REPORT

Lisheen

Stage 1 Screening - Natura 2000

Submitted to:

Lisheen Mine

Lisheen Mine Partnership
Lisheen Mine
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Co. Tipperary

Submitted by:

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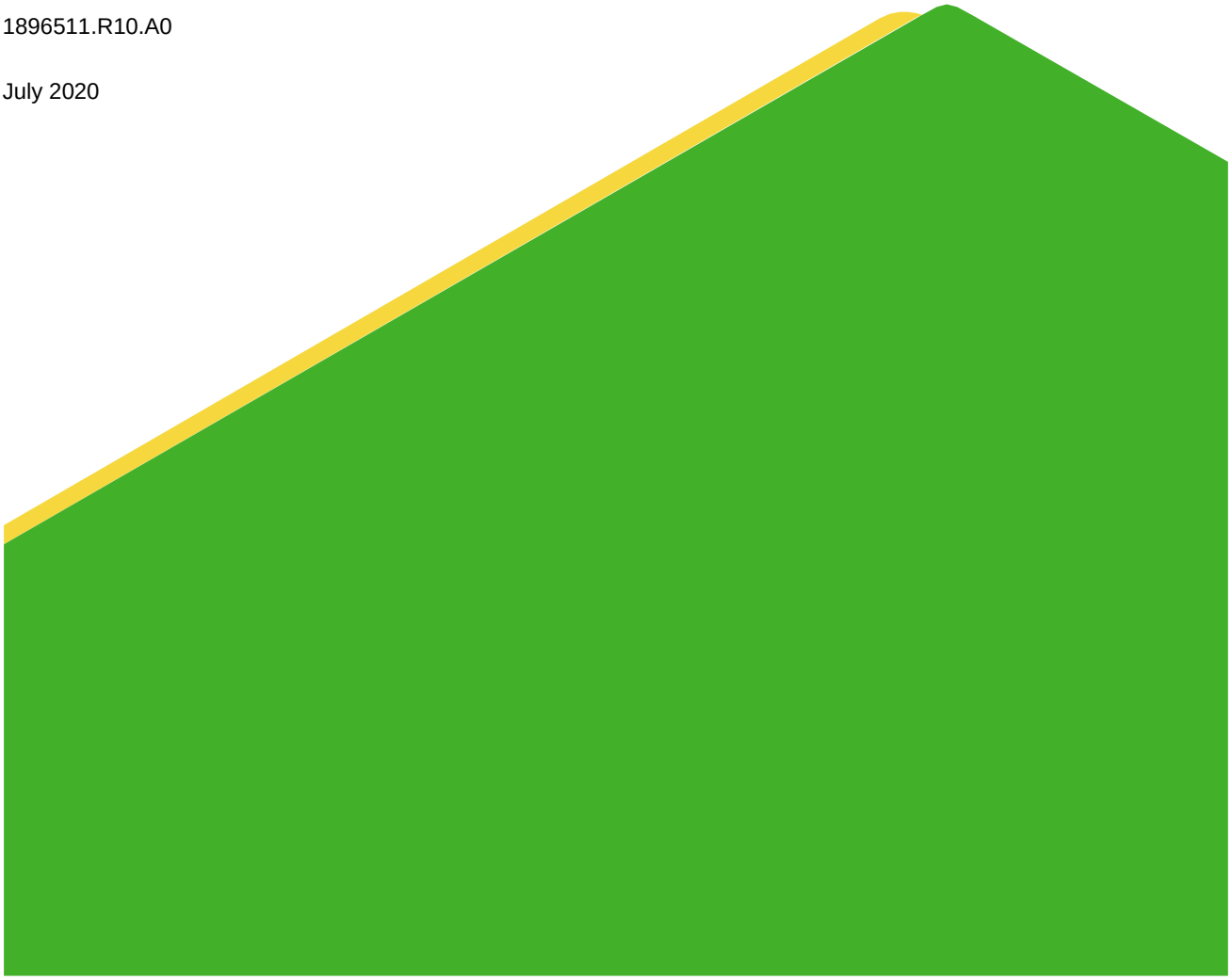

