Dalradian Gold Limited

Curraghinalt Project

County Tyrone

Northern Ireland

Technical Report:

Ecology and Nature Conservation

Karl David Goodbun
BSc(Hons) MCIEEM

PAC Refs:

Planning Refs:

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1. INTRODUCTIION

Purpose of this Technical Report

1.1. This Technical Report ("TR") describes the effects of the Curraghinalt Project proposals in relation to ecology and nature conservation matters.

Qualifications and Experience

1.2. My name is Karl David Goodbun. I hold a BSc (Hons) degree in Countryside Management from Aberystwyth University, and I am a member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

1.3. Until early March 2024, I was employed by Ecology Solutions Ltd. I joined Ecology Solutions in February 2006 and was appointed to its board of Directors in 2016, a position which I held until leaving that company. I am currently a Director of Karl Goodbun Limited, a company which I recently formed following my departure from Ecology Solutions. Prior to my employment with Ecology Solutions, I worked as a field ecologist with MKA Ecology Ltd after holding project management positions with the Essex Wildlife Trust and Sandwich Bay Bird Observatory (based in Kent).

1.4. During my time at Ecology Solutions I undertook and oversaw a broad spectrum of environmental planning work relating to ecology and nature conservation. In addition to Dalradian Gold Limited, recent clients included (*inter alia*) National Grid, BAE Systems, Aggregate Industries, This is Gravity, Rigby Real Estate, Royal Portrush Golf Course, SITA, EDF Energy, Legal and General, Ulster Farmers Union and a range of national house-builders including Vistry, Persimmon, Taylor Wimpey, Redrow and Bellway.

1.5. I have extensive experience of evaluating development proposals in relation to a range of ecological receptors, including sites designated at the international, European, national and district / local level for their ecological importance. I have evaluated development proposals and produced avoidance / mitigation strategies in relation to many Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar Sites, Sites of Special Scientific Interest (SSSIs) and Areas of Special Scientific Interest (ASSIs), locally designated sites, such as Local

Wildlife Sites (LWSs) and also Ancient Woodlands. I have also prepared a significant number of mitigation strategies for a range of protected species including Badgers, Bats, Dormice, Water Voles and herpetofauna including Great Crested Newts, Smooth Newts and common reptiles. In addition, I have held (acting as the Named Ecologist) numerous mitigation (development) licences for Great Crested Newts and Badgers.

1.6. I have been closely involved in a number of high-profile projects relating to the ecology and conservation of various species and habitats, including those relating to large residential, retail and leisure schemes, mineral workings, aerodromes and giga factories. I have personally provided written and oral evidence for section 78 appeals and local plan inquiries in addition to providing written evidence for the High Court in respect of judicial review proceedings. Further, I have assisted in the preparation of evidence for numerous section 78 appeals, call-in inquiries, Lands Tribunal hearings and judicial review proceedings in the High Court.

1.7. My role in the Curraghinalt Project extends back to 2020 and my appointment involves oversight of ecology and nature conservation matters generally, leading in relation to relevant (nature conservation) legislative provisions and principal expert witness evidence (ecology and nature conservation) relevant to the planning inquiry process. I have reviewed all relevant documents pertaining to the planning application and inquiry process and I was the lead author of the "Update Shadow Habitats Regulations Assessment" (Update sHRA), dated November 2020. Work undertaken on behalf of Dalradian Gold by Ecology Solutions up until April 2024, such as the production of the Update sHRA, was completed by "Ecology Solutions (Manchester) Ltd"[1], of which I was a shareholder until recently.

1.8. The evidence which I have prepared and provided for this con-joined public inquiry, contained in this TR, is true and has been prepared with due regard had to the guidance of my professional institution. I confirm that the opinions expressed are my true and professional opinions.

1.9. In preparing this TR I have had regard to technical information and expert opinion provided to me by Mr Steve Judge of Green and Blue Ecology and Mr Steve Coats

[1] A sister company of Ecology Solutions Ltd

of Ricardo. A short summary of their respective qualifications, experience and project involvement is described below.

Steve Judge – Green and Blue Ecology

1.10. Mr Judge holds a BSc (Honours) degree in Environmental Management and Monitoring from University College Northampton (2000) and has over 23 years of experience in ecological and environmental consultancy. He is a full member of CIEEM and founded Green and Blue Ecology in 2020, having left his roles at SLR Consulting Limited and SLR Consulting Ireland.

1.11. Mr Judge has been involved in the project since 2010 when working for SLR Consulting Limited and SLR Consulting Ireland. As part of an Environmental Baseline Study, he was the lead ecologist responsible for the planning and carrying out of baseline ecological surveys over an area of circa 2,500 hectares (ha) of land, encompassing the current planning application, that included a broad suite of habitat and species surveys, including for example Phase 1 Habitat surveys, Peat Characterisation surveys and, Badger surveys, Bat surveys (building assessment and transects), Otter surveys (Owenkillew and Owenreagh Rivers), bird surveys (breeding and wintering), herpetological surveys (Smooth Newt and Common Lizard) and assessment of biological water quality in the Owenkillew and Owenreagh Rivers.

1.12. Mr Judge has also been the lead ecologist, responsible for baseline ecological surveys and carrying out Ecological Impact Assessments (EcIAs) feeding into the following planning applications:

K/2013/0072/F -	Extension to existing underground exploration tunnel and associated works;
K/2014/0246/F -	Application under Article 28 of the Planning (NI) Order 1991 for non-compliance with conditions 25 and 26 of approved planning application no. K/2013/0072/F. Conditions 25 and 26 relate to water discharge parameters.
K/2014/0387/F -	Development of a temporary explosives store and associated works;

1.13. Since 2022, Green and Blue Ecology have been responsible for the programme of ecological monitoring carried out on behalf of the Applicant which includes *inter alia* update species surveys and habitat assessments and macro invertebrate monitoring surveys (river water quality assessments). Mr Judge was responsible for the planning, execution and reporting of the ecological survey / monitoring work.

Steve Coates – RSK Biocensus Ltd

1.14. Mr Coates is an Associate Director of Ecology at RSK Biocensus Ltd. Prior to this he was an Associate Director at Ricardo. He has over 30 years' experience as a fish scientist and has expertise in carrying out fisheries-based assessments. Prior to consultancy, Mr Coates spent 20 years at the Environment Agency (EA), starting his career in 1991 as a Fisheries Officer within the current EA Thames Area. He established baseline freshwater fisheries monitoring programmes within several river catchments and has authored numerous fisheries reports.

1.15. From 2001 to 2011 he moved to EA Head Office where he was a Fisheries and Water Framework Directive (WFD) Advisor working on developing WFD monitoring programmes and classification tools. Notably, he was the UK lead on the intercalibration of European fisheries classification schemes for the European Commission.

1.16. Steve has been working as a private sector environmental consultant since 2011 and has been involved with the Curraghinalt Project in his capacity as a fish scientist and fisheries consultant since 2014, initially employed by SLR Consulting Limited and latterly of Ricardo. He is a member of the following:

1) The Chartered Institute of Water and Environmental Management (CIWEM) - Chartered Water Environment Manager (C.WEM);
2) The Royal Society of Biology (MRSB) - Chartered Biologist (C.Biol);
3) The Institute of Fisheries Management (IFM); and
4) Freshwater Biological Association (FBA).

Additional expertise relied upon

1.17. In preparing this TR I have also had regard to the expert opinions and evidence of others who have prepared TRs on behalf of the Applicant for the conjoined Inquiry.

1.18. Where relevant to do so, I refer the reader to the TRs of others or to specific information found within the Environmental Statement (for example), in order to keep my TR as succinct as possible.

2. RELEVANT DOCUMENTATION

1.19. In this section I describe the key sources of information relevant to effects on ecological receptors and relied upon by me in drawing my conclusions. I have highlighted below the relevant ES chapters and associated Appendices, together with other documents submitted with the planning application. I have also identified new information which is being relying upon since the second Further Environmental Information ("FEI") submission (ES Addenda). Such information is appropriately referenced and is included as an Annex to this TR.

Environmental Statement dated November 2017

Key Document Name	Key Section and Subsection	Key Page Numbers	Summary notes
Environmental Statement dated November 2017 Volume 2 Prepared by SRK Consulting (UK) Limited			
Environmental Statement - Volume 2: Chapter 7: Biological, Human and Aesthetic Environment	Section 7 Sub-sections 7.2 (7.2.1 to 7.2.16)	Pages 1 - 71	Provides an overview of the biological baseline conditions within the defined ecological study area built upon an environmental baseline study (2011/2013) and further suites of studies into ecology (2015-2016).
Environmental Statement - Volume 2: Chapter 8: Environmental and Social Impact Assessment	Section 8.11 Sub-sections 8.11.1 to 8.11.15	Pages 167 - 202	Provides an assessment of the potential environmental impacts on identified important ecological features.
Environmental Statement - Volume 2: Chapter 9: Cumulative Impacts	Section 9.5	Pages 16 - 17	Provides an assessment of cumulative ecological impacts from other proposed development in the vicinity of the Curraghinalt Project.
Environmental Statement - Volume 2: Chapter 10: Environmental and Social Management Plan	Section 10.3 Sub-section 10.3.7	Pages 31 – 32	Details the measures required to prevent or minimise negative impacts and optimise positive impacts including any identified ecological impacts.

Key Document Name	Key Section and Subsection	Key Page Numbers	Summary notes
Environmental Statement Volume 2: Chapter 11: Conclusion	Section 1 Tables 11-1, 11-2 and 11-3	Pages 2 - 5	Summarises the outcomes of the assessment process to inform the decision makes about environmental and social effects from the project.
Environmental Statement November 2017 **Volume 3: Appendices** Prepared by SLR Consulting and dated September 2017			
Appendix B2: Outline Construction Environmental Management Plan	Complete Document	All	Describes the construction methodology for the Curraghinalt Project and presents measures that are proposed to be implemented at construction stage to prevent / mitigate environmental (including ecological) impacts.
Appendix C8: Ecological Impact Assessment and Baseline Reports	Complete Document	All	Provides an EcIA of the Curraghinalt Project including a description of baseline conditions, evaluation of ecological features, identification of potential ecological effects and assessment of likely significance, mitigation measures to prevent, reduce or offset the level of impact, identification of any residual effects.
Appendix C8 – Annex A: Northern Ireland and Fermanagh & Omagh District Priority Habitats and Species (included in the Ecological Impact Assessment Report)	Complete Document	All	Presents a summary list of priority habitats and species in a Northern Ireland and local context.
Appendix C8 -Annex B: Target Notes (included in the Ecological Impact Assessment Report)	Complete Document	All	Presents a summary description of any feature of particular ecological interest identified as an individual target note.

Key Document Name	Key Section and Subsection	Key Page Numbers	Summary notes
Appendix C8 – Annex C: Phase 1 Habitat Survey and Phase 2 Vegetation Survey Report	Complete Document	All	Presents the results of the habitat surveys carried out in 2015/16 to inform the baseline conditions within the application site and evaluation of habitats to inform the EcIA.
Appendix C8 – Annex D: Peat Characterisation Survey Report	Complete Document	All	Presents the results of the peat characterisation survey carried out in 2012 as part of the EBS and in 2015 in areas not previously covered by the ESB to inform the baseline conditions to inform the EcIA.
Appendix C8 – Annex E: Badger Survey and Evaluation Report. (Marked Confidential)	Complete Document	All	Presents the results of the badger survey carried out in 2015/16 site to inform the baseline conditions for this species and inform the EcIA.
Appendix C8 – Annex F: Bat Survey and Evaluation Report	Complete Document	All	Presents the results of the bat surveys carried out in 2015/16 inform the baseline conditions for this group of species and inform the EcIA.
Appendix C8 – Annex G: Otter Surveillance and Evaluation Report	Complete Document	All	Presents the results of the otter surveys carried out in 2015/16 inform the baseline conditions for this species and inform the EcIA.
Appendix C8 – Annex H: Breeding Bird Survey Report	Complete Document	All	Presents the results of the breeding bird surveys carried out in 2015/16 inform the baseline conditions for this group of species and inform the EcIA.
Appendix C8 – Annex I: Wintering Bird Survey Report	Complete Document	All	Presents the results of the wintering bird survey carried out in 2015/16 inform the baseline conditions for this group of species and inform the EcIA.

