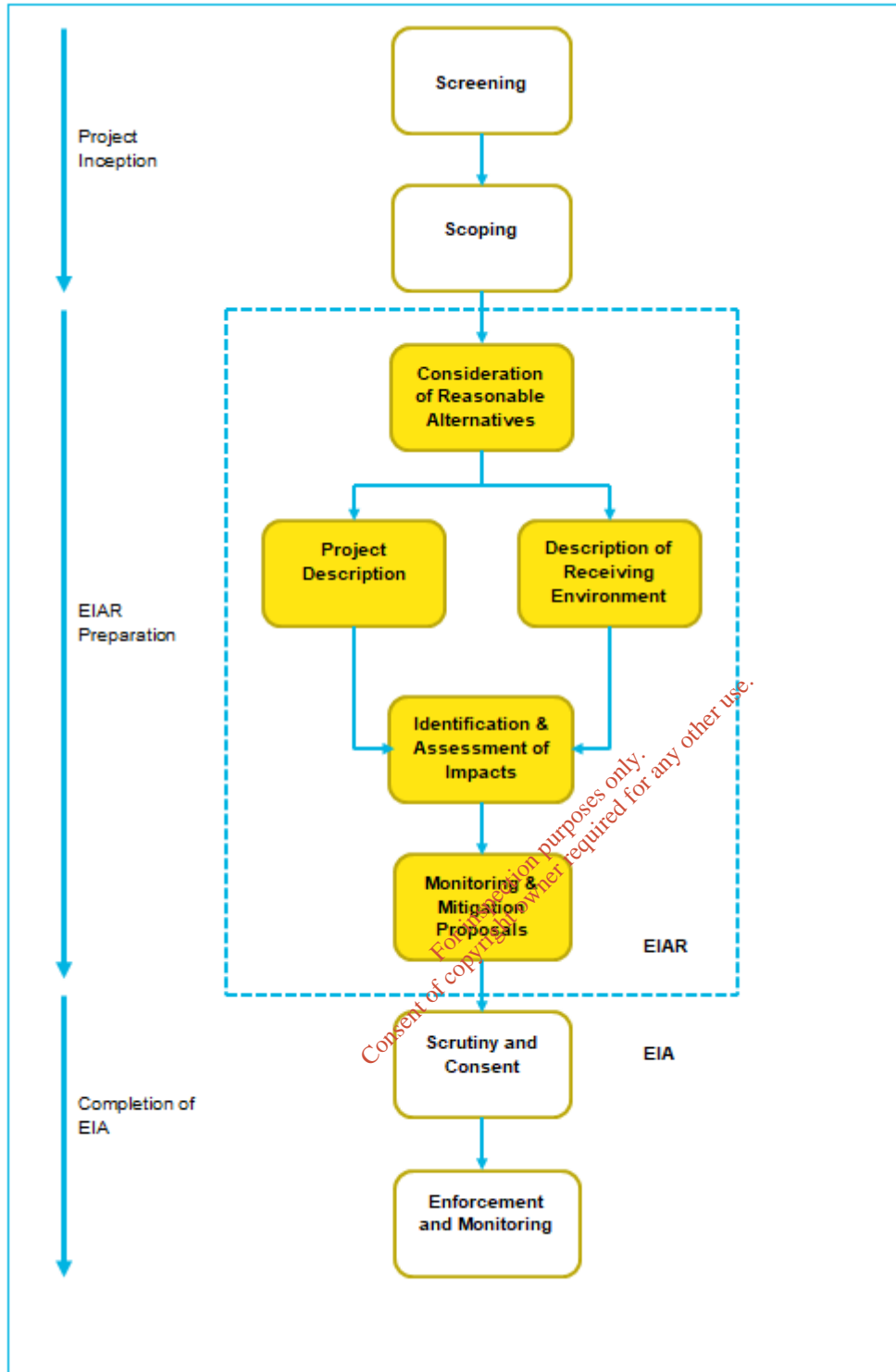


Figure 2-1 The EIA process (after EIAR Draft Guidelines, EPA, 2017)

2.3 Purpose of this Report

Scoping is the process of determining the content and extent of the matters which should be covered in the environmental information to be submitted for projects which are subject to EIA. It is intended to focus this assessment on the likely significant effects of the increase to sulphate limits and thus to exclude issues that can readily be considered not likely to have a significant effect. This Scoping Report and the EIAR will be submitted directly to the Environmental Protection Agency (EPA) and will accompany an application for an IEL review.

2.4 Structure of this Report

The Scoping Report is structured as follows:

- **Site Location & Context:** an overview of the existing environmental baseline, highlighting key environmental receptors, to provide the context for the remainder of the report.
- **Proposed Development:** a description of the Proposed License Amendment. The aim of this section is to enable potential activities that might give rise to environmental impacts.
- **Approach to Assessment:** a general overview of the assessment process and its relationship with other environmental assessments that must be undertaken, including a general method of assessment, the approach to establishing the significance of effects, the approach to mitigation and proposed assessment scenarios.
- **Topic specific scoping chapters:** each chapter addresses individual aspects of the environment (ecology, land and soils, hydrology and hydrogeology etc.) and identifying matters within that aspect that could be affected significantly by the Proposed License Amendment. Where it is concluded that certain matters may indeed experience significant effects, the methodology for the assessment is explained.

2.5 Project Team

The EIA Scoping Report has been prepared by the AECOM EIA team, who are also responsible for project management and the environmental assessment. The EIA process requires a multi-disciplinary approach due to the varied environment topics under consideration. The project team collectively possesses extensive experience in all aspects of EIA.

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3 Application Site and Surroundings

3.1 Introduction

This chapter describes the mine site location and gives an overview of existing conditions at the mine site and surrounding areas. More detail on topic-specific baseline matters can be found in the technical chapters that follow later in this report.

3.2 Site Location and Context

The mine site is located in Co. Monaghan and is located in the townlands of Knocknacran, Drummond, Derrynascobe, Derrynaglah, and Enagh. It is bound by the R179, a regional road between Carrickmacross and Kingscourt, to the north and west and by local road to the south and east (Appendix A Figure 1). The site is accessed from a local road the L4816.

Gypsum deposits have been known to be in the Kingscourt-Carrickmacross area for over a century with historical records of extraction within the area as far back as 1971. A gypsum mine has been operational at the site since 1989. The predominant land use on the site is the existing gypsum underground mine and the open pit mine. The produce from the site supplies a plasterboard factory owned and operated by Saint-Gobain and independent Irish cement and agricultural industries.

3.3 Surroundings

The surrounding landscape is predominately agricultural fields (pastures) delineated by hedgerows and treelines, interspersed with small areas of woodland and loughs. One off residential housing and farmsteads also surround the site. Local urban populations occur in Kingscourt to the south of the site and Carrickmacross to the north of the site.

The closest Special Protection Area (SPA) and Special Area of Conservation (SAC) to the mine site are Dundalk Bay SAC (site code 000455), SPA (site code 004026) circa 38.6 km downstream of the mine site and Stabannan-Braganstown SPA (site code 004091) circa 27.5 km downstream of the mine site.

Natural Heritage Areas (NHA) downstream of the mine site include Ballyhoe Lough pNHA (site code 001594) circa 4.5 km downstream of the site and Stabannan-Braganstown pNHA (site code 000456) circa 27.5 km downstream of the mine site. These are discussed further in Section 7.

The site is located within the Glyde_30 waterbody which currently has an overall good River Waterbody WFD status (2013 – 2018) according to the EPA maps website data. The surface watercourses in proximity to the mine site are the River Bursk and the River Lagan/Glyde which occur downstream of the mine site.

The existing compliance point is located circa 70m downstream of the mine discharge point to the River Bursk (Appendix A see Figure 2). A drinking water abstraction point is located circa 18 km downstream of the mine discharge point on the River Glyde at Tallanstown.

4 Proposed License Amendment

4.1 Introduction

The Applicant is seeking a review of the IEL (Reg No. P0519-03). The licence issued by the Environmental Protection Agency (EPA) covers mineral extraction and waste recovery for their site in Drummond Co. Monaghan and the Applicants processing operation at Lisnabow, Kilmainham, Kells, Co. Meath. While the IEL licence covers both the mining and the process site the IEL review only looks to obtain an increased emission limit value (ELV) for sulphate for the mining operation. The mine water has been discharged under IEL P0519-03 which has a set a compliance limit of 200 mg/l for Sulphate at compliance point CP-1, located circa 70m downstream of the discharge point to the River Bursk. The mine water discharge from the mine site comprises natural groundwater which has come in contact with gypsum mineral underground. The water released to the stream is not subject to industrial use; it is simply being collected from the underground workings or the quarry pit and discharged. The existing discharge point has been in use by the Applicant for circa 30 years. The license review is required due to a change in the water management procedure at the mine site and seeks to increase the complacence limit for sulphate at Compliance Point CP1 from 200 mg/L to 1,250 mg/L.

4.1.1 Drummond Mine Site Discharge

The water management procedure on site consisted of two systems, one for water which had come in contact with gypsum and a separate system for water that has not been in contact with gypsum. Water that has come in contact with gypsum is characterised by high levels of sulphate and conductivity. Water which has come in contact with gypsum is managed in line with the current IEL P0519-03, and consists of natural groundwater which has come in contact with gypsum mineral underground and does not include process water or effluent.

Over the 30 year period of discharge to the River Bursk it was observed to experience low flows during the summer period, between April and September. During these times it was not possible to discharge directly to the River Bursk as the compliance monitoring point would register high levels of sulphate. Water would then be diverted to the decommissioned Drumgoosat Mine. Once flow conditions in the River Bursk allowed, release to the River Bursk resumed. The decommissioned Drumgoosat Mine provided an area for mine water storage during periods of low flow in the River Bursk that could be incorporated into the overall mine water management procedure.

Following unexpected water ingress into Drummond Mine on the 22nd of June 2018 and the subsequent subsidence of Drumgoosat Mine which occurred on the 23rd of September 2018 it is now proposed that all site mine water will be discharged directly off site to the existing discharge point in the River Bursk.

4.2 Rationale for IEL Review

The direct discharge of site mine water to the River Bursk during lower flows in the river (during the summer period, between April and September) has resulted in a continued risk of breaching the IEL compliance for sulphate (200 mg/l) in the River Bursk at compliance point CP-1. Following the water ingress to the Drummond mine and the subsidence of Drumgoosat Mine as outlined above the Applicant is seeking an increase of the compliance limit for sulphate from 200 mg/L to 1,250 mg/L.

4.2.1 Previous Studies (by Others)

A range of surveys were carried out to provide supporting information to the application for a license review made on the 04th July 2019 to the EPA, these included water quality monitoring in the River Bursk and River Lagan, biological water quality monitoring, toxicity testing on the mine water discharge, and mass balance results for sulphate in the mine water discharge to the River Bursk.

Water Quality Sampling Carried Out Between October 18 and April 19

The concentration of sulphate in the mine water discharge had been identified to be circa 1,423 mg/l.

An assessment of the impact of the existing discharge to the River Bursk based on water quality results taken downstream as far as Tallanstown as carried out by SGCPIL and Minerex. The assessment identified that increased discharge from the mine site had not resulted in exceedance of 200 mg/l at Tallanstown. As part of the previous study, sulphate monitoring was carried out between October 2018 and April 2019 and included a sample

point circa 16 km downstream of the mine discharge point and a sample point circa 2 km upstream of the water abstraction point at Tallanstown (this sampling period therefore did not include periods of low flow in the River Bursk). During this period the highest record for sulphate at CP-1 (circa 70 m downstream of the discharge point) was 962 mg/l (this occurred on the 12th October 2018). The sample results indicated sulphate levels below 200 mg/l circa 16 km downstream of the mine water discharge point (circa 2 km upstream of the water extraction point).

Biological Sampling Carried Out in 2018 and 2019

Biological water quality monitoring was carried out in the River Bursk in 2018 as part of the Compliance Action CI001693 Action Number A020858 in the River Bursk. Samples were taken upstream of the mine discharge point, at the mine discharge point and downstream of the mine discharge point. The results identified a Q-value of Q3 (moderately polluted) upstream of the mine discharge and Q4-5 (Unpolluted) downstream of the mine discharge.

Biological sampling was also carried out in July 2018 and July 2019 by KD Environmental Ltd. In July 2018 macroinvertebrate samples were taken 10 m upstream of emission point MSE1 and at compliance point CP-1, the results reported a Q-value of Q3-4 (Slightly Polluted) both the upstream and downstream of MSE1

In July 2019 macroinvertebrate samples were taken 10 m upstream of emission point MSE1, at compliance point CP-1, 1.6 km downstream of MSE1 and 5.1 km downstream of MSE1.

The report concluded the following:

“Under the Q scoring system the water quality both 10m upstream and 70m downstream of the MSE1 discharge is scored as Q3 doubtful water quality with slight levels of pollution. As both locations are both upstream and downstream of the MSE1 discharge, the Q rating score of Q3 is not as a result of the MSE1 discharge. Off site agricultural influences and the natural environment in a slow flowing river with heavy to moderate canopy cover results in a build up of silt on the river bed and in lower dissolved oxygen levels when compared to other sampling locations further downstream. This results in fewer pollution sensitive species that require high dissolved oxygen levels and a stony, gravel river bed”.

The report continues:

“The sampling location DW4-SW5 is scored as Q4-5, fair to good water quality, due to the presence of pollution sensitive species and the high number of species and aquatic life that was recorded. The sampling location DW1-SW12 is scored as Q3 doubtful water quality with slight levels of pollution. The water quality at this location is heavily influenced by adjacent agricultural practices along the River Glyde.

Biological monitoring of macroinvertebrate compositions indicate that the MSE1 discharge is not having a negative effect on the water quality of downstream receiving waters”.

