



DALRADIAN GOLD LTD

CURRAGHINALT PROJECT
COUNTY TYRONE
NORTHERN IRELAND

**SHADOW
HABITATS REGULATIONS
ASSESSMENT**

November 2025
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1. INTRODUCTION AND BACKGROUND

1.1. Background & Proposals

- 1.1.1. Bennu Environmental Ltd was commissioned by Dalradian Gold Ltd (DGL), in relation to matters concerning the Curraghinalt Project, County Tyrone (the Application Site).
- 1.1.2. The Curraghinalt Project is concerned with prospecting / exploration and mining for gold (the Curraghinalt deposit) in County Tyrone, Northern Ireland.
- 1.1.3. Project design decisions have been informed through the undertaking of an Environmental Impact Assessment (EIA). The application for planning permission was supported by an Environmental Statement (ES), produced and submitted in 2017. ES Addendums (Further Environmental Information – “FEIs”), were produced and submitted in 2019 and 2020.
- 1.1.4. This Update (2025) Shadow Habitats Regulations Assessment (sHRA) has been produced in order to supplement and expand upon previous iterations of such assessments submitted by the Applicant. It has been produced in order to reflect:
 - 1) Additional baseline survey results of material importance to the application of the relevant legal tests. Such surveys have been undertaken in order to verify baseline information / assertions submitted by Loughs Agency, or to update those surveys and assessments undertaken by the Applicant, noting the passage of time, to verify existing information on a precautionary basis.
 - 2) The publication, in September 2024, of revised Conservation Objectives for the Owenkillew River Special Area of Conservation (SAC), River Foyle and Tributaries SAC and Upper Ballinderry River SAC.
 - 3) The publication of new guidance, such as that relating to air quality considerations², which necessitates a revision to the assessment process.
 - 4) To address specific concerns raised through the (e.g. Transboundary) consultation process, regarding the need for an updated sHRA to be prepared (see for example An Taisce page 15, Loughs Agency pages 86 to 89, TBA1537 - Dr Strecker pages 8 to 10).
- 1.1.5. For completeness and ease of reference, those preceding sHRAs submitted by the Applicant are as follows:

² Revised Operational Protocol for assessing ammonia and air pollution impacts on the natural environment. A guide for planners and developers.

- a) "Information to inform Habitats Regulation Assessment Pursuant to Article 6(3): Curraghinalt Project" (October 2017), Prepared by Corvus Consulting [see Appendix C10 of the 2017 ES].
- b) "Information to inform Habitats Regulation Assessment Pursuant to Article 6(3): Curraghinalt Gold Project" (July 2019), Prepared by James O'Neill Associates [see Appendix C10 of the 2019 ES Addendum].
- c) "Update Shadow Habitats Regulations Assessment", prepared by Ecology Solutions (November 2020) [see Appendix C10 of the 2020 ES Addendum].

- 1.1.6. This further (2025) assessment is an update and has been undertaken in view of additional information, which was not available at the time of the 2020 sHRA Update. It consolidates relevant evidence and, makes reference to existing information (already before the Inquiry) in order to keep this update sHRA as succinct as possible.
- 1.1.7. The Application Site is not located within any site subject to European / international level designation / protection for nature conservation reasons. However, such sites are present within close proximity and potential pathways for adverse effects to arise, therefore exist.
- 1.1.8. The location of the Application Site in context with relevant designated sites is shown at Plan ECO1 of Appendix C10 of the 2020 ES Addendum.
- 1.1.9. This update sHRA (2025) considers the implications for the relevant designated sites which could arise from the project proposals associated with the Application Site. The information is presented such that in discharging its legal duties, the Competent Authorities (in this instance the Department for Infrastructure – DfI and also DAERA in respect of the water discharges and abstraction applications) can undertake an Appropriate Assessment.

2. SCREENING OF RELEVANT DESIGNATED SITES

- 2.1. As described above, the Application Site is not located within any site subject to European / international protection for nature conservation reasons. The Application Site is however located in close proximity to the Owenkillev River Special Area of Conservation (SAC) and hydrological connectivity exists between the Application Site and this SAC along with several other European designated sites / Ramsar sites.
- 2.2. The following European designated sites / Ramsar sites are located within a 10km radius of the Application Site boundary (maximum extent of exploration):
- I. Owenkillev River SAC;
 - II. Upper Ballinderry River SAC; and
 - III. Black Bog SAC/Ramsar site;
- 2.3. Beyond this 10km radius, the following European designated sites / Ramsar sites are present, which, whilst well removed from the Application Site, are hydrologically linked with it:
- I. River Foyle and Tributaries SAC;
 - II. Lough Foyle SPA;
 - III. Lough Foyle Ramsar site;
 - IV. River Finn SAC (Republic of Ireland); and
 - V. Lough Foyle SPA (Republic of Ireland).
- 2.4. In addition, Teal Lough SAC / Ramsar site is located approximately 12.5km east of the Application Site in the upper reaches of the Owenkillev catchment and with no direct hydrological connectivity to the Application Site.
- 2.5. For clarity the Owenkillev River SAC is located in very close proximity to the Application Site and watercourses which drain the Application Site (including the Curraghinalt Burn to which discharges are proposed³), drain into the Owenkillev River SAC. The Owenkillev River itself drains into the River Strule near Newtownstewart, with the downstream section of the River Strule from this location being designated as part of the River Foyle and Tributaries SAC. The River Foyle system drains into Lough Foyle which is located at the border of Northern Ireland and the Republic of Ireland.
- 2.6. Regarding the River Finn SAC, this designated site is also part of the River Foyle system, with the River Finn discharging into the River Foyle at its confluence with the River Mourne. For assessment purposes, the River Finn itself can be considered 'upstream' of the Application Site although the tidal nature of the River Foyle means that, at times, there is an element of mixing of waters in the southern reaches of the River Finn. Additionally, the River Finn SAC designation extends to cover the western bank / channel of the River Foyle, being contiguous at this point with the River Foyle and Tributaries SAC.

³ Note: Existing consented discharges apply in relation to the Curraghinalt burn. Proposed discharges include a circa 30% uplift in flow rate and stricter regulation in relation to parameters.

3. CONSERVATION STATUS OF DESIGNATED SITES

- 3.1. For each relevant site, information relating to its quality and importance, in nature conservation terms is described within citations, Standard Natura Data Forms and within formal Conservation Objective documents (and supporting Annexes). Relevant information is summarised at Section 4 (internal pages 23 to 28) of Appendix C10 of the 2020 ES Addendum. However, additional information (not included in the 2020 ES Addendum sHRA) is presented below in relation to Black Bog SAC / Ramsar Site and Teal Lough SAC / Ramsar site.
- 3.2. Further, whilst the actual (high level) conservation objectives remain unchanged, it is noted that the Conservation Objectives documents (and supporting Annexes) have been updated (September 2024) in respect of:
- 1) Owenkilley River SAC
 - 2) River Foyle and Tributaries SAC
 - 3) Upper Ballinderry River SAC
- 3.3. Copies of the updated (2024) Conservation Objectives documents for the Owenkilley River and Upper Ballinderry River SACs and those in respect of Teal Lough and Black Bog are included at Annexe 1 of this sHRA. The Conservation Objectives document (2024) in respect of the River Foyle and Tributaries SAC can be found at internal page 489 of the NIEA Water Discharges SoC.
- 3.4. Copies of site designation information, including Conservation Objectives documents which have not been subject to recent revision (or are already before the Inquiry) are included at Annexes 1 to 6 of the 2020 ES Addendum sHRA.

Black Bog SAC

- 3.5. Black Bog SAC is designated on account of it containing active raised bog, for which this is considered to be one of the best areas in the United Kingdom.

Conservation Objectives

- 3.6. The Conservation Objective for this site is as follows:

“To maintain (or restore where appropriate) the active raised bog to favourable condition.”

- 3.7. The current formal Conservation Objectives for this SAC (1st April 2015) are included at Annex 1. For each SAC feature, component objectives are outlined and these include a series of attributes, measures and targets which form the basis of the Condition Assessment.

Black Bog Ramsar Site

- 3.8. Black Bog is designated as a Wetland of International Importance under criteria 1 of the Ramsar Convention. The justification for qualification is provided below:

“The site is a large and relatively intact example of a lowland raised bog and one of the best examples of this habitat in the UK.”

- 3.9. A copy of the Ramsar Information Sheet is included at Annex 1.

Teal Lough SAC

- 3.10. Teal Lough SAC was designated in March 2007 on account of it containing blanket bog, for which this is considered to be one of the best areas in the United Kingdom.

Conservation Objectives

- 3.11. The Conservation Objective for this site is as follows:

“To maintain (or restore where appropriate) the Active Blanket Bog to favourable condition.”

- 3.12. The current formal Conservation Objectives for this SAC) 13th October 2017) are included at Annex 1. For each SAC feature, component objectives are outlined and these include a series of attributes, measures and targets which form the basis of the Condition Assessment.

Teal Lough Ramsar Site

- 3.13. Teal Lough has been selected for designation as a Ramsar site under criteria 1 of the Ramsar Convention. The justification is stated as follows:

“Teal Lough contains one of the most extensive and least disturbed examples of upland blanket peat and raised bog habitats in Northern Ireland, including one of the finest hummock and pool complexes of any raised bog in Northern Ireland.”

- 3.14. The JNCC website states that this site remains as a proposed Ramsar site. A copy of the Ramsar citation downloaded from the DAERA website is included at Annex 1.

4. ASSESSMENT OF THE PROPOSALS: TEST OF LIKELY SIGNIFICANCE

Test of likely significance

- 4.1. This assessment is initially concerned with the (screening) 'likely significant effect' stage of the assessment process. In line with current and applicable case law, this must comprise a broad assessment of the proposals, in the absence of any mitigation or avoidance measures which may be required to address any identified potential significant effects on the SAC. For clarity, where any such measures are deemed necessary, they must be considered under the 'integrity test' associated with an Appropriate Assessment.
- 4.2. It is clear that the formal Conservation Objectives of a European site are the most important consideration in determining whether the plan / project will have an adverse effect on the site, including any effects on its integrity.
- 4.3. It is evident that there is a clear hierarchical approach to assessing effects on European sites in line with the Habitats Directive/Regulations. The primary test is that against the Conservation Objectives with other considerations following these. Such other considerations include:
 1. Other features of interest associated with the site; and
 2. Other relevant baseline information for the site and its immediate surrounds.
- 4.4. In line with the above, whilst the qualifying interest features of the site and other baseline information have informed this assessment, the greatest weight has been placed upon the formal Conservation Objectives for the relevant European site.
- 4.5. In addressing Regulation 43(1) of the Habitats Regulations, this section of the assessment report discusses the relevant potential pathways for a significant effect to occur. This information is presented having regard to the nature and scale of the proposed activities and other relevant information. In line with relevant jurisprudence, this screening exercise is undertaken at a 'high level' and in the absence of any consideration of required mitigation measures, and on a precautionary basis, even where such measures are integral to the proposals.

Potential significant effects

- 4.6. The proposed project is not directly connected with or necessary to the management of any European level designated sites or Ramsar sites.
- 4.7. The proposed project is not directly associated with any European level designated sites or Ramsar site. No potential for direct impacts / adverse effects have been identified. There is however potential for indirect effects to arise in relation to qualifying interest features of relevant designated sites. This information is set out within the tables below.

Owenkillew River SAC

Qualifying Feature and status	Sensitivity and Potential effects	Likelihood of significant effect (LSE)
Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> <i>Unfavourable</i>	Sensitive to water quality, inc sedimentation. Water discharges are proposed into two burns which have connectivity with the SAC. Changes to water quality arising from water discharges could therefore adversely affect feature. Significant changes in flows could reduce existing / potential habitat extent. Deposition of Nitrogen compounds through air quality pathways could give rise to increased algal growth leading to reduced existing / potential habitat extent and implications for BOD and sedimentation.	Curraghinalt Burn is directly connected to the SAC. Proposed water discharges could have a significant adverse effect on the feature. Pollanroe Burn is indirectly connected to the SAC, via the Owenkillew River. Proposed water discharges could have a significant adverse effect on the feature. Regarding flows, abstraction and water discharges could have a significant adverse effect on the feature. Possible that emissions from traffic and mine vent raise could have a significant adverse effect on the feature.
Old sessile oak woods <i>Unfavourable</i>	Deposition of Nitrogen compounds through air quality pathways could lead to reduction in quality and extent of feature. No LSE from hydrological pathways.	Possible that emissions from traffic and mine vent could have a significant adverse effect on the feature.
Bog woodland <i>Unfavourable</i>	Deposition of Nitrogen compounds through air quality pathways could lead to reduction in quality and extent of feature. No LSE from hydrological pathways.	Possible that emissions from traffic and mine vent could have a significant adverse effect on the feature.
Atlantic Salmon <i>Unfavourable</i>	Sensitive to water quality, inc sedimentation. Water discharges are proposed into two burns which have connectivity with the SAC. Changes to water quality arising from water discharges could therefore adversely affect feature. Significant changes in flows could reduce existing / potential habitat extent in main rivers and burns affected by the proposals. Nitrogen deposition (notably ammonia) from air emissions pathways could give rise to increased algal growth, and therefore implications for	Curraghinalt Burn is directly connected to the SAC. Proposed water discharges could have a significant adverse effect on the feature. Pollanroe Burn is indirectly connected to the SAC, via the Owenkillew River. Proposed water discharges could have a significant adverse effect on the feature. Regarding flows, abstraction and water discharges could have a significant adverse effect on the feature. Possible that emissions from traffic and mine vent could have a significant adverse effect on the feature.

	BOD and sedimentation in particular. Sensitive to noise, vibration and increased lighting.	Possible that increased noise, vibration and lighting during construction and operational phases could adversely affect feature.
Otter <i>Cons Objs do not cite status. Understood to be Favourable as at 2016.</i>	Adverse effects on fish through water quality / flow pathways could reduce prey availability. Sensitive to noise and visual disturbance. Possible loss of foraging habitat.	Abstraction and water discharges could have a significant adverse effect on the feature, indirectly through impacts on fish populations. Possible losses to foraging habitat if burn sections to be lost (very upper reaches of Pollanroe support prey) and if used by Otter. Construction operations could result in disturbance effects.
Freshwater Pearl Mussel <i>Unfavourable</i>	Adverse effects on Salmonids (inc Atlantic Salmon) could have an adverse effect on feature given they are a required host species. Sensitive to water quality, inc sedimentation. Water discharges are proposed into two burns which have connectivity with the SAC. Changes to water quality arising from water discharges could therefore adversely affect feature. Significant changes in flows could reduce existing / potential habitat extent in main rivers and burns affected by the proposals. Nitrogen deposition (notably ammonia) from air emissions pathways could give rise to increased algal growth, and therefore implications for BOD and sedimentation in particular.	Curraghinalt Burn is directly connected to the SAC. Proposed water discharges could have a significant adverse effect on the feature. Pollanroe Burn is indirectly connected to the SAC, via the Owenkillew River. Proposed water discharges could have a significant adverse effect on the feature. Regarding flows, abstraction and water discharges could have a significant adverse effect on the feature. Possible that emissions from traffic and mine vent could have a significant adverse effect on the feature.

Overall Conclusion: LSEs cannot be ruled out for this site.

River Foyle and Tributaries SAC

Qualifying Feature and status	Sensitivity and Potential effects	Likelihood of significant effect (LSE)
Water courses of plain to montane levels with the Ranunculus fluitans and Callitriche-Batrachion.	Sensitivities as for Owenkillew River SAC above. Whilst hydrologically connected, given the distances involved (circa 20km), no LSE identified in	No LSE identified

<i>Understood to be unfavorable as at 2011 (ref NIEA SoC HRA)</i>	respect of water quality or flows due to mixing and dilution. At that distance and noting the volumes of water involved, mine discharges would be nugatory and indiscernible against the background (see discussion at Annex 13).	
Atlantic Salmon <i>Understood to be unfavourable as at 2011 (ref NIEA SoC HRA)</i>	Population present throughout Foyle Catchment and linked with that associated with the Owenkillev River SAC. Sensitivities as for Owenkillev River SAC above. Given hydrological connectivity and population distribution, potential effects as for Owenkillev River SAC are considered relevant.	As for Owenkillev River SAC, proposed water discharges, emissions to air, along with increased noise, vibration and lighting could have a significant adverse effect on the feature.
Otter <i>Understood to be favourable as at 2011 (ref NIEA SoC HRA)</i>	Adverse effects on Atlantic Salmon in the Foyle System could reduce prey availability. No other pathways for LSE identified.	Potential indirect significant effect through reduction in Salmon prey availability.

Conclusion: LSEs cannot be ruled out for this site

Lough Foyle SPA

Qualifying Feature and status	Sensitivity and Potential effect	Likelihood of significant effect (LSE)
Wintering bird populations	Given the distances involved and the features for which the site is designated, no pathway for LSEs identified.	No LSE identified.

Conclusion: LSEs can be ruled out

Lough Foyle Ramsar Site

Qualifying Feature and status	Sensitivity and Potential effect	Likelihood of significant effect (LSE)
Wintering and migrating bird populations.	Given the distances involved and the requirements of the features for which the site is designated, no pathway for LSEs identified.	No LSE identified.
Wetland complex	Given the distances involved, no pathway for LSEs identified	No LSE identified.
Species assemblages, including fish (e.g. Atlantic Salmon).	Atlantic Salmon population present throughout Foyle Catchment and linked with that associated with the Owenkillev River SAC.	As for Owenkillev River SAC, there is potential for a significant adverse effect on the feature.

	Sensitivities as for Owenkillev River SAC above.	
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Conclusion: LSEs cannot be ruled out for this site

Upper Ballinderry River SAC

Qualifying Feature and status	Sensitivity and Potential effect	Likelihood of significant effect (LSE)
Water courses of plain to montane levels with the Ranunculus fluitans and Callitriche-Batrachion <i>Understood to be unfavorable as at 2011 (ref NIEA SoC HRA)</i>	No hydrological connectivity and no pathway for LSEs identified.	No LSE identified
Otter <i>Understood to be favourable as at 2016 (ref NIEA SoC HRA)</i>	No hydrological connectivity and no pathway for LSEs identified.	No LSE identified
Freshwater Pearl Mussel <i>Understood to be unfavourable as at 2011 (ref NIEA SoC HRA)</i>	No hydrological connectivity and no pathway for LSEs identified.	No LSE identified

Conclusion: LSEs can be ruled out

River Finn SAC

Qualifying Feature and status	Sensitivity and Potential effect	Likelihood of significant effect (LSE)
Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	Whilst hydrologically connected, given the distances involved, no LSE identified in respect of water quality or flows due to mixing and dilution.	No LSE identified
European Atlantic wet heaths with Erica tetralix	No pathway for LSEs identified	No LSE identified
Blanket bogs	No pathway for LSEs identified	No LSE identified
Atlantic Salmon	Atlantic Salmon population present throughout Foyle Catchment and linked with that associated with the Owenkillev River SAC. Sensitivities as for Owenkillev River SAC above.	As for Owenkillev River SAC, there is potential for a significant adverse effect on the feature.
Otter	Adverse effects on Atlantic Salmon in the Foyle System could reduce prey availability. No other pathways for LSE identified.	As for Owenkillev River SAC, there is potential for a significant adverse effect on the feature.