Key Document Name	Key Section and Subsection	Key Page Numbers	Summary notes
Appendix C8 – Annex J: Common Lizard Survey and Evaluation Report	Complete Document	All	Presents the results of the common lizard survey carried out in 2016 inform the baseline conditions for this species and inform the EcIA.
Appendix C8 – Annex K: Smooth Newt Survey and Evaluation Report	Complete Document	All	Presents the results of the smooth newt survey carried out in 2015 inform the baseline conditions for this species and inform the EcIA.
Appendix C8 – Annex L: Fisheries Habitat Assessment of the Owenkillew and Owenreagh Rivers Report	Complete Document	All	Presents the results of a River Habitat Survey (RHS) and fisheries habitat survey carried out in 2015 and forming an extension and review of a fisheries habitat assessment undertaken as part of the initial Ecological Baseline Study (EBS) and was used to inform the EcIA.
Appendix C8 – Annex M: Freshwater Pearl Mussel Survey Report. (Marked Confidential)	Complete Document	All	Presents the results of the freshwater pearl mussel survey carried out in 2015 inform the baseline conditions for this species and inform the EcIA.
Appendix C8 – Annex N: Marsh Fritillary Butterfly Survey Report	Complete Document	All	Presents the results of the marsh fritillary butterfly survey carried out in 2016 inform the baseline conditions for this species and inform the EcIA.
Appendix C8 – Annex O: Terrestrial and Freshwater (Lotic) Invertebrate Appraisal Report	Complete Document	All	Presents the results of the invertebrate appraisals carried out in 2015 inform the baseline conditions for this group of species and inform the EcIA.
Appendix C8 – Annex P: Biological Water Quality Assessment of the Owenkillew, Owenreagh and Tributaries	Complete Document	All	Presents the results of the biological water quality assessments carried out in 2015/16 to inform the EcIA.

Key Document Name	Key Section and Subsection	Key Page Numbers	Summary notes
Appendix C9: Ecological Mitigation and Management Plan (EcMMP) (Annex Q of the Ecological Impact Assessment)	Complete Document	All	Intended to provide agreement on the details of the proposed mitigation measures and management of important ecological features with the potential to be affected during the development of mine and its operation.
C10: Shadow Habitat Regulations Assessment	Complete Document	All	Presents an assessment of the proposals in view of the legal tests associated with the application of the Habitats Regulations. Assessment superseded in 2019 and again in 2020.
Environmental Statement dated November 2017 **Environmental Statement - Volume 3: C23 Powerline Specialist Study Reports** Prepared by SLR Consulting and dated September 2017			
Appendix C23a: Preliminary Ecological Appraisal of the 33 KiloVolt Power Connection of the Proposed Mine to the Substation at Ballymagorry	Complete Document	All	Intended to provide baseline information on the proposed route of the power line connection and the potential ecological implications to ensure Appraisal superseded by information contained within the 2020 FEI2.

Table 1: Key references for information sources relevant to the 2017 ES

1.20. In addition to the documents highlighted in Table 1 above, the following 2017 ES appendices are also relevant to ecological considerations and informed the EcIA process:

- B2 Outline Construction Environmental Management Plan;
- B7 Peat Landslide Hazard and Risk Assessment;
- B8 Peat Management Plan;
- B11 Lighting Specifications (replaced by Hoare Lee Lighting Plan – see Lighting TR);
- C3 Surface water baseline report;
- C4 Surface water impact assessment;

- C16 Landscape and Visual Impact Assessment and Visualisations;
- C17 Landscape and Landscape Restoration Plans;
- C18 Noise Impact Assessment;
- C19 Air Quality Impact Assessment and Baseline Report; and
- C20 Vibration and Impact Assessment.

Addendum to the Environmental Statement (2019)

1.21. DfI requested the submission of FEI pursuant to Regulation 23 of the "Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2015" in a letter dated 8th January 2019. Hereinafter this will be referred to as "FEI1" where relevant. Table 2 below provides a summary of the further information submitted as part of FEI1 in relation to ecology.

Key Document Name	Key Section and Subsection	Key Page Numbers	Summary Notes
Curraghinalt Gold Project Addendum to Environmental Statement prepared by SRK Consulting (UK) Limited and dated July 2019	Section 4 Sub-section 4.2.11	Pages 27 - 30	Addendum to the Environmental Statement that addresses the request by the DfI for FEI taking into the account the scheme revisions and the implications for important ecological features, on-going monitoring programme and peat management.
FEI Appendix B.2: Updated oCEMP	Complete Document	All	Document supersedes the 2017 ES version, taking account of scheme revisions.
Technical Appendix C.8: Addendum to the Ecological Impact Assessment and Baseline Report prepared by SLR Consulting Limited and dated August 2019	Complete Document	All	Assessment of the ecological implications of minor revisions to scheme design and provided Ecological Monitoring Reports for 2017 (Appendix 1) and 2018 (Appendix 2).
FEI Appendix C8 Badger Monitoring Report 2017 (Marked Confidential) prepared by SLR Consulting Limited and dated April 2018	Complete Document	All	Presents the results of ecological monitoring in 2017 of badgers at the proposed infrastructure site

Key Document Name	Key Section and Subsection	Key Page Numbers	Summary Notes
FEI Appendix C8 Badger Monitoring Report 2018 (Marked Confidential) prepared by SLR Consulting Limited and dated August 2019	Complete Document	All	Presents the results of ecological monitoring in 2018 of badgers at the proposed infrastructure site
Technical Appendix C.9: Addendum to the Ecological Mitigation and Management Plan prepared by SLR Consulting Limited and dated July 2019	Complete Document	All	Update to the Biodiversity Impact Statement originally presented in the EcIA (September 2017) and EcMMP (September 2017) based on the proposed minor revisions to the scheme.
Appendix C10: Shadow Habitats Regulations Assessment dated July 2019 prepared by James O'Neill Associates	Complete Document	All	Update to the assessment presented in the 2017 ES.
Appendix C23: Drawing showing the proposed Power Line route	Complete Document	All	Addendum to the information contained in the 2017 ES.
Note: *NIEA requested redacted copies of the Badger Monitoring Reports for 2017 and 2018 (provided by the Applicant), it is not known whether these have subsequently been made openly available.*			

Table 2: Key references for information sources relevant to FEI1

1.22. In addition to the documents highlighted in Table 2 above, the addendum to the Surface Water Baseline Report, included at FEI1 Appendix C.3 is also of direct relevance to ecological considerations and the evidence presented in this TR.

Second Addendum to the Environmental Statement (2020)

1.23. A second request for FEI was made by DfI by way of a letter dated 15th September 2020. Hereinafter this will be referred to as "FEI2" where relevant.

1.24. The second Addendum to the Environmental Statement submitted in response to the FEI2 letter included an Update Shadow Habitats Regulations Assessment, Appendix C10, produced by Ecology Solutions. In addition, Appendix C.23 included Powerline Specialist

Study Reports, with a summary of the proposals provided at section 3.2.5 of the Second Addendum to Environmental Statement. Also of direct relevance to ecological considerations and the evidence presented in this TR, FEI2 included a second addendum to the Surface Water Baseline Report, included at FEI2 Appendix C.3.

New Information

1.25. Ecological monitoring has been carried out by consultants appointed by the applicant since the planning application was submitted in 2017. Other parts of the wider environment have also been periodically re-surveyed and monitored, access permitting.

1.26. The programme of specific ecological monitoring work was initially carried out by SLR Consulting Limited from 2017 to 2021. Green and Blue Ecology continued with this work since 2022.

1.27. The results of this ecological monitoring have been reported. It provides updated information to ensure the adequacy of ecological information available for the decision-making process, with due regard had to guidance provided by British Standard (BS) 42020:2013 (Biodiversity - Code of Practice for Planning and Development) and that issued by CIEEM.

1.28. The new ecological monitoring information prepared by Green and Blue Ecology is detailed below in Table 3. Copies of the reports referenced below are included as appendices to this TR.

Appendix Reference	Document Name	Purpose
Annex 1	Phase 1 Habitat Survey Report dated April 2024	This report presents the findings of the walkover survey to review the habitats present within the proposed infrastructure site in April 2024.

Appendix Reference	Document Name	Purpose
Annex 2	Badger Survey Report dated April 2024	This report presents the findings of a badger survey undertaken at the proposed infrastructure site in April 2024 to update the survey originally carried out by SLR Consulting Limited in 2015/16, and which was submitted as part of the original planning application in 2017 (Appendix C8 Annex E). It also presents a summary of any ecological monitoring carried out by SLR during the period 2017 to 2021 and by Green and Blue Ecology from 2022-2023.
Annex 3	Bat Survey Report dated January 2024	This report presents the findings of a bat survey undertaken at the proposed infrastructure site in 2022/23 to update the survey originally carried out by SLR Consulting Limited in 2015/16, and which was submitted as part of the original planning application in 2017 (Appendix C8 Annex F). It also presents a summary of any ecological monitoring carried out by SLR during the period 2017 to 2021.
Annex 4	Otter Survey Report dated April 2024	This report presents the findings of the otter surveillance along the Owenkillew and Owenreagh Rivers in April 2024 to update the survey originally carried out by SLR Consulting Limited in 2015/16, and which was submitted as part of the original planning application in 2017 (Appendix C8 Annex G). It also presents a summary of any ecological monitoring carried out by SLR during the period 2017 to 2021 and by Green and Blue Ecology from 2022-2023 on the Pollanroe Burn flowing through the proposed infrastructure site.
Annex 5	Breeding Bird Survey Report dated December 2023	This report presents the findings of a breeding bird survey undertaken at the proposed infrastructure site in 2022 to update the survey originally carried out by SLR Consulting Limited in 2015/16, and which was submitted as part of the original planning application in 2017 (Appendix C8 Annex H).

Appendix Reference	Document Name	Purpose
Annex 6	Wintering Bird Survey Report dated January 2024	This report presents the findings of a wintering bird survey undertaken at the proposed infrastructure site in 2022 to update the survey originally carried out by SLR Consulting Limited in 205/16, and which was submitted as part of the original planning application in 2017 (Appendix C8 Annex I).
Annex 7	Common Lizard Survey Report dated November 2023	This report presents the findings of a common lizard survey undertaken at the proposed infrastructure site in 2022 and 2023 to update the survey originally carried out by SLR Consulting Limited in 2016, and which was submitted as part of the original planning application in 2017 (Appendix C8 Annex J). It also presents a summary of any ecological monitoring carried out by SLR during the period 2017 to 2021.
Annex 8	Smooth Newt Survey Report dated December 2023	This report presents the findings of a smooth newt survey undertaken at the proposed infrastructure site in 2022 and 2023 to update the survey originally carried out by SLR Consulting Limited in 2015/16, and which was submitted as part of the original planning application in 2017 (Appendix C8 Annex K). It also presents a summary of any ecological monitoring carried out by SLR during the period 2017 to 2021.
Annex 9	Marsh Fritillary Survey Report dated January 2024	This report presents the findings of a marsh fritillary survey undertaken at the proposed infrastructure site in 2022/23 to update the survey originally carried out by SLR Consulting Limited in 2016, and which was submitted as part of the original planning application in 2017 (Appendix C8 Annex N).
Annex 10	Biological Water Quality Assessment Report	This report presents the results of the biological water quality assessment undertaken in 2022/23 to update the assessment originally carried out by SLR Consulting Limited in 2015/16, and which was submitted as part of the original planning application in 2017 (Appendix C8 Annex P).