Mine Water Toxicity Testing 2018

Toxicity testing in 2018 of the raw mine water discharge was found to “indicate an absence of significant acute toxicity to freshwater fish or crustaceans and only a minor impact on freshwater algae and marine bacterium. The concentration of Sulphate in the mine water discharge (subject to toxicity testing) is typically around 1,500 mg/l, and this is higher than the sulphate concentration in the River Bursk.”.

Mine Water Impact Assessment for the River Bursk

An impact assessment of the mine water discharge on the River Bursk was undertaken in October 2018 and a report submitted to the EPA as part of compliance. The following conclusions were made following the assessment with regards to the impact of the mine water discharge on the River Bursk:

- “There is some available Assimilative Capacity in the River Bursk for all parameters;
- The Mass Balance calculations for the River Bursk indicate that the water quality parameters are below the EQS limits except for Sulphate which will exceed the EQS limit at CP-1 in the River Bursk; and
- The average of the measured values for the water quality in the River Bursk are all below the EQS at CP-1 except for Sulphate and Conductivity”.

A mass balance assessment was also carried out as part of previous surveys carried out at the mine site. The results found the “*maximum discharge in the current IEL is 510 m³/hr. from the Drummond Mine Site, including the mine water from Drummond Mine, Drumgoosat Mine and Knocknacran Quarry. The Mass Balance calculations for Sulphate in the River Bursk is less than 1,250 mg/l for all months*”.

The seasonal mine discharge from the Drummond Mine site ranged from 259 m³/hr to 276 m³/h. The mass balance assessment for seasonal mine water discharge indicated “*that during the 50th%ile normal flows in the River Bursk the Sulphate concentration will be below 200 mg/l for January and February with slight exceedances in March, April, and December; there were significant exceedances of a Sulphate concentration level of 200mg/l in the River Bursk during May, June, July, August and September. For the minimum monthly mean daily flows, Sulphate exceeded 200 mg/l during all months except January. The Mass Balance calculations for sulphate in the River Bursk is less than 1,250 mg/l for all months during the 50th%ile normal flows and minimum monthly mean daily flows.*”

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5 Approach to Assessment

5.1 Introduction

This section outlines the proposed overall approach to the EIA. It identifies the environmental topics to be considered during the scoping process, describes the assessment scenarios and explains how significance will be defined.

5.2 Scoping Report Preparation

The following EIA regulations and guidance documents have been used in the EIA Scoping Report and will be used during the preparation of the EIAR:

- The requirements of the Regulations and Directives regarding EIA, the Planning and Development Regulations 2001 - 2019, and EIA Directive 2014/52/EU;
- Guidelines on the information to be contained in Environmental Impact Statements, EPA, 2002;
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements, EPA, 2003; and
- Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA draft, 2017.

In addition to this, a number of specific guidance documents will also be used in individual assessments where required. These are identified within the policy and legislation section of each assessment topic listed below.

In accordance with EPA guidance, the following topics will be examined in the chapters that follow and, where scoped in, assessed in the EIAR:

- Population & Human Health
- Biodiversity
- Land and Soils
- Hydrology and Hydrogeology
- Air Quality & Climate
- Noise and Vibration
- Landscape and Visual Impact
- Cultural Heritage
- Material Assets – Built Services
- Material Assets - Waste Management
- Material Assets - Traffic and Transportation
- Major Accidents and Disasters

5.3 The Environmental Impact Assessment Process

5.3.1 Establishing the Baseline Conditions

The current environmental and physical conditions of the mine site ('the baseline') needs to be established so that a comparison of future changes as a result of the Proposed License Amendment can be understood within its context, and potentially significant effects can be identified.

5.3.2 Identifying Potential Impacts

The EPA's draft guidance states the identification of potential likely significant impacts from the proposed development should be considered as far as reasonably possible at the scoping stage. The environmental assessments for this project will evaluate the operational phases of the proposed development, in addition to the likelihood, extent, magnitude, duration, reversibility and significance of any likely potential impacts.

As outlined in Annex IV of the Planning and Development Regulations 2001 - 2019, the description of likely significant environmental impacts should cover direct and indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, as well as positive and negative impacts of the project. During the scoping assessment, all 'likely' and 'significant' impacts determine what should be addressed in an EIA. Any potential impacts that are not identified as being likely or significant will be omitted, or 'scoped out' from further environmental assessments.

The EPA's draft guidance describes a significant effect as "*An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment*". Therefore, part of the function of this scoping report is to identify those impacts that could lead to such effects. It is also necessary to address the likelihood of such effects arising.

The draft guidance says that "*...it should be possible to greatly narrow down the areas of concern and to derive a list confined to 'effects' that may reasonably be seen as 'likely'. Likely or probable effects can be described as those which are planned to take place (e.g. the projected emissions, the proposed earthmoving etc.) and those which can be reasonably foreseen to be inevitable consequences of the normal construction and operation of the project.*"

5.3.3 Significance Criteria

For each technical EIA chapter, the classification and significance of effects will be evaluated with reference to definitive standards, accepted criteria and legislation where available. Where it has not been possible to quantify effects, qualitative assessments will be carried out, based on professional opinion and professional judgement by competent experts. Where uncertainty exists, this will be noted in the relevant EIA chapter.

For each topic, the technical assessment will consider the magnitude of impacts and the sensitivity of the resources / receptors that could be affected in order to classify the effect. Each technical discipline will have its own method based on various standards and approaches, which will be detailed in a transparent and understandable way within the EIA chapter.

The EPA draft guidance states that the definitions of 'Likely' and 'Significant' are the principal criteria for determining what should be assessed further in the EIA. Any issues that do not pass this test should be omitted (scoped out) from further assessment.

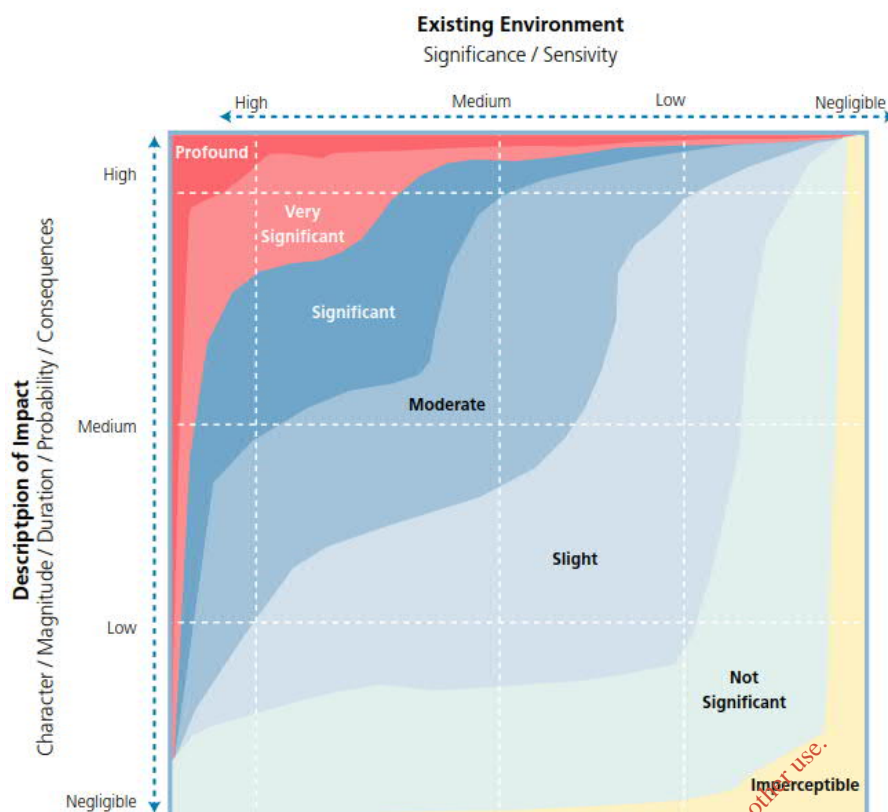


Figure 5-1 Determination of Significance (Draft EIAR Guidelines, EPA, 2017)

In general, residual effects found to be 'significant', 'very significant' or 'profound' are deemed to be 'significant effects'. Effects found to be 'moderate' and 'slight' are considered to not be significant effects, although they may be a matter of local concern. 'Not significant' and 'imperceptible' effects are considered to not be significant and not a matter of local concern.

5.3.4 Assessment Terminology

In order to provide a consistent approach across the different technical disciplines addressed within the EIA, the following terminology will be used throughout the EIAR. This terminology has been adapted from the EPA draft guidance. Where individual environmental topics use different terminology due to specific guidance or legislative requirements, this will be described further in that section.

To define residual effects (i.e. the effect after the application of any required additional mitigation measures), the following terminology will be used:

- Positive Effects – A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
- Negative/Adverse Effects – A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
- Neutral Effects – No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.

When addressing the duration of an effect, the following terminology will be used:

- Momentary Effects – Effects lasting from seconds to minutes
- Brief Effects – Effects lasting less than a day
- Temporary Effects – Effects lasting less than a year
- Short-term Effects – Effects lasting one to seven years.

- Medium-term Effects – Effects lasting seven to fifteen years.
- Long-term Effects – Effects lasting fifteen to sixty years.
- Permanent Effects – Effects lasting over sixty years
- Reversible Effects – Effects that can be undone, for example through remediation or restoration
- Frequency of Effects – Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)

The extent and context of an effect will also be described as this can affect the perception of significance. These terms are defined as:

- Extent – Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
- Context – Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Where adverse or beneficial effects are identified, these will be assessed against the following scale:

- Imperceptible – An effect capable of measurement but without significant consequences.
- Not significant – An effect which causes noticeable changes in the character of the environment but without significant consequences.
- Slight Effects – An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
- Moderate Effects – An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
- Significant Effects – An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
- Very Significant – An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
- Profound Effects – An effect which obliterates sensitive characteristics.

Finally, the probability of an effect should be defined to establish how likely it is to occur.

- Likely Effects – The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
- Unlikely Effects – The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

5.3.5 Approach to Mitigation

The EIAR will include a description of the measures envisaged to prevent, reduce and, where relevant, offset any significant adverse effects.

In line with the Institute of Environmental Management and Assessment (IEMA) guidance and professional best practice, consideration will be given to three key types of mitigation:

- Embedded Mitigation (also known as Primary or Inherent mitigation);
- Good Practice Mitigation (also known as Tertiary or Inexorable mitigation); and
- Additional Mitigation (also known as Secondary or Foreseeable mitigation)

The first two of these types of mitigation will be described then taken into account at the impact assessment stage (that is to say, they will be assumed to be 'in place' for the purposes of the assessment). If significant environmental effects are still predicted following the impact assessment, then additional mitigation will be recommended where practicable and any residual effects will be described.

Design Measures ('Primary', Inherent)

Defined as “an intrinsic part of the project design”, this mitigation is a result of the design evolution. Embedded mitigation describes efforts undertaken to prevent or reduce potential significant adverse effects by iteratively altering design throughout the evolution of the proposed development.

Good practice mitigation ('Tertiary', Inexorable)

Defined as “required regardless of any EIA assessment”, this is mitigation imposed as a result of standard good practice and due to legislative requirements. For example, this would include practices to manage contractor activities and minimise nuisance effects contained within the Construction Environmental Management Plan (CEMP) that the contractor will be obliged to implement.

Additional mitigation ('Secondary', Foreseeable)

Additional mitigation will be identified, where appropriate, where an effect requires further mitigation in order to achieve the anticipated outcome. This follows the initial assessment which takes into account both embedded and good practice mitigation. Topic assessments reported within the EIAR will identify additional mitigation that is to be implemented to further reduce identified significant adverse effects. These measures will then be taken into account when evaluating residual effects. They are expected to be secured through the application of appropriate planning conditions.

Cumulative Effects

As part of the EIA process, cumulative effects of the proposed development should be considered. These effects, although not defined in the Planning Regulations, are typically distinguished into two types, combined and cumulative.

Combined Effects / Inter-relationships

Combined effects occur when separate impacts associated with the proposed development act on the same receptor, with the potential to lead to a significant effect. These effects may be additive, for example where noise impacts from construction activities such as piling and noise impacts from increased traffic may act upon one receptor. Combined effects will be considered within the environmental topic sections of the EIAR.

Cumulative Effects

Cumulative effects consider the impacts of other 'reasonably foreseeable' developments within the vicinity and context of the proposed development. A four-stage approach for undertaking a Cumulative Effects Assessment (CEA) is proposed:

- Stage 1: Establish the Zone of Influence (ZOI) of the proposed development and identify long list of 'other development' of the type just described;
- Stage 2: Identify shortlist of 'other development' for CEA by determining whether interactions are possible between 'other development' and the proposed development;
- Stage 3: Information gathering to determine what the scale of impact from 'other development' is; and
- Stage 4: Assessment of the cumulative effects.

5.3.6 Alternatives to the Proposed License Amendment

The EIA Directive requires “a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studies by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.”

As the EPA points out, an analysis of high-level or sectoral strategic alternatives cannot reasonably be expected within a project level EIAR. The test would be are the alternatives discussed “reasonable” and “relevant to the proposed project and its specific characteristics”.