Conclusion: LSEs cannot be ruled out

Black Bog SAC/Ramsar site

Qualifying Feature and status	Sensitivity and Potential effect	Likelihood of significant effect (LSE)
Active raised bog <i>Understood to be favourable as at 2011 (ref NIEA SoC HRA)</i>	Particularly sensitive to changes in water table and water quality, and nitrogen deposition. No hydrological connectivity and abstractions would not alter water table at the site. Deposition of Nitrogen compounds through air quality pathways could lead to reduction in quality and extent of feature.	Site is circa 5km from the Application Site. Whilst unlikely that emissions from traffic and mine vent could have a significant adverse effect on the feature, this is to be assessed on a precautionary basis.

Conclusion: LSEs cannot be ruled out

Teal Lough SAC / Ramsar

Qualifying Feature and status	Sensitivity and Potential effect	Likelihood of significant effect (LSE)
Blanket and raised bog	Particularly sensitive to changes in water table and water quality, and nitrogen deposition. Site is upstream of Application Site and abstractions / discharges would not affect the site. Site is circa 13km from the Application Site, thus no LSE identified in relation to air quality matters.	No LSE identified.

Conclusion: LSEs can be ruled out

4.8. In view of the above, by way of summary it has been concluded that LSEs cannot be ruled out in respect of the following designated sites:

- a) Owenkillew River SAC;
- b) River Foyle and Tributaries SAC;
- c) Lough Foyle Ramsar site;
- d) River Finn SAC;
- e) Black Bog SAC / Ramsar.

4.9. By way of summary, the key pathways for significant effects to arise, relate to water quality matters, flows (water quantity) and also air quality. In addition, disturbance is relevant to Otter associated with the

Owenkillew River SAC during the construction phase and disturbance through noise / vibration and potentially lighting is relevant to Atlantic Salmon.

- 4.10. The inter relationships between Atlantic Salmon (salmonids) and Freshwater Pearl Mussel and between Atlantic Salmon and Otter are important considerations.
- 4.11. The following points should be noted in relation to this assessment:
 - 1) In the 2020 sHRA submitted by the Applicant concluded that LSEs could be screened out in relation to Black Bog SAC / Ramsar. However, this assessment has proceeded on a more precautionary basis and will assess implications for the site in relation to air quality matters;
 - 2) The 2020 sHRA screened in implications for the Lough Foyle SPA in relation to water quality matters. Following from that assessment however, it is considered that it is possible to screen out such effects given the distances involved (the mixing and dilution which occurs) and the fact that the site is designated for its bird interest, features which are not likely to be affected by the proposals.
 - 3) Teal Lough SAC / Ramsar was not specifically considered in the 2020 sHRA. It has been assessed in this sHRA and a conclusion of no LSE reached.
- 4.12. By way of summary conclusion, in the absence of mitigation, there exists the potential for likely significant effects to arise on at least one European / Ramsar designated site. As such, in line with relevant jurisprudence, it is considered necessary that the Competent Authority undertakes an Appropriate Assessment to determine whether it can be excluded (on the basis of the best up to date scientific knowledge available) that an adverse effect on the Integrity of any of the European / Ramsar site will arise.

5. ASSESSMENT OF THE PROPOSALS: INTEGRITY TEST

- 5.1. In undertaking this stage of the assessment, each of the previously identified pathways for likely significant effects are addressed in relation to the relevant designated sites, in view of their respective Conservation Objectives and qualifying interest features. Reference has been made to the information contained in the 2017 ES, the 2019 and 2020 Addendums to the ES and to additional information which has become available in the intervening period. At this stage of the assessment, in reaching conclusions as to the nature of any effect, any measures proposed which mitigate or avoid adverse effects are taken into consideration.
- 5.2. Before dealing with the relevant pathways for significant effects and addressing required mitigation measures, it is necessary to consider relevant baseline information in relation to those key species highlighted through the undertaking of the LSE stage of assessment, these being Atlantic Salmon, Freshwater Pearl Mussel and Otter. These three species are singled out on the basis of sensitivity and also interdependency.

Summary of relevant baseline information

Freshwater Pearl Mussel

- 5.3. Freshwater Pearl Mussel ("FWPM") are known from locations within both the Owenkillev and Owenreagh rivers. Given the protection afforded to the species and pressures faced by it from a range of factors including illegal pearl fishing, data regarding locations of mussel beds is highly sensitive. Data obtained from NIEA, regarding the most recent (reported) survey work conducted in 2021 and 2022 is included in a Confidential Annex (Annex 17) to TR6. The data is however summarised below on the basis that it was not available, and therefore not included within the 2020 sHRA submission.
- 5.4. Survey work undertaken on behalf of NIEA in 2021 was focussed on the Owenkillev River SAC and upstream of the Curraghinalt Burn. A total of 2,277 FWPM are reported from various locations with the largest beds in the upper extent of the survey area.
- 5.5. Survey work undertaken in 2022 by NIEA included three sites in the Owenkillev River. These sites are downstream of the Curraghinalt Burn. A total of 10 mussels are reported for this area. As cited in TR6 at paragraph 1.118, no FWPM were recorded in this section during survey work undertaken by SLR during a survey in 2020.
- 5.6. The 2022 NIEA survey work also included a total of nine survey sites in the Owenkillev River downstream of Curraghinalt Burn and the confluence of the Owenreagh/Owenkillev. A total of 365 FWPM are reported by NIEA in this stretch.
- 5.7. Regarding the NIEA survey of the Owenreagh River in 2022, no FWPM are reported for the (undesignated) river section downstream of the Pollanroe Burn. During survey work undertaken by SLR in 2020, no FWPM were recorded in this section. Data from a 2012 ATEC survey showed 5 individual FWPM recorded in this section. This section of the

Owenreagh River has been the subject of dredging in the past, resulting in the loss of suitable habitat. FWPM beds are however present further upstream at Greencastle.

- 5.8. Further information regarding the conservation status of FWPM in the Owenkillev SAC is described in the Condition Assessments (2011 and 2017) reproduced at Annexes 18 and 19 of TR6.
- 5.9. The identified FWPM beds are of direct relevance to the Application proposals, most notably in relation to water quality matters. Impacts on Atlantic Salmon are also relevant on the basis that they are the primary host species for FWPM, as confirmed by reference to the “Fish host population assessment” section of the 2017 condition assessment at Annex 18 of TR6. Here it is stated:

“Atlantic salmon are the preferred host in the Owenkillev River, confirmed through gill inspection for glochidia encystment in this survey”

Atlantic Salmon

- 5.10. Atlantic Salmon are known to be present throughout the Foyle Catchment.
- 5.11. Insofar as concerns the waterbodies where significant effects could arise in relation to this species (burns within the Application Site where changes to water quality or hydrology could occur, and the Owenkillev and Owenreagh Rivers), the following information is directly relevant:
- Fish habitat condition surveys undertaken by the Applicant (2013, 2015, 2020 and 2025) [see paragraphs 1.76 to 1.84 of TR6, Annex 14 of TR6 and the two documents at Annex 5 of this sHRA].
 - Fish habitat condition surveys undertaken by Loughs Agency [see paras 1.87, 1.88, 1.91-1.94, 1.101-1.102 of TR6. Also see Appendix 5 of Loughs Agency transboundary response.
 - Electro fishing surveys undertaken by the Applicant (2022) [see TR6 paras 1.105-1.113 and Annex 16 of TR6]
 - Electro fishing surveys undertaken by Loughs Agency [see paras 1.87 – 1.104 and Annex 14 of TR6]. Also see Appendix 5 of Loughs Agency transboundary response.
 - Electro fishing surveys undertaken by the Applicant (2025) undertaken in order to verify claims made by Loughs Agency [see Annex 2 of this sHRA].
 - eDNA surveys undertaken by the Applicant (2024 and 2025) undertaken in order to verify claims made by Loughs Agency [see Annex 3 of this sHRA].
 - eDNA surveys undertaken by Loughs Agency 2024 and 2025 [see paragraph 8.2 and Appendices 1 and 2 of Loughs Agency transboundary response].

- Redd surveys / inspections undertaken by Loughs Agency undertaken 2024 / 2025 season [see Appendix 5 of Loughs Agency transboundary response].
- Hydro-morphological Assessments relating to the main rivers and burns principally undertaken by the Applicant [see Annex 4 of this sHRA] in order to address NIEAs assertion that the Pollanroe burn should not be considered as heavily modified.

- 5.12. All of the above information is not reproduced as part of this sHRA. Information already included within submissions made as part of the Inquiry process, is referred to where relevant, with references provided above. However, updated information obtained by the Applicant in order to ensure a robust, current baseline is available for assessment by the Competent Authority, is presented as Annexes to this sHRA. That includes the 2025 electrofishing and eDNA surveys (see Annexes 2 and 3), updated Fish Habitat Assessments (see Annex 5), and Hydro-morphological Assessments (which assist in understanding the nature and extent of barriers to fish movement and the quality of habitat) (see Annex 4).
- 5.13. The reader is directed to the individual survey reports for detail in relation to fish presence and the quality of habitat available, however information is summarised on the plan included at Annex 6 and the overall conclusions can be summarised as follows:

1. Atlantic Salmon are the dominant species within the main rivers, with Trout dominating the burns;
2. Atlantic Salmon parr have been recorded in the lower reaches of the Pollanroe Burn, which offers localised nursery habitat. It is considered unsuitable for spawning Salmon. It is noted that whilst Loughs Agency report a Redd from a November 2024 survey (see pdf page 4 of LA Water Discharges Rebuttal), no actual evidence of Redds in the burn is provided by Loughs Agency (see Appendix 5 of LA transboundary response). The survey report actually confirms that none were found. Trout are present in the same locations and are likely to represent a resident population (present at all life stages). Fish are confined to burn sections downstream of the Crockanboy Road bridge with no fish recorded or likely to be present within any section upstream.
3. Low numbers of young Trout have been recorded in the lower section of Curraghinalt Burn near the confluence with the Owenkillew River, confined by the steep rocky nature of the burn, with one particular feature towards the confluence representing a significant barrier and the upper sections only being accessible during flood periods. Trout has been recorded in the upper reaches, confirming access is possible under certain conditions. The burn is used by Trout as conditions allow and spawning may occur, but successful spawning is unlikely on an annual basis since redds / eggs will be flushed during high flows. Towards the confluence, Trout will move in and out of the burn from the main river.
4. No Salmon have been recorded in the Curraghinalt Burn and conditions are sub-optimal. eDNA evidence presented by Loughs

Agency shows 1/12 replicates thus at the very lowest end of the range in terms of confidence that the species is actually present within the body of water. Other location specific evidence shows the species not to be present and it is likely therefore that the result is anomalous, possibly for example as a result of feeding remains (from birds or Otter) being within the water course.

5. The Unnamed burn supports both Salmon and Trout in the lower reaches. Not likely to be used as spawning grounds for Salmon, but suitable as nursery habitat. Trout are likely resident.
 6. The Attagh burn supports Trout in the lower reaches. A single Salmon was recorded during the 2025 electrofishing surveys, but this was within a pool at the confluence with the Owenkillew River as is considered to be associated with the main river as opposed to the burn *per se*.
 7. The Glenealy burn is unsuited to supporting Salmon primarily on the basis of the gradient, rocky nature of the bed and flow conditions.
 8. The Glenlark Burn (unaffected by the proposals) is a significantly larger burn, with better quality salmonid habitat. It supports Salmon and Trout and is a spawning site for both species.
- 5.14. It is notable that Salmon fishing by rod and line remains possible (licensed) on waters associated with the Foyle catchment, under a catch and release scheme. Loughs Agency is perfectly content that this continues, despite vociferously arguing that the mine proposals give rise to unacceptable impacts on Salmon and their habitat. The two positions remain inconsistent in the context of the catchment. If it were the case that Loughs Agency believed the population to be under such pressure, then it would follow the same approach as in other regions, such as ROI and put in place a ban on angling until pressures abate.

Otter

- 5.15. Numerous Otter surveys have been undertaken by the Applicant in support of the Application. Further to the Original surveys reported in the 2017 ES (during 2015/16), additional monitoring checks have been undertaken over subsequent years (between 2017 and 2023). The report included at Annex 4 of TR6 summarises the survey work from those years and details the results of surveys undertaken in 2024.
- 5.16. Further Otter surveys were undertaken in 2025 in order to update the ecological baseline given the further passage of time. The report is included at Annex 7 of this sHRA.
- 5.17. By way of summary, Otters are known to be widespread through the catchment and evidence for their presence has been consistently observed along the Owenkillew and Owenreagh rivers. The burns offer varying quality of foraging, shelter and transiting habitat, with localised and sporadic evidence recorded over the years.
- 5.18. Consistent evidence for Otter has been recorded at the Pollanroe Bridge on Crockanboy Road in recent years, including 2025.

- 5.19. During 2025 the Otter survey also confirmed the presence of field signs (spraints) on both the Attagh and Curraghinalt Burns at their confluence with the Owenkillew River. No evidence of otter was recorded on the section of Glenealy Burn which was surveyed. It was not possible to survey the Unnamed Burn due to access restrictions.
- 5.20. No holts have been confirmed however, a hole in an accumulation of boulders on the Attagh Burn has the potential to be used as a holt as does a mammal hole in the bank of the Pollanroe burn, which will be unaffected by the Mine proposals.
- 5.21. The woodland/scrub habitat along the riparian corridors, but in particular at the lower end of the Curraghinalt Burn, provide good opportunities for resting Otters. However, this type of habitat is not restricted to these burns and forms part of an extensive network of available habitat for Otter along both the Owenkillew and Owenreagh rivers.
- 5.22. It is considered that, given the presence of fish (Salmon / Trout), the lower reaches of the Curraghinalt, Pollanroe, Attagh and Unnamed burns provide at least a seasonal foraging resource for Otter. However, they are not likely to be reliant upon these resources given the resource available in the main rivers.

Assessment Approach

- 5.23. To avoid unnecessary duplication of information, noting the same qualifying features are relevant to many of the designated sites where LSEs could not be ruled out, this section of the sHRA deals with potential effects under impact pathway headings. This was the same approach adopted for the 2020 sHRA. Additionally, duplication of information is avoided by considering water quality and quantity (flow) effects on FWPM and Salmon which are both known to be sensitive to these parameters. Avoiding adverse effects on these species (associated with the Owenkillew River SAC) will equally mean that effects on other qualifying features are avoided and sound conclusions can be reached in relation to all downstream designated sites, including those with Transboundary implications. In all instances however, clear conclusions are given in relation to each designated site and the relevant qualifying interest features.
- 5.24. As a headline point, the Owenkillew River SAC is currently determined as being in unfavourable condition. The formal Conservation Objectives require the maintenance of, or restoration to, favourable condition in respect of the qualifying interest features. In this regard, the assessment must consider the extent to which the proposals could undermine the objective of restoring favourable condition in respect of relevant qualifying interest features.

Functional Linkage

- 5.25. In addition to considering effects within the designated sites, it is also necessary to consider the extent to which a Functional Link exists with the sites. This is relevant where mobile species utilise habitats beyond the boundary of the designated site in question and where off-site effects

could adversely affect a feature of interest of the designated site, giving rise to an indirect adverse effect on Integrity.

- 5.26. From the outset it should be noted that in view of the evidence, a functional linkage does exist between the Application Site and the Owenkillew River SAC, River Foyle and Tributaries SAC, River Finn SAC and Lough Foyle Ramsar site. This is principally on account of the use of the Pollanroe Burn and Unnamed Burn by Atlantic Salmon, though the potential for Trout breeding within the burns and moving out into the main rivers where they may interact with FWPM (becoming a host) is also relevant, a point discussed in further detail below and at Annex 5. Effects on Otter are also considered in relation to Functional Linkage.
- 5.27. Whilst a link has been established, in terms of the application of the Integrity test, it is not the case that any impact on Salmon (for example) automatically means that Integrity is affected. Rather, it is necessary to consider the significance of those impacts in the context of the species population relevant to the designated site and the value and importance of the area of habitat affected.
- 5.28. In this matter, regard has been had to the Natural England guidance document NERC207⁴, an extract of which is included at Annex 8 of this sHRA. In defining what is meant by the term functional linkage, the following is stated, with reference to other guidance⁵ at page 9:

“The favourable conservation status of a given species is not therefore limited to how the species fares within the defined boundary of designated SACs. The guidance states at paragraph 17 that:

“Assessing and evaluating the conservation status of habitats and species within the Natura 2000 network is therefore not always enough, especially when the occurrences of habitats or species are only partly covered by the network, maybe even in some cases only to a relatively small extent.”

- 5.29. It goes on to consider the Birds Directive and states:

“Likewise, the Birds Directive refers not only to the protection of species within special protection areas, with reference to the network of SPAs, Article 4(4) provides:

“...Outside these protection areas, Member States shall also strive to avoid pollution or deterioration of habitats”.

⁴ Natural England Commissioned Report NERC207: Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects - a review of authoritative decisions (February 2016).

⁵ Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC, February 2007.

- 5.30. The guidance then considers three scenarios relevant to designated sites and protected species, with the second being relevant in this situation, that being.

*“Supporting habitat in areas beyond the boundary of a SAC or SPA which are **connected with or ‘functionally linked’ to the life and reproduction of a population** for Habitats Regulations Assessment. However, that assessment will **need to determine how critical the area may be to the population of the qualifying species and whether the area is necessary to maintain or restore the favourable conservation status of the species.** Effects which would not be acceptable within the boundary of a European site **may or may not be acceptable if they occur on functionally linked land or sea.**”*

[emphasis added]

- 5.31. Thus, the guidance is clear that whilst the provisions of the Habitats Regulations are relevant in relation to Functionally Linked land, it is not mere presence which is assessed, but how “critical” the habitat is to the qualifying population and *whether “the area is necessary to maintain or restore the favourable conservation status”*.
- 5.32. Matters concerning Functional Linkage were not explicitly assessed in the 2020 sHRA submission. The more recent (post 2020) evidence base (namely use of the burns by salmonids) necessitates that this is, specifically assessed. The matter is discussed within TR6 at (for example) paragraphs 1.73, 1.112, 1.283 to 1.285. The position as described within TR6 is one which places emphasis on the significance of any effects which may arise (consistent with the above), but also one which discounts the presence of Functional Linkage on the basis of a lack of significance of effects. This sHRA updates (with regard had to the transboundary representations citing the requirement for an updated sHRA) the initial, high level, screening assessment; it being accepted that Functional Linkage exists in view of the evidence. The significance of effects however, remains a fundamental assessment consideration in terms of considering effects on site Integrity, as fully reflected in this sHRA.