Appendix Reference	Document Name	Purpose
Annex 11	Updated Biodiversity Net Gain calculation	Updates the Biodiversity Net Gain calculation presented in the Ecological Mitigation and Management Plan (September 2017) and Technical Appendix C.9 submitted as part of FEI Addendum to Environmental Statement 2019.
Annex 12	River and Fish Habitat Assessment of the Owenkillew River, Owenreagh River and Tributaries	Update to the Fish Habitat Assessment using data from 2020.

Table 3: Key references for new information associated with ecological monitoring

1.29. In addition to the above, further information has also been obtained in connection with implications for surface water quality associated with relevant watercourses, and on use by fish of the Pollanroe and Curraghinalt burns. Further survey and assessment information is also relied upon as part of the evidence base pursuant to water quality matters and associated implications for qualifying features of nearby designated sites. This information is referred to where relevant within this TR and where necessary the information is appended. Such information is also considered and discussed within the Statement of Case relating to Water Discharges submitted on behalf of the Applicant.

1.30. A Betterment Plan has also been prepared. This Betterment Plan relates directly to the issue of discharge and the discharge consent to the water system. It will deliver significant material improvement to the environment that reduces discharges that otherwise would enter the water system from uncontrolled uses that would take place. As a result, it is linked to and impacts directly upon the proposed discharges from the project into the water system.

1.31. The proposals go beyond what is considered necessary mitigation for the Mine proposals. A copy of this document is presented at **Annex 13**.

3. SCOPE AND METHODOLOGY OF ASSESSMENT

Establishing the ecological baseline

1.32. Baseline ecological data was collated by SLR Consulting Ireland in 2015-2016 through a combination of desk-based studies and field survey consistent with standard methodologies and published good practice guidelines which were current at the time. The scope of the ecological field surveys was defined on the basis of known and potential ecological interest within the study area (which extended beyond the application site boundary where relevant). This survey and assessment process built upon data collated as part of the earlier Ecological Baseline Study (EBS) carried out by SLR Consulting Ireland from 2010 to 2013. This body of information informed the ecological assessment work which supported the EIA process (initial planning submission).

1.33. A programme of ecological monitoring was and continues to be carried out, predominantly at the proposed infrastructure site. SLR was responsible for the ecological monitoring programme from 2017 to 2021 which included the annual monitoring for Badgers, Bats, Otter, Common Lizard and Smooth Newt.

1.34. The annual monitoring reports for 2017 and 2018 were submitted as part of FEI1. The results of the monitoring undertaken by SLR Consulting Limited is included in the relevant updated survey reports prepared by Green and Blue Ecology as detailed above in Section 2 of this TR.

1.35. Since 2022, further targeted ecological monitoring associated with the proposed project has been carried out by Green and Blue Ecology. The monitoring programme was devised in order to maintain baseline information for key species / groups given the timescales involved in determining the planning application/s. The focus of this additional monitoring work was on the proposed Infrastructure Site, where the greatest level of impact from the mine development will occur.

1.36. Additional fish habitat and population surveys have also been undertaken (2020 and 2022) by SLR Consulting and Ricardo.

1.37. New information being relied upon is described in Section 2 of this TR.

1.38. Full details of the methodologies used are described in the relevant survey reports either included as part of the ES (including FEI1 and FEI2) or presented as appendices to this TR.

1.39. Insofar as matters concern implications for the Owenkillew and Owenreagh Rivers and the statutory designations associated with these sites (ASSI and SAC, as relevant), and also implications for aquatic ecological receptors more generally, the reader is additionally directed to the Statement of Case regarding Water Discharges submitted by the Applicant.

1.40. The EcIA, which underpins relevant ES Chapters (as described at Table 1 in Section 2 of this TR), was undertaken with due regard had to the guidelines published at the time by the Chartered Institute of Ecology and Environmental Management (CIEEM) and BS42020:2013 “Biodiversity - Code of Practice for Planning and Development”. The EcIA followed a standard approach based upon:

a) The description of the existing baseline conditions within the application site for the mine development;
b) An evaluation of the designated sites, habitats and species present within the application site and wider surrounding area;
c) The identification of potential ecological effects of the mine development;
d) An assessment of the likely significance of identified impacts on important ecological features;
e) Identification of mitigation, enhancement and/or compensatory measures to prevent, reduce or offset a significant effect; and
f) The determination of the significance of any residual impacts of the mine development and its implications from a legal and policy perspective.

1.41. Insofar as the submitted Shadow Habitats Regulations (sHRA) assessments are concerned (including the Update sHRA of 2020), these were produced with appropriate regard to the legislative provisions, associated guidance and case law, the relevant Conservation Objectives and the best available evidence. Matters concerning the relevant baseline environment and the current (unfavourable) condition of the SAC are specifically discussed within this TR and I also refer the reader to the Statement of Case regarding Water Discharges.

Permitted development works and previous planning consents

1.42. In carrying out my assessments, I have been mindful of previous planning permissions relating to this site (set out above) and I have considered the extent to which the baseline may have been influenced by the exploration activities which took place between 27th August 2014 and 8th May 2017.

1.43. The principal point in this regard is that such activities were focussed below ground, with no significant impact upon flora / fauna. Further, the location of the exploration activities is significantly removed from the proposed infrastructure site and sufficiently distant not to impact upon the terrestrial baseline recorded, assessed and reported in the ES.

1.44. Of specific relevance, given the issues raised by consultees (and objectors to the proposals) are any changes to the baseline which may have occurred in respect of water quality during the exploration activities. This is a matter expressly dealt with in the Surface Water TR prepared by Dr Michael Stewart of Kaya Consulting and also in the Statement of Case regarding the Water Discharge applications. Reference is made to the programme of on-going water quality monitoring undertaken by the Applicant and also third party data. This data shows no significant change in water quality within the Owenkillew River caused by the exploration activities The well documented issues regarding water quality within the Owenkillew catchment (including the Owenkillew River SAC itself) can be largely attributed to land use practices such as agriculture and forestry operations and discharges from Waste Water Treatment Plants, matters discussed in detail further below within this TR.

4. OVERVIEW AND SUMMARY OF ASSESSMENT WORK

1.45. The EcIA (submitted as part of the ES) has three principal purposes:

1) To provide an objective and transparent assessment of the effects of the proposed mine development on ecological receptors;
2) To allow objective and transparent determination of the consequences of the proposed development in view of national, regional and local policies relevant to nature conservation matters; and
3) To demonstrate that the proposed development complies with nature conservation legislation.

1.46. Although a key focus of the EcIA was on new above ground development, it nonetheless had to fully consider potential environmental pathways by which important ecological features could be impacted from the overall mine development including below ground and existing infrastructure development.

1.47. Ecological features were valued in accordance with a geographical frame of reference, ranging from International to Local (lower tier), based on documented / recognised ecological value or through using professional judgement.

1.48. Broadly, important ecological features were defined as:

- Designated sites including statutory and non-statutory nature conservation sites;
- Habitats, sites and features of recognised biodiversity value; and
- Species protected or controlled by law or of biodiversity value or significance including priority (Biodiversity Action Plan – BAP) species.

1.49. With due regard had to CIEEM guidelines, only ecological features considered to be important (as defined above) were carried forward for detailed assessment.

1.50. The sources of potential impacts (arising from the proposed development) and the relevant ecological features which have the potential to be directly or indirectly affected in the absence of mitigation, were carried forward for further assessment.

1.51. It should be noted that given the timeframe over which the initial survey /assessment work, applications, consultations and application process has run, monitoring has been undertaken to ensure that the conclusions of the EIA assessment work remain valid. Where relevant to do so, I confirm the current position within this TR.

1.52. Regarding matters concerning designated sites, the Owenkillew River SAC / ASSI lies in close proximity to the Application Site and hydrological connectivity exists. As such, the statutory tests of The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 are invoked. The ES package of documentation submitted by the Applicant contains Shadow Habitats Regulations Assessments, including an Update sHRA (2020), submitted as part of FEI2.

5. SUMMARY BASELINE

1.53. In this section of my TR, I summarise the key information relevant to the ecological and nature conservation baseline. For detail, I refer the reader to the reports highlighted at section 2 of this TR.

Designated Sites

1.54. The following European designated sites / Ramsar sites are located within a 10km radius of the Application Site boundary:

a) Owenkillew River SAC;
b) Upper Ballinderry River SAC; and
c) Black Bog SAC/Ramsar site.

1.55. The Owenkillew River SAC and Black Bog SAC/Ramsar site are both located within 5km of the Application Site, with the Owenkillew River SAC located in very close proximity and linked to the Application Site by the Curraghinalt Burn, into which it is proposed that appropriately treated water will be discharged.

1.56. Beyond a 10km radius, the following European designated sites / Ramsar sites are present which, whilst well removed from the Application Site, are hydrologically linked with it:

a) River Foyle and Tributaries SAC;
b) Lough Foyle SPA;
c) Lough Foyle Ramsar site;
d) River Finn SAC (Republic of Ireland); and
e) Lough Foyle SPA (Republic of Ireland).

1.57. Additionally, sites designated at the national level are located in close proximity to the Application Site. Excluding any sites that were designated for geological reasons (only), eight such sites are located within 5km of the Application site boundary. These are the Owenkillew River ASSI, Drumlea and Mullan Woods ASSI, Owenreagh River ASSI, Black Bog ASSI, Mullaghcarn ASSI incorporating Boorin Nature Reserve (NR), and Murrins ASSI and NR.

1.58. The Owenreagh River was formally designated as an ASSI on 29th March 2018. The EcIA (2017 ES submission) considered implications for the site in view of its status as a proposed ASSI (as it was at that time). However, prior to formal designation no site boundaries were defined for the site and so the assessment proceeded on a precautionary basis and considered the entire length of Owenreagh River as the potential ASSI. In fact, this designated site extends upstream of Cashel Bridge, Greencastle and therefore upstream of the Application Site. This is an important consideration. It means that whilst in broad terms hydrological connectivity exists between the Application Site and this ASSI, discharges to water courses as part of the proposed surface water strategy could not impact water quality within the ASSI as all discharges would be relevant to points downstream of the designation. This is a matter explored in more detail at later points within this TR.

1.59. The locations of the closest designated sites, is shown in Figure 1 below:

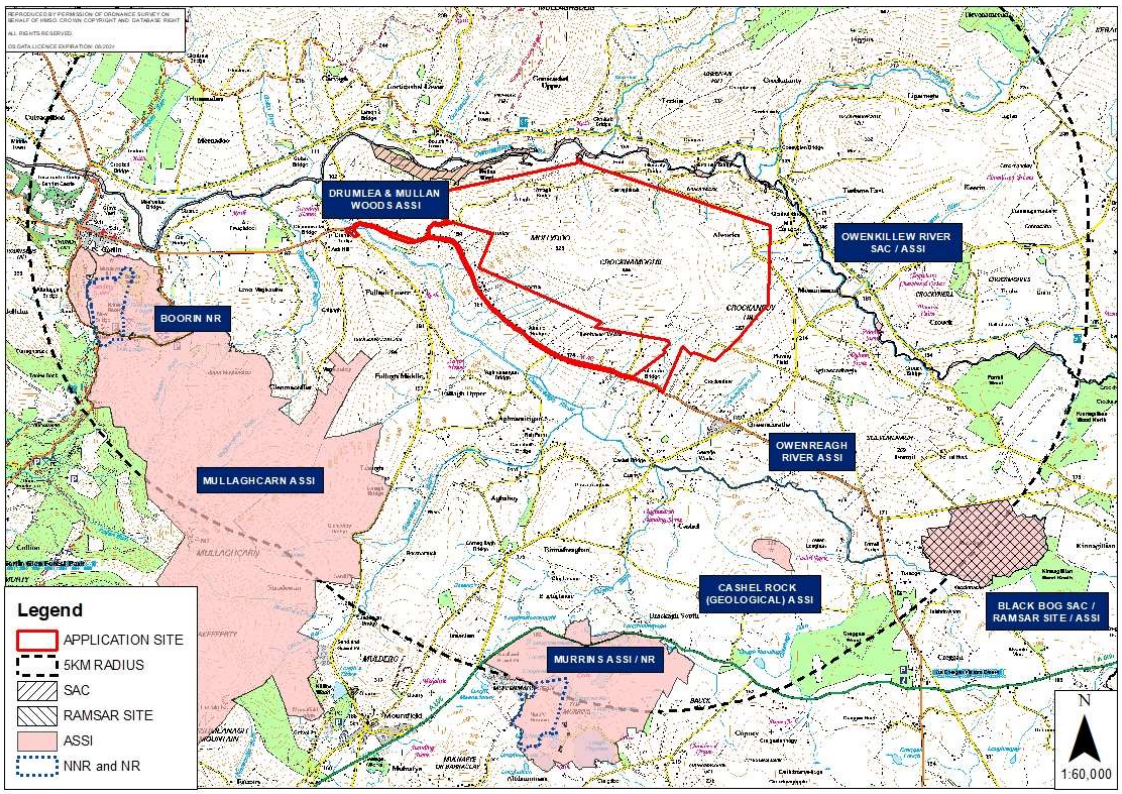

Figure 1 Designated sites within 5km of the Application Site

1.60. Qualifying interest features associated with relevant European level designated sites are described within section 4 of the Update sHRA (2020)[2], which also includes the Conservation Objectives for these sites.