AECOM understands that the following alternatives were considered by the applicant:

- Alternative discharge point - An alternative discharge point to the River Glyde in proximity to Cormey Bridge was previously considered however Inland Fisheries Ireland have raised environmental concerns of discharging to this location. As a result this option was not brought forward.
- On site treatment of water containing sulphate. Electrocoagulation and reverse osmosis have been considered as possible treatment technologies. However, both were excluded due to the volume of water requiring treatment. In particular:
 - Electrocoagulation has never been used to treat such a volume of water. Significant challenges were identified in designing and implementing such a scale of treatment.
 - Reverse osmosis has the capability of treating the flow to a sulphate concentration of 200 mg/L. however; this would generate a significant amount of waste concentrate which would require management. On site storage (within the disused portions of the mine) and direct discharge of the concentrate during heavy flow conditions would increase the overall environmental risk (highly concentrated effluent and mine stability) and off-site disposal of large volumes of concentrate would not be deemed practical or sustainable (tankering discussed below).
- On site containment and controlled discharge of water containing sulphate. This option was temporarily implemented by using disused portions of the mine as storage. However, the practice was discontinued due to stability concerns for the disused mine. Construction of water attenuation/storage infrastructure would not be practical due to the large volumes considered. This option was not brought forward.
- Tanker water off site. This option was not brought forward as it would potentially introduce additional environmental impacts such as increased traffic on the roads surrounding the mine site. An increase in traffic in the local area could result in local impacts to air quality and climate, and noise and vibration environments. An increase in traffic could also have knock on effects on population and human health and landscape and visual environment. In addition this option is unlikely to be sustainable both short and long term resulting from the amount of water that would be required to be tankered off site (circa 12,240 m3 per day or 510 m3 per hour would need to be tankers off site) and would be extremely expensive over the lifetime of the mining operation.
- Release of all mine water at the existing discharge point in the River Bursk – This option has been taken forward as the most environmentally sustainable and best available option as it is considered unlikely to cause a significant impact on air quality and climate, noise and vibration, cultural heritage, landscape and visual, material assets, population and human health, and land and soils. In addition this option would not require the implementation of any additional infrastructure and would utilise the infrastructure already in place on site.

5.4 Associated Assessments - NIS

An AA Screening report was produced (by others) to accompany the application for IEL review in July 2019. As part of an IEL review carried out by the EPA in December 2019 (application for IEL review received by the EPA on 04 July 2019) it was determined that a Natura Impact Assessment (NIS) was required as per Regulation 2(1) of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended.

An AA is triggered by an AA Screening determination where significant effects on 'European sites' (i.e. Special Protection Areas (SPAs) and Special Areas of Conservation (SACs)) are likely to occur (or more specifically 'cannot be excluded on the basis of objective information'). Collectively, the SPAs and SACs throughout the EU comprise a network known as Natura 2000.

If triggered by Screening, the competent authority must complete an AA to determine whether the project will adversely affect the integrity of any European site, in light of the site's Conservation Objectives. The competent authority's AA is typically informed by a Natura Impact Statement (NIS) requested from a technical expert.

There is a potential hydrological pathway for pollutants from the mine site to Stabannan-Braganstown SPA, Dundalk Bay SPA and Dundalk Bay SAC via the River Bursk and then the Lagan/Glyde River. Based on this potential pathway and on an EPA AA Screening Determination an NIS is required.

The NIS will be drafted in accordance with relevant AA guidance including recent AA guidance issued by the EC in 2018, and online guidance published by the National Parks Wildlife Service (NPWS, 2018).

6 Population and Human Health

6.1 Introduction

This section describes the scope of works and methods that will be applied to identify and assess the potential impacts of the Proposed License Amendment on Population & Human Health. This section should be read in conjunction with Chapter 4: Proposed License Amendment and related technical chapters which will be specified.

The appraisal of likely significant effects of the Proposed License Amendment on Population & Human Health will be conducted by reviewing the current socio-economic environment and the potential impact of the Proposed License Amendment on this environment at multiple spatial scales, which are set out in the study area section below.

The Population & Human Health chapter of the EIAR will assess impacts on:

- Economic activity and employment;
- Human health and well-being; and
- Land uses and local community (effects on uses of a site through amenity impacts or loss of land).

6.2 Legislation, Policy and Guidance

The following relevant policy and legislation has informed the scope for the impact assessment.

Monaghan County Development Plan 2019-2025¹

The key strategic objectives of the Monaghan County Council Development Plan are “*To develop to its full potential each part of County Monaghan in economic, social and environmental terms*” (SO1) and “*To protect and nurture the County’s rich natural resources, heritage, tourism assets and amenities along with the environmental quality of the natural and built environment in both the urban and rural areas*” (SO5).

Within the Plan, the Council sets out specific economic development strategy objectives to facilitate economic activity and employment growth. Objective ESPO 1 aims “*To promote Monaghan as a local and regional centre of trade, business and tourism and to build on its strong spirit of enterprise to create a dynamic local economy with job creation at its heart*”.

The Plan also recognises the importance of extraction industries for Monaghan’s economy. Policies ERP 1 and ERP 2 are focused on safeguarding locations of major mineral deposits for future extraction, and promoting the development involving the extraction of mineral reserves and their associated processes, provided sustainable implementation.

Monaghan Local Economic & Community Plan 2015- 2021²

The Local Economic & Community Plan aims “*to develop and promote social and economic opportunities for all people living in and visiting County Monaghan*”. The Plan sets out objectives and actions for economic and community elements. These include:

- Community Goal 5: promote the health and wellbeing of all people in Monaghan by ensuring equal opportunity to access, participate and engage in the social, economic, cultural, sporting and educational opportunities available in the County.
- Community Goal 6: protect, enhance and maximise the potential of the natural, cultural and heritage resources of County Monaghan.

¹ Monaghan County Council (2019) Monaghan County Development Plan 2019-2025

² Monaghan County Council Economic Strategic Policy Committee (2015) Monaghan Local Economic & Community Plan 2015-2021

Healthy Monaghan Plan 2019-2022³

The Plan sets out a framework for delivery of a healthier Monaghan, following the national Healthy Ireland Framework. The Plan identifies goals and actions across six themes: physical activity, healthy eating, tobacco cessation and alcohol harm and substance misuse reduction, sexual health, mental health and a cross cutting these to advocate, promote, facilitate and measure positive healthy behaviours for people in County Monaghan.

6.3 Baseline Conditions

In order to gather baseline information pertaining to employment, demographics, human health and local amenities a desktop study has been undertaken, drawing on information from the Central Statistics Office (CSO). A summary of the initial baseline findings is described below.

Economic Activity and Employment

The site is located within Monaghan County Council area. The population of Monaghan County is approximately 61,386, of which 683 people are estimated to be living within the Enagh Electoral Division⁴. In 2016, an estimated 58.3% of the residents in the Enagh Electoral Division were aged between 19 and 64 years⁵. This is broadly in line with the average recorded for Monaghan County (57.7%), but below the national level for Ireland (60.3%). The proportion of residents aged 65 years or older in the Enagh Electoral Division (12.7%) was smaller than the average for Monaghan County (14.0%) and Ireland (13.4%).

Monaghan County's population is less highly skilled compared to the rest of the country. Within Monaghan, 20.3% of residents are qualified to Ordinary bachelor's degree / professional qualification and above, which is below the recorded national average (28.5%). Monaghan also recorded a higher proportion of residents with no formal education (2.5%) in comparison to the national average (1.7%)⁶.

The industrial composition of the County shows that professional services is the largest employment sector, accounting for 21.5% of workers, closely followed by commerce and trade (21.3%). Monaghan County also has a concentrated agricultural sector, accounting for 11.2% of employment which is more than double the proportion at the national level (4.6%).

Human Health and Well-being

The health conditions in Monaghan are positive. In 2016, 88% of the population aged 15 years and over in the County considered themselves to be in very good or good health, compared to Ireland's average of 87%⁷. This performance is also reflective of the Enagh Electoral Division, where 88% of the population were in very good or good health.

According to the Pobal HP Deprivation Index⁸, the primary source for deprivation in Ireland, the Enagh Electoral Division has a 'marginally below average' classification which is also representative of Monaghan County.

The closest health facilities in the area are located in Carrickmacross approximately 6.5km north east of the site. These include general practices, dental services, and a care home. The closest hospital (Louth County Hospital) is approximately 30km north east of the site. Within the County, Monaghan General Hospital is located approximately 44km north west of the site.

Land Uses and Local Community

The area surrounding the site is predominantly used for agricultural purposes. There are some scattered residential properties in the area primarily concentrated along the local roads, with closest residential hamlets including Clonseady approximately 1km north east of the site.

Facilities in close proximity to the site include a petrol station (Top Oil), a post office and a church. The closest community infrastructure facilities are located in Carrickmacross approximately 6.5km north east of the site.

³ Monaghan County Council (2019) Healthy Monaghan Plan 2019-2022

⁴ Central Statistics Office, (2019); Census 2016 Population

⁵ Central Statistics Office, (2019); Census 2016 Age Profile

⁶ Central Statistics Office, (2019); Census 2016 Skills Profile

⁷ Central Statistics Office, (2019); Census 2016 Health Conditions

⁸ Haase, T., and Pratschke, J. (2017); The 2016 Pobal HP Deprivation Index for Small Areas (SA)

6.4 Potential Significant Effects

An initial screening of population and human health effects has been undertaken to examine the need for further assessment of potential effects.

Initial findings of the screening for potential population effects are presented in Table 6-1 below.

Table 6-1. Initial Population Screening

Activity	Findings of Initial Screening	Scope In/Out
Employment and economic activity	The site will continue to provide employment opportunities; however, the employment levels are not expected to change as a result of the Proposed License Amendment. Therefore the Proposed License Amendment is not likely to result in significant employment generation.	Scope out
Local community and land uses	Scoping findings from other topics – air quality, traffic, noise and vibration – indicate that there will be no loss of amenity expected as a result of the Proposed License Amendment. The Proposed License Amendment will not change the baseline conditions for traffic, noise, dust and vibration. The Proposed License Amendment does not require any land take or change in land use. The Proposed License Amendment has limited scope to impact on nearby communities.	Scope out

The initial screening of human health effects has been undertaken by drawing on the health impact assessment guidance from the Institute of Public Health (IPH) and the checklist from the London Healthy Urban Development Unit (HUDU) Rapid Health Impact Assessment Tool Fourth Edition 2019. Whilst not designed or specifically developed for Ireland, the tool provides a broad overview of the potential health impacts and is applicable to a wide range of proposals. The checklist is split into 11 broad determinants and is based on the World Health Organisation (WHO) publication 'Healthy Urban Planning'. Table 6-2 below summarises the initial findings.

Table 6-2. Initial Human Health Screening

Health Determinant	Findings of Initial Screening
Housing quality and design	The Proposed License Amendment is located within an existing mining site. As such, there would be no displacement of land and property expected as a result of the scheme and there is no housing proposed as part of the Proposed License Amendment. Housing quality and design has limited relevance to the Proposed License Amendment.
Access to healthcare services and other social infrastructure	The Proposed License Amendment does not alter access to healthcare services or other social infrastructure as it does not impact on demand, physical access or land take for such facilities. The scope of the Proposed License Amendment means there would be no impact on access to healthcare services or other social infrastructure.
Access to open space and nature	The Proposed License Amendment site is surrounded by agricultural fields and is not expected to result in land take from open spaces, or in changes to access to these spaces for users.
Air quality, noise and neighbourhood amenity	There are limited receptors on which the Proposed License Amendment can impact. Scoping findings from other topics – air quality, traffic, noise and vibration – indicate that there will be no loss of amenity expected as a result of the Proposed License Amendment.
Accessibility and active travel	The Proposed License Amendment site will have a limited impact on accessibility and active travel given its location and scope of activities.
Crime reduction and community safety	The Proposed License Amendment is not expected to have any significant effects on crime and community safety.
Access to healthy food	The scheme is not envisaged to have any effect on the availability of food.
Access to work and training	The Proposed License Amendment may support local employment opportunities, providing access to jobs and training for the local workforce. The scale of these activities is not likely to change from the existing on-site employment; therefore the effect as a result of the Proposed License Amendment is not expected to be significant in EIA terms.
Social cohesion and lifetime neighbourhoods	The Proposed License Amendment is not displacing existing residential developments. The Proposed License Amendment would have limited scope to impact on social cohesion and lifetime neighbourhoods.
Minimising the use of	The Proposed License Amendment site is already an operating mine, with no change to land

Health Determinant	Findings of Initial Screening
resources	use or waste management expected.
Climate Change	The Proposed License Amendment is not expected to result in changes to the climate of the existing site due to no change to extent of mining works occurring on site or any requirement for changes to the existing infrastructure on site (see Chapter 11: Air Quality & Climate). The Proposed License Amendment may have potential impacts on the freshwater aquatic environment (see Chapter 7: Biodiversity). However, due to the lack of community receptors in the area, such effects are considered to have limited scope to impact on human health Overall, there is limited scope for the Proposed License Amendment on impact on climate change and human health.

6.5 Summary

Taking into consideration the initial screening results for Human Health impacts, it is considered that the Proposed License Amendment would have no material adverse impact on existing communities and human health. Having followed the appropriate methodology and considered the assessment of human health effects in this scoping report, the scoping did not identify any potential for material adverse impact on health and wellbeing, therefore human health effects can be **scoped out** of the EIA.

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7 Biodiversity

7.1 Introduction

This Section addresses the scope of assessment in relation to biodiversity; in other words, flora and fauna. Throughout this Section, the term 'ecological feature' is used to refer to designated sites, habitats and species.

The scope of assessment proposed has been informed by review of existing reports and available data, collated as part of a desk study.

7.2 Legislation, Policy and Guidance

The assessment of potential effects on biodiversity features will be carried out with cognisance of the following relevant legislation and policy:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive');
- Council Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive');
- Council Directive 2000/60/EC establishing a framework for Community action in the field of water policy (the 'Water Framework Directive');
- Convention on Wetlands of International Importance ('Ramsar convention');
- The Planning & Development Act 2000 S.I. 30/2000 as amended; the Planning and Development (Amendment) Act 2010 S.I. 30/2010 as amended; The Planning & Development (Amendment) Act 2010 S.I. 16/2018 as amended (collectively known as the 'Planning Acts');
- European Communities (Bird and Natural Habitats) Regulations 2011 and 2015 (the 'Habitats Regulations');
- The Wildlife Act, 1976; and the Wildlife (Amendment) Act 2000 (together known as the 'Wildlife Acts');
- Flora (Protection) Order, 2015 S.I. 356/2015 (the 'Flora Protection Order');
- EC Environmental Objectives (Surface Waters) Regulations 2009 (SI 272 of 2009);
- National Biodiversity Plan 2017 – 2027;
- Project Ireland 2040 National Planning Framework (NPF); and,
- Monaghan County Development Plan 2019 – 2025.