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1.0 INTRODUCTION

Golder Associates Ireland Limited ('Golder') was requested by the Lisheen Mine Partnership ('Lisheen') to carry out a Stage 1 Screening an Appropriate Assessment (AA) for their Integrated Pollution Control Licence (IPCL) project (the 'Project') located at Lisheen Mine (the 'Site') in Co. Tipperary. The Stage 1 Screening comprised an appraisal of potential impacts on European designated conservation sites within a 15 km radius of the Site. This appropriate assessment screening has been prepared by **Freddy Brookes MSc., MCIEEM – Senior Ecologist,** Golder Associates. The terms of reference of this report are set out below.

1.1 Rationale for study

The Sites IPCL defines a surface water discharge location ("emission point") for the Drish River. The discharge point is located over 14 km upstream (straight line distance) of the confluence with the River Suir. The Site operator must meet a series of water quality ("emission limit values" or ELVs) and quantity ("volume to be emitted") conditions at the discharge point which are defined in the licence. From 22 December 2015, the IPCL defined a reduction in ELVs for biochemical oxygen demand (BOD), orthophosphate, ammonia, arsenic, mercury, cadmium, lead, zinc, copper and nickel (EPA, 2014).

This report references the accompanying report '*Support document for the revision of IPCL Emission Limit Values'* (Piteau, 2020), which presents a methodology for assessing the ELVs based on best available techniques and, where applicable, proposes alternative ELVs which are more appropriate to the local conditions, while ensuring that environmental and Natura 2000 objectives are achieved. It is important to note the following details. There are no new 'plans, projects or activity' proposed at the Site. There will be no change in emissions to the receiving environment. This Stage 1 Screening simply seeks to address the potential for significant effects to Natura 2000 sites as a consequence of discharging water through the existing passive treatment system at the proposed ELV limits described by Piteau (2020) and summarised herewith.

1.2 Terms of Reference

This screening has been undertaken in accordance with the requirements of the EU Habitats Directive (Directive 92/43/EEC). Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora – the 'Habitats Directive' - provides legal protection for habitats and species of European importance. Article 2 of the Directive requires the maintenance or restoration of habitats and species of European Community interest, at a favourable conservation status. Articles 3 - 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as *Natura 2000*. Natura 2000 sites are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC).

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans or projects affecting Natura 2000 sites. Article 6(3) establishes the requirement for Appropriate Assessment:

> *"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."*

Article 6(4) deals with the steps that should be taken when it is determined, as a result of Appropriate Assessment, that a plan/project will adversely affect a European site. Issues dealing with alternative solutions, imperative reasons of overriding public interest and compensatory measures need to be addressed in this case.

Article 6(4) states:

> *"If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.*
>
> *Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."*

The requirements of Articles 6(3) and 6(4) of the Habitats Directive have been transposed into Irish legislation by means of the Habitats Regulations, 1997 (S.I. No. 94 of 1997) and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011).

2.0 METHODS

2.1 Desktop Review and Data Collation

A desktop review was conducted of available published and unpublished information, together with a review of data available on the NPWS http://www.npws.ie/en/, National Biodiversity Data Centre http://maps.biodiversityireland.ie/, and Environment Protection Agency web-based databases. In addition, reports pertaining to the biodiversity status of the Site were also reviewed and are referenced within this report, they are:

- Habitat Quality of the Clogheen Stream in the Vicinity of the Lisheen Mine Site. (Sweeney, 2020a);
- Lisheen Mine Receiving Water Monitoring – Biological. Invertebrates, Diatoms, Macrophytes. (Sweeney, 2020b);
- The Lisheen Mine - Closure, Restoration & Aftercare Management Plan (CRAMP 2009-2013) (2009);
- Environmental Monitoring of the Drish and Rossestown Rivers, Co. Tipperary (2006);
- Recommendations for ecological and sediment quality monitoring in the Rivers Drish and Rossestown downstream of the Lisheen Mine, Co. Tipperary (Jarvis, A.P. and Kelly, M., 2007);
- Lisheen Mine Biodiversity Action Plan (2013);
- Summary Reports Lisheen Mine– Biological Monitoring of the River Drish (2013);
- South Eastern River Basin District Characterisation Report (WFD,2010);
- Upper Suir WMU Action Plan 2010 (WFD,2010);
- Rossestown, Tributary of the Suir IE_SE_16_4121 WFD Report;
- Drish, Tributary of Drish Suir IE_SE_16_3521 WFD Report;

- Water Framework Directive Annex IV Protected Areas: Water Dependent Habitat and Species, and High Status Sites (Mayes, 2008); and
- Report on River Water Quality in North Tipperary (EPA, 2011).

2.2 Screening for Appropriate Assessment

This report has been prepared with reference to the following documents:

- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6 (3) and (4) of the Habitats Directive 92/43/EEC (European Communities, 2002);
- Managing Natura 2000 sites: the provisions of Article of the 'Habitats Directive' 92/43/EC; and
- Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. (DOE, 2009, Revision Notes 2010).

Appropriate Assessment is carried out in stages, as recommended by the above-referenced Guidance Documents. There are four stages as follows:

2.2.1 Stage 1: Screening

This initial stage aims to identify the likely impacts of the project on a Natura 2000 site, either alone or in combination with other projects or plans. The impacts are examined to establish whether these impacts are likely to be significant. Assessment of the significance of effects is carried out in consultation with the relevant nature agencies.

2.2.2 Stage 2: Appropriate Assessment

The aim of this stage is to identify the conservation objectives of the site and to assess whether or not the project, either alone or in combination with other projects or plans will result in adverse effects on the integrity of the site, as defined by the conservation objectives and status of the site. Stage 2 is carried out in consultation with the relevant nature agencies. Where it cannot be demonstrated that there will be no adverse effects on the site, it is necessary to devise mitigation measures to avoid, where possible, any adverse effects.

2.2.3 Stage 3: Assessment of Alternative Solutions

This stage examines alternative ways of implementing the project that, where possible, avoid any adverse impacts on the integrity of the Natura 2000 site. If alternative solutions have been identified that will either avoid any adverse impacts or result in less severe impacts on the site, it will be necessary to assess their potential impact by recommencing the assessment at Stage One or Stage Two as appropriate. However, if it can be reasonably and objectively concluded that there is an absence of alternatives, it will be necessary to proceed to Stage Four of this assessment methodology.

2.2.4 Stage 4: Assessment where Adverse Impacts Remain

For sites that host priority habitats and species, it is necessary to consider whether or not there are human health or safety considerations or environmental benefits flowing from the project. If such considerations do exist, then it will be necessary to carry out the Stage Four assessments of compensatory measures. If no such considerations exist, then it is necessary to establish whether there are other imperative reasons of overriding public interest (IROPI) before carrying out the Stage Four assessments. Where IROPI exist, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the site will be necessary before the project or plan can proceed.

This report is for Screening (Stage 1) for Appropriate Assessment only.

3.0 PROJECT OPERATION

Dewatering of the mine Site concluded in December 2015. By January 2018, the groundwater table had recovered to baseline levels as recorded in the pre-mining hydrogeological studies. Most surface infrastructure was dismantled, and the land surface restored once all mining and processing on site had ceased (Piteau, 2020).

A retention basin was constructed adjacent to the Site's Tailings Management Facility (TMF) to collect drainage and run off from cells within the TMF. Runoff from the TMF is discharged via three spillways to a transfer box and then flows into a retention basin. The TMF is designed to be a passive system which essentially collects precipitation within the catchment, minimises contact of this precipitation with the tailings and discharges this precipitation during periods of low evapotranspiration. Discharge from the retention basin occurs once the water level reaches the spillways' level. Water flows through a channel to the Clogheen Pond, from where it discharges to the Clogheen Ditch (a field drainage system). The Clogheen Ditch is part of a field drainage system and so also receives water from the adjacent fields along its 4 km course before reaching the River Drish, which flows into the Lower Suir SAC approximately 20 km downstream of the Site. The water quality from the Site via source pathway receptors, specifically Natura 2000 receptors, is the focus for this Stage 1 Screening Assessment.