1.61. Given the hydrological connectivity between the Application Site and the Owenkillew and Owenreagh rivers, and also on the basis of concerns raised by NIEA regarding proposed water discharges, the water quality baseline is also of relevance. In this regard I direct the reader to the Statement of Case (and associated annexes) in respect of Water Discharges and the TR in respect of Surface Water prepared by Dr Michael Stewart of Kaya Consulting.

Habitats

1.62. A summary of the habitats identified as important ecological features is provided in Table 4 below. The table also indicates which of these habitats are EU Annex I Habitats and Northern Ireland (NI) Priority Habitats. Figure 2 shows the location and extent of habitats considered likely to fulfil the criteria of EU Annex I and Figure 3 shows the location and extent of NI Priority Habitats in the application site.

[2] Appendix C.10 of FEI2

Habitat Type	Phase 1 Habitat Classification	Application Site	Proposed infrastructure site only	Hierarchy	Importance
Woodland & Scrub	A1.1.1 Woodland - broadleaved – semi-natural	1.83 ha	0.80 ha	Local (Higher)	NI Priority Habitat
Grassland & Marsh	B5 Marsh/marshy grassland (NVC M23a)	189.79 ha*	37.30 ha	Local (Higher)	NI Priority Habitat
Heathland	D6 Wet heath/acid grassland mosaic	65.55 ha	2.86 ha	County	EU Annex I NI Priority Habitat
Mire	E1.7 Bog – wet modified / E1.8 Bog – dry modified	485.55 ha	33.49 ha	Up to County	EU Annex I NI Priority Habitat
	E2.1 Flush spring - acid / neutral flush	-	0.26 ha	Local (Higher)	NI Priority Habitat
	E3.1 Fen – valley mire	7.99 ha	7.99 ha	County	NI Priority Habitat
Open Water	G1.4 Standing water – dystrophic	0.19 ha	0.15 ha	County	NI Priority Habitat
	G2 Running water (unclassified)	27,182 m	260 m	Local (Higher)	
	G2.3 Running water – oligotrophic	2,747 m	2,384 m	Local (Higher)	Possibly NI Priority Habitat
Miscellaneous	J2.1.1 Boundaries – hedges – intact – species-rich	6,930 m**	105 m	Local (Higher)	NI Priority Habitat

Notes:
*Area does not distinguish between NVC M23a and other marshy grassland communities.
** Length does not distinguish between intact species-rich and intact species-poor hedgerows.

Table 4: Habitats Identified as Important Ecological Features in the Application Site and Proposed infrastructure site in the EcIA

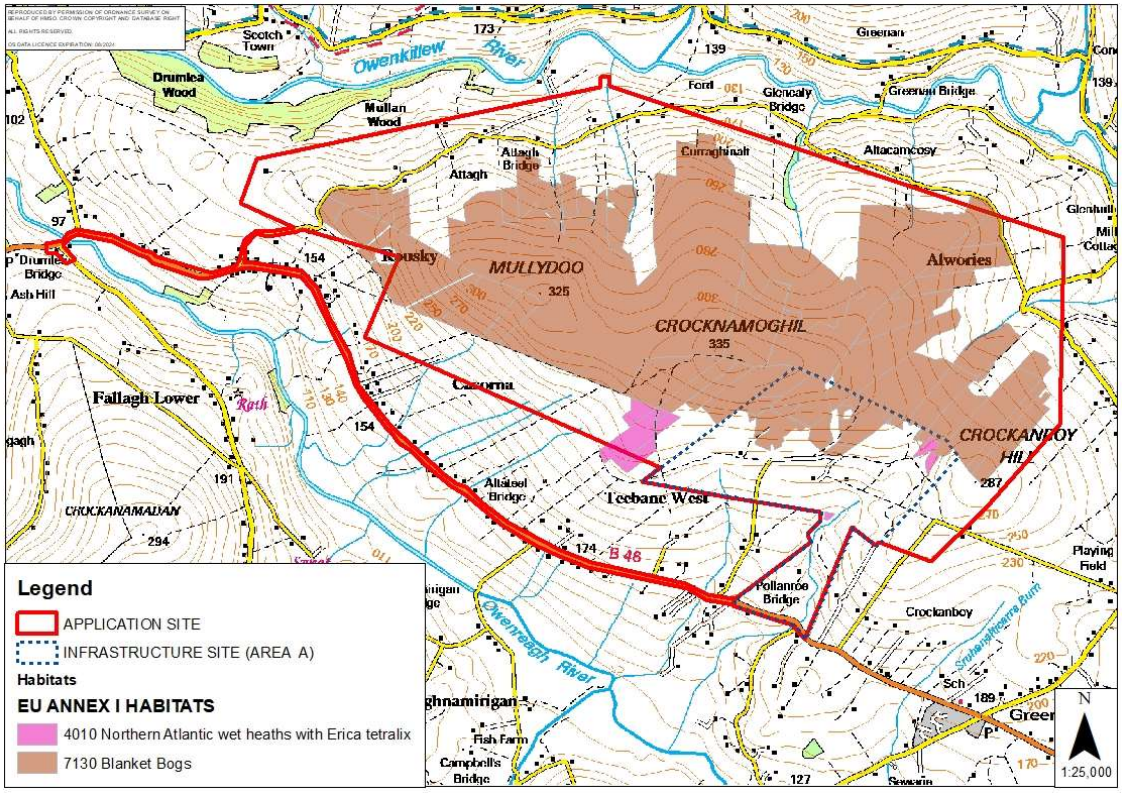

Figure 2: EU Annex I Habitats

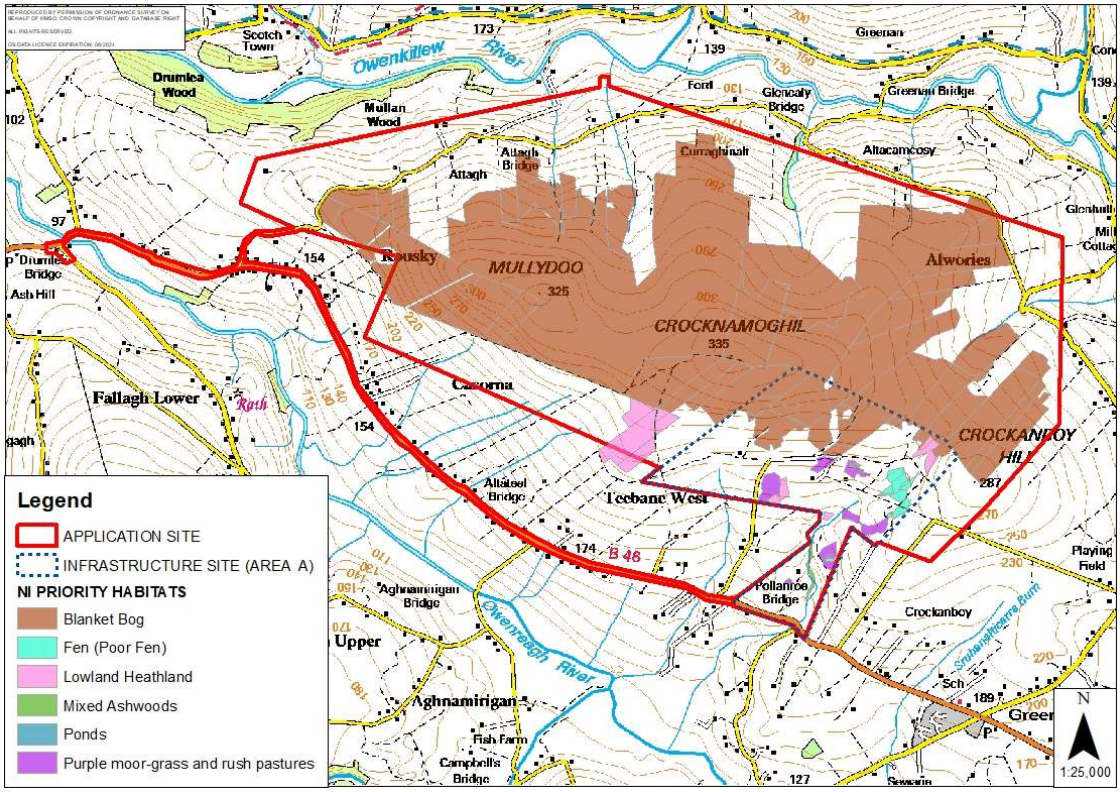

Figure 1: NI Priority Habitats

Invasive Non-Native Species (INNS)

1.63. Himalayan balsam (*Impatiens glandulifera*) was previously recorded at one location in the proposed infrastructure site although it was known to be widespread through the catchments of both the Owenkillew and Owenreagh Rivers.

1.64. The baseline conditions of Himalayan balsam have significantly changed both at the proposed infrastructure site and wider Application Site. This species is now present and prolific along the entire length of the Pollanroe Burn as well as throughout the wider surrounding area. The Applicant commenced a programme of treatment for this invasive species in 2023 to try and control it within its landholding and other areas within its control.

Faunal Species

1.65. In this section of the TR I summarise the baseline position in relation to faunal interest features. For ease of reference, I have presented the information under the following broad headings:

1) Terrestrial species;
2) Fish and Freshwater Pearl Mussel.

Terrestrial Species

1.66. A summary of the species identified as present and representing important ecological features at the proposed infrastructure site (as presented in the EcIA) is provided in the table below.

Species Group	Species	Evaluation	Importance
Mammals	Badger (*Meles meles*)	Local (Higher)	Protected under the Wildlife (Northern Ireland) Order 1985.
	Bats (all species) including Leisler's bat (*Nyctalus leisleri*), Nathusius' pipistrelle (*Pipistrellus nathusii*), common pipistrelle, soprano pipistrelle (*Pipistrellus pygmaeus*), and brown long-eared bat (*Plecotus auritus*)	Local (Higher)	Protected under the Wildlife (Northern Ireland) Order 1985 and the Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995 (as amended) including the Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019. NI Priority Species*
	Irish hare (*Lepus timidus subsp. Hibernicus*)	Local (Higher)	NI Priority Species
Birds	Bird assemblage (breeding and wintering)	Local (Higher)	Protected under the Wildlife (Northern Ireland) Order 1985 (as amended).
Reptiles	Common lizard (*Zootoca vivipara*)	Local (Higher)	Protected under the Wildlife (Northern Ireland) Order 1985 (as amended). NI Priority Status
Amphibians	Smooth newt (*Lissotriton vulgaris*)	County	Protected under the Wildlife (Northern Ireland) Order 1985 (as amended).
	Common frog (*Rana temporaria*)	Local (Higher)	
Notes: *The EcIA recognised that Nathusius' pipistrelle, soprano pipistrelle, brown long-eared bats were at the time listed as Northern Ireland Priority Species whereas at this current time all eight species of bat currently recorded in Northern Ireland are identified as priority species.			