Aside from the protection of sites and species afforded by many of the above legislative instruments, of particular relevance in this case is the Water Framework Directive (WFD). The WFD requires that waterbodies (including watercourses) achieve 'good' status by set deadlines. Since the overall status assigned a given waterbody is the lowest assessed status for biological, hydromorphological and physio-chemical elements, it follows that good status cannot be achieved without good biological status.

The assessment of potential effects on biodiversity features will be carried out following the guidelines for Ecological Impact Assessment, published by the Chartered Institute for Ecology and Environmental Management (CIEEM, 2018). Where the methods or terminology prescribed by CIEEM differ from the EPA draft guidelines⁹, they will be cross-referenced to the latter document to ensure consistency with the wider EIA.

7.3 Baseline Conditions

The likely baseline conditions have been established through a preliminary desk study and review of previous reports and available data (see Section 7.5 for further details).

⁹ Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA draft, 2017

7.3.1 Waterbody Ecological Status

The mine water discharge point is located within the Glyde_030 waterbody, which currently has an overall good River Waterbody WFD status (2013 – 2018) according to the EPA maps website data. In accordance with Article 5 of the EC Environmental Objectives (Surface Waters) Regulations 2009 (SI 272 of 2009), the existing good condition of this waterbody should not be deteriorated (EPA, 2018; IFI, 2019).

The upper and middle reaches of the Glyde generally have good ecological status with one site at Lagan Bridge having high ecological status (EPA, 2020). The Lagan Bridge site is located approximately 8.4 km downstream from the mine water discharge point. However, water quality in the lower reaches of the Glyde appears to be deteriorating and exhibits unsatisfactory conditions (EPA, 2020). Agriculture negatively affects most of the at-risk waterbodies in the Newry-Fane-Glyde-Dee Catchment (KD Environmental Ltd, 2019; EPA, 2018). Other pressures include hydromorphological pressures, urban wastewater, industry, and forestry (EPA, 2018).

The Q biological rating (determined from macro-invertebrate sampling results, where higher rating indicates higher water quality) directly upstream and 70 m downstream of the mine water discharge point in the River Bursk decreased from Q3-4 in June 2018, to Q3 in June 2019. The Q biological ratings indicated that the water at these sampling locations had a WFD status of 'moderate' and was considered slightly polluted in June 2018, whilst in July 2019, the WFD status was 'poor' and considered moderately polluted. Based on these results, the River Bursk has an unsatisfactory condition, which the EPA refers to as the likelihood of interference with beneficial or potential beneficial uses (KD Environmental Ltd, 2018; KD Environmental Ltd, 2019; EPA, 2020).

The Q biological rating in the River Bursk located 1.6 km downstream of the discharge point before reaching Rahans Lough was scored as Q4-5 in July 2019, which is considered to indicate a WFD Status of High with unpolluted waters. The Q biological rating of the River Glyde located 5.1 km downstream of the discharge point was scored as Q3, which is considered to indicate a WFD Status of Poor with moderately polluted waters (KD Environmental Ltd, 2019; EPA, 2020).

In terms of sulphate concentration and possible effect on ecological features, the maximum predicted sulphate concentration at CP-1 at a mine water discharge rate of 510 m³/hr is 1,144.6 mg/L in June (when river flow is lowest) (SLR, 2019c). Initial desk study information suggests that adverse effects are possible on various aquatic species at considerably lower sulphate concentrations. The average water hardness, which influences the toxicity of sulphate, in the River Bursk at the sampling point D4-SW1 (approximately 2.2 km upstream of the mine water discharge point) is 148 mg/L (IFI, 2019; SLR, 2019a). This is a relatively high level of water hardness, which may act to a limited degree to reduce the toxicity of sulphate.

7.3.2 Designated sites

There are no European sites within 15 km of the mine site. However, there is direct hydrological connectivity via the River Bursk and thence the River Lagan/Glyde to three downstream European sites:

- Stabannan-Braganstown Special Protection Area (SPA) (004091) – the River Glyde runs along part of the north edge of this SPA, 27.5 km downstream from the mine. The sole Special Conservation Interest (SCI) is non-breeding greylag goose *Anser anser*;
- Dundalk Bay SPA (004026) – the River Glyde enters Dundalk Bay 38.6 km downstream of the mine. The Special Conservation Interests comprise a number of coastal wader, goose, duck and gull species; and,
- Dundalk Bay SAC (000455) - the River Glyde enters Dundalk Bay 38.6 km downstream of the mine. The Qualifying Interests (QI) comprise coastal habitats including estuary, mudflats and sandflats, salt meadows, and others.

With regard to nationally-designated nature conservation sites, there are two proposed Natural Heritage Areas (pNHA) that have a direct hydrological connection to the mine:

- Ballyhoe Lough pNHA (001594) – the River Glyde enters Ballyhoe Lough 4.5 km downstream from the mine site. The interests comprise bog, acid peaty lake, wet grassland and birds; and,
- Stabannan-Braganstown pNHA (000456) – the River Glyde enters the pNHA 27.5 km downstream from the mine site. The majority of this pNHA overlaps with the Stabannan-Braganstown SPA and it was designated for birds.

pNHAs are protected from damage from the date they are proposed under the Wildlife (Amendment) Act 2000.

The following pNHAs are within 15 km of the mine site, but they are upstream of the mine discharge point, or upstream of confluences with downstream tributaries, such that the mine discharge cannot reach them: Breakey Loughs (001558), Mentrim Lough (001587), Corstown Loughs (000552), Ardee Cutaway Bog (001454), Reaghstown Marsh (001828), Louth Hall And Ardee Woods (001616), Spring And Corcrin Loughs (001671), Monalty Lough (001608), Lough Naglack (000561), Lough Fea Demesne (000560), Nafarty Fen (002077), Creevy Lough (001599), Lough Egish (001605).

No other statutory or non-statutory designated sites are known to be directly hydrologically-connected to the mine.

7.3.3 Habitats

The primary habitat of concern is the river system into which the mine water discharges. This includes the River Bursk, the River Lagan/Glyde, and two loughs along the route of the River Glyde. One of the loughs (Ballyhoe Lough) is a pNHA and is described in the previous section. Rahans Lough is elongated, and inspection of aerial photography indicates presence of peripheral swamp and scrub/woodland (which may include wet woodland), and there is suggestion of algal blooms. This river system flows through a highly agricultural landscape, and nutrient pollution from agriculture is a known issue (EPA, 2020). The waters of the River Glyde discharge into Dundalk Bay which includes estuarine and other coastal habitats covered by the Dundalk Bay SAC (see above).

7.3.4 Protected and notable species

The upper reaches of the River Bursk contain salmonid spawning and nursery habitat, and the lower reaches constitute suitable habitat for adult salmonid and coarse fish (IFI, 2019). Downstream of the River Bursk, there is nursery and adult salmonid habitat, and coarse fish habitat, in the River Glyde. The River Bursk and Glyde support various fish species including Atlantic salmon *Salmo salar*, trout *Salmo* spp., European eel *Anguilla anguilla* (an endangered species according to the International Union for the Conservation of Nature (IUCN)), perch *Perca* spp. and roach *Rutilus rutilus*.

Rahans Lough and Ballyhoe Lough (which is a nationally-designated pNHA) approximately 2.2 km and 4.5 km, respectively, downstream of the discharge point, are both hydrologically connected to the mine site. They both support fish species including roach, bream *Abramis* spp., tench *Tinca tinca*, perch, and pike *Esox lucius*.

There are National Biodiversity Data Centre (NBDC) records of otter *Lutra lutra* (a European Protected Species) approximately 1.5 km south-east of the discharge point north of Rahans Lough, and approximately 8.4 km downstream of the discharge point in the River Glyde, by Lagan Bridge. There are also NBDC records within 5 km of the discharge point of other protected species that may rely on the river system and/or the loughs along its route, including kingfisher *Alcedo atthis* (an Annex I species under the Birds Directive), common frog *Rana temporaria* (protected under the protected under the Wildlife Acts), and several bat species (common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Leisler's bat *Nyctalus leisleri*, brown long-eared bat *Plecotus auritus*, and Daubenton's bat *Myotis daubentonii* – all bats are European Protected Species).

7.4 Potential Significant Effects

The likely significant effects which could arise on ecological features as a result of the Proposed Licence Review will only be directly related to the freshwater aquatic environment. Therefore, the biodiversity assessment of the EIA will be concerned with aquatic species and habitats, and designated sites incorporating them. Significant effects on aquatic ecological features could result directly from the altered chemical and physical properties of freshwater receiving the mine discharge (raised sulphate concentration, calcium concentration and conductivity). However, there is also the potential for significant indirect effects on other ecological features as a result of these effects.

The likely significant effects which could occur, and which will be assessed in the EIA, can be categorised as follows:

- direct mortality of aquatic organisms (either at all or particular life stages);
- injury, stress or other detrimental effects on the physiology of aquatic organisms;
- possible changes (other than direct changes to water quality) to habitats and species diversity/assemblages;

- indirect effects on other species relying on affected aquatic organisms, for example as prey resource (this could include otter and kingfisher, both primarily utilising fish prey, and bats whose prey includes aquatic invertebrates with aerial stages such as caddisflies and mayflies); and,
- compromised integrity of designated nature conservation sites caused by the above effects.

Note that the potential for significant effects on European sites (in this case comprising Stabannan-Braganstown SPA, Dundalk Bay SPA and Dundalk Bay SAC) will be addressed through an Appropriate Assessment, and reported in a Natura Impact Statement (NIS) which will be provided alongside the EIAR. The outcomes of the Appropriate Assessment will, however, be referenced in the EIAR for completeness.

7.5 Assessment Methodology

A thorough desk study will be carried out to inform the ecological impact assessment. The following sources of data, amongst others, will be reviewed:

- Environmental Protection Agency (EPA) maps website (<https://gis.epa.ie/EPAMaps/>);
- National Parks and Wildlife Service (NPWS) Protected Sites in Ireland website (<https://www.npws.ie/protected-sites>);
- information on local watercourses (www.catchments.ie) and water quality (www.epa.ie);
- information on soils, geology and hydrology in the local area (www.gsi.ie);
- *EPA River Quality Surveys: Biological (06 – Newry, Fane, Glyde and Dee)* (EPA, 2020);
- *Newry-Fane-Glyde-Dee Catchment Assessment 2010 – 2015 (HA 06)* (EPA, 2018);
- *Re: Licence Review – Saint-Gobain Construction Products (Ireland) Limited Ref. No.: P0519-04* (IFI, 2019);
- *Drummond Mine Water Management Plan (2019 to 2020)* (SLR, 2019a);
- *Appropriate Assessment: Screening Report for Industrial Emissions (IE) Licence Review Drummond Mine, County Monaghan* (SLR, 2019b);
- *Attachment 1-1 Reasons for Licence Review* (SLR, 2019c);
- *Knocknacran Open-Pit Mine Environmental Impact Statement* (Golder Associates, 2017);
- *Biological Impacts Assessment of the MSE1 discharge from the Mine Site 2018* (KD Environmental Ltd, 2018);
- *Biological Impacts Assessment of the MSE1 discharge from the Mine Site 2019* (KD Environmental Ltd, 2019); and,
- available peer-reviewed scientific research into the effects of sulphate on aquatic habitats and/or organisms.

At this stage it is assumed that fish surveys would not be required as it is likely that sufficient desk-study data will be available to inform the assessment of likely significant effects in relation to fish. It is furthermore not proposed to do any field survey for those ecological features which may be indirectly affected (e.g. otter, kingfisher and bats) as initial desk study indicates that these species are all present. The assessment of ecological impacts will therefore be carried out on the assumption of their presence.

However, following an initial review of existing reports and available data, it has been identified that additional field survey for macro-invertebrates is required to enable a robust assessment of the potential ecological effects of the Proposed Licence Review. Although macro-invertebrate surveys have been previously carried out, the small number of sample sites, small number of samples per site, unusually low macro-invertebrate abundances, and potentially missed, omitted or miss-identified taxa limit the reliability of conclusions drawn from the previous survey data from the 2018 and 2019 investigations (KD Environmental Ltd, 2018; KD Environmental Ltd, 2019).

Therefore, further macro-invertebrate survey upstream and downstream of the mine discharge within the seasonal window of March to May (ideally the first week of March) will be carried out to inform the impact assessment. Macro-invertebrate samples are proposed at eight sites during one site visit up to approximately 5 km downstream of the mine discharge following standardised EPA methods which will involve kick sampling and *in situ* water quality measurement. The sampling point locations will attempt to replicate the sites sampled during the 2018 and 2019 investigations (KD Environmental Ltd, 2018; KD Environmental Ltd, 2019) where possible at Mine Site 1, Mine Site 2, D4-SW5, D1-SW12, with adjustments where necessary to gain comparable sample

sites and with the inclusion of additional sites as appropriate to fill existing data gaps. Following laboratory processing and identification of the samples, the macro-invertebrate data will be analysed to generate Q values. The Q values will provide an indication of the ecological quality in the watercourse, and hence can be used to evaluate potential effects of the mine site discharge.

As highlighted in Section 7.2, the results of the desk study and targeted field survey will be used to inform the Ecological Impact Assessment. This will be conducted in accordance with CIEEM guidelines, cross-referenced, as necessary, to the EPA draft guidelines. In line with the EPA draft guidelines, the significance of effects will be determined by the sensitivity (or importance) of assessed ecological features and the severity of impact upon them.

7.6 Ecology References

CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

EPA (2018). *Newry-Fane-Glyde-Dee Catchment Assessment 2010 – 2015 (HA 06)*. Version 3. Catchment Science & Management Unit, Environmental Protection Agency, Wexford.