4.0 THE RECEIVING ENVIRONMENT

Aquatic receptors are the key focus for the Stage 1 Screening process as there are no habitat or species synergies between Natura sites and the Project Site. Aquatic habitat can provide ecological connectivity between a Site and sensitive receptors such as Natura 2000 sites.

4.1 Receiving Watercourses

As described by Piteau (2020), site water flows via the Clogheen ditch to the River Drish:

The Drish is located to the south of Lisheen and flows southwest before joining the Suir River 2 km south of Thurles (14 km downstream of SW1). In the vicinity of the mine, the Drish has a catchment area of ca. 54 km² and a median flow of ca. 47 MLD (0.54 m³/s). The Drish is within the South Eastern River Basin District (SERBD). This is an administrative area for managing the WFD objectives and monitoring for all rivers in the southeast of Ireland.

The SERBD is responsible for dividing the surface water catchments into 'water management units' and creating an action plan for meeting the objectives of the WFD as defined in the Regulations (see Section 2). The Drish is within the Drish Water Management Unit. For the purposes of setting objectives, this area is further divided into 'sub basins' as shown in Table 3-3 and Figure 3-2. The SERBD water management unit action plan (last updated in 2010) for the Drish (Appendix B) states that the objective for the Drish sub basins is to achieve good status is 2021. Therefore, Article 30 from the Regulations has been used to extend the deadline for meeting the environmental objectives by 6 years from 22nd December 2015. For the purposes of monitoring and assigning status, the water management units are divided into reaches. SW1 is located in the Upper sub basin (code: SE_16_970), part of Drish_040. The status for the reach (as published in March 2010) shows that it is classified "Poor".

4.2 Flora and Fauna Baseline Conditions

Biological monitoring of the River Drish has been undertaken by the EPA and Lisheen Mine over the past 20 years. A yearly sampling programme has been undertaken on behalf of Lisheen Mine since 2004. This entails three sampling events for aquatic invertebrates (Q values), macrophytes and diatoms. The river is sampled

upstream and downstream of the Lisheen Mine discharge point (Figure 1 below). The 2020 suite of surveys have been undertaken and the results of the water quality and habitat survey for the Clogheen Stream which eventually feeds the River Drish are summarised as follows; '*The channel of the Clogheen Stream in the vicinity of the Lisheen Mine site does not support any significant plant or animal species. This is because it can dry out in May, it cannot support any fish life. While adult frogs could potentially live here in wet or damp conditions, if they were to spawn here, tadpoles could not survive drying out. Overall the ecological importance of the channel in proximity to the Lisheen Mine site is low and is equivalent to that of an average field boundary drain Sweeney (2020a).'*