Consideration of Effects

- 5.33. The following likely significant effects are identified for assessment and are discussed below:
1. Habitat loss, physical damage and fragmentation;
 2. Disturbance (noise / vibration, visual disturbance and lighting);
 3. Dust deposition;
 4. Disturbance from vibration;
 5. Changes in air quality (traffic emissions);
 6. Changes in water quality (groundwater and surface water); and
 7. Changes to the hydrogeological and hydrological regime.

Habitat loss, physical damage and fragmentation

- 5.34. No designated habitat is to be lost, damaged or fragmented through the proposals during either the construction, operational or closure phases.
- 5.35. With reference to Table 16 of the 2017 EcIA, it is noted that following comprehensive assessment in relation to such potential effects on the Owenkillev River SAC, effects are determined to be not significant and no specific ecological mitigation is required. It is stated:

“The proposed works and activities associated with the construction phase of the mine development will not result in any direct loss, damage or disturbance to any habitats within the defined boundaries of the Owenkillev River SAC. The site of the existing exploration adit and infrastructure site do not support any Annex I habitats, as cited for the Owenkillev River SAC, that will be lost and which could be considered to contribute to those qualifying habitats within the SAC.

The retention of the existing exploration adit and its associated infrastructure will not result in any fragmentation of habitats within the Owenkillev River SAC which would directly or indirectly impact upon any of the Annex II qualifying species as a result of the proposed works and activities associated with the construction phase of the mine development.”

- 5.36. The 2019 Addendum to the ES reported that no additional significant effects were identified and that no additional mitigation is required.
- 5.37. The project (Outline) Construction Environmental Management Plan (CEMP) (Appendix B2 to the 2019 Addendum to the ES) describes a comprehensive range of measures which would be implemented in order to prevent adverse environmental impacts. Those measures are summarised at Table 6-2 of the CEMP. Further, section 3.2 of the CEMP specifically considers those mitigation measures relevant to water pollution, vegetation clearance and soil conservation. The reader's attention is drawn to the CEMP for the relevant detail.
- 5.38. Consideration has been given to the potential for the main river habitat used by FWPM and Salmon, and the potential for burn habitat used by Salmon to be damaged through changes in the flow regime and this is discussed in detail further below. No such effects are concluded to arise as a result of the proposals.
- 5.39. Consideration has been given to direct losses to the upper reaches of Pollanroe Burn and additionally the potential for indirect adverse effects to arise on salmonids further downstream. Specifically regarding burn habitat losses, the relevant sections of watercourse do not represent salmonid habitat as evidenced through the suite of habitat and fish survey work. Salmonids have not been recorded anywhere near these upper sections of the burn (see discussion at Annex 5), the habitat itself is suboptimal for salmonids and numerous barriers to dispersal exist which are concluded to prevent migration by salmonids into these areas (see

Annex 4 in relation to hydro morphological matters). It is therefore concluded that no effects arise in relation to direct habitat losses.

- 5.40. Regarding indirect downstream effects associated with salmonids within the Pollanroe Burn, these are concluded not to be significant. Noting the poor quality of the lost habitat, and the extent of the retained habitat including that within which fish have been recorded, losses would not be significant in terms of invertebrate prey availability. Matters concerning changes in flows and water quality are discussed below.
- 5.41. Further consideration has been given to the extent to which effects of blasting / vibration, could cause damage or fragmentation to Salmon habitat both in relation to the main rivers and in the burns. This matter is discussed further below, but by way of summary conclusion effects are not significant.
- 5.42. As part of the package of mitigation and avoidance measures associated with the proposals, some measures are proposed which will be of direct benefit to qualifying interest features of the relevant designated sites, most notably the Owenkillew SAC. These measures are to be delivered through a Betterment Plan. An outline Betterment Plan was included within the Applicant's SoC (see Annex 13 of TR6). This details a palette of measures to be delivered by way of mitigation and enhancement, primarily focussed upon land under the direct control of the Applicant. In addition to the cessation of agricultural practices, restorative and enhancement measures are proposed in relation to bankside habitat associated with burns and main rivers, including the Owenkillew SAC. All such measures are conservation based and focussed upon enhancing SAC / ASSI feature condition and importantly, all measures are to be agreed as part of a final Betterment Plan which is to be the subject of a planning condition. To be clear, with reference to the proposals at Annex 13 of TR6, none will give rise to any habitat loss, damage or fragmentation effects, or indeed any other adverse effects on a designated site. All represent positive advancements for the conservation status of the designated site/s.
- 5.43. It is concluded that **no adverse effect on the integrity of the Owenkillew River SAC or any other European / Ramsar site** would arise in relation to habitat loss, damage or fragmentation.

Disturbance (noise / vibration, visual disturbance and lighting)

- 5.44. Effects relating to disturbance are relevant to the construction and operational phases of the proposed project. It is the construction period when any potential effects would be most acute. Once the mine site is operational, activity would be focussed within the mine and in/on associated infrastructure (such as haul roads and yards). Closure would see a further downgrading of any potential effects. The focus is therefore upon the construction and operational phases in relation to potential implications for the designated sites and associated qualifying interest features.
- 5.45. Having regard to the conservation objectives (qualifying interest features) of the designated sites (see section 3 above), effects of noise, vibration,

visual disturbance and lighting would be of direct relevance to populations of Otter and Salmon. In addition, adverse effects on Trout would be relevant insofar as they are a potential host species for Fresh Water Pearl Mussel larvae (as discussed above). Potentially significant effects in relation to vibration are linked to blasting. In terms of the locations of the relevant species as receptors, these are shown graphically on the plan included at Annex 6. By way of brief summary, Salmon are identified as being present in the Owenkillew and Owenreagh rivers and the lower reaches of the Pollanroe Burn and Unnamed Burn. Trout are identified as being present in the Curraghinalt Burn and in the lower reaches of the Pollanroe, Attagh and Unnamed burns. Evidence of Otter has been recorded in the main rivers as well as in the Pollanroe Burn and at / near the confluence of the Owenkillew river in respect of the Attagh and Curraghinalt burns. This sHRA also proceeds on the assumption that given salmonid presence in the lower reaches of the Unnamed Burn, that habitat will also be of some value to Otter, at least as a foraging resource.

Noise

5.46. As reported in Table 16 of the 2017 EclA:

"The existing exploration adit and its associated infrastructure will be used for approximately two years until the decline from the new portal entrance is completed. During this period there will be a continuation of human disturbance from the use of this site. The majority of the noise generated through the mine development works will be below ground and not anticipated to alter environmental baseline levels within the Owenkillew River SAC. However, surface noise sources are likely to be predominantly from the movement of HGVs transporting waste rock generated from the mine development to the DSF within the proposed infrastructure site and returning with empty loads. These vehicle movements have the potential to result in disturbance⁶ to parts of the Owenkillew River SAC that lie in close proximity to the existing exploration adit site (245 m at its closest point) and to the Camcosy Road (270 m at its closest point at the entrance to the existing surface infrastructure site and 300 m along this route where it passes the Drumlea and Mullan Woods) that will be used for access.

The existing infrastructure site is permitted⁷ for up to 36 HGV vehicle movements in and out this site per day. It is estimated that the waste rock that will be moved by road from the existing surface infrastructure site will be 35 HGV movements in and out of the site per day.

Baseline noise monitoring indicates that the existing background noise levels around the existing exploration adit site, based on day and night- time monitoring, range from 33.5 to 34 dB. The Owenkillew River is the dominant source of background noise levels with livestock and other agricultural noises and very

⁶ Possible avoidance of e.g. foraging habitat, due to increased noise levels.

⁷ Note – this Planning Permission has now expired.

occasional traffic on the Camcosy Road the other main noise sources.

The retention of the existing exploration adit and its use for mine development works until such time as the new portal and decline are in operation is not anticipated to generate increased noise levels over and above existing levels at this site, or along the Camcosy Road from HGV movements. Therefore no significant changes in baseline noise levels are predicted at the boundary of the Owenkillew SAC where there is likely to be any [sic] measurable effects on either Atlantic salmon and/or otter."

- 5.47. Section 4.2.7 of the 2019 Addendum to the ES describes the changes to the impact assessment in relation to noise, which arise as a result of the changes to the project parameters as detailed in the 2019 Addendum. Detail on the assessment methodologies and assessment results are contained at technical appendix C18 of the 2019 Addendum.
- 5.48. For both the construction and operational phases of the project, noise levels are not considered significant when compared against the measured baseline. The existing baseline values and degree of separation between the SAC and noise source points are relevant factors. There is no change to the overall conclusions reached in the 2017 ES and 2019 Addendum to the ES, namely that noise effects on Otter are not determined to be significant. However, it is also relevant that the Applicant agrees with NIEA's position that a planning condition should be imposed in relation to the protection of Otter during the construction phase.
- 5.49. Specific consideration has also been given to noise impacts in relation to the burns within the Application Site, most notably, the Pollanroe Burn and Unnamed burns (both of which support habitat used by Salmon in their lower reaches) during both the construction and operational phases of development. This updates the position on the basis of the baseline data which demonstrates Salmon presence (with reference to the transboundary representations e.g. An Taisce page 15, Loughs Agency pages 86 to 89, TBA1537 - Dr Strecker pages 8 to 10). Importantly, those sections of burn which have been identified as supporting salmonids (including Salmon as relevant to the Pollanroe and Unnamed burns) are well outside the surface infrastructure development footprint. They would not be subject to any significant effects from noise associated with the construction or operational phase. In this matter, the reader is directed to the following:
- a) Appendix C18 of the 2017 ES;
 - b) Appendix C18 of the ES Addendum 2019 and in particular, the figures included at Annex A and Annex B;
 - c) Figure 4 on page 31 of TR6.
- 5.50. Section 6 of Appendix C18 of the 2017 ES describes the prevailing background noise levels (in view of the recorded wind speed). Figure 2 on page 20 of C18 shows the Noise Monitoring Locations (NMLs) associated with the assessment work undertaken. Of relevance are NMLs 1, 4 and 6, with 1 and 6 being relevant to background noise levels

associated with the Pollanroe Burn and Owenreagh River, and NML 6 being relevant to the Curraghinalt Burn and Owenkillew River SAC.

- 5.51. With reference to the figures included at Annex A and Annex B of Appendix C18 of the ES Addendum 2019, these figures show the noise contours associated with both the construction and operational phases (over the mine life). Figure 4 on page 31 of TR6 is highlighted here simply as a cross check to show the locations of the burns when viewed in tandem with the noise contours plans.
- 5.52. As demonstrated by reviewing the aforementioned figures, noise levels at the burns are not significant, a maximum of 65 dB, relevant to the construction stage (only) and at the middle and upper reaches of the Pollanroe burn where Salmonids are absent. For the lower reaches of all burns containing salmonids, noise levels are negligible under all assessed scenarios.
- 5.53. Absent UK guidance, the most relevant guidance source for underwater noise thresholds for fish are those guidelines published by the American National Standards Institute (ANSI) (Popper et al., 2014⁸). The table below is an extract from that guidance, showing thresholds defined for impulsive sound. It cites three fish hearing sensitivity categories, with impact criteria ranging from injury to behavioural responses. Note that Atlantic Salmon are of medium sensitivity on the basis that the swim bladder is not involved in hearing.
- 5.54. The thresholds include physical injury (mortality/ mortal injury and recoverable injury), and auditory injury, termed temporary threshold shift (TTS). There are no accepted thresholds available for behavioural responses, due to a lack of scientific evidence and high levels of site and context specific variation. Behavioural impact criteria are described in terms of relative risk (high, moderate, low) at a distance from the sound source defined in relative terms as 'near' (N), 'intermediate' (I), and 'far' (F).

⁸ Popper et al., Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI, 2014

Table 7.3 Pile driving. Data on mortality and recoverable injury are from Halvorsen et al. (2011, 2012a, c) based on 960 sound events at 1.2 s intervals. TTS based on Popper et al. (2005). See text for details. Note that the same peak levels are used both for mortality and recoverable injury since the same SEL_{cum} was used throughout the pile driving studies. Thus, the same peak level was derived (Halvorsen et al. 2011).

Type of Animal	Mortality and potential mortal injury	Impairment			Behavior
		Recoverable injury	TTS	Masking	
Fish: no swim bladder (particle motion detection)	>219 dB SEL _{cum} or >213 dB peak	>216 dB SEL _{cum} or >213 dB peak	>>186 dB SEL _{cum}	(N) Moderate (I) Low (F) Low	(N) High (I) Moderate (F) Low
Fish: swim bladder is not involved in hearing (particle motion detection)	210 dB SEL _{cum} or >207 dB peak	203 dB SEL _{cum} or >207 dB peak	>186 dB SEL _{cum}	(N) Moderate (I) Low (F) Low	(N) High (I) Moderate (F) Low
Fish: swim bladder involved in hearing (primarily pressure detection)	207 dB SEL _{cum} or >207 dB peak	203 dB SEL _{cum} or >207 dB peak	186 dB SEL _{cum}	(N) High (I) High (F) Moderate	(N) High (I) High (F) Moderate
Sea turtles	210 dB SEL _{cum} or >207 dB peak	(N) High (I) Low (F) Low	(N) High (I) Low (F) Low	(N) High (I) Moderate (F) Low	(N) High (I) Moderate (F) Low
Eggs and larvae	>210 dB SEL _{cum} or >207 dB peak	(N) Moderate (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) Moderate (I) Low (F) Low

Notes: peak and rms sound pressure levels dB re 1 µPa; SEL dB re 1 µPa²-s. All criteria are presented as sound pressure even for fish without swim bladders since no data for particle motion exist. Relative risk (high, moderate, low) is given for animals at three distances from the source defined in relative terms as near (N), intermediate (I), and far (F).

Underwater sound impact thresholds for fish in relation to impulsive sound sources

- 5.55. It is clear from the above guidance that, in view of the noise assessment work undertaken and the distances involved, that **no adverse effect on the integrity of the Owenkillev River SAC or any other European / Ramsar site** would arise in relation to noise.

Vibration

- 5.56. It is considered that effects relating to vibration are only relevant to the Owenkillev River SAC, given the distance / separation of the other European levels designated sites from the Application Site. Such effects are relevant to the construction and operational phases of the proposed project.
- 5.57. Having regard to the conservation objectives (qualifying interest features) of the SAC (see section 4 above), effects from vibration are of relevance to Salmon and Otter. In addition, adverse effects on Trout would be relevant insofar as they are an important host species for Fresh Water Pearl Mussel larvae.
- 5.58. With reference to Table 15 of the 2017 EclA, it is generally recognised by ecologists that vibration can cause disruption to wildlife, triggering for example a 'flight response'. However, the effects of vibration are very often masked by other disturbance factors including human visual disturbance and also noise. It is likely that any species sensitive to

increased noise will also be sensitive to vibration, with the converse also true.

- 5.59. Table 15 of the 2017 EclA states that the zone of influence of any above ground blasting associated with the construction phase is assessed to be similar to the disturbance anticipated from noise and as such is likely to be up to a 300 m radius from the point source.
- 5.60. Below ground blasting operations undertaken as part of the mine development including the construction of the decline and extraction of rock have the potential to generate vibration. The effects of any vibration will be dependent on a range of factors including the magnitude of the blast, the frequency of blasting, the depth of any blasting event and the location of any blast event in relation to any important ecological feature.
- 5.61. Table 15 of the 2017 EclA states that during monitoring of blasting events carried out during exploration activities at the site, recorded vibration levels below 1 mm/second peak particle velocity (PPV) at above ground receptors.
- 5.62. Regarding operational effects, in Table 15 of the 2017 EclA it is stated that due to the narrow veins of ore being mined, any below ground blasting event will be of relatively small magnitude. Whilst the below ground point of blasting will inevitably change during the operation of the mine, it is considered that any blasting event will have a negligible effect above ground, even where any such event occurs in close proximity to the ground surface (25 m at closest point). Vibration levels would remain below 6 mm/second PPV as currently consented as part of the existing exploration activities and it is noted that a planning condition is proposed which would set a limit value of 6 mm/second PPV. Following the brief summary below regarding conclusions set out in the ES package of information, this sHRA gives specific consideration to the proposed limit value of 6 mm/second PPV with reference to underpinning scientific information and guidance.
- 5.63. Table 17 of the 2017 EclA also discusses operational effects. It states that:
- “No blasting will take place directly below the Owenkillev River SAC. At predicted levels below 6 mm/second, it is considered that there would be no discernible surface vibration or noise from any such blasting event and is not likely to have any significant effects on the freshwater pearl mussel or the other the Annex II qualifying species present but not a primary reason for site selection, namely Atlantic salmon and otter for which the Owenkillev River SAC is of European importance, or any other species of importance for which the Owenkillev River ASSI and the Drumlea and Mullan Woods ASSI are of conservation importance.”*
- 5.64. With reference to the 2019 Addendum to the ES, at section 4.2.8 it is stated:

“Construction and operation vibration impacts for the project remain unchanged from the 2017 ES. As such, the proposed Construction and Operational Mitigation Measures outlined in Section 6 of the Vibration Impact Assessment for the project remain unchanged from the 2017 ES.

Consistent with the findings of the 2017 ES, no significant residual adverse vibration impacts will occur during operation of the Curraghinalt Project. Continuous monitoring of vibration in proximity to the nearest residential properties will ensure that the recommended vibration thresholds and the relevant Planning Condition vibration limits are not exceeded.”

5.65. The Vibration Impact Assessment Report Addendum is at Appendix C.20 (2019 Addendum), and the reader’s attention is drawn to that document for further detail regarding identified effects and proposed mitigation.

5.66. In its consultation response of 24th April 2020 DAERA (NED) state:

“In relation to the commentary on vibration impacts on Atlantic Salmon, NED would suggest that an iterative monitoring plan is put in place to ensure the receptors and monitors are adequately picking up any potential impacts on sensitive receptors in the river especially salmon and otter. NED acknowledge in a face to face meeting, the applicant outlined that the Alaskan Standards to be met, were what they [sic] applicant has considered as accepted industry levels. NED would note that the applicant should ensure the appropriate noise levels as used in these studies are not breached. Monitoring should ensure these standards are met, but this should also be reflected appropriately in the HRA. NED have also noted there appears to be a discrepancy between the noise levels outlined in the HRA (possibly expected levels) and the levels noted in the FEI response. In addition, as outlined previously, consideration should be given to the timing of works to avoid potentially impacting spawning Salmon.”