EPA (2020). *EPA River Quality Surveys: Biological (HA 06)*. Environmental Protection Agency, Wexford.

Golder Associates (2017). *Knocknacran Open-Pit Mine Environmental Impact Statement*. Prepared for Saint-Gobain Construction Products (Ireland) Limited.

IFI (2019). *Re: Licence Review – Saint-Gobain Construction Products (Ireland) Limited Ref. No.: P0519-04*. Inland Fisheries Ireland, Dublin.

KD Environmental Ltd (2018). *Biological Impacts Assessment of the MSE1 discharge from the Mine Site 2018*. Prepared for Saint-Gobain Construction Products (Ireland) Limited.

KD Environmental Ltd (2019). *Biological Impacts Assessment of the MSE1 discharge from the Mine Site 2019*. Prepared for Saint-Gobain Construction Products (Ireland) Limited.

SLR (2019a). *Drummond Mine Water Management Plan (2019 to 2020)*. Prepared for Saint-Gobain Construction Products (Ireland) Limited.

SLR (2019b). *Appropriate Assessment: Screening Report for Industrial Emissions (IE) Licence Review Drummond Mine, County Monaghan*. Prepared for Saint-Gobain Construction Products (Ireland) Limited.

SLR (2019c). *Industrial Emissions Licence P0519-03 Review: Attachment 1-1 Reasons for Licence Review*.

8 Land and Soils

8.1 Introduction

This section describes the scope of work and methods that will be applied to identify and assess the potential land and soil impacts associated with the Proposed License Amendment.

In assessing potential significant impacts associated with the Proposed License Amendment on land, soils, geology and hydrogeology AECOM will consider both the importance of the attribute and the predicted scale and duration of likely impacts.

8.2 Legislation, Policy and Guidance

The following relevant policy and legislation and guidance has informed the scope for the impact assessment:

Table 8-1. Legislation, Policy and Guidance

Legislative Policy and Guidance

European Union Water Framework Directive (2000/60/EC).	<p>As outlined in Section 10.1.2, the following legislation in Ireland governs the shape of the WFD characterisation, monitoring and status assessment programmes in terms of monitoring different water categories, determining the quality elements and undertaking characterisation and classification assessments:</p> <ul style="list-style-type: none"> • European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003); • European Communities Environmental Objectives (Surface Water) Regulations, 2009 (S.I. No. 272 of 2009 as amended); • European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010 as amended); • European Union (Drinking Water) Regulations, 2014 (S.I. No. 122 of 2014 as amended); and • European Union (Radioactive Substances in Drinking Water) Regulations, 2016 (S.I. No. 160 of 2016).
Environmental Protection Agency	<ul style="list-style-type: none"> • EPA, Guidelines on the Information to be Contained in Environmental Impact Statements (2002); • EPA, Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (2003); • EPA Towards Setting Guideline Values for the Protection of Groundwater in Ireland (2003); and • EPA, Draft guidance document 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017).
Additional Guidance	<ul style="list-style-type: none"> • Groundwater Directives (80/68/EEC and 2006/118/EC); • Institute of Geologists of Ireland (IGI), Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (2013); • Management of Contaminated Land and Groundwater at EPA Licensed Sites (2013); and • Local Authority planning guidance as applicable.

8.3 Baseline Conditions

In order to gather soil and geological baseline information for the study area and to identify the environmental sensitivity and setting of the application site, a desktop study has been undertaken by AECOM with the following sources of information consulted:

- Ordnance Survey of Ireland (OSI) website¹⁰ for historical maps of 1:2,500 scale and 1:10,560 scale (1837 to 1913) and aerial photographs (1995, 2000, 2005);
- Geological Survey of Ireland (GSI) 'Spatial Resources Viewer'¹¹;
- Environmental Protection Agency (EPA) Map Viewer¹² for land use information, as well as EPA Integrated Pollution Control (IPC) Industrial Emissions (IE) licensed facilities or EPA licensed waste facilities;

¹⁰ [Ordnance Survey Ireland](#) – accessed 3 February 2020

¹¹ [GSI Spatial Resources Viewer](#) - accessed 3 February 2020

- National Parks and Wildlife (NPWS) website Map Viewer¹³; and
- Teagasc Irish Soils Information System¹⁴.

In addition, previous site investigation reports and documentation provided on the EPA licence website were reviewed.

A site walkover was undertaken on 29 January 2020.

8.3.1 Site History

The open-pit mine at Knocknaran (referred to as Knocknacran Quarry) has been in operation since 1989 producing between 300,000 and 500,000 tonnes of gypsum per annum. The open pit mining operations commenced in the southeastern portion of the site in 1989 prior to extending to the north and northeast of the site near the boundary of the R179 by 2000.

To supplement resources and recovery of gypsum planning permission was granted in 2004 by Monaghan County Council (Planning permit, 07430) for extraction of gypsum from underground (referred to as Drummond mine) and commenced full production in 2006. The underground mine is ca. 114 ha covering two underground seams (an upper and lower seam).

In 2017, planning permission was granted by Monaghan County Council (Planning permit, 17217) to continue extraction of gypsum deposits from the open pit mine over an area of 54.86 hectares including progressive restoration and associated site works.

Activities at the mine and processing site have been operated under an Integrated Pollution Control (IPC) licence since 2002. A revised licence was issued in 2005, which was subject to three subsequent technical amendments. The IPC details the site emission requirements and discharge points, including water emission to the River Bursk (Glyde_030).

Gypsum deposited within the Kingscourt formation has been subject to extensive historical mining in the region, including the nearby decommissioned Drumgoosat underground mine. The Drumgoosat underground mine is located to the north/northwest of Knocknaran Quarry extending to depth of circa 140 m below ground level.

As part of the Water Management Plan for the mine, the decommissioned Drumgoosat underground mine was utilised to store mine water to manage discharge to the River Bursk. This storage system allows the mine to temporarily store the groundwater until suitable flow conditions for release. Water discharged from the Drummond mine is natural groundwater which has come into contact with the gypsum associated minerals underground. The discharge water does not include any process water or effluent from onsite operations.

Following the unexpected water ingress into Drummond Mine on the 22nd June 2018 and the Drumgoosat Mine subsidence which occurred on the 23rd September 2018 at the closed Drumgoosat underground mine. The decommissioned Drumgoosat Mine provided an area for mine water storage during periods of low flow in the River Bursk that could be incorporated into the overall mine water management procedure. However, since the incident in September 2018 it has been decided not to store water in Drumgoosat Mine and all site mine water from Drummond Mine, Drumgoosat Mine and Knocknacran Open Mine has been discharged directly off site to the existing discharge point on the River Bursk.

8.3.2 Geology

Data and information relating to the geology of the mine site was derived from the online GSI 'Spatial Resources Viewer', as well as from previous site investigation reports provided by the client. Additional data were obtained from the websites listed above.

Overburden Geology/Teagasc soils

According to the EPA mapping tool the subsoils in the areas surrounding the mine consists of made ground and till derived from lower Palaeozoic sandstones and shale.

The overburden and till has been stripped from the site surface area to allow for the open pit mining operations. These deposits are being used during the ongoing phased restoration of the site.

¹² [EPA Map Viewer](#) - accessed 3 February 2020

¹³ [NPWS Map Viewer](#) - accessed 3 February 2020

¹⁴ [Teagasc Irish Soils Information System](#) accessed 06 February 2020

Bedrock Geology

Data relating to the geology and hydrogeology of the site was derived from the online GSI Spatial Resource Viewer.

Three bedrock geological units are identified in the vicinity of the site, as follows:

- Kingscourt Gypsum Formation, consisting of mudstone with gypsum and anhydrite units, containing six members of basal conglomerate member (up to 18 m thick), a lower mudstone, a lower gypsum, a middle mudstone, an upper gypsum (6 – 10 m) and a final upper mudstone unit;
- Kingscourt Sandstone Formation, consisting of red sandstone, containing red basal siltstone member and three red sandstone member, the middle sandstone member is impersistent and known from only a few boreholes containing marine acritarchs and foraminifera; and
- Cabra Formation, consisting of interbedded sandstone and shale, a thick sandstone unit (circa 15 m) occurs near the middle of the formation.

The extents of current mine site is underlain by the Kingscourt Gypsum formation, which is distributed in a north-south oriented belt 12 km in length and 1.2 km wide, the site boundary encompasses the width of the formation.

Topography and landslides

The local surrounding land to the mine is located 43 m Ordnance Datum (OD), with a steep decrease in elevation towards the mine excavation. The surrounding land generally slopes to the south, southeast towards the coast and Irish Sea with a localised high point to the west near Cornasaus and Ballieborough.

It is noted that following the unexpected water ingress into Drummond Mine on the 22nd June 2018, a subsidence occurred at the Drumgoosat Mine on the 23rd September 2018.

8.4 Land Use

The Corine 2019 mapped land cover on the EPA website indicates the site area is classified as a mineral extraction site, with that the majority of the land surrounding the site classified as 'pastures'. Mixed forest areas are noted to the northeast and southwest representing Lough Fea and Dun Na Ri Forest park respectively. No additional land uses of interest were noted within a 1 km radius of the site.

Low density residential house are present surrounding the site, with the closest residence located to 170 m west. Top Oil fuel station is located on the northwest boundary of the site on the R179. The Magheraclone Mitchells GAA club is located 150 m north of the mine boundary; due to the formation of a sinkhole within the property boundary in 2018 the GAA club is proposed to be moved from its current location to the northwest corner of the mine, currently undergoing rehabilitation.

8.4.1 Licensed Facilities

One EPA Industrial Emissions licence (IE) for the site, P0519 is established. The licence covers the operations and emissions from the mine and processing site. The licence P0519-01, issued by the EPA in 2002 was amended in 2005 to P0519-02 and to the current licence P0519-03 in 2015.

Six licensed facilities (P0519, P0806, P0065, P0528, P0037 and P0371) and one waste facility (W0195) is located within a 10 km radius of the site.

Of these, one EPA licensed facility (P0866-01) is within a 1 km radius of the site. The registered licensed activity, P0866-01 is for the rearing of poultry in installations where the capacity exceeds 40,000 places. National Parks and Wildlife Services (NPWS)

A review of the NPWS database (28.01.2020) did not identify any designated areas of conservation (Natural Heritage, Proposed Natural Heritage, Special Areas of Conservation, Special Protected Areas) within a 10 km radius of the site.

8.4.2 Potential Contamination Sources

The licence amendment does not propose changes to the land use or onsite infrastructure. As such, the potential for additional contamination sources is unlikely.

8.5 Potential Significant Effects

Changes to the mining operations and land uses are not proposed as part of the licence amendment. The potential significant effect to land is considered limited to the subsidence of nearby land uses associated with historical water management practices. For that reason, the revised water management strategy and associated proposed licence amendment would be generally considered to have an overall positive effect to land and soils.

Table 8-2 Operational Phase Impacts

Activity	Effect	Potential Significance
Direct discharge of water to the River Bursk.	Reduced risk of subsidence of mine sections.	Potentially significant – positive impact scoped out at this stage of assessment

As no significant negative effects on land and soil have been identified further assessment has been **scoped out** of the EIAR.

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9 Hydrology and Hydrogeology

9.1 Introduction

This section describes the scope of works and methods that will be applied to identify and assess the potential impacts on the water environment. Essentially, the assessment considers the potential for non-conformance with the EU Water Framework Directive¹⁵ (WFD) objectives including:

- “The need for the avoidance and reduction of impacts on the water environment is taken fully into account in the environmental evaluation”; and
- “The selection of appropriate means of preventing any significant predicted impact is made through modification of the drainage design, choice of discharge location(s) and/or adoption of runoff treatment methods, with the objective of designing-out potential adverse environmental impacts”.

9.2 Legislation, Policy and Guidance

The following relevant policy and legislation has informed the scope for the impact assessment:

Table 9-1. Legislation, Policy and Guidance

Legislative Policy and Guidance

European Union Water Framework Directive (2000/60/EC)	<p>This was adopted as a single piece of legislation covering rivers, lakes, groundwater, transitional (estuarine) and coastal waters. The following legislation in Ireland governs the shape of the WFD characterisation, monitoring and status assessment programmes in terms of monitoring different water categories, determining the quality elements and undertaking characterisation and classification assessments:</p> <ul style="list-style-type: none"> • European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003); • European Communities Environmental Objectives (Surface Water) Regulations, 2009 (S.I. No. 272 of 2009 as amended); • European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010); • European Communities Environmental Objectives (Groundwater) (Amendment) Regulations, 2016 (S.I. No. 366 of 2016); • European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (S.I. No. 610 of 2010); • European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011); and • European Union (Water Policy) Regulations 2014 (S.I. No. 350 of 2014).
Guidelines for Drinking-Water Quality, 4 th Edition, World Health Organisation 2017	Provides drinking water quality standards.
EPA, Towards Setting Guideline Values for the Protection of Groundwater in Ireland (2003)	Interim Guideline values (IGVs) were developed by the EPA using a number of water quality guidelines in use in Ireland, including existing national environmental quality standards, proposed common indicators for the groundwater directive, drinking water standards and GSI trigger values.
EPA, Draft guidance document ‘Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017)	<p>An update to earlier guidance:</p> <ul style="list-style-type: none"> • EPA, Guidelines on the Information to be Contained in Environmental Impact Statements (2002) • EPA, Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (2003)
Institute of Geologists of Ireland (IGI), Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (2013)	Provides topic-specific guidance on preparation of this technical chapter.