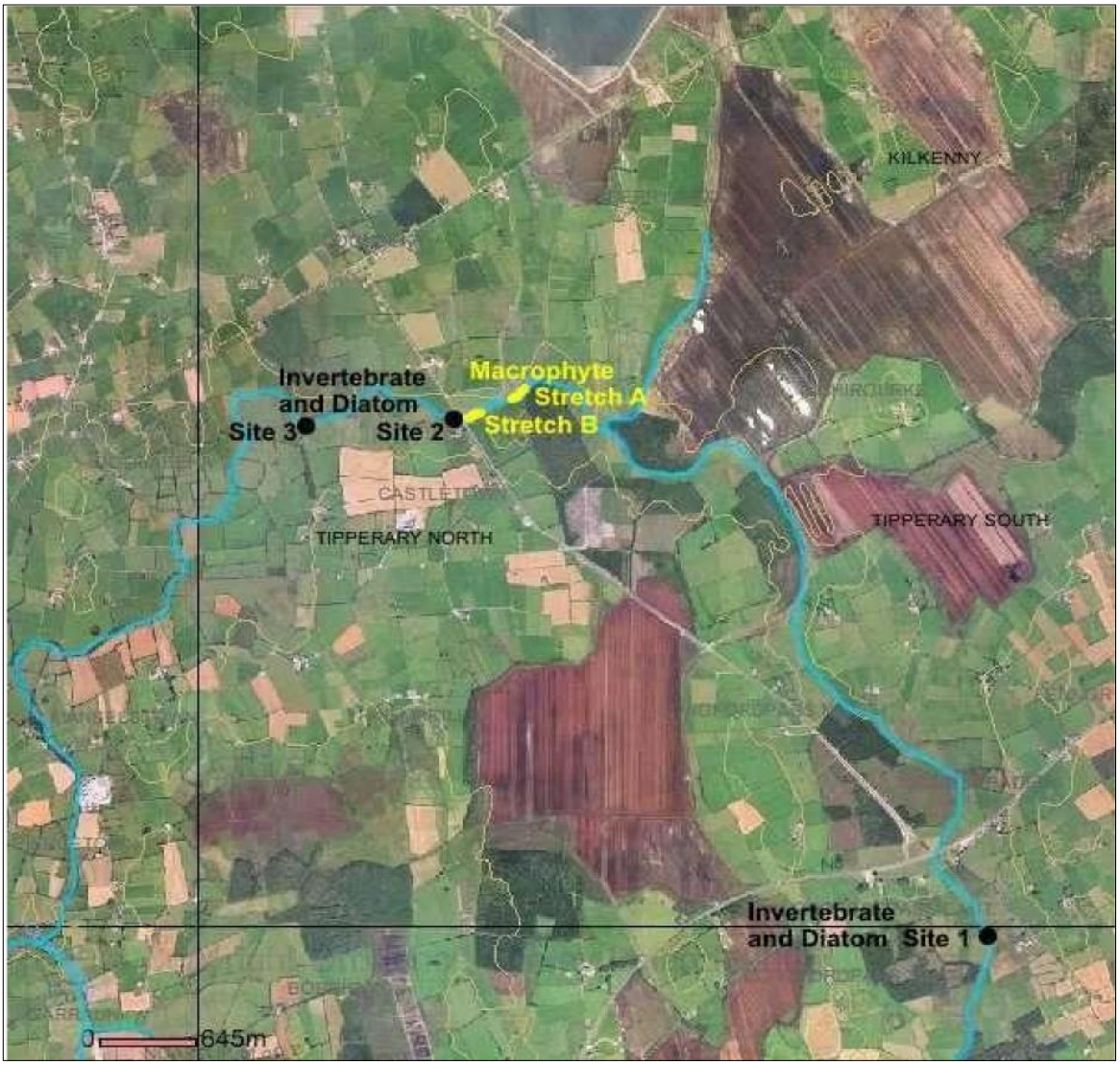

Figure 1: Biological Monitoring Points - Sweeney 2020

A broader suite of monitoring over a larger survey area, consistent with previous years surveys was undertaken as described by Sweeney (2020b); *'the biological water quality of the Drish upstream of the Lisheen Mine remains in unsatisfactory condition, with an added impact of siltation affecting the fauna. Q3 (Poor Condition) was also recorded at Sites 2, 3 and 4, as has been the case on every sampling occasion May 2016. Although missing Group A indicator species, the fauna at all sites downstream of Lisheen Mine is diverse, with representation of all major invertebrate taxonomic groups, indicating that there is no evidence of any residual toxic impact on the fauna at any of the sites assessed.*

As siltation prevented analysis of the diatom fauna at Site 1, a comparison between the two sites cannot be made. The TDI recorded at Site 3 is similar to that recorded here in June 2018. The macrophyte results do not show any significant difference between the two stretches of river assessed, with close MTR values calculated from the species assemblages. The May 2020 MTR results are also similar to those calculated for the flora in these two stretches of the river in June 2018. Overall, apart from a siltation impact at Site 1, due to livestock access, the biological water quality of the River Drish in the vicinity of the Lisheen Mine is practically unchanged from that last recorded by EPA in July 2017 and by Sweeney Consultancy in June 2018.'