5.67. The important point to note is that the Applicant fully accepts the need for a monitoring plan (see for example paragraph 2.11 of TR18). Underground seismic and surface monitoring are proposed as well as surface vibration monitoring. The monitoring data will be *“used in the mining study to refine mining extraction strategies that is appropriate for the project environment”*. Monitoring locations can, and will, be chosen to include assessment of any potential impacts on sensitive receptors including salmon and otter. For completeness, insofar as any “discrepancy” may exist between the noise levels outlined in the 2019 sHRA and the levels noted in the FEI response, it is understood that this most likely relates to the recorded (i.e. baseline) vibration levels of “below 1 mm/second PPV” cited in the 2019 sHRA (as also reported above) and the anticipated levels of “below 6 mm/second”, as referenced in the Addendum. Note that levels of below 6 mm/second are currently consented in relation to exploration activities and are also cited in the 2019 sHRA and in ES Appendix C.20 (2019 Addendum).

- 5.68. Regarding the adoption of appropriate precautionary thresholds for relevant effects, guidelines developed to protect fish and incubating embryos from the effects of blasting in and near water bodies, produced by the Alaska Department of Fish and Game are relevant and it is those standards set out in that guidance which the Applicant proposes to adopt. This is discussed below and has previously been reported within RS6.
- 5.69. In the absence of any appropriate UK and European standards, standards developed by the Alaskan Department of Fish and Game (ADFG) have been considered and are to be adopted by the Applicant. In its consultation response dated 24th April 2020, NED confirmed agreement on the adoption of these standards, but maintained that *“consideration should be given to the timing of works to avoid potentially impacting spawning Salmon”* For clarity, it is considered that the proposed limit value is fully protective of spawning salmon. The ADFG developed blasting standards for the protection of fish in 1991, as the ADFG has a responsibility to issue permits in relation to projects that involve pile driving, blasting and seismic activity. In 2013 the ADFG published a report which includes and discusses scientific information in support of their standards and this report specifically considers blasting effects upon salmonid fish. The 2013 report not only reviews the effects upon caged salmonid fish but also the effects of blasting and mechanical shock on salmonid embryos. It is noted that the fish involved within the studies are species that belong to the genus *Oncorhynchus*, though other salmonid species, coarse fish and marine fish species are also considered. A key species within the studies is Rainbow trout (*Oncorhynchus mykiss*), which has been used as a surrogate species for members of the *Salmo* genus e.g. Atlantic salmon (*Salmo salar*) and Brown/Sea trout (*Salmo trutta*) in relation to ecotoxicological studies. A key conclusion within the 2013 ADFG report is that the ADFG 1991 blasting standards are more than sufficient to protect fish and embryos that may be present during blasting. The guidance establishes that blast induced pressure should not exceed 2.7 psi in the water and vibrations should not exceed 13 mm/second
- 5.70. Section 4 of the guidance document concerns effects on salmonid embryos (most sensitive part of the life cycle) and several scientific studies (empirical evidence) are discussed. In relation to “Jensen 2003, Jensen and Alderdice 1989” (see pages 9 and 10 of Appendix 3 to RR6) it is stated that a limit of 13 mm/s provides at least a ten-fold margin of protection:
- “In this study Jensen (2003) compared velocity thresholds to PPV criteria recommended by Wright and Hopky (1998) and concluded that the current DFO guideline criteria of 0.5 in/s (13 mm/s) provided at least a ten-fold margin of protection for Pacific salmon eggs during their most sensitive life stages.”*
- 5.71. The report included at Appendix 3 of RR6, describes the research that underpins Canadian and Alaskan guidelines relating to blasting.
- 5.72. The adoption of an appropriate standard and monitoring to ensure compliance will mitigate against habitat loss or fragmentation due to blasting.

- 5.73. There is no evidence to suggest that a different limit to that proposed by the Applicant is relevant to the protection of Salmonids. A robust evidence base is provided to demonstrate that the Applicant's proposals are fully protective of salmonids including during spawning.
- 5.74. From the evidence presented in the ES and associated addendum, such thresholds would not be breached. In addition, the Applicant committed to on-going monitoring as part of the mitigation package. In line with NIEA NED's assertion, an iterative monitoring plan is to be put in place to ensure the receptor and monitor locations are appropriately identified to avoid potential impacts on sensitive receptors, including those associated with the main rivers and also the burns, notably in relation to Salmon and otter.
- 5.75. No additional mitigation is considered to be required.
- 5.76. It can be concluded that **no adverse effect on the integrity of the Owenkillev River SAC or any other European / Ramsar site** would arise in relation to effects from vibration.

Visual disturbance

- 5.77. Effects of visual disturbance were not explicitly discussed in previous sHRA documents submitted by the Applicant. The matter is discussed here primarily in order to address Transboundary consultation responses where impacts on Otter are raised (e.g. Save our Sperrins submission) and also to ensure that NIEA's concerns regarding potential implications for Otter (rebuttal stage evidence) are fully addressed within the sHRA.
- 5.78. Visual disturbance is relevant to species that respond to visual cues, for hunting, behavioural responses or predator avoidance, and that have the visual range to perceive cues at distance. In this instance it is relevant to Otter and Salmon (and Trout). Identified pathways include the movement of people and / or machinery. Effects from visual disturbance are most relevant to the construction phase of the proposals with works taking place throughout the proposed Infrastructure Site. During the operational phase activities will be less intrusive (from a visual perspective), with vehicles confined to access roads / yards and the mine itself, and pedestrian access also controlled and focussed around buildings and key infrastructure at the proposed Infrastructure Site, well away from the main rivers and the burns.
- 5.79. No works associated with the mine proposals will occur in locations where Salmon have been recorded and so, no visual disturbance effects on the species is considered likely to result from these proposals.
- 5.80. Proposed habitat enhancement measures associated with the Betterment Plan will involve some measures, such as tree planting along the banks of main rivers (e.g. Owenkillev). This has the potential to disturb Salmon (and Otter – see below). Such effects are not likely to be significant on the basis that they will be very localised, temporary and fully reversible. Nonetheless, a precautionary approach to bankside habitat improvements will be adopted, with the key Salmon spawning months of November to January avoided. The detail of the Betterment Plan is to be

agreed through the production of a Final Betterment Plan, secured by way of planning condition. That final Betterment Plan will include a specific schedule for all works, referencing sensitivities and any times when works are not to be undertaken.

- 5.81. In relation to Otter, this species is recognised as being present in the local area and the proposed infrastructure site has been subject to ecological monitoring since 2017. Relevant to the Infrastructure Site, evidence of sprainting has been recorded at the Pollanroe Bridge, but the value of the sections of watercourse within the proposed infrastructure site to Otters is limited.
- 5.82. Notwithstanding the above, construction stage mitigation is required. NIEA NED stated the following in its SoC in respect of the mine proposals:

“NED require mitigation for otters using the watercourses within the site, including a pre-construction otter survey carried out by the ECoW to check for otter activity within 150m of works, and standard mammal protection measures to be implemented during any construction works”.

- 5.83. Ecological Clerk of Works supervision is proposed for the construction phase and monitoring for Otter will be maintained throughout. A pre-construction Otter survey (with regular monitoring thereafter) can be conditioned as part of any consent granted. Further detail in relation to monitoring and protective measures will be detailed in the CEMP, noting that an outline CEMP has been submitted, with the final version to be submitted and agreed ahead of any construction work commencing.
- 5.84. It can be concluded that **no adverse effect on the integrity of the Owenkillev River SAC or any other European / Ramsar site** would arise in relation to effects from visual disturbance.

Lighting

- 5.85. Construction stage lighting will be relevant to localised areas and would only be relevant to autumn / winter months (working hours). There would be no illumination of salmonid habitat and the CEMP will detail specific mitigation in respect of Otter (and other species) including that associated with avoiding impacts of lighting (check surveys for Otter and oversight by ECOW, careful siting of lighting to avoid illumination of any features potentially used by Otter).
- 5.86. Operational stage lighting would not impact upon any main river or on any salmonid habitat.
- 5.87. It can be concluded that **no adverse effect on the integrity of the Owenkillev River SAC or any other European / Ramsar site** would arise in relation to effects from lighting disturbance.

Air Quality

- 5.88. An assessment relating to air quality effects on designated sites and associated qualifying interest features was included within previous

sHRAs submitted by the Applicant. For reference, paragraphs 5.31 to 5.42 of the 2020 sHRA submission concerns dust impacts and paragraphs 5.57 to 5.65 considered traffic related emissions. However, the assessment has necessarily been revisited on the basis that new guidance has been published by NIEA⁹ (hereinafter referred to as the Revised Operational Protocol) which describes a different approach to assessment insofar as designated sites are concerned. The revised assessment, prepared by AONA (2025) is included at Annex 9 of this sHRA. The results are discussed and summarised below in order to fully inform the conclusions of the sHRA.

5.89. There are three pathways for air quality impacts to arise in relation to the proposals, as follows:

- 1) Traffic / vehicle related emissions (Nitrogen deposition); and
- 2) Blast related emissions (Nitrogen deposition) from the mine vent infrastructure;
- 3) Airborne dust during the construction and operational phases.

5.90. Such effects are relevant to the construction and operational phases of the proposed project.

5.91. Notably in relation to this updated assessment, in addition to having direct regard to the new guidance referenced above, the update also has regard to the following:

- a) The original EIA assessment work proceeded on the basis of using emission rates attributable to the exploratory mining activities. That process used ANFO type explosives. Whereas the explosives to be used during mining associated with a consented scheme would be an emulsion type (aqueous gel) explosive, resulting in significantly lower NO_x emissions (40 times lower) than was relevant to the exploration mine phase.
- b) Vehicle fuel use has also been reassessed based on a more accurate reflection of vehicle types and movements relevant to the mine design.
- c) Consideration of nitrogen deposition on land which is not designated (e.g. SAC) but nonetheless is relevant to ecological considerations including information relevant to the Betterment Plan.
- d) Specific consideration of dust deposition at the Pollanroe Burn, given concerns raised by Loughs Agency.

5.92. In undertaking this supplementary assessment, again the Air Pollution Information System (APIS) was used to determine the location of ecologically sensitive sites within 15 Km of the Application Site.

⁹ Revised Operational Protocol for assessing ammonia and air pollution impacts on the natural environment A guide for planners and developers, (February 2025), NIEA,

- 5.93. The reader is directed to the report included at Annex 9 for the detail in relation to this updated assessment. However, key points are summarised below where relevant.

Traffic related emissions

- 5.94. It is recognised through guidance, that deposition at or beyond 200m from a road is at a level which is so small as to be insignificant (negligible). In this light, potential significant effects can be screened out of the assessment process where qualifying interest features of a European designated site do not fall within 200m of a road affected by the plan or project. This position is reflected in the Revised Operational Protocol, Design Manual for Roads and Bridges (DMRB) and similarly in guidance issued by UK statutory agencies¹⁰.
- 5.95. As reported at Table 16 of the 2017 EclA, any HGVs accessing and travelling along the Camcosy Road will be >200 m from the boundary of the SAC and it is therefore considered that any increase in traffic emissions as a result of the movement of waste rock from the existing exploration adit to the DSF in the infrastructure site is not likely to have a significant impact on the qualifying interest features of the Owenkillev River SAC.
- 5.96. The assessment process has however consistently adopted a conservative approach. The 2017 ES and 2019 Addendum to the ES considered in further detail the potential implications for the Owenkillev River SAC in relation to air quality effects. The reader's attention is drawn in particular to Table 16 of the 2017 EclA and the "Air Quality & Dust Impact Assessment Addendum" included at technical appendix C.19 of the 2019 ES Addendum. Specific and detailed consideration is given to increases in NO_x and Nitrogen deposition. The 2020 sHRA considered air quality impacts at paragraphs 5.57 to 5.65 with reference to available assessment data at that time, including updated information available on the APIS website.
- 5.97. The supplementary assessment work presented at Annex 9 of this sHRA gives detailed, holistic and robust consideration to project emissions, assessing the cumulative effects of ground level vehicle emissions and those associated with vehicle movements and blasting within the mine itself (emissions from the vent raise and portal). This overall position is discussed below, with conclusions drawn thereafter.

Emissions All Sources - Vent Raise & Portal plus Ground Level Vehicles

- 5.98. There are two key elements which require assessment in relation to emissions:
- 1) Airborne concentrations of NO_x, for which the Air Pollution Information System (APIS) lists Critical Levels for relevant habitats and species (including interest features of designated sites).

¹⁰ "Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations", Natural England (June 2018).

- 2) Nitrogen deposition for which APIS lists Critical Loads for relevant habitats and species (including interest features of designated sites). Critical Loads are expressed as a range (e.g. 5kg/ha/yr to 10kg/ha/yr) rather than a single value.

- 5.99. In the context of an HRA, implications of the project are assessed against the relevant Critical Levels and, on a precautionary basis, against the lower end of the range in respect of Critical Loads.
- 5.100. It should be noted that Critical Levels and Critical Loads do not represent benchmarks at or above which adverse effects will occur. APIS provides the following definitions:

Critical Loads are defined as: "a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge"

Critical levels are defined as "concentrations of pollutants in the atmosphere above which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge".

- 5.101. Thus, where predicted effects show that a Critical Load or Level is not breached, confidence can be had in relation to a lack of adverse effect. Where a Critical Load or Level is breached, it is possible that that adverse effects could occur.
- 5.102. The Revised Operational Protocol describes the use of screening thresholds and the need for more detailed air quality modelling and assessment where certain thresholds are breached. This assessment process is described in the AONA report included at Annex 9. An extract from the Revised Operational Protocol is provided at Annex 10. To briefly summarise here in order to assist the reader, the screening and assessment process described in the Revised Operational Protocol can be summarised as follows:

- 1) Determine if there is a sensitive (designated) site which may be affected;
- 2) Apply the generic *de minimis* threshold (very low precautionary value) and test the process contribution against it¹¹;
- 3) If *de minimis* threshold is exceeded, apply a Site Relevant Threshold (SRT - based on site relevant information, including setting and surrounding development pressure);
- 4) If the SRT is exceeded by the PC, an in combination assessment is required;
- 5) The "Screening / Test of Likely Significance" Thresholds are then applied (page 6 of the Revised Operational Protocol –

¹¹ Pollutant concentration or deposition from the proposal compared against the relevant Critical Level or Load for the site in question and expressed as a percentage.

Annex 10 of this sHRA). If a PC alone or in combination with other plans or projects, is above the Screening Threshold, a detailed assessment must be undertaken.

- 6) The detailed assessment takes account of any relevant mitigation measures and the level of exceedance. The level of exceedance is assessed by calculating the Predicted Environmental Level (PEL), which is the combination of existing background levels and the PC, tested against the Critical Load or Level.

5.103. As is clear from the guidance, only where the calculated SRT is exceeded, does an in combination need to be undertaken and detailed assessment is only needed where the SRT and then the Screening / Test of Likely Significance Threshold is exceeded.

5.104. With reference to the detailed report included at Annex 9 of this sHRA, a full and detailed consideration of air quality impacts on designated sites and relevant sensitive (to air quality) features, has been undertaken.

5.105. The assessment undertaken includes modelling of (NO_x) emissions from underground sources (incl. transport and explosives), Surface Support Equipment, TSF Management and Process Plant emissions. It has considered four scenarios, which include life of mine average and annual fuel usage, and also the use of either diesel or HVO. Thus, the assessment is comprehensive and reflective of the movement towards different (cleaner fuels). The scenarios are as follows:

- a) Life of Mine Average of 1,717,175 million litres of diesel per annum;
- b) Life of Mine Average of 1,717,175 million litres of HVO / annum
- c) Annual Peak of 2,143,407 million litres of diesel / annum
- d) Annual Peak of 2,143,407 million litres of HVO / annum

5.106. The reader is directed to the report for the detail but the following key points arise:

- a) The assessment process has had full regard to the Revised Operational Protocol and its associated steps and also the relevant information contained on the APIS website;
- b) The assessment process is broad in its scope such that the reader can be confident as to the absence of significant adverse effects arising in relation to all designated sites and associated sensitive habitats / species;
- c) In respect of Nitrogen deposition, accepting that the *de minimis* threshold is exceeded for relevant sites / features, the SRT has been calculated and the PC tested against that threshold;
- d) For all relevant designated sites, and under all scenarios, when the Nitrogen deposition PC is expressed as a percentage of the Critical Load (lowest end of the range used), the SRT is not exceeded;
- e) For Nitrogen deposition therefore, in accordance with the guidance, the emissions are screened out of requiring further assessment;

- f) In respect of NO_x (airborne concentrations), again the *de minimis* threshold is exceeded for relevant sites / features and SRTs have been calculated;
- g) In the case of the Owenkillev River SAC (Bog Woodland and Oak Woodland features), SRTs are exceeded in the case of diesel fuel (both average and peak calculations) and in the case of annual peak use of HVO. All other designated sites are screened out at the SRT stage and annual average use of HVO is also screened out;
- h) The assessment has then proceeded to apply the Screening Threshold. This is not breached in relation to any designated site under any scenario.
- i) For completeness, the assessment has also calculated the Process Environmental Contribution / PEL (PC + background);
- j) As is clear from the data presented when the PC is added to the background levels, the relevant Critical Levels are well below any exceedance level;
- k) In line with the guidance for all relevant designated sites and features, the proposals do not give rise to significant adverse effects in relation to air quality matters.

5.107. It can be concluded that **no adverse effect on the integrity** of the **Owenkillev River SAC or any other European / Ramsar site** would arise in relation to effects from emissions in relation to air quality matters.

Dust impacts

5.108. Regarding dust, no additional assessment is considered necessary. The matter is discussed at paragraphs 5.31 to 5.42 of the 2020 sHRA submission. The reader is directed to that information.

5.109. For completeness; it can be concluded that **no adverse effect on the integrity** of the **Owenkillev River SAC or any other European / Ramsar site** would arise in relation to effects from dust.

Hydrological Matters

5.110. For reference, important context in relation to Hydrogeology and Hydrology is provided at:

- 1) Paragraphs 5.66 to 5.81 of the 2020 sHRA submission;
- 2) Update Hydro-morphological Survey reports at Annex 4 of this sHRA
- 3) Reports describing baseline flows and water quality at Annexes 11 and 13 of this sHRA.