¹⁵ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for the Community action in the field of water policy

9.3 Baseline Conditions

In order to gather hydrological and hydrogeological baseline information for the study area and to identify the environmental sensitivity and setting of the application site, a desktop study has been undertaken by AECOM with the following sources of information consulted:

- Ordnance Survey of Ireland (OSI) website¹⁶ for historical maps of 1:2,500 scale and 1:10,560 scale (1837 to 1913) and aerial photographs (1995, 2000, 2005);
- Geological Survey of Ireland (GSI) 'Spatial Resources Viewer'¹⁷;
- EPA Map Viewer¹⁸ for ground and groundwater information, as well as EPA Integrated Pollution Control (IPC) licenced facilities or EPA licenced waste facilities;
- Office of Public Works (OPW) website, CFRAM website¹⁹ and Flood Info website²⁰ for flood data;
- National Parks Wildlife Service website Map Viewer²¹; and
- EPA Catchments Map²².
- Teagasc Irish Soils Information System²³

9.3.1 Site history

The open-pit mine at Knocknaran (referred to as Knocknacran Quarry) has been in operation since 1989 producing between 300,000 and 500,000 tonnes of gypsum per annum. The open pit mining operations commenced in the southeastern portion of the site in 1989 prior to extending to the north and northeast of the site near the boundary of the R179 by 2000.

To supplement resources and recovery of gypsum planning permission was granted in 2004 by Monahan County Council (Planning permit, 07430) for extraction of gypsum from underground (referred to as Drummond mine) and commenced full production in 2006. The underground mine is circa. 114 hectares covering two underground seams (an upper and lower seam).

In 2017, planning permission was granted by Monaghan County Council (Planning permit, 17217) to continue extraction of gypsum deposits from the open pit mine over an area of 54.86 hectares including progressive restoration and associated site works.

Activities at the mine and processing site have been operated under an Intergrated Pollution Control (IPC) licence since 2002. A revised licence was issued in 2005, which was subject to three subsequent technical amendments. The IPC details the site emission requirements and discharge points, including water emission to the River Bursk (Glyde_030).

Gypsum deposited within the Kingscourt formation has been subject to extensive historical mining in the region, including the nearby decommissioned Drumgoosat underground mine. The Drumgoosat underground mine is located to the north/northwest of Knocknaran Quarry extending to depth of circa 140 m below ground level.

Discharge water from the Drummond mine site has been discharged to the River Bursk for the last circa 30 years. The mine water was discharged under the IE Licence P0519-03 which set a compliance limit of (200 mg/l) for Sulphate at compliance point CP-1, located circa 70 m downstream of the discharge point to the river.

Over the 30 year period the River Bursk was known to experience low flows during the summer period, between April and September. During these times it was not possible to discharge directly to the River Bursk. When low flow within the River Bursk occurred, the on-site water management system facilitated the diversion of mine water to a holding area in the decommissioned Drumgoosat Mine. Once flow conditions in the River Bursk improved, direct discharge to the River Bursk resumed. The decommissioned Drumgoosat Mine provided an area for mine

¹⁶ [Ordnance Survey of Ireland](#) accessed 28 January 2020

¹⁷ [GSI Spatial Resources Viewer](#) accessed 28 January 2020

¹⁸ [EPA Map viewer](#) accessed 28 January 2020

¹⁹ [CFRAM](#) accessed 28 January 2020

²⁰ [Flood Maps - Floodinfo.ie](#) accessed 28 January 2020

²¹ [NPWS Map Viewer](#) accessed 28 January 2020

²² [EPA Catchments](#), accessed 28 January 2020.

²³ [Teagasc Irish Soils Information System](#) accessed 06 February 2020

water storage during periods of low flow in the River Bursk that could be incorporated into the overall mine water management procedure.

Following unexpected water ingress into Drummond Mine on the 22nd of June 2018 and the subsequent subsidence of Drumgoosat Mine which occurred on the 23rd of September 2018 it was decided to no longer store water in Drumgoosat Mine. Following the unexpected change in the Water Management Plan all site mine water from Drummond Mine, Drumgoosat Mine and Knocknacran Open Mine has been discharged directly off site to the existing discharge point on the River Bursk. Geology/Hydrogeology

Data and information relating to the geology / hydrogeology of the site were derived from the online GSI 'Spatial Resources Viewer', as well as from previous site investigation reports provided by the client.

9.3.1.1 Overburden Geology

According to the EPA mapping tool the subsoils in the areas surrounding the mine consists of made ground and till derived from lower Palaeozoic sandstones and shale. The overburden and till has been stripped from the site surface area to allow for the open pit mining operations. These deposits are being used during the ongoing phased restoration of the site.

9.3.1.2 Bedrock Geology and Aquifers

The groundwater abstracted as part of the mining operations is considered primarily from the Louth groundwater resource. Nearby groundwater bodies include the Kingscourt and Carrickmacross basins.

The groundwater vulnerability within the mine area is classified as extremely vulnerable with the rock at or near surface. Surrounding groundwater vulnerability ranges from moderate to low. The extreme vulnerability of the groundwater is considered associated with the mining in the area.

A summary of the groundwater body conditions is presented in Table 9-2.

Table 9-2. Groundwater Body

Groundwater Body	Description	Distance from site	2013 – 2018 Status	Trends/Charts 2007 - 2018	Risk
Louth IEGBNI_NB_G_019	Poorly productive bedrock	0m	Good	Upwards trend Ammonia – Total (as N), Chloride, Conductivity and Orth-Phosphate (as p) Downwards trend Nitrate (as NO3)	Review
Kingscourt IE_NB_G_017	Productive fissured bedrock	Directly east and west	Good	No data available	Not at risk
Carrickmacross IE_NB_G_016	Karstic	1.5km east	Good	Upwards trend Ammonia – Total (as N), Chloride, conductivity and Orth-Phosphate (as p) Downwards trend Nitrate (as NO3)	Review

9.3.1.3 Depth to Groundwater and Flow

A review of the GSI online mapping database infers regional groundwater elevation is approximately 40 – 60 m OD. The regional groundwater flow is anticipated to be towards the southeast with the final discharge point the Irish sea 28km southeast from the site.

Due to the dewatering operations as part of the underground mining the groundwater level within the site is significantly reduced and noted as 10 m OD m on the online database. The low groundwater elevation in the mine is considered to result in a cone of depression in the local area creating a preferential flow pathway for surrounding water towards the mine.

9.3.1.4 Wells and Groundwater Usage

The GSI database identifies a number of groundwater wells within a 1 km radius of the area. Of these, nine were noted to be for agricultural and domestic use and three for industrial use, the remaining well uses were not recorded. Well depths ranged from 0.7 m and 122 m below ground level with yield generally classed as poor, with some areas moderate – excellent.

The GSI database of wells is not complete as there is no legal requirement to register wells. Due to the rural nature of the site it is considered likely groundwater well in the area are used for agricultural and domestic purposes.

The mine site contains 12 groundwater monitoring wells for periodic monitoring events in accordance with the EPA licence P0519-03.

A review of source protection zones (SPZ) within a 3 km radius of the site identified two key areas, associated with domestic supply wells in the area. A summary of the findings is presented in Table 9-3.

Table 9-3. Source Protection Zone

Source Protection Zone	Distance from Site	Active	Information
Kingscourt Mullantra PWS BW01	1.2 km southwest upgradient	Yes	Kings court public water supply is provided by BW01 (500 m ³ /day) and Ervey Lough (500 m ³ /day). Cavan County Council plan to phase out abstraction from Ervey Lough by 2013 and replace it with two additional borehole groundwater sources, outlined below. Localised groundwater flow is east towards the mine site.
Descart wells BW02 and BW03	2 km southeast upgradient	No	Two test wells established to replace abstraction from Ervey Lough BW02 and BW03. The wells are currently not listed as active, based on this it is considered public water supply is still sourced from BW01 and Ervey Lough.

The mine sites water supply is provided by mains services.

9.3.2 Surface Water Courses

The mine site falls within the WFD 06 - Newry, Fane, Glyde and Dee catchment and sub catchment 06_7 (Glyde_SC_010). Glyde_SC_010 falls within two river sub basins, both of these currently receive site surface water.

Glyde_020 is 27 km in length and located to the north and west of the mine site travelling generally in a south-southeast direction. Discharge water from MSW-1 flows through a ditch east along the site boundary before veering northeast approximately 200 m from the site, where it eventually joins the Glyde_020 (River Lagan) 680 m northwest of the site. Glyde_SC_020 flows south from this point, before amalgamating with Glyde_010 and Glyde_030 1.1 km southwest of the site. The Glyde_020 river body is classed 'in review' up and downgradient of the mine site. Where it joins Glyde_030 down gradient of the site it is classed 'not at risk'. Routine biological, operation, supporting chemistry, investigative and chemical monitoring is undertaken within the river. The online EPA map viewer records the upstream monitoring point Q value Score of 4 – 5 and the downstream Q value Score of 4. The river water quality status 2013-2018_ is listed as good. Glyde_020 is not classed as a drinking water river.

Glyde_30 is 57 km in length and located to the east of the mine site travelling in a south-southeast direction. The mine surface water discharge point enters this river as presented in Appendix A Figure 2. Downstream of the discharge point the river (River Bursk) flows southeast adjoining Descart Lough and Rahans Lough. The river continues in a general southeastern direction prior to the eventual discharge to Irish Sea 28 km southeast of the site. The Glyde_30 river body is classed not at risk directly up and down gradient of the site. Routine biological and operation monitoring of the river body is undertaken. The online EPA map viewer recorded the nearest ecological monitoring point approximately 6 km downstream of the site, with a Q value Score of 4. The river water quality status 2013-2018_ is listed as good. Glyde_030 is classed as a drinking water river (IE_NB_06GO20400), protected area code: IEPA1_NB_06G020400.

Two potential surface water abstractions points from nearby river systems were identified during the desktop review:

- Tallanstown pumping station, location approximately 18 km down gradient of the site on the Rive Glyde north of Tallanstown; and
- Ervey Lough water supply located approximately 5 km up/cross gradient from the site southwest of Kingscourt.

A request for further information and any additional surface water abstractions points in the area was submitted to Irish Water; at the time of writing this report the information was still outstanding. Surface water abstractions points are to be reviewed in further detail in the EIAR.

9.3.3 Site Emissions to Water

Site water emissions comprise of groundwater inflow water from the underground mining, direct rainfall water from the open pit mine and site surface water from the areas surrounding the site. Site surface waters around the workshop area is directed to a hydrocarbon separator prior to pumping into the settlement lagoons.

The site has four registered discharge/monitoring points for water, presented in Appendix A Figure 2 and detailed below. It is noted that MSW-1 is planned to be decommissioned in the near future.

Table 9-4. Emissions to Water

Name	Location	Receiving water body	Volume	Required analysis
MSE-1	Discharge from final holding tank 281489E 299140N	River Bursk Glyde_030	12,240 m ³ (daily max.) 510 m ³ (hourly max.)	Temperature, pH, biochemical oxygen demand, chemical oxygen demand, Suspended solids, settleable solid, total ammonia (as N), molybdate reactive phosphorus MRP (as P), total phosphorus (as P), copper, manganese, chromium, nickel, mineral oil, chlorides
CP1	70 m downstream of discharge to River Bursk 282041E 298746N	River Bursk Glyde_030	-	Conductivity, sulphate, barium. Conductivity, nitrate, suspended solids, sulphate, biochemical oxygen demand, ammonia (as N), MRP (as P), total phosphorus (as P), heavy metals
MSW-1	280582E 288637N	Glyde_020	-	Temperature, pH, biochemical oxygen demand, calcium, sulphate, total phosphorus (as P), total nitrogen, conductivity
B	281991E 298912N	River Bursk (upstream of MSE-1) Glyde_030	-	Conductivity, nitrate, suspended solids, sulphate, biochemical oxygen demand, ammonia (as N), MRP (as P), total phosphorus (as P), heavy metals

Limit values for emission parameters set out in EPA Licence P0519-03

9.3.4 Drainage

The onsite drainage systems are not considered to be impacted by the license amendment. Additionally, the change in surface water discharge is not associated with significant site upgrades; therefore these are not brought forward in the assessment.

9.3.5 Flood Risk

A review of the flood maps online mapping tool indicated the site is not within a flood probability area. The nearest flood risk was identified to the northeast in Carrickmorris. The proposed licence amendment does not entail an increase of discharge volumes and therefore flood risk will not be brought forward in the assessment.

9.3.6 Waste Water

The site is not licenced to discharge to sewer, the Proposed Licence Amendment will not entail discharges to sewer and therefore waste water will not be brought forwards in the assessment.

9.4 Sensitive Receptors

Following review of the publicly available information, data provided by the client and observations from the site walkover, the following sensitive receptors have been identified:

- The river body Glyde_030 (River Bursk) is considered the most sensitive receptor, with the proposed licence amendment potentially impacting the receptor. Associated downgradient surface water abstraction points and surface water users are considered potential stakeholders.
- The river body, Glyde_020 (River Lagan) is not considered to be impacted by the proposed licence amendment nor by existing conditions, as the water body is upstream of the discharge point.
- Groundwater beneath the site has a known public abstraction point up hydraulic gradient of the site. Additionally the presence of downgradient supply wells to local residents cannot be excluded at this point.

- The current and future site practices do not entail waste water discharge; as such this will not be assessed further.

9.5 Potential Significant Effects

Table 9-5 below outlines the potential significant impacts from the proposed licensed amendment.

Table 9-5. Operation Phase Impacts

Activity	Potential Effect	Scope in/Out
Continual discharge of site water to surface water receptor Glyde_030.	Reduction of water quality at surface water discharge location. Reduction of water quality at surface water abstraction points, Tallanstown pumping station and other potential abstraction points	Potentially significant – cannot be scoped out at this stage of the assessment.
Continual discharge of site water to surface water receptor Glyde_030.	Localised impacts on nearby shallow groundwater wells.	Potentially significant – cannot be scoped out at this stage of the assessment.
Continual discharge of site water to surface water receptor Glyde_030.	Impacts on bedrock groundwater quality.	Unlikely to be significant – scoped out at this stage of the assessment.