4.3 Natura 2000 Sites

Sites of international importance including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are collectively known as Natura 2000 sites. These sites contain examples of some of the most important natural and semi-natural ecosystems in Europe. The designated search area was 15 km from the Project for Natura 2000 sites as this was deemed to be an ecologically relevant buffer zone. There are five Natura 2000 sites in the 15 km radius of Lisheen Mine and these are given in Table 1 and shown in Figure 2.

Table 1: Natura 2000 sites within the Desk Study Area

Site	Approximate distance from Application Site	Site Code
Galmoy Fen	SAC	001858
Cullahill Mountain	SAC	000831
Spahill and Clomantagh Hill	SAC	000849
The Loughans	SAC	000407
Lower River Suir	SAC	002137

These sites above are summarised below:

- Galmoy Fen SAC (Site Code: 001858) is designated for Alkaline fen 7230;
- Cullahill Mountain SAC (Site code: 000831) is designated for Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*) (*Important orchid sites) 6210;
- Spahill and Clonmantagh Hill SAC (Site Code: 000849) is designated for Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*) (*Important orchid sites) 6210;
- The Loughans SAC (Site Code: 000407) is designated for *Turloughs 3180; and
- Lower River Suir SAC (Site Code: 002137) is designated for a number of aquatic species and habitats.

Cullahill Mountain SAC and Spahill / Clonmantagh Hill SAC are not considered further in this assessment as the designated features of semi natural grasslands are not impacted by Lisheen Mine. Galmoy Fen SAC and Loughans SAC are also not considered further as although the fen and turlough are groundwater dependent terrestrial habitats, they do not lie within the Lisheen Groundwater Body (GWB) (www.wfdireland.ie).

Lisheen mine discharges to the Drish River and this river occurs within 15 km upstream of the River Suir SAC – an EU designated Natura 2000 site. Therefore, the Lower River Suir SAC is the focus of the Stage 1 Screening report.