Table 5: Terrestrial species Identified as Important Ecological Features in the EcIA

1.67. Following from the above table, it should be noted that in addition to recorded foraging and commuting behaviour, bat roosts were identified within the proposed infrastructure site.

1.68. Pollan Rua cottage was identified as a roost site for Common Pipistrelle bats during survey work which supported the ES (2017). Subsequently, monitoring of the Pollan Rua cottage has recorded a further two bats roosting at this building including Leisler's bat and Natterer's bat (*Myotis nattereri*). Whilst this represents a change in the baseline it should be noted that only low numbers of Common Pipistrelle constantly use this building on an annual basis and at all times of the

year. It is therefore considered that the evaluation conclusions (and required mitigation) remain the same as presented in the 2017 EclA. No greater conservation significance arises in relation to the updated position regarding the roost site.

1.69. The derelict farm building (Building B08) was originally recorded as being used by roosting Leisler's bat. However, as identified during monitoring work undertaken subsequently, its suitability for roosting bats has been reduced due to the southern part of the building having been partly demolished. This work was not carried out or authorised in any way by the Applicant.

1.70. Regarding Otter, the survey carried out in 2015/16 did not record any evidence of otter activity along the Pollanroe Burn and the un-named tributary flowing through the proposed infrastructure site. However, Otter spraints were recorded on the Pollanroe Burn along with footprints in May 2018 within the proposed infrastructure site at the ford structure east of the Pollan Rua Cottage. Since 2022 Otter spraints have been regularly recorded on the Pollanroe Burn at the culvert under the Crockanboy Road although no evidence of Otter has been recorded upstream of this location. It is considered that this culvert marks the upstream territorial boundary of an Otter.

1.71. Badger surveys have identified use of the proposed Infrastructure Site by Badgers and active sett entrances have been recorded. A currently active (as recorded in April 2024) main sett for a small social group is considered to be present.

1.72. I refer the reader to section 2 (above) for the references regarding where to find the baseline data relevant to terrestrial faunal species.

Fish and Freshwater Pearl Mussel

1.73. The principal concern maintained by NIEA relates to the discharge limits to be applied to any discharge consents in the light of the unfavourable condition of the Owenkillew SAC (e.g. in respect of Freshwater Pearl Mussel) and purported 'functional linkage' existing between the SAC and the Pollanroe / Curraghinalt burns.. Specifically regarding functional linkage, whilst a hydrological link exists with the SAC, it is disputed that the either of the burns perform a function which is

significant in the context of maintaining the populations of species (e.g. Atlantic Salmon) for which the SAC is designated. This matter is discussed below (and see section 13) in relation to the recorded use of the burns by relevant fish species. The unfavourable condition of the SAC Freshwater Pearl Mussel population has been linked to a deterioration in water quality (although other pressures are also documented). The deterioration in water quality arises from a range of sources, with agriculture, forestry and consented discharges (e.g. from waste water treatment plants. Relevant ecological baseline data is discussed below, with further analysis of the issues raised, presented at section 13.

Fish Species

1.74. Fish species recorded as being present within the Owenkillew and Owenreagh catchments, based on Loughs Agency records[3], include:

- Atlantic salmon;
- Brown trout/sea trout;
- European eel;
- River lamprey / brook lamprey (and possibly sea lamprey);
- Minnow; and
- Stone loach.

1.75. In addition, it is well known (and reported) that both the Owenkillew and Owenreagh Rivers support populations of Freshwater Pearl Mussels.

1.76. There are four watercourses which are of principal interest in relation to the Project, where potential significant effects could arise in the absence of appropriate and proportionate mitigation. These are:

- The Owenkillew River;
- The Owenreagh River;
- Curraghinalt Burn; and
- Pollanroe Burn.

[3] The Foyle system is monitored by the Loughs Agency using fish counters and via annual semi quantitative electrofishing surveys at several reference sites.

1.77. Figure 4 below shows the locations of the above watercourses in context. The Curraghinalt burn flows north and has a confluence with the Owenkillew River SAC. The Pollanroe Burn flows south and has a confluence with the Owenreagh River, downstream of the ASSI designated section of this river.

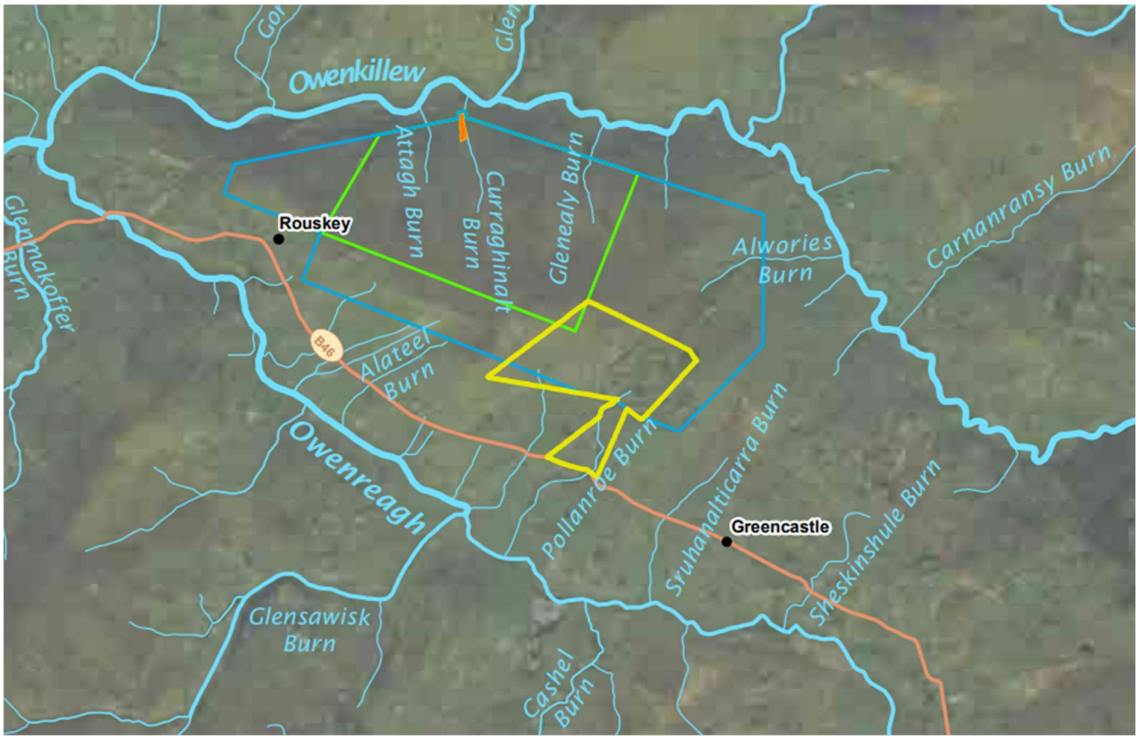

Figure 4. Location of relevant watercourses, extracted from the ES (2017) Appendix C.3 (Surface Water Baseline Report)

1.78. Each have been subject to specific surveys as part of the EIA process. Fish Habitat Surveys were undertaken in 2013 and 2015, with a repeat of this exercise undertaken in 2020. All of these surveys were undertaken by SLR Consulting using the Life Cycle Unit Method (LCUM) which was developed in Northern Ireland by the Loughs Agency. A copy of the update (monitoring) report regarding the 2020 survey work[4] is included at **Annex 14** of this TR. Results from the 2020 survey work are summarised below.

1.79. The 2020 monitoring programme indicated that the baseline conditions as recorded in 2015/16 had not significantly altered with regard to the surveyed

[4] River and Fish Habitat Assessment of the Owenkillew River, Owenreagh River and Tributaries for the Curraghinalt Gold Project, County Tyrone, Northern Ireland (2021)

stretches of the Owenkillew and Owenreagh rivers. However, it was noted that within the Owenkillew River (survey Reach 2 and Reach 3) and the Owenreagh Rivers (survey Reach 4 and Reach 5) the riverbed exhibited poor stability, with unconsolidated gravels, cobbles and boulders. This was attributed to the flood event that occurred within both rivers in August 2017, where peak flows are understood to have exceeded 500 cumecs.

1.80. Surveyed lengths of the Owenkillew and Owenreagh Rivers both contain areas of good holding, nursery and spawning habitat for Atlantic Salmon and Brown trout/sea trout. These species are still known to be present in both rivers, however data suggests that the Atlantic Salmon population is in decline, a situation mirrored across the UK and a matter which is discussed in more detail later in this TR when addressing the concerns of Statutory Consultees.

1.81. The Curraghinalt Burn is a small watercourse which was recorded as offering no habitat for fish due to its steep gradient, water depth and substrate. Significantly, the bed of the burn is 'perched' above the bed of the Owenkillew river by around 2m and the channel substrate was recorded as consisting of bedrock, boulders, and cobbles. A chute of <5m in height was also encountered circa 100m above the confluence of the Owenkillew River. This feature was considered impassable to fish. No suitable salmonid spawning areas were observed.

1.82. The Curraghinalt Burn is considered unsuitable for FWPM and no evidence of presence was recorded during any survey.

1.83. The Pollanroe Burn is a linear watercourse comprising a series of riffles and, largely, an unconsolidated bed of cobbles, gravels and sand. Iron ochre is evident in parts and the watercourse supports no aquatic or marginal vegetation. From the surveys, the watercourse was considered to be unsuitable for salmonid fish and no suitable spawning areas were observed within the sections surveyed.

1.84. The Pollanroe Burn was also considered unsuitable for Freshwater Pearl Mussel and no evidence of presence was recorded during any survey.

Updated fish surveys (electrofishing)

1.85. During consultation on the planning application, the Loughs Agency stated that it considers the lower reaches of the Curraghinalt and Pollanroe burns to support important habitat for salmonid fish species. Subsequent to the Loughs Agency issuing its consultation response of 5th March 2021, it undertook specific surveys of the Curraghinalt and Pollanroe burns during 2021 (NIEA officers were also present in an observational capacity). These surveys involved both habitat assessments and electrofishing.

1.86. Habitat assessments and electrofishing surveys were also undertaken on behalf of the Applicant in 2022, with Loughs Agency and NIEA officers attending in an observational capacity. For these surveys, a significant proportion of the Curraghinalt burn was surveyed, however due to access restrictions only one section of the Pollanroe Burn previously surveyed by Loughs Agency could be surveyed by the Applicant. The results are however valuable in the context of improving the level of baseline data available for assessment purposes, noting that the section surveyed lies in the lower reaches of the burn (i.e. the area reported to be of greater concern to Loughs Agency).

Loughs Agency 2021 data - Curraghinalt Burn

1.87. The survey report and underpinning data is included at **Annex 14** of this TR. In respect of habitat suitability for various life stages of salmonids, it is stated:

> *"In the case of the Curraghinalt Burn the range of habitat which was accessible to fish was small, but nevertheless it was felt that it would at the very least provide a refuge for juvenile salmonids in times of spate in the main Owenkillew River. The Pollanroe Burn was deemed to have a greater expanse of suitable habitat capable of providing spawning, nursery and pockets of holding. Therefore all three habitat types required for Salmonids to complete their life cycle were judged to be present in the lower section of the Pollanroe Burn."*

1.88. As reported by the Loughs Agency, the Curraghinalt Burn has a limited range of habitat available to (salmonid) fish, with only its potential to provide a refuge for juvenile salmonids (under very specific conditions within the main river) cited in terms of suitability. The value of the Pollanroe burn was purported to be higher.

1.89. Additional survey work was undertaken by Loughs Agency, and this was specifically focussed upon determining actual fish presence through electrofishing. In other words, the survey work went beyond habitat analysis, where judgements are made on the likelihood of a species being present, to a fish capture exercise where raw data in terms of fish presence (e.g. species, age class) is documented.