9.6 Assessment Methodology

9.6.1 Study Area

The area encompasses the surface water receptor Glyde_030 (River Bursk) and groundwater, up and down gradient of the site.

Surface water receptor Glyde_020 receptors are not considered to be impacted by the increase in surface water discharge at MSE-1, as such will not be included in the assessment, however the quality of these waterbodies will be considered in the overall conceptual site model for the site

9.6.2 Proposed Methodology and Assessment Scope

The assessment will be conducted in accordance with the legislation and guidance documents listed above. The following is a list of sources of information that will be consulted for use in the assessment:

- OSI website for historical maps of 1:2,500 scale and 1:10,560 scale and aerial photographs;
- OSI Discovery Series of 1:50,000 scale;
- GSI website for Public Viewer and Groundwater Maps;
- EPA website Envision;
- Local Authority web portals;
- Topography maps;
- OPW national flood hazard mapping and CFRAM; and
- Existing site investigation information.

The assessment will include identifying and describe water; hydrology and issues associated with the increase in sulphate concentrations from the discharge point and should be read in conjunction with the section of the report, which pay particular attention to the potential for impacts upon the aquatic/riparian and hydrogeological environments respectively.

A conceptual site model (CSM) will be developed identifying potential sources of contamination, the potential sensitive receptors which may be impacted by each source, and the potential pathways by which the impact may occur. Mitigation measures will be devised, where appropriate, for each potential complete pollutant linkage (comprising a source, pathway and receptor).

The impact assessment will involve:

- Assigning the receptor sensitivity;
- Identifying and characterising the magnitude and significance of any potential impacts;
- Incorporating measures mitigate and avoid where possible, these impacts during operational phases; and,
- Assessing the significance of any residual effects after mitigation.

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10 Air Quality & Climate

It is considered there will be no significant effects to the air quality and climate environment arising from the Proposed License Amendment. The most likely emission to air from quarrying and mining activities is dust arising from the excavation, processing and transportation of materials. However as the Proposed License Review relates solely to an increase in sulphate at the mine site discharge point air quality emissions are not anticipated. The existing IEL for the mine site sets out a range of emission limits as well as monitoring requirements including dust monitoring for both the mine site and the process site. This Proposed License Amendment does not look to alter any of the emissions limits or monitoring requirements relating to air quality and climate.

For this reason, it is considered that the topics of air quality and climate will not be affected by the Proposed License Amendment and are therefore **scoped out** for further assessment within the EIAR.

11 Noise & Vibration

It is considered there will be no significant effects relating to the noise and vibration environment arising from the Proposed License Amendment. The primary source of noise from quarrying and mining would include traffic, blasting, and noise from plant and machinery. Noise sources relating to the discharge of water may include noise from plant associated with the pumping and movement of water from one location to another. The existing IEL for the site sets out noise and vibration level limits for sensitive locations in proximity to the mine site that must be adhered to by the Applicant during their operations. The license also sets out the requirements for a yearly noise survey of site operations. This Proposed License Amendment does not look to alter any of the noise and vibration limits or monitoring requirements relating to noise and vibration.

For this reason, it is considered that the topics of noise and vibration will not be affected by the Proposed License Amendment and are therefore **scoped out** for further assessment within the EIAR.

12 Landscape and Visual

The Knocknacran open-pit mine has been in operation since 1989 and the underground mine at the Drummond mine has been occurring since 2005. The landscape in the vicinity of the mine site is characterised as drumlin and undulating farmland. This Proposed License Amendment does not require any additional infrastructure and will not alter existing operations or buildings on the mine site. As a result, the Proposed License Amendment will not result in new landscape and visual effects.

For these reasons, it is considered that there will be no significant landscape effects arising from the Proposed License Amendments and this topic has therefore been **scoped out** for further assessment within the EIAR.

13 Cultural Heritage

The scoping report relates to the potential significant effects of a review to the site's current Industrial Emissions Licence No. P0519-03. This is to allow for an increase from a limit of 200 mg/l for Sulphate in the River Bursk at compliance point CP-1 to 1,250 mg/l. The change to the licence relates to an increase in permitted Sulphate discharge at an existing compliance point utilising existing equipment. It will not require additional land take or construction which could potentially impact physically upon previously unrecorded heritage assets.

Additionally, the requested increase in the permitted sulphate discharge will not alter the settings of the recorded heritage assets located within the 1km study area.

Given these conditions, the potential for impact to heritage assets is considered low and it is recommended that the assessment of impacts on heritage be **scoped out** of the EIAR.

14 Material Assets – Built Services

The potential for significant environmental effects arising from impacts on built services resulting from the Proposed License Amendment is considered to be **scoped out** of the EIAR as the Proposed License Amendment does not seek to introduce new infrastructure nor change the existing built services connecting to the site.

15 Material Assets - Waste Management

As the Proposed License Amendment does not include any changes to existing buildings, on site operations or the surrounding lands, there will be no changes to the baseline waste management of the existing mine site.

For these reasons, it is considered that there will be no significant waste effects arising from the Proposed License Amendments and this topic is **scoped out** for further assessment within the EIAR

16 Material Assets - Traffic and Transport

Access to the mine site is provided directly from the L4816 Local Road. The L4816 extends from its junction with the R179 national road in the north, and continues southwards past the mine access. The site operates 6 days with opening hours between 08:00 and 20:00.

The Proposed License Amendment does not result in any changes to existing roads infrastructure, traffic to and from the mine site, on site operations or the surrounding lands. There will be no changes to the traffic and transport baseline of the existing mine site. There will be no change of extent of mining works occurring at the mine site.

For these reasons, it is considered that there will be no significant traffic and transport effects arising from the Proposed License Amendment and this topic is **scoped out** for further assessment within the EIAR.

17 Major Accidents and Disasters

17.1 Introduction

The 2014 EIA Directive introduced the requirement for an assessment of the risk of major accidents and disasters into the scope of an EIA. As explained the recital of the Directive:

“In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment. For such projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment.”

The recital further explains that in order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out in accordance with European Union or member state legislation.

The purpose of this chapter is to identify the requirement for an assessment of major accidents and disasters and to outline a potential approach to the assessment to occur as part of the EIA process should an assessment be required.

The chapter thus covers the following topics:

- The vulnerability of the Proposed License Amendment to natural disasters or a major accident from existing sources of hazards;
- The risk of the Proposed License Amendment creating a new source of a major accident; and
- The environmental consequences of these events

17.2 Legislation, Policy and Guidance

Table 17-1. Legislation, Policy and Guidance

Legislation, Policy and Guidance	How does the legislation shape the assessment
EIA Directive 2014/52/EU	Requires an assessment of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned.
Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA draft, 2017	The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other regulations e.g. a COMAH (Control of Major Accident Hazards involving Dangerous Substances) assessment.
Guide to Risk Assessment in Major Emergency Management, Department of the Environment, Heritage and Local Government, 2010.	Provides criteria to enable the assessment of risk for this topic.

17.3 Baseline Conditions and Data Sources

Where relevant, baseline information regarding the mine and baseline information from previous surveys will form part of the baseline data collection.

17.4 Assessment Methodology

17.4.1 Study area

The distance and buffers used for the assessment will be informed by professional judgement aligned with experience from assessment of potential major accidents and disasters at similar facilities. The study will also take into consideration the study areas from other chapters of the EIAR.

- The study area and receptors will be kept under review as the Proposed License Amendment progress through the EIA process as more information becomes available.

17.4.2 Proposed Methodology and Assessment Scope

The current EIA assessment approach (prior to the revised EIA Directive 2014/52/EU) already considered some accidents and disasters such as the potential for pollution to ground and surface waters, the potential pathways to sensitive biodiversity receptors (through AA) and the potential for flood events.

For the assessment, the scope and methodology is based on the assumption that the Proposed License Amendment will be carried out in line with relevant best practice guidelines. Therefore, major accidents and disasters are unlikely to occur. However, the assessment will be carried out in order to identify major accidents and disasters that could potentially occur during the operational phase.

A risk analysis-based methodology will be used in the assessment scope, covering identification, likelihood and consequence of major accidents and/or natural disasters. The assessment of the risk of major accidents and/or disasters will consider all factors defined in the EIA Directive 2014/52/EU, i.e. Population & Human Health, biodiversity, land and soil, water, air and climate, material assets, cultural heritage and the landscape. The approach is based on the EPA's 'Guidance on Assessing and Costing Environmental Liabilities' (2014) and the 'Guide to Risk Assessment in Major Emergency Management' (Department of the Environment, Heritage & Local Government, 2010).

The following stages will be undertaken as part of the risk assessment:

- **Stage 1:** Risk identification/baseline establishment – confirm the existing baseline, establish an understanding of the interface of the Proposed License Amendment with existing operations, identify possible risks and review potential receptors to identify any groups not considered necessary to include in the assessment.
- Major accidents and disaster risks are not assessed or brought forward to the next stage if they are considered 'not reasonably foreseeable'. Potential major accidents or disasters can be left out for a variety of reasons which may include; no receptors exist, no source of major accidents exist, no pathway exists, and the risk is being assessed in another part of the EIA, amongst others.
- **Stage 2:** Risk classification: likelihood and consequence– having identified potential risks, the likelihood of a risk occurring and the consequence of the risk if the event occurs will be assessed. Major events originating from stage 1 will create a short list and their relevance to the Proposed License Amendment will be considered. An analysis of the proposed environmental mitigation measures throughout the EIAR will be considered when estimating the likelihood of the identified potential risks occurring. It should also be noted that when the consequence rating is categorised to each risk, it will assume all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster.

Table 17-2. Risk Classification - Likelihood

Ranking	Category	Description
1	Extremely Unlikely	May occur only in exceptional circumstances; once every 500 or more years
2	Very Unlikely	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities or communities; and / or little opportunity, reason or means to occur; May occur once every 100-500 years.
3	Unlikely	May occur at some time; and /or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisations worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

Source: *Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage and Local Government, 2010).*

Table 17-3. Risk Classification - Consequence

Ranking	Classification	Impact	Description
1	Minor	Life, Health, Welfare Environment Infrastructure Social	Small number of people affected; no fatalities and small number of minor injuries with first aid treatment. No contamination, localised effects <0.5M Euros Minor localised disruption to community services or infrastructure (<6 hours).
2	Limited	Life, Health, Welfare Environment Infrastructure Social	Single fatality, limited number of people affected; a few serious injuries with hospitalisation and medical treatment required. Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements. Simple contamination, localised effects of short duration 0.5-3M Euros Normal community functioning with some inconvenience.
3	Serious	Life, Health, Welfare Environment Infrastructure Social	Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation. Large number of people displaced for 6- 24 hours or possibly beyond; up to 500 evacuated. External resources required for personal support. Simple contamination, widespread effects or extended duration 3-10M Euros Community only partially functioning,
4	Very Serious	Life, Health, Welfare Environment Infrastructure Social	5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated Heavy contamination, localised effects or extended duration 10-25M Euros Community functioning poorly, minimal services available
5	Catastrophic	Life, Health, Welfare Environment Infrastructure Social	Large numbers of people impacted with significant numbers of fatalities (>50), injuries in the hundreds, more than 2000 evacuated. Very heavy contamination, widespread effects of extended duration. >25M Euros Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support.

Source: *Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage and Local Government, 2010).*

- **Stage 3:** Risk evaluation/risk management options –The likelihood and consequence ratings are then multiplied to form a risk score for risk and ranked. The purpose of the risk evaluation is to assist in making decisions, using the outcomes of the risk analysis identifying and prioritising the risks for mitigation/treatment. A risk matrix will be developed to allow the risks to be easily displayed and prioritised.

17.5 Potential Significant Effects

The assessment will consider potential major accidents and disasters that could potentially occur relating to the Proposed License Amendment. A construction phase has been scoped out of the assessment as no construction or alternation to existing infrastructure is proposed as part of the Proposed License Amendment. Those that are considered significant (if any) will be progressed further within the EIA. Low consequence events do not meet major accidents and disasters definitions and therefore are not considered in this section. Potential major accidents and disasters which are assessed to be not credible, i.e. those where there is no source, pathway or receptor, or where the magnitude of damage is below the threshold of a major accident and disaster, will not be considered further.

17.5.1 Construction Phase Impacts

Table 17-4. Construction Phase Impacts

Activity	Impact	Scope In/Out
N/A no construction is proposed as part of the Proposed License Amendment	N/A	Scope out – no construction is proposed as part of the Proposed License Amendment

17.5.2 Operational Phase Impacts

Table 17-5. Operational Phase Impacts

Risk Factor	Impact	Scope In/Out
Meteorological events such as extreme rainfall, heatwaves, extreme cold or storms.	Potential injury or loss of life, increased risk to operating procedures	Scope Out – the Proposed License Amendment is focused on an increase in the licensed amount of sulphate that can be released into the River Bursk only
Geological and seismic hazards such as unstable ground or earthquakes.	Damage to structures and underground services	Scope Out – The Proposed License Amendment is focused on an increase in the Licensed amount of sulphate that can be released into the River Bursk only
Other natural hazards such as geomagnetic storms, or solar flares	Damage to electronic equipment, exposure of people to elevated levels of radiation	Scope Out – this is considered unlikely given the type of operation and the subject of the Proposed License Amendment.
Sites operating under Integrated Pollution Control or requiring other safety related regulatory consents.	Accidents involving spillage or leaks of hazardous chemicals	Scope Out – There is no significant increase in risk from the proposed license activity above the current license activity
Fuel storage and fuel pipelines.	Leak or explosion	Scope Out – The Proposed License Amendment is focused on an increase in the Licensed amount of sulphate that can be released into the River Bursk only
Unearthing of an historic site specific hazard (e.g. unexploded ordnance, ground contamination, landfill gas, asbestos)	Fatalities, injuries and damage to property within the study area, potential release of environmentally damaging substance	Scope Out – The Proposed License Amendment is focused on an increase in the Licensed amount of sulphate that can be released into the River Bursk only and does not include any proposal for the development of infrastructure or disturbance of ground.
Structural collapse / component failure of permanent or temporary structure including man-made and natural causes e.g. seismic	Fatalities, injuries to people within the study area, potential release of environmentally damaging substance	Scope Out - No underground structures to be used in the proposed license amendment.
Major Groundwater Contamination	Spill or leakage (release of contaminated firewater/fighting foam/ incorrect chemicals or equipment failure)	Scope Out - There is no significant increase in risk from the proposed license activity above the current license activity

17.6 Summary

Although instability of land has occurred following unforeseen circumstances in 2018, the Proposed License Amendment is to alleviate pressures which contributed to the occurrence of these unforeseen circumstances. As the Proposed License Amendment relates to an increase in the current compliance limit value for sulphate only and does not require any additional infrastructure, it is considered unlikely to influence the effect of major accidents or disasters by acting as a source of major accident or a pathway between a source of major accident/disaster and a receptor. Further assessment is therefore **scoped out** of the EIAR.