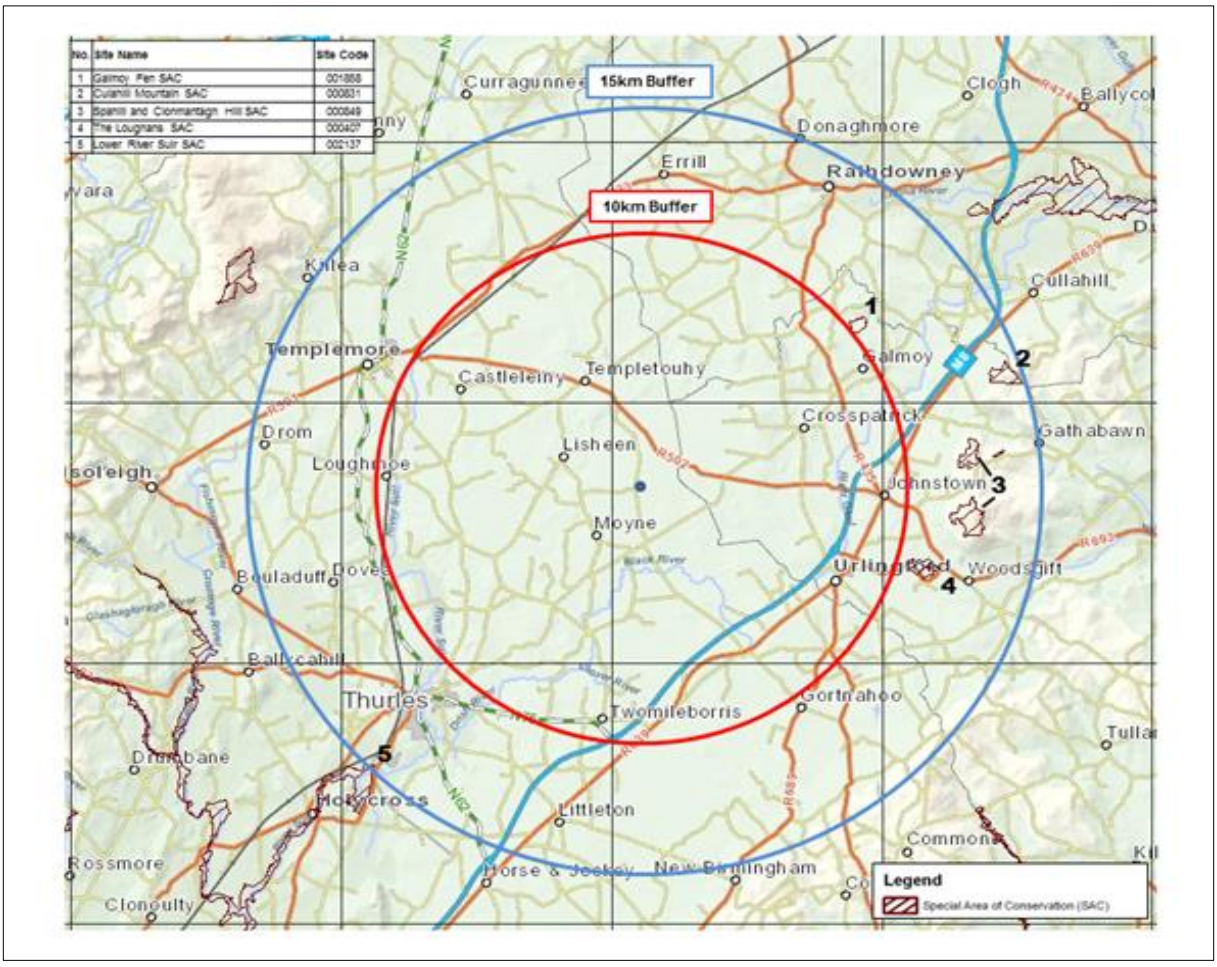

Figure 2: Natura 2000 sites within 15 km of the Site

Hydrological connectivity between the Site and the Lower River Suir is facilitated via the Drish River. The distance between the Site and the Lower River Suir SAC is approximately 20 km as measured watercourses or 15 km as a straight line measurement (Figure 3 below).

Figure 3: Lower Suir SAC and Site Location

5.0 STAGE 1 SCREENING ASSESSMENT CRITERIA

5.1 Describe any likely direct, indirect or secondary impacts of the Project (either alone or in combination with other plans or projects) on the Natura 2000 sites by virtue of:

Size and Scale	There are no new 'plans, projects or activity' proposed at the Site. There will be no change in emissions to the receiving environment. This Stage 1 Screening simply seeks to address the potential for significant effects to Natura 2000 sites as a consequence of discharging water through the existing passive treatment system at the at the proposed ELV limits described by Piteau (2020).
Land-take	None from Natura 2000 sites. The closest Natura 2000 site is ca. 20 km via a hydrological link.
Distance from Natura 2000 site or key features of the site	■ Lower Suir SAC (ca. 20 km south west, ca. 15 km 'as the crow flies'.).
Resource requirements (water abstraction etc.)	No resources from a Natura site are required.
Emissions (disposal to land, water or air)	**Air Emissions** Air emissions from the project Site are unlikely to cause impacts on the Natura 2000 site due to the nature of project proposals and relative lack of proximity. **Groundwater** Any interaction with groundwater will be localised with no hydrogeological connectivity to SAC receptors. **Surface Water Management** There will be no change in emissions to the receiving environment. Proposed ELV limits should be evaluated in the context of significant dilution occurrence as the passive site water management system only releases Site water during high rainfall events through a notched weir system. Discharge can only take place from Lisheen during times of high rainfall / low evaporation and at these times the rivers will have good flow and increased assimilative capacity. Evidence presented by Piteau (2020) as shown in Figure 3-4 to Figure 3-6 (and the charts included in Appendix C, Piteau 2020) indicate that presently the Site discharge is not having a negative impact on the Drish River and therefore the downstream Natura receptor (ca. 20 km). Parameters such as zinc and nickel are consistently in compliance with the EQS in the Drish River downstream of the SW1 discharge despite non-compliances being recorded for the same parameters in addition to BOD and COD in the SW1 discharge itself (Table 4-4, Piteau, 2020). This monitoring data and the associated assimilative capacity presented in the Piteau report demonstrate that higher ELVs could be applied to the Lisheen discharge that would not result in a residual effect to ecological receptors including the downstream Natura 2000 Site.