5.111. The below contextual information is supplemental to that reported in the above.

Water quality (surface water)

5.112. The only groundwater abstraction licence in the vicinity of the study area is understood to be held by Cemex NI Ltd, approximately 2 km from the project infrastructure area. EIRs were submitted by the Applicant in

October 2025 in order to confirm the current position. The responses confirmed that there are no new water receptors. Detail is provided further below in relation to in combination effects.

5.113. Data available from NIEA in relation to the status of relevant waterbodies is relevant to considerations of observed water quality in a WFD context and is also helpful as contextual information insofar as this assessment is concerned, although specific and detailed discussion regarding the relevant standards to be applied for water discharges is considered further below with reference to species requirements, relevant Conservation Objectives and specific guidance available.

5.114. The 2020 sHRA reported (see paragraphs 5.77 to 5.79) that in WFD terms, the stretch of the Owenkillew adjacent to the project site, and the longstanding existing site discharge, was (at that time) of Good status. It also reported that:

- The stretch of the Owenreagh adjacent to the application site is currently of Good status with upstream waterbodies also of Good status.
- The Mourne River is currently of Moderate Ecological Potential with objectives of Good Ecological Potential.
- The Upper Foyle transitional water is of Moderate status.
- The Foyle Harbour and Faughan water body is of Moderate Ecological Potential and is termed a heavily modified water body.
- Lough Foyle is of Good status.

5.115. Information was obtained from NIEA regarding current and historic WFD status, covering data up to 2024 for the closest and most relevant WFD waterbodies. This information is presented at Annex 12 of this sHRA. The conclusions are however set out below for ease of reference:

“There are two river water bodies downstream of the proposed mine development: Owenkillew River (Drumlea) and Owenreagh (East) River (Drumlea). Both river water bodies have been consistently assessed as Good Ecological status since 2015.

The remaining four river water bodies Coneyglen, Glenlark, Owenkillew (Glenhull) and Owenreagh (Greencastle) are upstream of the lands proposed for development.

Owenkillew (Glenhull) River and Coneyglen Burn have consistently been assessed as Moderate Ecological status due to the specific pollutant Dissolved Iron.

The Owenreagh (East) River (Greencastle) has declined from Good Ecological status in 2015 to Moderate in 2018, 2021 and 2024 due to SRP and Dissolved Iron.

Glenlark River has declined from Good Ecological status in 2015 and 2018 to Moderate in 2021 and 2024 due to Dissolved Iron.

While there are no standards set for Suspended Solids in the Water Framework Directive they are monitored monthly or quarterly at selected monitoring stations. Examination of the results for the stations show that all six water bodies passed the annual average guideline standard of 25mg/l in each year suspended solids were monitored.

WFD 2024 Chemical status assessments show that when failures due to Cypermethrin or uPBT substances are not included all six river water bodies are of High Chemical status.

Cypermethrin was newly identified in December 2018 as an Annex X Priority Substance. Two river water bodies, Owenkillev River (Glenhull) and Coneyglen Burn, have been assessed as exceeding the cypermethrin standard.

GBNI1NW010102086 Owenkillev River (Glenhull) was the only one of the Owenreagh and Owenkillev waterbodies where biota monitoring was carried out and exceedances of the uPBTs mercury and brominated diphenyl ethers were found.

With the extrapolation of uPBTs all six river water bodies are assessed as Moderate Chemical status.”

- 5.116. Additional information regarding baseline chemical status of relevant waterbodies, including the Owenkillev and Owenreagh rivers, is presented at Annex 13.

Assessment

- 5.117. For reference, paragraphs 8.84 to 5.119 of the 2020 sHRA gave detailed consideration to changes in surface water quality. Paragraphs 5.120 to 5.130 considered changes in ground water quality.
- 5.118. This sHRA revises and updates that assessment information specifically to take account of the following:
- 1) The updated ecological baseline, notably in respect of the recorded presence of salmonids (including Atlantic Salmon) within burn habitat as discussed above and on the plan included at Annex 6 of this sHRA;
 - 2) The updated (September 2024) Conservation Objectives for relevant designated sites, including most notably, the Owenkillev River SAC. The 2024 Conservation Objectives include revised supplementary information annexed to the Conservation Objectives with reference to specific targets set for defining favourable condition for qualifying interest features;
 - 3) Revised proposed standards and limit values (in instances) relevant to the discharge consent applications associated with proposed discharges to the Pollanroe and Curraghinalt burns; and
 - 4) Additional detail in relation to the efficacy of the proposed Reverse Osmosis water treatment plant (RO plant).

- 5.119. Key to this assessment is the fact that, in order to ensure that the aquatic environment (including designated sites) is protected from harmful effects, Discharge Consents set strict limit values for relevant parameters. These limit values are defined with reference to relevant standards and through detailed modelling undertaken in accordance with accepted industry guidance. The existing discharge Consent 068/12/2 (relevant to the previous exploration activities at the project site) included such limits and any new Discharge Consent/s would also, necessarily, include relevant, agreed limits.
- 5.120. In view of points 1 - 4 above, the Applicant has undertaken a review of those proposed standards and limit values to be applied in respect of parameters relevant to the two discharge consent applications. For the avoidance of doubt, the proposed Pollanroe Burn discharge is a new application, the Curraghinalt Burn discharge is an existing discharge and is subject to a variation application.
- 5.121. Specific consideration has been given to the updated Conservation Objectives (2024) as relevant to the Owenkillew River SAC and, in tandem the current condition of the Owenkillew River SAC. As already discussed, whilst the hydrological connectivity of the Application Site to other downstream designated sites is noted and is relevant to the HRA, given the cited interest features for these sites, the separation of these additional designated sites from the Application Site and the mixing and dilution which will occur; where it can be determined that the Integrity of the Owenkillew River is not adversely affected, the same conclusion can equally be drawn in relation to those other designated sites.
- 5.122. With reference to the Conservation Objectives for the Owenkillew SAC (2024), it is necessary to consider both the “maintenance” of the qualifying features at favourable condition and “restoration” of those features to favourable condition where relevant. The SAC is currently determined as being in unfavourable condition (see tables at section 4 in relation to feature condition). The FWPM and Salmon interest features are of particular importance in the context of this assessment, with both being sensitive to adverse changes in water quality. For the purpose of the HRA these two features can be viewed as a proxy for the overall assessment in terms of water quality. That is to say, the stringent assessment criteria applied in respect of these features, if met, would also mean that a conclusion of no adverse effect can be reached in respect of the other qualifying interest features, such as “Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion*” and Otter.
- 5.123. The HRA should proceed to determine whether in allowing the proposals, the project would hinder or prevent favourable condition being met (and / or maintained once it is met).
- 5.124. Baseline information relating to FWPM and Atlantic Salmon is presented up front within this section of the sHRA. The reader is referred to the Conservation Objectives included at Annex 1 for the detail in relation to water quality favourable condition targets relevant to the Owenkillew River

SAC and associated interest features. However, a summary is presented below.

Freshwater Pearl Mussel

- 5.125. Specific water quality targets for certain parameters are given for FWPM within the Conservation Objectives (Annex A Feature 1), principally derived from the JNCC Common Standards Monitoring Guidance (Rivers and Freshwater Fauna). As a general guide it is stated that in relation to water quality “targets within the CSM Guidance for Rivers should be used” and that for “freshwater pearl mussel, organic pollution, reactive phosphorous, acidification and other nutrients are particularly important.” It is further stated (within the comments section) that:

“Water quality should not be injurious to any life stage. All classified reaches within the designated site that contain, or should contain, freshwater pearl mussel should comply with targets given.”

- 5.126. In addition, however, some more stringent targets are given in relation to:

- a) Phosphorous;
- b) Nitrate; and
- c) BOD.

- 5.127. Targets are also given for sedimentation (redox and fine sedimentation).

- 5.128. Matters concerning water quality targets derived from CSM Guidance for Rivers are applicable to Atlantic Salmon and these are discussed in relation to that species further below. The relevant targets for the above specific parameters are described here.

Phosphorus

- 5.129. From the attribute tables at Annex A of the Conservation Objectives:

“In locations where annual mean soluble reactive phosphorous (SRP) levels are $<5 \mu\text{g L}^{-1}$, the target should be $5 \mu\text{g L}^{-1}$. For rivers that exceed this, the target is the more stringent value of either: high status values for SRP under the WFD, or the SRP target for CSM river habitat.”

- 5.130. Clarification is given within the comments section that:

“The SRP target value should not be set for a river without first checking the baseline P levels and any historical data available for the that river.”

Nitrate

- 5.131. The following target for favourable condition is given within the attribute tables at Annex A of the Conservation Objectives:

“Nitrate annual median value of $<0.125 \text{ mg L}^{-1} \text{ N}$ ”

5.132. Clarification is given within the comments section that:

“This threshold is based on a study of 560 sites in 126 rivers: 0.125mg L⁻¹N for Ireland (Moorkens, 2006).

Like phosphorous, nitrate levels are a measure of the naturalness of the surrounding catchment, and limits should be set at those natural for that catchment. Where nutrient levels are too high to sustain pearl mussel populations, levels of all nutrients should be reduced until sustainability is achieved.”

BOD

5.133. The following target for favourable condition is given within the attribute tables at Annex A of the Conservation Objectives:

“Mean BOD <1.0 mg L⁻¹”

5.134. Clarification is given within the comments section that:

“Rivers with reproducing populations in the UK, Ireland and Spain have BOD levels consistently <1.0 mg L⁻¹.”

5.135. Specifically regarding suspended solids, the following information is given within Annex A of the Conservation Objectives:

“The continued use of the following Suspended Solids target is under further review by NIEA - Annual mean <10mg L⁻¹.”

Ammonia

5.136. For completeness, a target for ammonia (a nitrogenous compound) is not given. 0.25mg/l in line with CSM for Rivers, is considered to be relevant.

Atlantic Salmon

5.137. In respect of water quality targets for Atlantic Salmon the relevant attribute tables at Annex A of the Conservation Objectives confirms that “Targets included in the CSM Rivers should be used.” The following targets are then described:

Dissolved Oxygen:	“10%ile DO (% saturation) 85”
BOD	“Mean BOD (mg L ⁻¹) 1.5”
Total ammonia	“90%ile total ammonia (NH ₃ -N, mg L ⁻¹) 0.25”
Un-ionised ammonia	“95%ile un-ionised ammonia (NH ₃ -N, mg L ⁻¹) 0.025”
Ph	“Mean pH >6.54 (clear waters)/>5.1 (humic waters)”

5.138. It is further stated, in relation to Phosphorus that:

“Nutrient concentrations should be near-natural. SRP may vary depending upon river size, site altitude and alkalinity. Given that the SAC covers a large catchment and each of these elements varies throughout the site, it is not appropriate to set one SAC-wide target for SRP.”

5.139. Qualification is given within the comments section as follows:

“Atlantic salmon are susceptible to a range of water quality impacts, particularly juvenile life stages (egg, fry, parr and smolt). Generally, water quality should not be injurious to any life stage. All reaches within the designated site that contain, or should contain, Atlantic salmon should comply with the targets given. Data from the last 3 years should be used.”

5.140. In relation to suspended solids (TSS), it is stated

The continued use of the following Suspended Solids targets is under further review by NIEA - Annual mean <10mg L⁻¹ (spawning and nursery grounds) Annual mean <25mg L⁻¹ (migratory passage).

Other relevant Parameters and Standards (relevant to FWPM and Atlantic Salmon)

5.141. In addition to the specifically highlighted water quality parameters discussed above, there are other parameters relevant to the discharge consents. Such parameters include, for example metals, Chloride, Fluoride, Sulphate and temperature. Whilst not specifically highlighted as being important within the SAC Conservation Objectives, limit values for such parameters are relevant (e.g. secondary) considerations in relation to general water quality and protection of the aquatic environment. Notably, temperature is not specifically cited as a parameter of importance in relation to the favourable condition assessment for either FWPM or Atlantic Salmon within the Conservation Objectives document.

5.142. Matters concerning flows are relevant to both FWPM and Atlantic Salmon, with information regarding flow targets given in the attribute tables of the Conservation Objectives (see Annex 1). Such matters are assessed further below, in relation to impacts on the hydrogeological and hydrological regime.

Applicant's approach to the adoption of relevant standards

5.143. The approach used by the Applicant is described in the updated discharge consent technical note provided with the Applicant's Statement of Case in relation to water discharges. The following have been used to guide the process;

- a) Formal Conservation Objectives for the Owenkillew River SAC (which references JNCC guidance) for certain specific parameters as relevant (and as discussed above);

- b) Where available, Northern Ireland EQS defined in SR 351 The Water Framework Directive (Classification, Priority Substances and Shellfish Waters) Regulations (Northern Ireland) 2015. Both Mean and Max standards have been applied to Pollanroe and Curraghinalt burns into which discharges are proposed. The use of Mean standards for the Curraghinalt is a proposed change from the position at SoC and rebuttal stage, bringing EQS proposals in line with those for the Pollanroe burn;
 - c) Where no national EQS is available to assist, EQS from Scotland, Canada, USA and EU have been applied;
 - d) Legislated Drinking Water Standards have been applied under a precautionary methodology, for example where Max EQS values are not available (as in the case of nitrate), or where such a limit is identified as being more protective (more conservative) than using a different relevant standard.
- 5.144. Other guidelines such as the old Freshwater Fish Directive, British Standards for Fresh Water Pearl Mussels (FWPM) have also been reviewed and references where appropriate during the Applicant's decision making process.
- 5.145. Regard has also been had by the Applicant to existing baseline values in setting limit values, most notably in relation to nitrate.
- 5.146. It is noted that NIEA described its own approach to setting what it considered appropriate standards within a letter to the Applicant dated 5th September 2024. The content of that letter is not described in detail here. A critique of the letter and the approach taken by NIEA is included at paragraphs 1.143 to 1.477 of TR6. Following from NIEA's position as described in its letter of 5th September 2024, NIEA has presented limit value tables showing the outworking of its approach. These are presented at Table 7 of Annex G (Data Tables) of its SoC in relation to the two discharge applications.
- 5.147. Fundamentally, whilst there is now broad agreement on the relevant standards to be applied (the sources for calculating appropriate enforceable limit values). It is agreed, for example, that for the key parameters (metals and non-metals) of direct relevance to FWPM and Atlantic Salmon, JNCC guidance (as now directly reflected in the Conservation Objectives) is relevant and should be applied. It is also agreed that published EQS values are applicable where JNCC does not assist. Disagreement on standards is focussed on parameters where no JNCC or EQS value is available, with NIEA proposing 'no increase over baseline', and the Applicant's position being that this is entirely inappropriate and that where no other guidance assists, Drinking Water standards should apply. It remains the case also, that there is significant disagreement between the Applicant and NIEA on the actual limits to be applied in relation to many parameters, with a key criticism of NIEA being that it has been misguided in how it has approached the use of (Monte Carlo) modelling software in deriving many limit values, a matter discussed in detail at paragraphs 7.12 to 7.21 of RR9 (the Applicant's Rebuttal Report regarding "Surface Water (including Discharge Consent

Applications and Abstraction Applications”). In addition, where no other relevant guidance on setting limits exists, NIEA has stated that the limit value should be set to avoid deterioration of the current baseline, a position which is not correct or appropriate on the basis that, with reference to legislation and guidance (e.g. EQS) it was deemed that no such limit on discharges is necessary (on account of no likely harm to the natural environment). EQSs are published for priority substances and other polluting chemicals, those which are evidenced as harmful and which require legislated values to protect the aquatic environment through (for example) consenting processes.

- 5.148. The Applicant has engaged fully with the matter of applying EQS to consent values, **deviating only where a more protective** limit value is derived from another guidance source (such as the Conservation Objectives / JNCC guidance or in instances, Drinking Water standards). Requiring ‘no increase from baseline’ for parameters which are not specifically highlighted in the Conservation Objectives (2024) and are not recognised / cited within legislation as being a priority or polluting substance achieves nothing in protecting, or assisting the restoration of the SAC. Monitoring for such substances at the designated site by NIEA, will in any event not occur as part of the rolling programme of favourable condition assessments or indeed WFD assessments.
- 5.149. The Applicant is aware of correspondence (including letters dated 22nd August and 23rd September 2025) from NIEA which confirm that its previous (SoC) submissions in relation to relevant discharge limits is now being reviewed (i.e. it no longer submits that its approach is/was correct). NIEA is understood to be undertaking new modelling. Thus at present, there remains (as has been the case throughout the Applicant’s engagement with NIEA) no settled position from the statutory authority, regarding what it considers to be appropriate limit values.
- 5.150. This sHRA is undertaken in view of the current proposed discharge criteria as submitted by the Applicant in view of all baseline evidence. Included at Annex 13 are tables which describe the relevant standards to be applied and the proposed discharge limits. To assist the reader, these tables summarise the position in relation to any disagreement between the Applicant and NIEA.
- 5.151. Specific consideration is given below to those key parameters highlighted as requiring more detailed consideration / stringent limits within the Conservation Objectives. Other parameters are then discussed. The closure phase is discussed separately, following consideration of the relevant parameters.

Nitrate (Specifically relevant to FWPM)

Construction and operation

- 5.152. The construction phase is not likely to give rise to any significant increases in nitrate in the watercourses.
- 5.153. It is the discharged mine waste-water (subject to discharge consent applications) which will contain elevated nitrate levels on account of the

projects use of ground / surface water which already contains baseline nitrate (present through natural and anthropogenic sources), and also, nitrate derived from explosive residue from blasting and that within waste water from the sewage treatment plant.