1.90. Raw survey data was requested by the Applicant in order to assist with understanding the survey information presented. Survey Data Sheets were subsequently provided by the Loughs Agency (see **Annex 14**).

1.91. For the Curraghinalt Burn, the relevant survey data sheet confirms that in terms of habitat suitability, for spawning, nursery and holding habitat, a grading of "3" is given for each. With reference to the Advisory Leaflet titled "The Evaluation of Habitat for Salmon and Trout" (see Annex 15), this grading puts the habitat "***well outside grade 1 on one or more counts***" in terms of nursery habitat. The grading is therefore "***failing***" in respect of suitability as nursery habitat. For spawning and holding areas a grading of 2 would be failing, so the grade of 3 falls below even that fail grade.

1.92. The electrofishing did not provide any evidence of the presence of Atlantic Salmon (qualifying interest feature of the SAC) within the Curraghinalt Burn. Only two Brown Trout (age class 1+ only, and not a qualifying feature of the SAC) were recorded in that burn during the survey.

1.93. The habitat quality data, bed morphology information and electrofishing data provided by the Loughs Agency, all point to the fact that Curraghinalt Burn is not important for Salmonid fish species. Specifically, regarding bed morphology, it is important to have regard to the fact that there is a significant (circa 2m) level change at the head of the burn, making fish passage into the burn extremely difficult, and very unlikely under most river conditions.

1.94. The 2021 Loughs Agency data does not support the proposition that the Curraghinalt burn is of value, let alone importance, to Atlantic Salmon. The habitat is documented as being sub-optimal (at best) in respect of nursery, spawning and holding habitat. No Atlantic Salmon, at any life stage, were recorded during the detailed surveys.

1.95. From the Loughs Agency's own data, it is clear that the Curraghinalt Burn does not provide habitat on which the qualifying SAC population of Atlantic Salmon are in any way reliant in terms of maintaining favourable conservation status for this species.

1.96. Regarding Brown / Sea Trout, the capture of (only) 2 Brown Trout parr at the very bottom end of the burn, is indicative of these fish moving into the burn when conditions allowed, then becoming trapped (noting the perched nature of the burn). A small number of fish may move into, and out of the burn as conditions allow / dictate. The burn cannot be concluded to be of importance to Brown / Sea Trout.

Loughs Agency 2021 data – Pollanroe Burn

1.97. In the case of the Pollanroe Burn, hydrological connectivity does exist with the Owenkillew River SAC, but unlike with the Curraghinalt Burn, this is via the undesignated (non ASSI) stretch of the Owenreagh River.

1.98. The survey report (see **Annex 14**) and detailed survey results provided by the Loughs Agency shows use of the Pollanroe Burn by both Atlantic Salmon and Brown Trout.

1.99. In the case of Brown Trout, both juvenile and adult trout were recorded. Brown Trout are not a qualifying interest feature of the Owenkillew River SAC. It is relevant that, as reported by the Loughs Agency[5], whilst there is some recognised cross-over in terms of habitat requirements, the general trend within the Foyle catchment is that Atlantic Salmon dominate the main river and swifter water, while trout dominate the smaller tributaries.

1.100. Atlantic Salmon were recorded in the Pollanroe Burn. This species is a qualifying interest feature of the SAC and as discussed, connectivity exists between the Pollanroe Burn and the SAC.

1.101. In view of the survey data sheets provided by the Loughs Agency, and having regard for the published Advisory Leaflet, the habitat grades associated with the habitat suitability for Salmonid species along surveyed lengths of this burn were

[5] Foyle Area and Tributaries Catchment Status Report 2015 (2016), Loughs Agency of the Foyle Carlingford and Irish Lights Commission, page 25 of 37

higher than for the Curraghinalt burn. However, the habitat was concluded not to be of the highest grade (Grade 1). Results are set out below.

Survey site POLL 001 was graded as follows:

	Grade
Spawning	2
Nursery	2
Holding	. 3

Survey site POLL 002 was graded as follows:

	Grade
Spawning	3
Nursery	2
Holding	3

Survey site POLL 003 was graded as follows:

	Grade
Spawning	3
Nursery	2
Holding	3

1.102. In the light of the above gradings, and with reference to the Advisory Leaflet discussed above, each of the burn sections can be categorised as sub-optimal in respect of nursery areas and failing in terms of spawning and holding areas.

1.103. Unlike the Curraghinalt burn, during the electrofishing surveys Atlantic Salmon were recorded in the Pollanroe Burn. These were all recorded at survey site “Poll 001”, closest to the confluence with the Owenreagh River. No Atlantic Salmon were recorded at survey site 002 and no fish at all were recorded at site 003.

1.104. Importantly, the Atlantic Salmon recorded during the surveys were all Salmon parr. No fry or adult Salmon were recorded. Therefore the Loughs Agency data does not show that the Pollanroe Burn is a breeding site for Atlantic Salmon. It is likely used as a temporary resource by juvenile Salmon when conditions allow.

Applicant surveys 2022 – Curraghinalt Burn

1.105. Electrofishing surveys and habitat assessments were undertaken on 28th June 2022 by the Applicant with representatives of the Loughs Agency and NIEA present. Three survey runs (over a 45m stretch) were completed at the bottom end of the burn (highlighted by Loughs Agency as providing suitable spawning and nursery habitat for salmonid species) and one upstream run was completed over an 800m stretch. The survey followed standard survey protocols and was more comprehensive than that undertaken by Loughs Agency, with greater coverage and use of stop nets. Survey data is presented at Annex 16, with the results summarised below.

1.106. In relation to all areas of the surveyed watercourse, a grading of "3" was given for nursery, holding and spawning habitat (i.e. failing on each count at the lowest grade, also concluded by Loughs Agency).

1.107. During the electrofishing survey of the bottom end of the burn, three Brown Trout were caught along with one European Eel. A single Brown Trout was caught on the upstream survey run.

Applicant surveys 2022 – Pollanroe Burn

1.108. Electrofishing and habitat surveys were undertaken on 27th June 2022 by the Applicant, again with representatives of the Loughs Agency present. Only one section of this burn could be surveyed due to access restrictions, however, the section surveyed was at the lower end of the burn close to the main river,from where salmonids could enter the burn. This was section Poll 002, previously surveyed by Loughs Agency. Three survey runs were undertaken (the second stopping 10m short of the run end due to interference.) Again, survey data is presented at **Annex16**, with the results summarised below.

1.109. In terms of habitat suitability the following was recorded:

	Grade
Spawning	3
Nursery	2
Holding	3

1.110. The grading shows the habitat to be ‘failing’ in all three aspects.

1.111. Across the electrofishing survey a total of 76 Brown Trout and 15 Atlantic Salmon (parr) were caught.

Summary conclusions regarding the 2021 and 2022 fish survey data

1.112. There is no evidence that any salmonid fish (of particular relevance to matters concerning the Owenkillew River SAC) permanently live (or spawn) within the Curraghinalt Burn. The data is consistent with a few isolated small brown trout being present in the burn. Access to the Curraghinalt Burn by salmonid fish species is only possible during high flood events. Individual fish are considered to become trapped when the river levels drop and are only expected to be resident within the Curraghinalt Burn in the short term only, between such events.

1.113. There is no evidence that Atlantic Salmon, Brown Trout / Sea Trout spawn in Pollanroe Burn. Evidence suggests that small numbers of juvenile salmon do visit the lower sections of Pollanroe Burn. Brown trout are expected to be resident in the lower sections of Pollanroe Burn circa 800m downstream of Crockanboy Road bridge. The extent to which these fish species use the burn over the course of the year is dependent upon water levels. As discussed, they have only been recorded in the lower reaches of the burn in any event, and during very low flows (e.g. during the summer months) access even to these areas will be significantly restricted or not possible. In these terms, the burns are not significant in the context of the maintenance of the Atlantic Salmon population and as such ‘functional linkage’ in Habitats Regulation terms is not demonstrated. This matter is discussed further in section 13 of this TR.

Freshwater Pearl Mussel

1.114. Freshwater Pearl Mussel ("FWPM") are known from locations within both the Owenkillew 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. For this reason, data obtained from NIEA, including that in relation to the most recent survey work conducted in 2021 and 2022 is included in a Confidential Annex (**Annex 17**). The data is summarised below.

1.115. Survey work undertaken on behalf of NIEA in 2021 was focussed on the Owenkillew River SAC and upstream of the Curraghinalt Burn. FWPM were found at similar locations to those previously recorded and discussed within the ES. A total of 2,277 FWPM are reported.

1.116. Survey work undertaken in 2022 included three sites in the Owenkillew River. These sites are downstream of the Curraghinalt Burn and are similar to those described in the 2012 ATEC survey and discussed in the ES[6]. A total of 10 mussels are reported for this area. It should be noted that no FWPM were recorded in this section during survey work undertaken by SLR during a survey in 2020.

1.117. The 2022 survey work also included a total of nine survey sites in the Owenkillew River downstream of Curraghinalt Burn and the confluence of the Owenreagh/ Owenkillew. A total of 365 FWPM are reported by NIEA in this stretch.

1.118. Regarding the 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 the 2012 ATEC survey showed 5 individual FWPM recorded in this section.

1.119. Further information regarding the conservation status of FWPM is included below at Section 13 of this TR, where the concerns of Statutory Consultees are considered.

[6] Confidential Appendix C.8 Annex M of the 2017 ES.

6. EXISTING CONSENTS

1.120. The Department has noted that the SAC is currently in unfavourable condition. In so noting, the Department has suggested discharge limits for the proposed development and linked them to various guidelines and standards. All of them are relevant to the consideration of the discharge that is to be permitted.

1.121. However, in understanding the receiving environment and the context of the Department's position, it is necessary to have regard for existing activities in the relevant area, and also to the discharge consents that have been issued by the Department for industrial and other processes that are directly and indirectly material to the SAC, the catchment and the conservation objectives.

1.122. The Tables below set out examples of the discharge consents that have been issued by the Department and its predecessor departments over a period of many years.

Sewage Treatment Plants

WWTW	Consent No.	Latest date of issue or re-issue	Receiving catchment	Catchment Area (km^2)	Discharge	Treated waste water discharge (m^3/day)	Treated Daily Dry Weather Flow waste water (m^3/day)	95th %ile limit (upper limit)		
								BOD (mg/L) O_2	TSS (mg/L)	NH4-N (mg/L)
Gortin	No. 6485_2007	3/30/2007	Owenkillew (Upper Foyle)	253	All	480	160	40	60	-
Greencastle	No. 6488_2007	11/19/2009	Owenkillew (Upper Foyle)	33	Secondary treated waste water	400	133	35	55	10
Rousky	No. 0432_2010	08/11/2010	Owenkillew (Upper Foyle)	0.6	Secondary treated waste water	55	7	-	-	-

NOTE – No samples will be taken during unusual weather conditions which will adversely affect the operation of the treatment works.
NB phosphorous not conditioned

Table 6: Existing discharge consents relating to WwTWs

Industrial

Operator	Consent No.	Latest date of issue or re-issue	Receiving catchment	Maximum limit		
				BOD (mg/L) O_2	TSS (mg/L)	NH4-N (mg/L)
Ulster Minerals Ltd	No. 10611/87	8/13/1987	Owenkillew (Upper Foyle)	No limit	50	-
Devlin Sand and Gravel	No. 165/05	06/07/2005	Owenkillew (Upper Foyle)	No limit	50	-
Pat Dobbs	No. 360/00	3/24/2000	Owenkillew (Upper Foyle)	No limit	50	-
Northstone (NI) Ltd	No. 21570/95	June 2005	Owenkillew (Upper Foyle)	No limit	50	-
P Keenan	No. 031/05/2	10/30/2019	Owenkillew (Upper Foyle)	No limit	50	-
Dalradian Gold Ltd	068/12/2	06/02/2014	Owenkillew (Upper Foyle)	10	50	-