Excavation requirements	There are no excavation requirements within the Natura 2000 site.
Transportation requirements	No traffic movements will affect the Natura 2000 site.
Duration of construction, operation, decommissioning etc.	The passive operation of surface water management at the Site will occur in perpetuity.
Other	None.

5.2 Describe any likely changes to the Site arising as a result of:

Reduction of habitat area	None to Natura 2000 sites.
Disturbance to key species	Disturbance to Natura qualifying species is considered to be improbable.
Habitat or species fragmentation	There will be no habitat or species fragmentation. The Site is not part of the Natura 2000 site in question and no resources are required from it. Designated habitats and species of the SAC will not be impacted given their distance from the Site.
Reduction in species density	No reduction in species density is anticipated.
Changes in key indicators of conservation value (water quality etc.	None.
Climate change	No significant contribution.

5.3 Describe any likely impacts on the Natura 2000 sites as a whole in terms of:

Interference with the key relationships that define the structure of the site:	No impacts are likely.
Interference with key relationships that define the function of the site	No impacts are likely.

5.4 Provide indicators of significance as a result of the identification of effects set out above in terms of:

Loss (Estimated percentage of lost area of habitat)	There will be no habitat loss.
Fragmentation	There will be no habitat fragmentation.
Disruption and disturbance	Disturbance and disruption to species is considered highly unlikely. Species for which the Natura 2000 sites have been designated are highly unlikely to utilise the Site or be influenced by the Site in terms of water quality due to distance and a lack of environmental connectivity between sites.
Change to key elements of the site (e.g. water quality etc.)	There will be no change in emissions to the receiving environment. The current and proposed ELV limits should be evaluated in the context of significant dilution occurrence as the passive site water management system only releases Site water during high rainfall events through a notched weir system.

5.5 Cumulative Impact – Screening

Cumulative impacts are defined as impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project (European Communities, 1999). A review of the County Tipperary Council planning website portal was undertaken for details of other developments in the area which might give potential for cumulative impacts to arise. It is assumed that all consented projects will have been rigorously scrutinised and appropriate mitigation committed to safeguard Natura 2000 sites. As such, no significant cumulative effects are predicted to the Lower Suir SAC.

6.0 CONCLUSION

The passive water management system at the Site continues to function in a way that is not detrimental to the ecological health of receiving waters. This assertion is made when considering that '*the aquatic invertebrate fauna at all sites downstream of Lisheen Mine is diverse, with representation of all major invertebrate taxonomic groups, indicating that there is no evidence of any residual toxic impact on the fauna at any of the sites assessed* Sweeney (2020b).

To reiterate, there will be no change in emissions to the receiving environment. Discharge can only take place from Lisheen during times of high rainfall / low evaporation and at these times the rivers will have good flow and increased assimilative capacity. As described in sections above, the proposed ELVs are considered highly unlikely to adversely affect Natura sites which are situated ca. 20 km downstream of the Site. Within this Stage 1 Assessment it is therefore considered highly unlikely that the proposed Project will significantly impact on the Natura 2000 site described in this Stage 1 Screening Assessment. There is a high level of confidence in the likely degree of the magnitude of impacts in accordance with the site operation and as such it is concluded objectively that significant effects to Natura sites will not be afforded.

7.0 REFERENCES

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