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18 Conclusion

18.1 Introduction

This chapter describes the conclusions reached in the scoping process, sets out the proposed structure of the EIAR and identifies the potentially significant environmental matters that will be addressed in each topic chapter.

Based on the scoping exercise undertaken the following topics are recommended to be brought forward for further assessment:

- Biodiversity
- Hydrology and Hydrogeology

The most likely significant impact associated with the proposed project will be related to potential impacts on the water environment into which the mine water discharges. This includes the River Bursk, the River Lagan/Glyde, and two loughs along the route of the River Glyde. The upper reaches of the River Bursk contain salmonid spawning and nursery habitat, and the lower reaches constitute suitable habitat for adult salmonid and coarse fish. Downstream of the River Bursk, there is nursery and adult salmonid habitat, and coarse fish habitat, in the River Glyde.

It was identified, significant effects on aquatic ecological features could result directly from the altered chemical and physical properties of freshwater receiving the mine discharge (raised sulphate concentration, calcium concentration and conductivity). However, there is also the potential for significant indirect effects on other ecological features as a result of these effects.

Additional potential significant effects for further consideration within the EIAR include the potential of a reduction in water quality at surface water extraction points, a reduction of water quality at surface water abstraction points, Tallanstown pumping station and other potential abstraction points, and Localised impacts on nearby shallow groundwater wells.

18.2 Proposed Structure and Content of EIAR

A summary of the proposed structure of the EIAR, together with the matters to be investigated, is set out below. Please consult the topic chapters and the overall methodology above for further details.

1. Introduction
2. Project Description
3. Examination of Alternatives
4. Biodiversity
 - European designated sites
 - Habitats (including watercourses)
 - Fish
 - Aquatic invertebrates
5. Hydrology and Hydrogeology (including Groundwater)
 - Water quality at surface discharge locations
 - Water quality at surface water abstraction points
 - Shallow groundwater wells
6. Interactions of the Forgoing
7. Mitigation and Monitoring (if required)

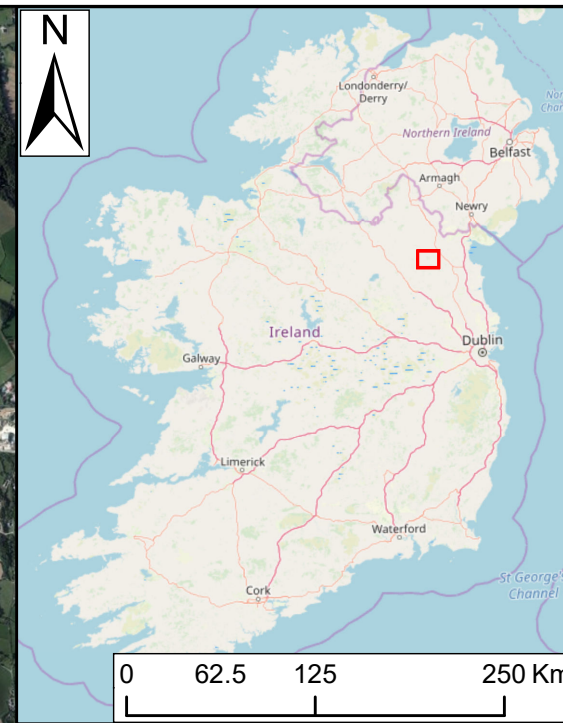
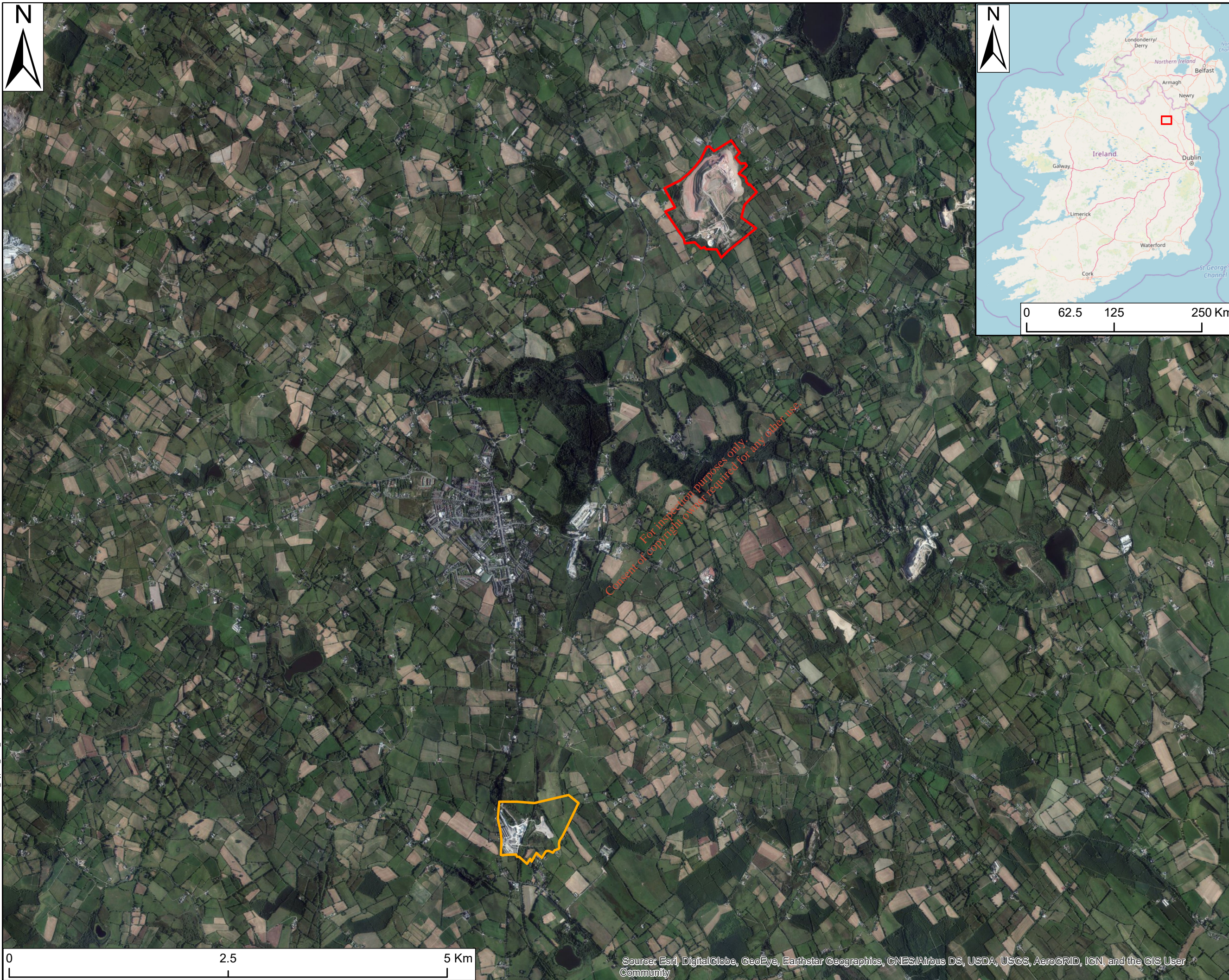
In addition, the EIAR will include a Non-technical Summary of the above information, together with supporting technical appendices.

Appendix A Figures

Figure 1: Mine Site and Factory Site Locations

Figure 2 Mine Site Layout

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Project Title:
GYPROC SITE,
KNOCKNACRAN,
CO. MONAGHAN

Client:
SAINT-GOBAIN
CONSTRUCTION
PRODUCTS (IRELAND)
LIMITED

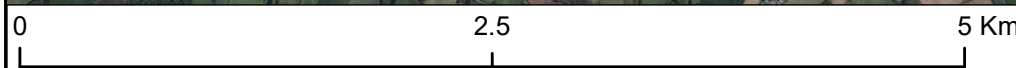
LEGEND

IPCC Boundary

- Mine Site
- Factory Site

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Filename: \\du-man-002.scotwilson.co.uk\Dublin-Jobs\GIS\PR-462978_Gyproc_Mine_Site\GIS\02_Maps\Figure 1 - Site Location.mxd



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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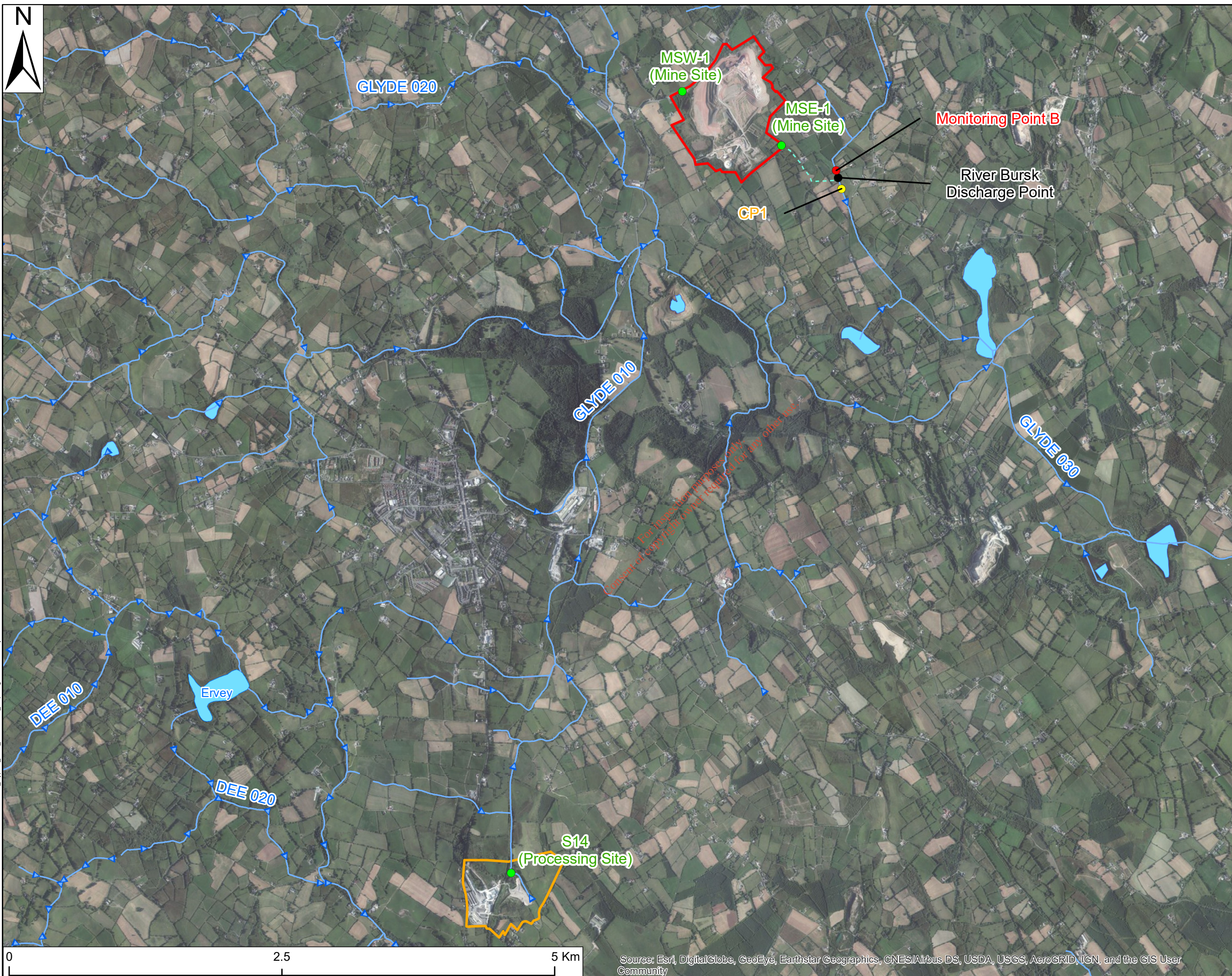
Drawing Title:
SITE LOCATION

Scale at A3: 1:40,000

Drawing No:

FIGURE 1

Drawn:	Chk'd:	App'd:	Date:
DG	AT	MV	07/02/20



Project Title:
GYPROC SITE,
KNOCKNACRAN,
CO. MONAGHAN

Client:
SAINT-GOBAIN
CONSTRUCTION
PRODUCTS (IRELAND)
LIMITED

- LEGEND**
- Mine Site
 - Factory Site
 - Waterbodies
 - Underground Discharge Line
 - ▶ Watercourses
 - Monitoring Points
 - Discharge Points
 - Compliance Points
 - Emission Points

AECOM Internal Project No:
PR-462978

Drawing Title:
SITE LAYOUT

Scale at A3: 1:32,000

Drawing No:

FIGURE 2

Drawn:	Chk'd:	App'd:	Date:
DG	AT	MV	19/02/20

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