- 5.154. It is noted that setting discharge limits below current baseline in effect means that the project is treating 'background' (e.g. at least in part, the results of the discharges of others). However, the Applicant's proposals in relation to the setting of the discharge limit value and additional mitigation in the form of mitigation measures (discussed below) are put forward such that there can be no doubt as to the efficacy of the mitigation and its ability to ensure that there is no hinderance of favourable condition being met.
- 5.155. Nitrate is not a 'toxic' substance in water discharge terms. Notably there is no legislated limit value, such as an EQS. It is linked with eutrophication and the secondary impacts which arise in such situations (e.g. increased algal growth, increased BOD and increased sedimentation).
- 5.156. Nitrate is of specific relevance to FWPM, with a stated target value of 0.125 mg L (see above). This is the target to be applied to habitat which supports FWPM. With reference to the baseline evidence described above, FWPM located downstream of the two discharge points are within the Owenkillew River. Thus, the test in terms of whether the proposed discharges will prevent or hinder restoration to favourable condition insofar as nitrate is concerned, is focussed on the resultant water quality at the confluence of the Owenkillew and Owenreagh River (Pollanroe discharge) and the confluence of the Curraghinalt Burn and Owenkillew River.
- 5.157. The Applicant's proposed approach is to set the discharge limit at current baseline for the mean (identified as 0.42 mg/L) with the max set at the drinking water standard 11.3 mg/L. However, in addition, in order to ensure that there is certainty as to there being no hinderance of favourable condition being reached (and indeed no hinderance of the maintenance of favourable condition in the future), additional measures are proposed which complement the proposed 'end of pipe' value. These proposals are included within the Betterment Plan, an outline version of which is included at Annex 13 to TR6.
- 5.158. The key measure included within the Betterment Plan, which relates directly to nitrogen discharges, is the cessation of livestock farming across lands under the control of the Applicant. This results in the positive removal of a source of nitrate from the catchment. The reader is directed to the Betterment Plan at Annex 13 of TR6 in relation to the betterment proposals. In addition, the reader is directed to Annexes 14 and 15. Annex 14 includes an updated assessment in relation to existing stock levels at the farmland which is incorporated within the betterment proposals. The updates to the assessment relate to a more recent survey of farm stock / fertiliser application rates and to take more direct account of additional land which had only just been acquired at the point of producing the outline Betterment Plan. Also, included at Annex 15 is a document which adds further clarification in relation to the efficacy of the Betterment Proposals. That report considers in greater detail the nitrate within the

catchment which is derived from agricultural sources and thus, those savings which can be made in nitrogen loading terms. This updating exercise was undertaken in order to ensure the assessment is both current and robust.

- 5.159. Unlike for England, where a model (including site specific nutrient calculators) has been produced in order to determine a projects nitrogen contribution to the environment and help demonstrate Nutrient Neutrality, no such model exists for Northern Ireland. It is axiomatic that cessation of farming practices (in line with the Betterment Plan) will deliver a benefit in terms of nitrogen loading in the catchment. Such measures are a keystone in nutrient nitrogen mitigation strategies in the UK. In the absence of a specific model, the Applicant has sought to quantify the benefits to be derived from the mitigation strategy by reference to published values relating to nitrogen run-off and through undertaking its own calculations. This information is presented in the Betterment Plan itself (Annex 13 of TR6), with further consideration given to this specific issue at Annex 15 of this sHRA. The published values establish a broad range within which the nitrogen run-off from Applicant's lands would be expected to fall within. The calculations undertaken by the Applicant then establish where within that range nitrogen run-off would fall in relation to the mine proposals. Importantly, the assessment takes a precautionary approach in determining the effectiveness of the mitigation.
- 5.160. Through a combination of setting the discharge limit value at 0.42 mg/L (calculated current mean baseline) and delivery of the Betterment Plan, the effect of the mine proposals is fully mitigated and indeed, nitrogen loading in the SAC is reduced and on a trajectory towards favourable condition. The calculations shown at Annex 15 demonstrate that this solution towards mitigation results in a better outcome for the SAC than simply applying the Conservation Objectives / JNCC value of 0.125 mg/L at end of pipe.
- 5.161. A supporting statement prepared by [REDACTED] of Alba Ecology is included at Annex 16 of this sHRA. Dr [REDACTED] is a FWPM specialist and his statement considers the Betterment Proposals and the implications of the Applicant's proposals on FWPM, concluding clearly that the package of measures not only delivers appropriate mitigation, but will deliver betterment for the species.
- 5.162. Notably, the position is better than the test which is broadly applied in England in relation to nutrient impacts on designated sites (e.g. SACs) where Natural England have developed specific guidance on the issue and in tandem with that guidance, the model / calculator/s referred to above is used to determine a project's nitrogen (and or / phosphorus) contribution to the catchment, with the requirement that proposals are determined to be nutrient neutral (not making the situation worse). There are numerous instances where demonstrating nutrient neutrality is all that has been required to pass the Integrity test insofar as nitrogen impacts are concerned, and this is so in the case of designated sites which are in unfavourable condition (as in the case of the Owenkillew River SAC). For

reference, relevant guidance and the specific calculators are available on the Gov.UK website. It is stated on the website¹² that:

“Nutrient neutrality means that a new residential development will not cause increased nutrient pollution to specific protected sites.

Developers must use nutrient budget calculations to show that their proposals will not bring about a net increase in nutrient pollution to specific habitats sites. Some local planning authorities also have their own nutrient neutrality calculators which can be used.”

5.163. The Gov.uk website also states¹³:

“To reduce the impact of nutrient pollution on protected sites, Natural England has given advice to local planning authorities across England. This is that, if protected sites are not in ‘favourable condition’ due to excess nutrients, projects and plans that affect the sites should only go ahead if they will not cause additional pollution.”

5.164. The efficiency of the RO plant is also an important consideration, noting that whilst a discharge limit must be set to ensure appropriate protection to the water environment, giving an enforceable limit, it does not follow that discharges will at that level. It should be stressed that the proposed RO plant represents the best available technology and whilst widely applied across the world in circumstances where highly effective treatment is required, no such plant currently exists in Northern Ireland and certainly no public Waste Water Treatment Plant in the country uses such technology. Included at Annex 17 is a report prepared by Mr [REDACTED] of ASDR concerning the design and efficacy of the proposed RO system. This report includes tables demonstrating the efficiency of the plant.

5.165. The above solution to the treatment of nitrogen is considered robust and certain, ensuring that there is no hindering of favourable condition being reached at the SAC.

5.166. It is also important that there remains no requirement for improvements in nitrogen application rates on farmland. The legislation and policy position is described in Annex 15. However, it is understood that the direction in policy is that such reductions will be sought and delivered over time. In view of the Dutch Nitrogen Cases [cases C-293/17 and C-294/17], at this time it would not be possible / appropriate to have regard to any future benefits (in water quality terms) of those other projects which may come forward. That is to say, their ability to move the feature towards favourable condition cannot be considered as part of the AA because the effects are not fully identifiable and certain. However, in the future, if they were to come forward, then the Applicant would be entitled to have regard to and indeed rely upon any benefits as part of the assessment process.

¹² <https://www.gov.uk/guidance/using-the-nutrient-neutrality-calculators>

¹³ <https://www.gov.uk/guidance/nutrient-mitigation-check-if-you-need-environmental-permissions>

Phosphorus (relevant to FWPM and Atlantic Salmon)

Construction and operation

- 5.167. The construction phase is not likely to give rise to any significant increases in phosphate in the watercourses.
- 5.168. It is the discharged mine waste-water (subject to discharge consent applications) which will contain elevated phosphorus levels, principally on account of the projects use of ground / surface water which already contains baseline phosphorus (present through natural and anthropogenic sources), but also, phosphate derived from waste water from the sewage treatment plant.
- 5.169. Setting discharge limits below current baseline in effect means that the project is treating 'background' (e.g. at least in part, the results of the discharges of others). However, the Applicant's proposals in relation to the setting of the discharge limit value is put forward such that there can be absolutely no doubt as to the efficacy of the mitigation and its ability to ensure that there is no hinderance of favourable condition being met.
- 5.170. As with nitrate, Phosphorus is not a 'toxic' substance in water discharge terms and there is no legislated limit value, such as an EQS. Like nitrate, it is linked with eutrophication and those secondary impacts which arise in such situations (e.g. increased algal growth, increased BOD and increased sedimentation).
- 5.171. Phosphorus is of specific relevance to FWPM and Atlantic Salmon. It is necessary to consider implications for Atlantic Salmon as a primary receptor in this instance on the basis that the species has been identified as present in the Pollanroe Burn, into which discharges are proposed (noting that FWPM are not present in the burns and are not recorded as present in the downstream section of the Owenreagh River).
- 5.172. For Atlantic Salmon the Conservation Objectives direct the reader to the CSM Rivers guidance (see Annex 23 of TR6). Table 6 of that guidance gives the following generic target information:

Table 6. Proposed maximum phosphorus concentrations ($\mu\text{g L}^{-1}$ SRP) consistent with favourable condition of SSSI/SAC river habitat.

River type			Headwater	River	Large river
High altitude (>80 metres)	Low alkalinity ($<50 \text{ mg L}^{-1} \text{ CaCO}_3$)		10	20	30
	High alkalinity ($>50 \text{ mg L}^{-1} \text{ CaCO}_3$)		15	25	40
Low altitude (<80 metres)	Low alkalinity ($<50 \text{ mg L}^{-1} \text{ CaCO}_3$)		30	40	50
	High alkalinity ($>50 \text{ mg L}^{-1} \text{ CaCO}_3$)	Chalk	40	50	50
		Clay	40	50	60

To be applied as a growing season (March-September) mean and as a whole year mean
River Habitat Survey (RHS) river flow categories are used to discriminate river size. (See notes under Table 3.)

- 5.173. Regarding the qualification given in the footnote to the table, in relation to determining river size, the notes under table 3 (to which the reader is directed) give a series of flow rates and an associated 'river' types which range from headwaters to large river. It is viewed as a simple categorisation tool.
- 5.174. In applying that approach, since we are dealing with a high altitude, low alkalinity watercourse, the burns are classified as 'headwaters' for the purpose of this particular assessment and thus the relevant favourable condition target would be 10ug / L SRP.
- 5.175. However, JNCC Guidance specifically allows for location specific targets to be set within Conservation Objectives, based on background (baseline) data. Importantly, the Conservation Objectives explicitly state that it is not appropriate to apply a single target for the SAC due to variations in the baseline water quality. It is stated (see Atlantic Salmon feature table at pdf page 47 of JNCC Rivers at Annex 23 of TR6):

"Given that the SAC covers a large catchment and each of these elements varies throughout the site, it is not appropriate to set one SAC-wide target for SRP."

- 5.176. The Applicant has confirmed new proposed limit values based on EQS in the table included at Annex 13 of this sHRA. A limit value of 0.016 mg/l is proposed for both the Pollanroe and Curraghinalt burns. This broadly accords with NIEA's proposed limits of 0.015 mg/l for the Curraghinalt Burn and 0.017 mg/l for the Pollanroe Burn (NIEA SoC Water Discharges), but is in fact more protective in relation to the Pollanroe Burn where evidence exists for Salmon presence (lower reaches only). The slightly higher limit proposed by the Applicant in relation to the Curraghinalt Burn is considered to be appropriately protective, given this watercourse is not identified through evidence as being of any significant value to Salmon (no firm evidence at all), and noting that the Applicant's proposed limit is only just above that proposed by NIEA. In both instances, the discharge proposals will be 'treating / diluting' the baseline.
- 5.177. The efficiency of the RO plant is described at Annex 17 of this sHRA. The RO plant delivers Total Dissolved Phosphorus at 0.001. Thus, actual discharge levels will be well below the proposed limit value. It would therefore be possible to impose any of the limit values put forward by any of the parties, however that proposed by the Applicant is both justifiable and appropriately protective of FWPM, Atlantic Salmon and more broadly, it gives rise to no concerns regarding the favourable condition of the relevant designated sites.
- 5.178. The Applicant's proposal is that the limit value should reflect Total Dissolved Phosphorus (TDP) (see tables at Annex 13 of this sHRA). With this approach, SRP is fully assessed, since it is a component of TDP and a far lower detection limit is possible, meaning that confidence can be had in the compliance monitoring results. Such an approach is far more appropriate in this instance allowing transparency and confidence in the monitoring and reporting.

BOD

Construction and operation

- 5.179. The construction phase is not likely to give rise to any significant increases in BOD in the watercourses.
- 5.180. It is the discharged mine waste-water (subject to discharge consent applications) which could give rise to elevated BOD levels.
- 5.181. The relevant standard is that contained within the Conservation Objectives as derived from JNCC Freshwater Fauna. It is a parameter of relevance to both FWPM and Atlantic Salmon and on this basis it is relevant to implications on Salmon within the Pollanroe Burns. The limit value should therefore be an end of pipe value.
- 5.182. The proposed limit value of 1 mg L as an annual mean, fully accords with the Conservation Objectives / JNCC Freshwater Fauna (at end of pipe). In fact this is more conservative, with the relevant limit being 1.5 mg L (annual mean) as relevant to Atlantic Salmon. Additionally, the Applicant proposes a 3mg L Max limit value which is derived from EQS.

Ammonia (relevant to FWPM and Atlantic Salmon)

Construction and operation

- 5.183. The construction phase is not likely to give rise to any significant increases in Ammonia in the watercourses.
- 5.184. It is the discharged mine waste-water (subject to discharge consent applications) which will contain elevated Ammonia levels, as relevant to the operational phase of the RO treatment plant.
- 5.185. The relevant standard is that contained within the Conservation Objectives as derived from JNCC Freshwater Fauna. It is a parameter of relevance to both FWPM and Atlantic Salmon and on this basis it is relevant to implications for Salmon within the Pollanroe Burn. The limit value should therefore be an end of pipe value.
- 5.186. The proposed limit values of 0.25 mg L Max and 0.2 mg L as an annual mean, accord with the Conservation Objectives / JNCC Freshwater Fauna in respect of Atlantic Salmon (and also FWPM).

Total Suspended Solids (relevant to FWPM and Atlantic Salmon)

Construction and operation

- 5.187. Unlike the other parameters discussed, for TSS it is the (early) construction phase when elevated levels are likely, due to run-off over exposed soils, before the drainage and water treatment process is installed and operational. At the operational stage, the water treatment process will remove almost all TSS.

- 5.188. In view of the baseline evidence, notwithstanding that no firm evidence is available to support the proposition that the Pollanroe Burn is used for spawning Salmon, the lower reaches of the Pollanroe Burn have been recorded as supporting Salmon parr. These reaches also support a resident population of Trout. Therefore, these sections of the burn can be considered to represent nursery habitat for Salmon and all life stages of Trout. Downstream of the proposed discharges, FWPM are present within the Owenkillev River.
- 5.189. For the Curraghinalt Burn, no Atlantic Salmon have been positively recorded. However, that burn does support Trout.
- 5.190. In view of this and in line with the Conservation Objectives / JNCC guidance, the correct target value to apply is Annual mean <10mg / L (as relevant to spawning and nursery grounds).
- 5.191. The Applicant proposes Annual mean 10mg / L in line with the Conservation Objectives / JNCC guidance. The Applicant also proposes a max concentration of 50 mg / L. These concentrations are easily achievable since the RO plant will in any event screen to remove solids before water passes through the RO membranes. As a matter of course, these screens are regularly cleaned and or replaced in order to ensure no loss in efficiency of the system. The table included at Annex 17 gives further clarity on the levels of TSS which will be discharged. As can be seen, these are well below the proposed limit value.
- 5.192. During the construction phase there is an increased risk of higher levels of TSS within the Pollanroe Burn on account of the earthworks which are due to take place. Run-off during wet weather would likely lead to mobilisation of soils. The reader is referred to table 3-2 (PDF page 16 of the OCEMP - 2019 Addendum) which demonstrates how construction could progress. Of note, the initial enabling works period is estimated at two months and this period includes the main elements of the earthworks programme, drainage system and upgrading of the existing surface WTP at the Camcosy Road complex. The new RO plant is also shown as being installed and commissioned over a two-month period and at the front end of the programme. Even where the initial construction phases are subject to an extended timeframe, any effects would still be temporary and fully reversible. Once commissioned and operational, the water treatment plants, including pre-screening for sediments will provide highly effective control over TSS discharges.
- 5.193. Ahead of full water treatment being available, mitigation is proposed in respect of increased TSS during the construction phase and this is outlined within section 4 of the oCEMP (2019). Such measures include the use of perimeter swales / straw bale check dams and temporary retention lagoons to mitigate mobilisation of peat soils in particular, all tried and tested techniques. Notwithstanding this, it is standard practice for construction stage consents to be issued with a higher, less stringent limit, than for operational phase discharges. This is reflective of the short-term nature of the effects, which are reversible.

Other Parameters (excluding flow) of relevance to FWPM and Atlantic Salmon

Construction and operation

- 5.194. Potential significant effects are limited to the operational stage, with no elevated levels likely during the construction stage.
- 5.195. With reference to the tables included at Annex 13, limit values have been derived based on the most relevant protective standards. All proposed values are protective of the aquatic environment. EQS values in particular are derived based on known effects so complying with EQS at end of pipe, without any reliance upon mixing or dilution provides an assurance that no adverse effects will arise.
- 5.196. Wherever relevant both mean and max EQS values are proposed for both the Pollanroe and Curraghinalt burns, reflective of the fact that limits should be protective of short term (acute) and long term (chronic) effects given the presence of Trout, and in the case of the Pollanroe Atlantic Salmon.
- 5.197. Regarding temperature, the Applicant proposes a limit value of 20°C. This is a Northern Ireland EQS value and is also reflective of the high end of the natural temperature range associated with the receiving watercourses. Discharges would be at ambient temperature. The mine operations do not heat or cool the water. Thus, setting the limit at 20°C is considered to be appropriate. It is noted that Loughs Agency have stated that a limit value of 18°C should be applied. This is neither appropriate nor necessary on the basis that:
- 1) Discharges would be at ambient temperature;
 - 2) Discharges will not be directly into habitat used by Salmon and an element of mixing would occur ahead of the discharge water entering habitat used by Salmon;
 - 3) Following from 2 above, natural processes impacting on the burn (e.g. sunlight, shading, turbulence caused by bed morphology) will all act to alter water temperature in any event; and
 - 4) The value of 20°C is grounded in guidance applicable to avoiding adverse effects on the aquatic environment.

Matters concerning Closure

- 5.198. In relation to the closure phase of the proposals, it will predominantly be the natural / baseline levels relevant at that time, which will drive the discharged concentrations. In the case of Iron and Manganese, elevated levels in the Curraghinalt burn are reflective of the fact that the adit discharge will be depressing levels during operation. They will rise to a level consistent with other burns in close proximity (where no discharges are proposed).

- 5.199. In the case of nitrate, there will be a continued discharge of mine related nitrate into the Curraghinalt Burn, as any remaining blasting residues within the underground mine are flushed out as the groundwater table rises to fill the underground mine. The primary discharge will be from the adit to the Curraghinalt Burn. It is noted that the mass of nitrate available to be mobilised will be finite (i.e., is not generated from the rock, but is a residue of mining). With no additional project source (no actual blasting), levels will decrease over time, trending to the background nitrate levels in groundwater.
- 5.200. As a headline point, the Applicant's proposed limit values in combination with the Betterment Plan will ensure that the achievement of favourable condition at the Owenkillew River SAC (and other relevant designated sites) will not be hindered (i.e. there is no undermining of the Conservation Objectives). Monitoring will be used to guide the point at which any discharge consent/s can be surrendered, with revision of the closure plan undertaken throughout the mine life, which is industry best practice.
- 5.201. Additionally however, during the closure period, there will be no mine dewatering and processing, and discharge flows will be lower. The change in regime could give rise to the Applicant applying for a new discharge consent which references the changes to consent requirements, justified through the analysis and submission of, monitoring evidence obtained throughout the life of the mine operations. Any new application/s would be assessed and judged on its own merits, in view of relevant legislation and guidance available at that time. In determining the current applications however, the Competent Authorities can be satisfied that the proposals would not undermine the relevant Conservation Objectives and that appropriate security exists, in the form of the package of measures to confirm the requisite level of certainty in this regard.