Table 7:: Existing discharge consents relating to Industrial operations

Domestic

Consent No.	Latest date of issue or re-issue		Maximum limit				Other
		Receiving catchment	BOD (mg/L) O_2	TSS (mg/L)	NH4-N (mg/L)		
2020/23/1	09/10/2023	Easting 248289 and Northing 388996	20	30	N/A	Not exceed 1 cubic m per day	
1167/22/1	14/06/22	Easting 261409 and Northing 381322	N/A	N/A	N/A	Not exceed 1 cubic m per day	The sewage treatment works shall have BSEN 12566-3 certification demonstrating at least 95% removal of the influent Biochemical Oxygen Demand (BOD)
1156/21/1	29/06/2021	Waterway at Irish Grid Reference H 5531 8487	N/A	N/A	N/A	Not exceed 1 cubic m per day	The sewage treatment works shall have BSEN 12566-3 certification demonstrating at least 95% removal of the influent Biochemical Oxygen Demand (BOD)
1478/23/1	18/07/2023	Easting 290646 and Northing 386370	N/A	N/A	N/A	Not exceed 1 cubic m per day	The sewage treatment works shall have BSEN 12566-3 certification demonstrating at least 97.5% removal of the influent Biochemical Oxygen Demand (BOD).
2166/21/1	05/11/21	Waterway at Easting 260818 and Northing 385682	N/A	N/A	N/A	Not exceed 1 cubic m per day	The sewage treatment works shall have BSEN 12566-3 certification demonstrating at least 97.5% removal of the influent Biochemical Oxygen Demand (BOD).
1392/21/1	03/08/21	Waterway at Irish Grid Reference H 5493 8743	N/A	N/A	N/A	Not exceed 1 cubic m per day	The sewage treatment works shall have BSEN 12566-3 certification demonstrating at least 95% removal of the influent Biochemical Oxygen Demand (BOD)
275/21/1	15/02/2021	Waterway at Irish Grid Reference H 5623 8418 j	N/A	N/A	N/A	Not exceed 1 cubic m per day	The sewage treatment works shall have BSEN 12566-3 certification demonstrating at least 97.5% removal of the influent Biochemical Oxygen Demand (BOD).
1784/21/1	02/09/2021	Waterway at Easting 248345 and Northing 389582	N/A	N/A	N/A	Not exceed 1 cubic m per day	The sewage treatment works shall have BSEN 12566-3 certification demonstrating at least 97.5% removal of the influent Biochemical Oxygen Demand (BOD).
2685/21/1	30/12/2021	Easting 261536 and Northing 381299	N/A	N/A	N/A	Not exceed 1 cubic m per day	The sewage treatment works shall have BSEN 12566-3 certification demonstrating at least 95% removal of the influent Biochemical Oxygen Demand (BOD)
794/20/1	30/07/2020	waterway at Irish Grid Reference H 6206 7949	N/A	N/A	N/A	Not exceed 1 cubic m per day	The sewage treatment works shall have BSEN 12566-3 certification demonstrating at least 97.5% removal of the influent Biochemical Oxygen Demand (BOD).
1254/23/1	15/06/23	Easting 261098 and Northing 381306	N/A	N/A	N/A	Not exceed 1 cubic m per day	The sewage treatment works shall have BSEN 12566-3 certification demonstrating at least 97.5% removal of the influent Biochemical Oxygen Demand (BOD).

NOTE – standard condition in domestic consents "The effluent discharged to the waterway shall not: a. contain any substance which will cause the water in the underground stratum or in any waterway to be toxic or injurious to fish or other aquatic organisms; b. contain any substance to such an extent as to cause the receiving waters, or any waters of which the receiving waters are a tributary, to be poisonous or injurious to the spawning grounds, spawn or food of fish in those waters, or otherwise cause damage to the ecology of those waters."

Table 8:: Existing domestic discharge consents

1.123. The discharge limits set by the Department far exceed the suggested limits for this development proposal. In particular, they far exceed what the Department asserts are key discharges relating to the SAC, conservation objectives and the relevant priority species.

1.124. Insofar as existing consents are helpful in understanding the significance of effects, the Department appear to have issued discharge consents and/or not sought to have them amended in full knowledge of the SAC, the unfavourable condition and the impacts on priority species. Therefore it is to be assumed, absent any contrary explanation, that the discharge consents were considered to be proportionate and acceptable having regard to the environmental designations.

1.125. I am also mindful of the fact that Discharge Consent 068/12/2 relating to discharges from the exploratory mine into the Curraghinalt burn remains extant. The limit values placed by the statutory authority upon relevant key parameters for this discharge consent are also well in excess of what is now being proposed. As with the other consents, at the point of the statutory authority issuing the discharge consent, the same issues associated with water quality) on interest features of the Owenkillew River SAC / ASSI (and wider catchment) were known. Significantly,

the baseline position was similar to now in that key features were recorded as being in unfavourable condition.

1.126. The rationale and proportionality of the discharge limits being suggested for the proposed development cannot be reconciled with the extant discharge consents. The discharge consents in the wider catchment are very significantly above the existing baseline level for the water environment.

1.127. In simple terms, if the proposed development was to discharge at the existing baseline level, any reduction of extant discharge consent limits in the wider catchment, and more particularly those related directly to the SAC would have the effect of reducing the baseline and returning the SAC to favourable condition.

1.128. In summary the development proposal will secure:

i. Discharge of key limits relevant to the SAC and favorable condition status at the current baseline;

ii. Delivery of a Betterment Plan securing significant benefits and controls in terms of discharge to the SAC over and above the baseline discharge, thereby securing effective discharges below the current baseline;

iii. The removal of agricultural activity from the infrastructure site and wider area that currently discharges to the water network with permitted limits that are again very significantly higher than the proposed discharge limits.

1.129. In terms of ecological assessment, it is not necessarily the case that the factors recited above demonstrate that the limit values previously and currently applied by the regulator ~~then~~ must still be acceptable and must still be applied to any new discharge consent. However, the approach now proposed by the regulator in respect of discharge consent makes it abundantly clear that, reflecting the change in stance of the regulator, all existing discharge consents, including those issued in respect of industrial processes and WwTWs in the catchment will need to be reviewed and almost certainly brought in line with the approach being taken by the regulator in respect of the Mine proposals as reflected in the published advice. This is a matter discussed in detail at Section 13 of this TR.

7. SUMMARY OF EFFECTS

1.130. Ecological impacts (in the absence of mitigation) on important ecological features will predominantly occur during the construction phase of the mine development and in the infrastructure site for which mitigation and compensation measures are deemed to be necessary. Long-term management of parts of the infrastructure site and any compensation areas will be required throughout the operational lifetime of the mine to maintain its biodiversity value.

1.131. Impacts sources arising from the proposed mine development were assessed against the relevant important ecological features which could be directly or indirectly impacted through the source-pathway-receptor model. The impact sources included:

- habitat loss, damage and fragmentation;
- disturbance from human activity (noise and visual disturbance);
- disturbance from vibration;
- increased lighting;
- dust deposition;
- changes in air quality (traffic emissions);
- alterations to hydrogeological regime;
- alterations to hydrological regime; and
- changes in water quality (groundwater and surface waters).

1.132. The tables presented below provide a summary of the assessment for the construction, operational and closure phases of the Proposal on the relevant receptors, in the absence of mitigation.

Receptor	Habitat Loss, Damage and Fragmentation	Noise and Visual Disturbance	Vibration	Light	Dust Deposition	Changes in Air Quality	Alterations to Hydrogeological Regime	Alteration to Hydrological Regime	Changes in Water Quality
Construction Phase									
Owenkillew River SAC and ASSI	Not significant	Not significant			Not significant	Not significant	Significant at European / International level	Significant at European / International level	Significant at European / International level
Drumlea and Mullan Woods ASSI		Not significant				Not significant			
Owenreagh ASSI	Not significant	Not significant				Not significant		Not significant	Not significant
Woodland – broadleaved – semi-natural	Not significant				Not significant	Not significant			
Marsh/marshy grassland	Significant at Local (Higher) level								
Wet heath/acid grassland mosaic	Significant at County level								
Blanket bot	Significant at County level				Not significant	Not significant		Not significant	
Flush	Significant at Local (Higher) level								
Fen (valley mire)	Significant at County level								
Standing water (ponds)	Significant at County level								

Receptor	Habitat Loss, Damage and Fragmentation	Noise and Visual Disturbance	Vibration	Light	Dust Deposition	Changes in Air Quality	Alterations to Hydrogeological Regime	Alteration to Hydrological Regime	Changes in Water Quality
Running water (streams)	Significant at Local (Higher) level							Not significant	Significant at Local (Higher) level
Hedges	Not significant								
Badger	Significant at Local (Higher) level	Significant at Local (Higher) level	Significant at Local (Higher) level	Not significant					
Bats	Significant at Local (Higher) level	Significant at Local (Higher) level	Significant at Local (Higher) level	Significant at Local (Higher) level					
Irish hare	Not significant								
Bird assemblage	Significant at Local (Higher) level	Not significant	Not signficant						
Common lizard	Significant at Local (Higher) level								
Smooth newt	Significant at County level								
Common Frog	Significant at Local (Higher) level								
Operational Phase									
Owenkillew River SAC and ASSI (including Drumlea and Mullan Woods ASSI)			Not significant				Significant at European / International level	Significant at European / International level	Significant at European / International level
Owenreagh River ASSI						Not significant			Not significant

Receptor	Habitat Loss, Damage and Fragmentation	Noise and Visual Disturbance	Vibration	Light	Dust Deposition	Changes in Air Quality	Alterations to Hydrogeological Regime	Alteration to Hydrological Regime	Changes in Water Quality
Blanket Bog					Not significant	Not significant			
Bats				Not significant					
Bird assemblage		Not significant							
Closure Phase									
Owenkillew River SAC and ASSI							Significant at European / International level	Significant at European / International level	Significant at European / International level
Owenreagh ASSI									Not significant

Table 9 Summary of Effects before mitigation

8. MITIGATION AND COMPENSATION

1.133. Where significant effects have been identified, mitigation measures are included to prevent, reduce or offset any significant effect. Where it was identified that any significant effect could not be mitigated, compensation measures have been identified. Compensation in these terms includes the provision of alternative, enhanced habitat for protected species (listed below), noting that in some instances (Badgers, Bats, Common Lizard and Smooth Newt) derogation licences will be required in order to implement mitigation strategies (including associated compensatory measures).

1.134. Receptors where significant effects could not be mitigated against included:

a) peatland habitats comprising of wet heath / acid grassland mosaic, bog (wet and dry modified) and valley mire habitats;
b) badgers;
c) bats;
d) birds;
e) common lizard;
f) smooth newt; and
g) common frog.

1.135. Outline compensation measures were included in the EcIA but were expanded upon in more detail in the EcMMP, submitted as part of the original planning application (2017). In addition, the EcMMP included for the management of INNS.

1.136. The EcMMP (2017 ES Appendix C.9 and Addendum to ES C.9) provided details of proposed mitigation / compensation strategies and management of important ecological features with the potential to be affected during the development of the mine and its operation.

1.137. In addition, to help demonstrate (qualify and quantify) the habitat impacts, and that that the mine development would have no net loss of biodiversity, a Biodiversity Impact Assessment (BIA) was included in the EcMMP (2017). The BIA was revised in 2019 (FEI Appendix C9) to take account of changes to the Peat Management Plan. It has since been revised further, principally given the need to include the

powerline footprint[7]. Whilst noting that the BIA metric itself has undergone revisions, for consistency, the same version of the metric as used in the original assessment undertaken by SLR has been used in undertaking the update BIA calculations. The BIA demonstrated that compensatory habitat creation / enhancement would be required outside the proposed infrastructure site to predominantly offset the loss of peatland habitats. The area of peatland habitat compensation (52.73ha) to the area of peatland habitat loss to the gold mine development (c.25.84ha) is at a ratio of approximately 2:1 clearly showing an overall net gain in terms of area (ha).