Matters concerning olfactory cues (relevant to Atlantic Salmon)

- 5.202. It is noted that Loughs Agency has raised a concern regarding the potential for discharged water to impact upon water chemistry in such a way that olfactory cues (potentially) relied upon by migrating salmonid fish would be impacted. In simple terms, the water would smell different and this could hinder migrating fish in their return to their natal waters.
- 5.203. However, the fact is that the water chemistry of the main rivers is determined by fluvial flows from numerous sources (tributaries). The percentage of the main river flow (water volume) derived from the Pollanroe and Curraghinalt burns is infinitesimal compared to other sources. When mixing and dilution are considered, it is not at all likely that the discharges will have any bearing on olfactory cues related to salmonid species, by either masking or mimicking chemical cues for example. The discharge proposals effectively result in the re-circulation of groundwater which is already present in the catchment (with treatment proposed for Mine related water which will be subject to strict limit values).
- 5.204. It is considered that no adverse effects arise in relation to olfactory cues.

Matters concerning osmotic shock

- 5.205. Osmotic shock would be relevant where the discharge water is so 'pure' that changes to baseline water chemistry causes a difference in the concentration of minerals on either side of the fish's cell membranes.
- 5.206. In this matter it is important to note that whilst the water chemistry within the two burns will change as a result of the proposals, in the case of the Pollanroe Burn there will be mixing with non RO water, such as that derived from the clean water pond and also run-off from land downstream of the discharge point but upstream of the parts of the burn inhabited by salmonids. This will act to recharge the discharge water with minerals. For the Curraghinalt Burn (used only as a contingency discharge point during the operational phase), there will be mixing with upstream surface water. In addition, the report included at Annex 17 confirms that the RO design will include the capability to remineralise the permeate water, adding hardness and alkalinity to match the end of pipe Total Dissolved Solids (TDS) with the natural background TDS of the burns, or to meet specific discharge consent requirements.
- 5.207. Potential effects related to osmotic shock on Salmonids are considered not to be significant.

Implications for Salmonid invertebrate prey resources

- 5.208. As discussed above, whilst the discharge proposals will result in changes to water chemistry, none of those changes are significant from an environmental / species protection perspective. The resulting water quality would be suitable for sustaining invertebrate food sources for Salmonid species, which in any event are focussed in the lower reaches of the burns.
- 5.209. There would be no adverse effects on Salmonid invertebrate food resources as a result of the proposals.

Implications for Otter (fish) prey resources

- 5.210. The proposed discharge limit values are protective of salmonids in the burns and main rivers. The proposed water treatment process, in combination with the Betterment Plan will deliver a positive outcome for water quality in the catchment, helping the SAC to achieve favourable condition in respect of the relevant interest features including Salmon, and therefore Otter (particularly insofar as prey resources are concerned).
- 5.211. There would be no adverse effects on Otter food resources as a result of the proposals.
- 5.212. By way of overall conclusion in relation to surface water quality issues, **no adverse effect on the integrity** of the Owenkillew River SAC would arise in relation to effects from changes in water quality.
- 5.213. Following from the above conclusion; and also noting the dilution which would occur within downstream receiving waters, it can be concluded that **no adverse effect on the integrity** of any other European / Ramsar site

would arise. Effects on these sites would be nugatory (insignificant and into discernible against the baseline).

Water quality (groundwater)

- 5.214. Matters concerning ground water quality are expressly dealt with at paragraphs 5.120 to 5.130 of the 2020 sHRA submission and the reader is directed to that information.
- 5.215. It is of relevance that the draft Surface Water and Groundwater Environmental Monitoring and Action Plan (SGEMAP at Appendix D2 of the Second Addendum (2020) covers monitoring of environmental performance in the groundwater environment, as well as actions that may be triggered in the event of an unforeseen occurrence.
- 5.216. The levels / limits presented in the SGEMAP are purposefully designed to be protective of compliance levels, associated obligations and any statutory conditions. These assessment limits and the monitoring regime will be subject to annual reviews. It is considered that this provides security as to the long-term safeguarding of the groundwater environment.
- 5.217. In conclusion, **no adverse effect on the integrity of the Owenkillev River SAC** would arise in relation to effects from changes in groundwater quality.
- 5.218. In the light of the above conclusion; and also, noting the distances involved and dilution which would occur within receiving waters, it can be concluded that **no adverse effect on the integrity of any other European / Ramsar site** would arise.

Flows - Changes to the hydrogeological and hydrological regime

- 5.219. Matters concerning flows are relevant to Atlantic Salmon (and by association Otter), within both the main rivers and the burns (notably the Pollanroe and Unnamed Burn). Impacts on flows are also relevant to Trout within the burns (noting the potential association with FWPM, but that Salmon are the primary host species). Further, impacts on flows are relevant to the Owenkillev SAC and those downstream designated sites in respect of FWPM and Water Crowfoot beds.
- 5.220. This assessment has had specific regard to information presented in the 2017 ES, 2019 Addendum to the ES and the 2020 Second Addendum. particularly, the "Groundwater Impact Assessment", prepared by SRK Consulting (2020) and the "Surface Water Impact Assessment", prepared by SRK Consulting (2020) together with the associated technical reports prepared by Kaya Consulting. In addition, further information regarding flows is presented within this sHRA given the numerous comments relating to flows within the Transboundary Responses (for example paragraph 10.5 to 10.8 and 10.15 to 10.30 of the Loughs Agency transboundary response).
- 5.221. Hydrological changes relating to flows, specifically concerning the Owenkillev River (SAC) have been assessed and a summary of the

conclusions is presented at Section 10.2.3 of the Surface Water Impact Assessment (2020). As can be seen from that summary information, for all phases of the project, impacts are assessed as negligible.

- 5.222. To further assist the Inquiry the impact of the proposed mine on surface water flows is put in context in the new Table below. It shows average monthly and annual flow conditions for locations downstream of the mine. Also presented is a catchment map showing the various catchments and locations referred to within that table.

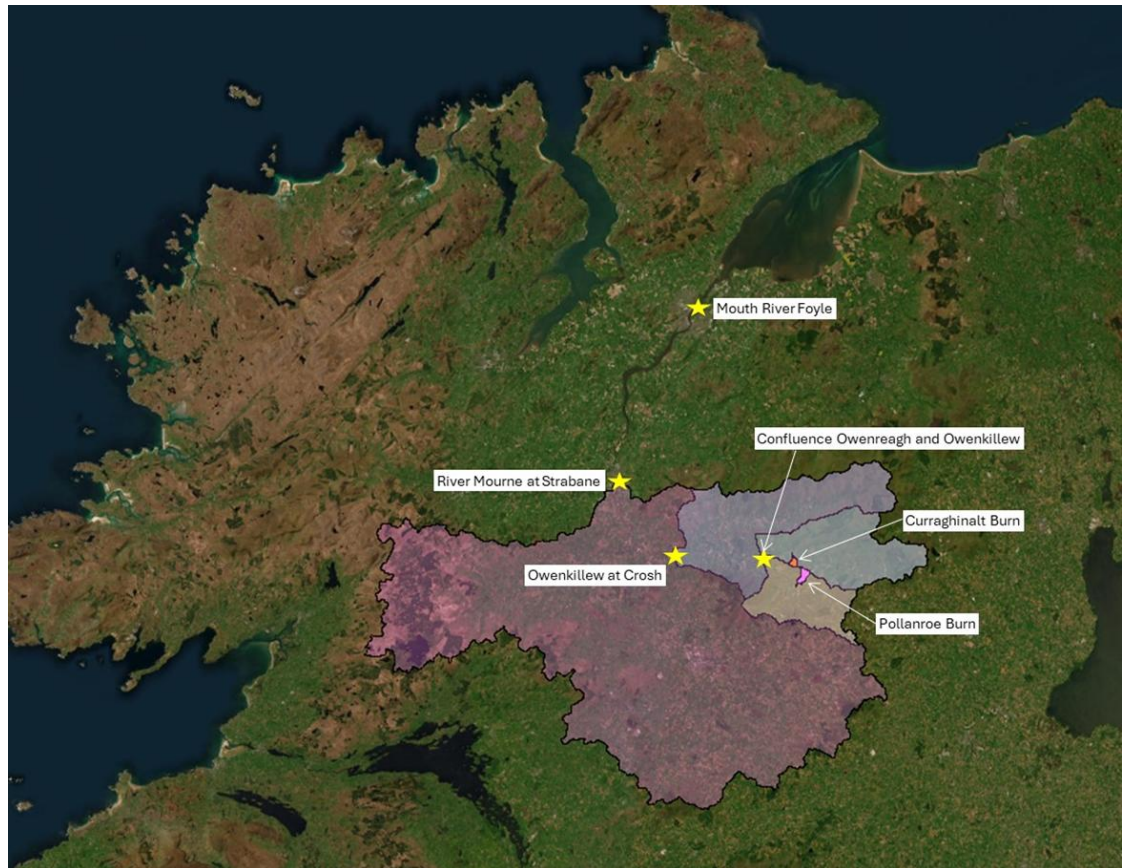


Figure 1: Catchment map showing Pollanroe and Curraghinalt Burn Catchments compared to main river catchments

Location	Catchment Area (km ²)	Unit	Monthly Flows (L/s) and Flow Change (%)												
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
^a Impact of mine on Pollanroe Burn	-	L/s	18	14	15	14	11	12	12	12	13	16	17	17	14
^b Baseline Flow - Owenreagh ds Pollanroe	53.5	L/s	2,707	2,229	1,850	1,235	840	597	516	676	926	1,785	2,188	2,561	1,510
		%	0.7	0.6	0.8	1.1	1.3	2	2.4	1.7	1.4	0.9	0.8	0.7	1
^c Impact of mine on Unnamed Watercourse	-	L/s	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
^b Baseline Flow - Owenreagh at Mouth	85.5	L/s	4,315	3,759	2,944	2,173	1,600	1,000	846	1,147	1,416	2,769	3,443	4,116	2,451
		%	0.4	0.3	0.4	0.6	0.6	1.0	1.2	0.9	0.8	0.5	0.4	0.4	0.5
^d Impact of mine on flows in Owenkilllew catchment	-	L/s	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4
^b Baseline Flow - Owenkilllew at its mouth	137	L/s	8,271	7,079	5,949	4,165	2,977	2,273	2,046	2,936	3,747	6,061	6,760	7,805	5,006
		%	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2
^b Baseline Flow - Owenkilllew downstream of Pollanroe	222.5	L/s	13,433	11,497	9,661	6,764	4,835	3,691	3,323	4,768	6,086	9,844	10,979	12,677	8,130
		%	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
^e Baseline Flow - Owenkilllew at DfI Rivers Agency Crosh Gauge	440	L/s	25,862	21,778	18,285	12,302	9,216	7,952	8,109	11,655	13,389	19,580	22,795	25,560	16,374
		%	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
^f Baseline Flow - River Mourne at DfI Rivers Agency Drumnabuoy House	1,844	L/s	99,845	84,158	66,593	43,117	30,433	23,411	24,748	37,927	41,724	70,562	85,277	98,604	58,867
		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
^g Baseline Flow - Foyle at its mouth	2,925	L/s	158,377	133,493	105,632	68,394	48,274	37,136	39,255	60,160	66,184	111,927	135,269	156,409	93,376
		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

^a From Section 9.2.2 of SWIA

^b From data in SWIA

^c Scaled as 5% loss of catchment as per Section 9.2.2 of SWIA

^d From Section 10.2.1 of SWIA

^e Data obtained from NFRA website

^f Estimated flows, scaled from River Mourne gauge

Impact of Mine on Average Monthly and Annual Flows (based on Water Balance data from Year 12 of operations)

5.223. Figures 2 and 3 below compare observed flows from DfI Rivers Agency gauges at Owenkilllew River (at Crosh) and River Mourne (at Strabane), with the changes which would arise in respect of the Mine proposals. It is clear that in every month of the year the variation in flow conditions experienced by aquatic life is significantly larger than the change in flow predicted for the rivers. Indeed, changes need to be viewed on a logarithmic scale given the small value of the flow compared to baseline conditions.

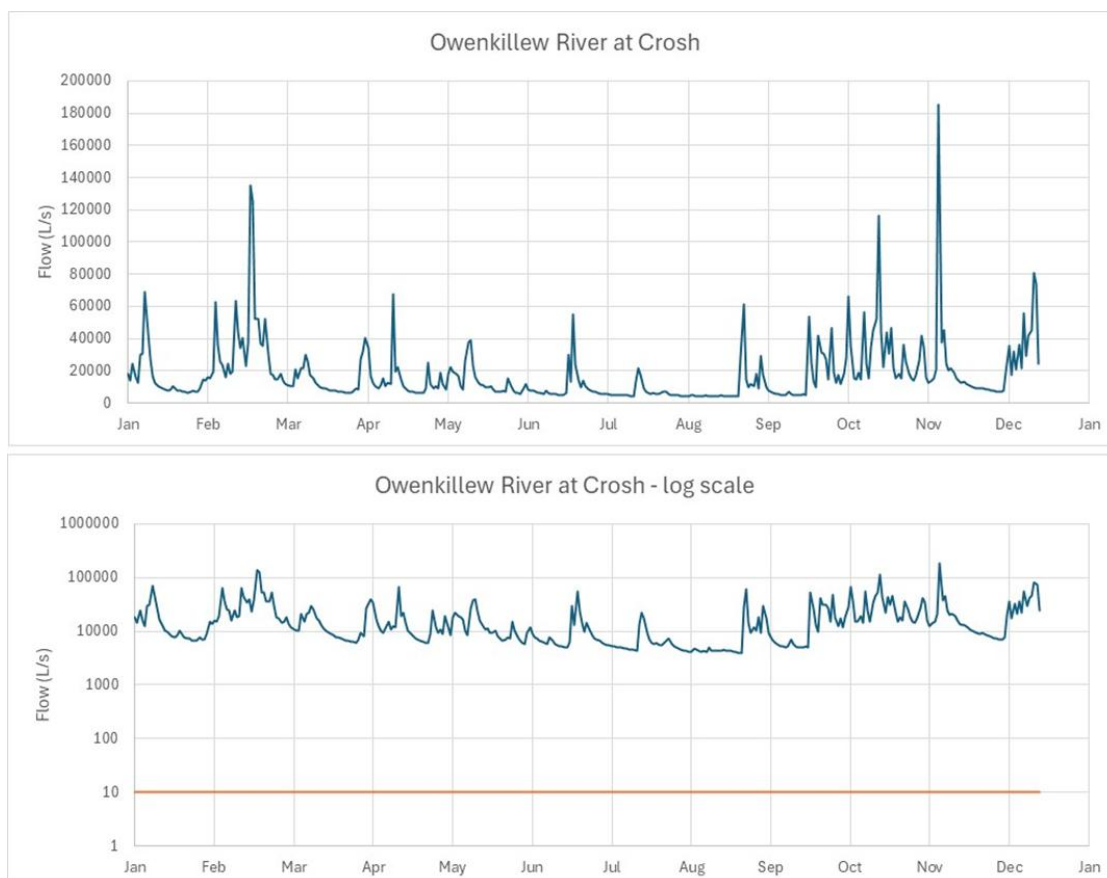


Figure 2: Example observed flow data for Owenkillev River at Crosh (from Dfl Rivers Agency gauge) for 2022

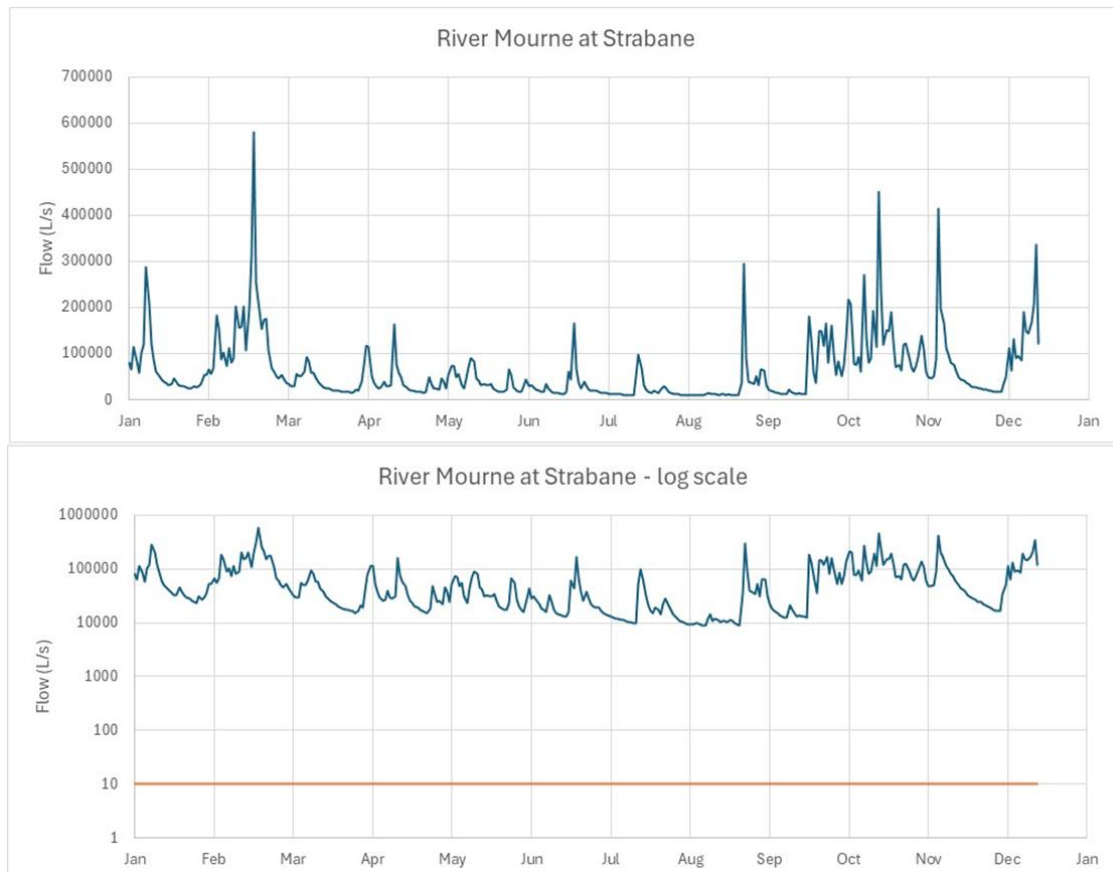
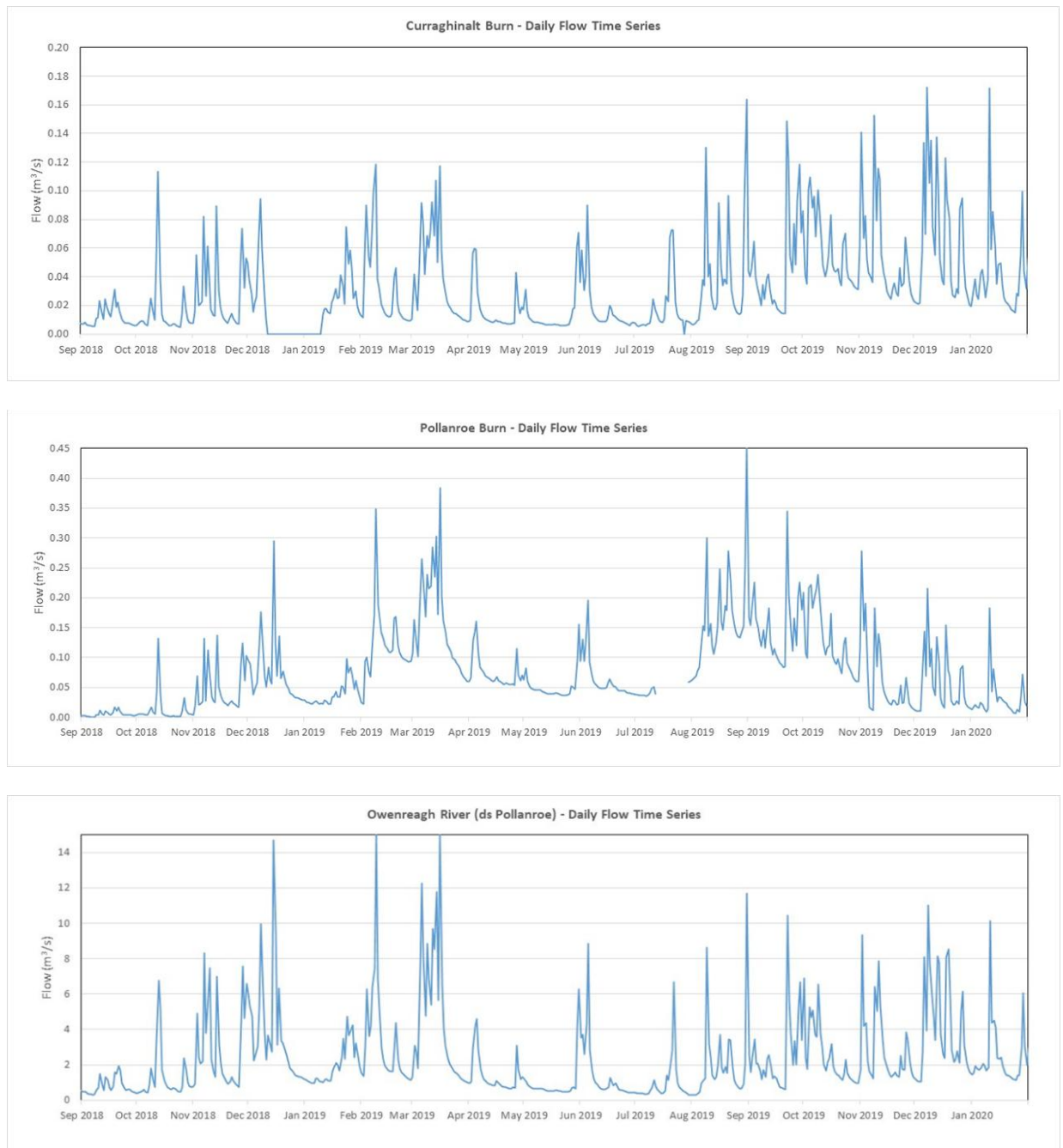


Figure 3: Example observed flow data for River Mourne at Strabane (from DfI Rivers Agency gauge) for 2022

- 5.224. It is clear by reference to the % changes cited in the table above that the scale of the changes in flow caused by the mine are negligible in respect of the flows within the larger rivers. There would be no measurable impact of the mine and any changes would be well within the range of flows naturally occurring in these rivers.
- 5.225. Regarding the burns, these are all flashy and subject to significant changes in flow conditions (see Annex 11 of this sHRA), often drying significantly during the summer months and are subject to high flow storm events during periods of heavy rain. Hydrographs are presented below for the Curraghinalt and Pollanroe Burns, and the Owenreagh River. It is clear that flow rates vary rapidly in response to rainfall, with every month experiencing a wide range of flow conditions. It is also the case that flows changes from year to year.



- 5.226. The discharge and abstraction proposals will not give rise to an adverse deviation from naturally occurring baseline conditions. Only minor changes to water depths occur, whether increases or decreases. The reader is directed to Annex 11 of this sHRA for additional information regarding flows, provided on the basis of Transboundary consultation comments including those submitted by Loughs Agency.
- 5.227. In respect of the Pollanroe Burn where the most significant changes occur, these changes are positive for Salmon. The proposals result in increased low and average flows and a reduction in the severity of high flow (storm events) which will reduce scouring and flushing. This is therefore viewed as a positive effect of the proposals and a benefit in terms of Salmonids, which will have slightly more water, for more of the

time and will not be subjected so regularly or severely, to the potentially deleterious effects of storm event which can alter the hydromorphology of the burns. The effects of the proposals in relation to Atlantic Salmon with specific regard to habitat requirements are discussed further at Annex 5.

5.228. In undertaking this sHRA, specific regard has been had to the issue of flows as cited for Salmon in the Conservation Objectives (2024) for the Owenkillev River SAC and JNCC Guidance on flows. This is discussed below.

5.229. The Owenkillev River SAC Conservation Objectives (2024) refer to the Common Standards Monitoring Guidance for Rivers (2016) ("CSM Rivers", a copy of which is included at Annex 23 of TR6 – see section 4.1). That same guidance is cross referenced within the Atlantic Salmon Favourable Condition Table 5 on page 52 of the Freshwater Fauna CSM Guidance (2016).

5.230. Specifically of relevance, the Conservation Objectives cite, at Annex A, advice on flow targets, as follows:

"Flow targets included in the CSM guidance for Rivers should be used, as these are intended to support a healthy naturally functioning river ecosystem which protects the whole biological community and individual species to a degree characteristic of the river. As a minimum, UKTAG standards for GES under the WFD should be met. River flow rates should be as natural as possible throughout the site, avoiding human induced high and low extremes."

5.231. Notably, whilst clearly reliant upon, and in many ways mirroring CSM guidance, the 2024 Conservation Objectives do not fully reflect the specific Atlantic Salmon flow target described at Favourable Condition Table 5 on page 52 of the Freshwater Fauna CSM Guidance (2016) (see Annex 23 of TR6). The JNCC guidance states that:

"Ideally, flow targets included in the CSM guidance for Rivers should be used as these are intended to support a healthy naturally functioning river ecosystem which protects the whole biological community and individual species to a degree characteristic of the river. As a minimum, UKTAG standards for GES under the WFD should be met".

[emphasis added]

5.232. In the context of the target, the JNCC wording is far more easily deduced and applied. That wording more clearly gives weight to a minimum standard of UKTAG Good Environmental Status (GES) under the WFD being met, but with a preference for CSM Rivers standards being met.

5.233. The wording of the 2024 Conservation Objectives however, appears to be more prescriptive in terms of the use of the CSM Rivers standards, despite still referring to a minimum standard of UKTAG GES.

5.234. The issue requires specific consideration on the basis that JNCC Rivers Guidance is published in order to protect and maintain important watercourse habitat (that which is designated). It is after all monitoring guidance used for condition assessments associated with such sites..

5.235. Turning to the CSM Rivers guidance, this states at section 4.1:

"Assessing compliance with flow targets is mandatory where data are available to make a judgement, unless there are no flow modifications affecting the site that are likely to give rise to non-compliance..."

Headwater sections are particularly vulnerable to abstraction, and downstream migration of perennial heads, other than in times of drought, is a sign of unfavourable condition."

5.236. Flow targets are given in Tables 2 and 3, with clarification that the principal flow targets at Table 3 should be taken as the minimum expected for an SAC river where appropriate and locally agreed targets are not already in place. For the detail the reader is directed to those tables (see Annex 23 of TR6). However, it is noted that in relation to the "compliance assessment", clarity is given on the fact that the targets relate to the designated site itself, referring to the fact that the targets are aimed at maintaining flow conditions required by the qualifying species relevant to the designation. It is stated:

*"Compliance assessment should be undertaken for each assessment unit **within the SSSI/SAC** in collaboration with the appropriate environment agency, and should consider the 6 years of daily flow data preceding the assessment".*

[emphasis added]

5.237. The aim is to preserve natural flow conditions for a river where the flow characteristics themselves are considered key to the designation.

5.238. Section 4.1 of the CSM Rivers guidance describes the targets and aims of the assessment of flows. It is clear from this text that the issues which the guidance is trying to address relate to reductions in flow, with key text set out below.

"The maintenance of both flushing flows and seasonal base flows, based on natural hydrological processes, is vital

Indicators of problems may be a very shallow water depth, a reduction in the wetted area, or reduced water movement compared with what might be expected."

5.239. However, the targets provided within Tables 2 and 3 of the guidance do not refer to reductions only, but refer to deviations from naturalised flows. These targets make sense within the context of applying strict standards within an SAC River, where the designation is made on the basis of the quality and importance of the habitats and associated value to supported species. The burns relevant to application are not SAC or ASSI habitat

(noting that the lower reaches of the Curraghinalt burn are within the SAC, but it is the riparian / woodland habitat which is the notable feature not the watercourse itself). It is not necessary or appropriate to extend the same strict standards to all connected waterbodies, a matter returned to further below.

- 5.240. For clarification, the minimum standard of UKTAG GES under the WFD only equates to protection of low flows. It is protection against exacerbating low flows which is of specific relevance in relation to the Pollanroe burn (Salmon presence) where discharges are proposed.
- 5.241. Increasing low flow conditions or maintaining Q95 flows (in line with UKTAG) is beneficial to in stream habitat. Reading the targets in Table 3 any other way would imply that if a channel were to dry out naturally in the summer months then efforts to maintain flows in the channel at that time would breach the JNCC targets. In addition, measures to increase low flows in a channel due to interventions would also breach JNCC targets even if desirable for fisheries or other environmental purposes.
- 5.242. Further, reducing flood flows can have wider societal benefits, particularly in areas of flood risk. If the JNCC guidance were to be applied strictly, (as suggested by LA and NIEA) in the absence of any regard to certain benefits which can accrue from changes to flows, the corollary is that measures to reduce peak flows / flood events (harmful to fish habitat) could be in breach of JNCC targets.
- 5.243. In the case of the Mine proposals, it is considered that since we are not dealing with designated habitat, representing the best quality or an important example of such a habitat, when addressing impacts on flows it falls to consider the implications for the supported species and in this case most notably Salmon (interest features of the SAC / ASSIs) and by association with FWPM, Trout.
- 5.244. To summarise the position regarding flows and implications for Atlantic Salmon:
- 1) JNCC Rivers guidance (broadly transposed into the Conservation Objectives regarding flows) is directed at maintaining the feature condition of watercourses which are designated and which have an intrinsic nature conservation value (warranting their designation);
 - 2) The burns themselves are not designated;
 - 3) Specific JNCC Atlantic Salmon targets highlight low flow issues as indicating unfavourable condition;
 - 4) The maintenance of “natural hydrological processes” is also cited, however in the case of Pollanroe Burn it is important to highlight that the hydrological processes are modified (through culverting for example), so they are not natural. We are not dealing with a pristine, natural watercourse;
 - 5) To apply an unwarranted, strict standard requiring no deviation from existing flows by more than 10% within a burn which is itself undesignated, but linked to an SAC squanders an opportunity to deliver benefits to salmonids and other species. This cannot be the situation envisaged by the JNCC in producing its guidance, or indeed by NIEA in publishing the Conservation Objectives.

- 6) If the 10% threshold is applied, then it is hard to imagine a situation where any minor tributaries which are subject to extreme low flows could ever be the subject of improvement measures for salmonids. A position which is plainly absurd given the issue of climate change;
- 7) Further, the A5 application is known to give rise to flow changes in watercourses which are greater than 10% of baseline (see discussion in report at Annex 11, a position which NIEA and Loughs Agency are content with (see paragraph 4.56 of Appendix 1 to FODC Water Discharges Rebuttal).

- 5.245. The Applicant's proposals will have no adverse effect on salmonid habitat through changes in flows, moreover the proposals will deliver enhancements for salmonids.
- 5.246. By way of summary conclusion, it is considered that no adverse effects in relation to flows occur either directly or indirectly on the Owenkillev SAC or in relation to Salmon which use the Pollanroe and Unnamed Burns.
- 5.247. By way of conclusion, **no adverse effect on the integrity of the Owenkillev River SAC** would arise in relation to effects from changes to the flow regime.
- 5.248. In the light of the above conclusion; and also, noting the distances involved, it can be concluded that **no adverse effect on the integrity of any other European / Ramsar site** would arise.

In-combination Assessment

- 5.249. In combination effects have previously been assessed and the reader is directed to the following information:
- a) Section 5.7 of the EclA 2017 (Appendix C8 of the 2017 ES) – this considers all relevant cumulative schemes / effects (at that time) and specifically considers such effects in relation to designated sites, including the Owenkillev River ASSI / SAC. That assessment concluded that no significant cumulative effects arise. The 2017 and 2019 sHRAs (Appendix C10 of the ES and 2019 ES Addendum respectively) each drew on those conclusions in the context of the Habitats Regulations assessment requirements.
 - b) The 2020 Update sHRA (Appendix C10 of the 2020 ES Addendum), additionally assessed in combination effects associated with the Powerline Application, also referencing the EclA and previous sHRA conclusions regarding cumulative (in combination) effects.
- 5.250. The ES and related materials have clearly defined the scope of the project and its relationship to other projects, identified relevant receptors and individual effects. However, noting the passage of time, in addition to the above, consideration has been given to any other projects that might give rise to a need to be assessed in combination with the Mine proposals. Relevant projects are detailed within Appendix 4 of the Planning Transboundary Statement.
- 5.251. None of those projects detailed would give rise to significant adverse in combination effects.

- 5.252. The majority of projects relate to small scale (single unit) dwellings and none have a relationship with surface water or ground water in a way which could give rise to in combination effects. They do not impact upon the infrastructure site or the stringent discharge levels that are proposed for the development.
- 5.253. Other non-residential developments identified at Appendix 4 and Appendix 5 of the Planning Transboundary Statement include small scale (e.g. single turbine) wind turbine developments, car park extensions and farm diversification projects (e.g. tea rooms and accommodation / glamping). Again, it is concluded that none have a relationship with surface water or ground water in a way which could give rise to in combination effects.
- 5.254. In relation to water abstractions; in October 2025 SLR undertook a follow up consultation (via email of 28th October 2025) to determine if there were any records of additional water supply wells or abstractions within the search area (8km from the mine), and since the previous searches in June 2024. Details of the consultations and responses received are outlined in the table below.

Organisation	Response date	Data received	Comment
Geological Survey of Northern Ireland	NO	NA	NA
Drinking Water Inspectorate	13/11/25	Names of 7 private wells	No additional private wells
FODC	13/11/25		FODC does not retain a database for water supplies, public or private, for the WFS search area
DAERA NIEA Water	28/10/25		Referred to DWI (No 2. above)
NI Water	30/10/25	Directed to online data request page	NI Water Assets included in June 2024 WFS Report
DAERA Private Water Supplies	13/11/25		Referred to DWI (No 2. above)
DfI Rivers Registry (Omagh Region)	17/11/25	Designated Watercourses (Owenkillew and Owenreagh)	Letter and Map of designated watercourses

Results of update consultation regarding water supply wells and abstractions 2025

- 5.255. It is concluded that there are no new water supply wells and abstractions to be included in the in combination assessment.
- 5.256. It is also appropriate to consider other regional mineral exploration activities. Whilst such projects are understood to be (ordinarily, after prior notification and provision of environmental reports and method

statements to Councils for EIA screening purposes) considered Permitted Development with no formal planning permission required, they are subject to permitting by Department for the Economy and there is therefore a process by which the project is assessed and any necessary mitigation can be secured / enforced.

- 5.257. By their nature, exploration activities are small scale and localised with effects being temporary. By way of example, stream bed sampling involves the use of hand-held equipment over a very short period of time and drilling (if undertaken) will be targeted, localised and in accordance with appropriate method statements, meaning potential adverse effects are minimised. Prior notification (28 days) is required to be given for boreholes or the making of other excavations, like trenching (subject to conditions). There is no credible evidence to suggest that these localised, small-scale activities have any material impact individually. In combination with this project, there is no likely significant impact.
- 5.258. In all instances, the Department for Economy screens for potential implications for designated sites and any necessary mitigation can be incorporated into the exploration proposals before the grant of a licence.
- 5.259. The suite of mitigation and enhancement measures (including the proposed limit values associated with the discharges and the Betterment Plan) are such that the Mine project is more than mitigating its effects, in many instances improving baseline conditions. Therefore, there is the potential for positive in combination effects to arise where NIW with responsibility for sewerage treatment, planning authorities and/or DAERA/NIEA also deliver on improving water quality in the catchment.

Integrity Test Summary Conclusions

Designated Site	Effect on Integrity	Notable Comments
Owenkillew River SAC	No adverse effect on Integrity	Mitigation will deliver improvements to water quality and help push feature condition towards favourable condition. Potential adverse effects on FWPM, Salmon and Otter are directly mitigated and the same conclusion can be reached in respect of Water Crow-foot beds.
River Foyle and Tributaries SAC	No adverse effect on Integrity	Improvements in water quality associated with the Owenkillew River not likely to be discernible at this site but if other projects come forward to address water quality

		issues across the catchment, the in combination effects can be viewed as beneficial. Potential adverse effects on Salmon population is mitigated.
Lough Foyle Ramsar site	No adverse effect on Integrity	Improvements in water quality associated with the Owenkillev River not likely to be discernible at this site. Potential adverse effects on Salmon population is mitigated.
River Finn SAC	No adverse effect on Integrity	Improvements in water quality associated with the Owenkillev River not likely to be discernible at this site. Potential adverse effects on Salmon population is mitigated.
Black Bog SAC / Ramsar	No adverse effect on Integrity	Air Quality assessment has confirmed no adverse effect.