1.138. The BIA currently shows a Habitat Impact Score (overall net gain for biodiversity in terms of habitats) of 86.01 biodiversity units[8]. A separate linear habitat (e.g. ditches, streams and hedgerows) calculation is also included as part of the BIA. This shows a loss of 6.35 biodiversity units. I refer the reader to the updated calculation at **Annex 11**.

1.139. Regarding the BIA calculations, the following points are important:

a) For linear habitats, the negative score (-6.35) is reflective of losses to running water habitat in "poor" condition, dry ditches and walls. A gain is in fact realised in respect of hedgerows;
b) Additional ecological enhancement, beyond that considered in the cited calculations, would be delivered at the Application Site on completion of the mining operations, predominantly through the restoration of the dry stack facility; and
c) Unlike in England, there is no legislative or planning policy requirement to confirm 'Biodiversity Net Gain' through the use of such a metric. The information presented as part of this planning application is included to assist in qualifying and quantifying the overall position regarding habitat impacts.

1.140. The requirement for a final EcMMP will be the subject of a planning condition associated with any planning permission granted. That EcMMP will be an update, fine-tuned to account for any changes to points of detail regarding mitigation. This

[7] For the powerline route, the BIA considered that assessed in the Environmental Statement prepared by RPS .
[8] A Biodiversity Unit in BIA terms, is a value derived by the application of a formula which takes account of a range of factors such as size, type, condition, difficulty of creation and time taken to reach target condition.

would include for example, the removal of reference to grazing[9], a matter discussed in detail further below in this TR in respect of water quality matters.

1.141. Construction stage mitigation for ecological (and other) receptors is also to be delivered through a CEMP. An outline CEMP was submitted with the 2017 ES[10] and an updated oCEMP was submitted as part of the 2019 Addendum to the ES, taking account of changes to the proposed scheme. A final CEMP will be agreed following the grant of any planning permission and will include as a minimum the issues identified in the ES process. The final CEMP will for example, contain full details of the timing of peat works during the construction stage, containment measures, drainage features and any associated treatment for the drainage for both the peat to be stored in the rehabilitation area and the DSF. Whilst the reader is directed to the 2019 oCEMP for the detail in terms of how construction phase risks to the environment are to be managed, at the end of this section of the TR, I have included information regarding the phasing for enabling and construction works, particularly in view of the need to deliver protected species mitigation, some of which will require licences to be obtained.

Designated sites

1.142. With reference to the Update sHRA (2020), effects relating to changes in water quality and the hydrogeological and hydrological regime are of greatest relevance to the Owenkillew River SAC. There is potential for effects to extend to River Foyle and Tributaries SAC, Lough Foyle SPA (UK and ROI), Lough Foyle Ramsar site and the River Finn SAC, due to hydrological connectivity. However, the mitigation proposed to address potential adverse effects arising in relation to water quality issues at the Owenkillew River SAC (waste water treatmentincluding below baseline for key parameters,, consented limits on discharges and Betterment proposals which include the removal of existing nitrogen sources from the Applicant's lands), would in turn, mitigate against adverse effects on these other sites.

[9] The grazing of livestock will cease on land controlled by the Applicant, as a result of mitigation commitments regarding water quality issues.
[10] Appendix B.2 of the 2017 ES.

1.143. It has been identified that significant adverse effects could arise through changes in water quality arising from discharges of waste water, and through changes in the hydrogeological and hydrological regime.

1.144. Construction related mitigation will be secured and delivered through the CEMP. In particular, strict controls will be implemented in respect of soils / silts, petrochemicals and other potential pollutants which could, through surface water run-off (for example) enter watercourses including the Owenkillew River.

1.145. The Proposal includes state of the art water treatment infrastructure based around Reverse Osmosis ("RO") technology and it should be noted that in addition to treating the 'mine / processing water' the effluent discharged from the proposed WwTW plant will also pass through the RO plant ahead of discharge to the environment (watercourses).

1.146. The critical consideration in relation to matters concerning water quality is the setting of appropriate enforcement values in granting Discharge Consents. Discharge Consents set strict limit values for relevant parameters, with non-compliance most likely leading to enforcement action.

1.147. The Applicant puts forward limit values which are considered fully protective of the aquatic environment and relevant species (including FWPM and Atlantic Salmon). The matter is discussed in detail below at section **13**of this TR which addresses the comments and concerns of Statutory Consultees, and also within the Statement of Case regarding Water Discharges. By providing a treatment system that achieves existing baseline for key parameters, together with a Betterment Plan linked to discharge that delivers significant benefits in respect of discharge of key discharges this results in a proposal that not only delivers no harm to the environment, but positively contributes towards moving feature conditions towards favourable condition against a background of current, and historic / long term, unfavourable condition.

1.148. Regarding changes to the hydrogeological and hydrological regime, it has been concluded that there would be no significant deviation from existing baseline flows. Notably, a 'baseline condition' discharge of water from the freshwater pond (collecting water from upstream of the proposed infrastructure site) is proposed to

ensure baseflow levels in the Pollanroe Burn are maintained / enhanced. I understand that the effect of this will, in simple terms, be to reduce peak (storm) flows and increase flows during low flow events (periods of drought).

1.149. In addition, a condition is proposed which will secure the Applicants commitment to monitor vibration and noise impacts. This is of relevance to potential effects on Atlantic Salmon. As discussed at paragraph 5.55 of the Update sHRA, it is proposed that the precautionary thresholds relevant to the protection of fish and incubating embryos from the effects of blasting in / near water bodies, produced by the Alaska Department of Fish and Game are adopted. With reference to paragraphs 5.43 to 5.46 of the Update sHRA, adverse effects are not likely, but the monitoring and adoption of appropriate triggers for cessation and review of (blasting) procedures provides certainty on the matter.

Peatland Habitats

1.150. The strategy for the identified peatland habitats has been developed to demonstrate that through the initial management prescriptions, as presented in this revised EcMMP, and proposed development of a long-term management plan, conditioned through any planning consent, that the compensatory measures proposed are sufficient to offset the loss of priority habitats and active peatland from the mine development. This strategy is based on four standard and accepted ecological principles that include:

1) **Protection of retained peatland habitats**. Retained peatland habitats will be protected during the construction phase of the mine within the overall proposed infrastructure site (Area A).
2) **Habitat creation**. New peatland habitats will be created within parts of the proposed infrastructure site (Area A) through the re-use of peat overburden arising during the construction works.
3) **Restoration and enhancement of retained peatland habitats**. During the development and operation of the mine retained peatland habitats within the proposed infrastructure site (Area A) will be restored and enhanced.
4) **Compensation**. The management of land outside the proposed infrastructure site, but within the overall Application Site boundary, through the restoration / enhancement of existing peatland habitats that are largely comparable, and with the same ecological functionality, to the peatland habitats being lost, or

permanently damaged where any residual impact cannot be avoided or mitigated.

Badgers

1.151. In view of the current evidence base relating to Badgers, the position is that the development will result in the loss of one badger sett assessed as being a main sett due to its levels of activity and with the risk of causing disturbance to three outlier setts due to their proximity of proposed construction works to these setts at the proposed infrastructure site.

1.152. The mitigation strategy for badgers is designed to mitigate and compensate for loss any active sett and minimise disturbance of all retained setts during the development of the above ground infrastructure associated with the mine. It will also ensure the protection of this species by avoiding badgers from being killed or injured and ensuring the local population status of this species is not affected through the mine development. The strategy includes the following:

1) Prior to the commencement of any site preparation / construction works an inspection will be made of all areas to be disturbed and within a 50m radius of these areas for any signs of badger activity.
2) Where a sett, or setts are found to be within the footprint of the proposed construction works or activities and a sett cannot be avoided a licensed closure will be undertaken between July to November, inclusive.
3) For any badger sett found in a given working area or adjacent a working area, an assessment will be made (by a suitably experienced ecologist) as to whether or not the sett can be retained, and/or disturbance minimised.
4) Where a sett is considered to be at high risk of damage, but not necessarily from destruction, and will not be fragmented by the installation of security fencing consideration will be given to temporary exclusion of the sett, with the exclusion measures being removed post construction works and the Badgers being allowed to re-colonise any such sett.
5) Where sett closure is unavoidable, the activity level of the sett and the sett's relative importance to the local Badger population will be re-appraised to determine whether the construction of an artificial replacement sett is required. As a minimum, an artificial sett will be constructed to replace the loss of a main, i.e. breeding sett. Any artificial sett will be constructed as close to the

original sett location as possible using proven construction methods and badgers encouraged to investigate the artificial sett using bait.

6) Any construction works or activities within 30m of a sett will be subject to a specific working method, agreed with an Ecological Clerk of Works (ECoW) and under an appropriate NIEA disturbance licence (if considered necessary). Where above ground blasting is required as part of any cut and fill earthworks consideration will be made to obtain a licence where any such blasting event will take place within 100m of any active Badger sett.
7) Instruction will be provided to site staff on the appearance of Badger setts and the action to take if a suspected mammal burrow is discovered.

Bats

1.153. Compensation is required for the loss of an existing roosting site and the loss of foraging habitat used by at least six species of bats.

1.154. The mitigation strategy for bats is designed to ensure the local population status of any bat species is not adversely affected from the development of the mine, in particular:

- To ensure no physical harm comes to bats during the demolition of the Pollan Rua cottage;
- To ensure no net loss of roost, or roosting potential for bat species recorded within the proposed infrastructure site through the provision of alternative roosting sites; and
- To enhance foraging and commuting habitats for bats in parts of the proposed Infrastructure Site not impacted by construction activities, or through the operation of the mine (linked with the Landscape Plan).

Birds

1.155. Compensation habitat will be delivered in respect of the loss of potential breeding habitat for a range of bird species.

1.156. The mitigation strategy for birds involves ensuring protection for nesting birds during site preparation and construction works as well as habitat creation and enhancement of retained habitats for birds.

Common Lizard

1.157. Compensation is required for the loss of existing habitat used by common lizard.

1.158. The mitigation strategy for common lizard is designed to ensure that all reasonable efforts are taken to mitigate and compensate for the loss of habitat confirmed as supporting, or which is likely to support common lizard to:

- Ensure the protection of individual animals from being killed or injured during construction works and activities; and
- To ensure there is no net reduction in the conservation status of the local common lizard population in the medium to long-term as a result of the mine development through the capture and removal of animals from within the development footprint area to an alternative safe area that provides suitable habitat that is of a sufficient size with adequate carrying capacity for the anticipated number of animals to be relocated, and with connectivity to other suitable habitat for common lizard.

Smooth Newt and Common Frog

1.159. Compensation is required for the loss of existing breeding and terrestrial habitat used by smooth newt and common frog. The strategy is designed to mitigate and compensate for the loss smooth newt breeding and terrestrial habitat and which is also used by common frog to:

- to avoid smooth newts from being killed or injured by the use of a capture and removal strategy from areas of the site likely to contain smooth newts prior to areas being released for construction works; and
- by ensuring there is no net reduction in the population size class within the site in the medium and long-term by retaining the population in the local vicinity by providing alternative breeding ponds, enhancement of retained terrestrial habitat and creation of features (i.e. providing artificial refuges and hibernacula close to newly created ponds) for smooth newts and common frog.

Invasive Non Native Species

1.160. Management is proposed which will aim towards the eradication of Himalayan balsam within the proposed infrastructure site and all other areas of the Applicant's landholding throughout the lifetime of the mine.

1.161. As previously discussed, the management of Himalayan balsam was commenced in 2023.

Specific consideration of construction activities and the oCEMP

1.162. As discussed previously, an outline CEMP has been submitted as part of the ES, the current version being that submitted as part of the 2019 Addendum package of information (FEI1 Appendix B2).

1.163. The reader is directed to section 3 of the oCEMP details the proposed construction phasing and associated works, with Table 3.2 showing the indicative programme of activities. A series of figures are also presented which shows the locations of construction phase activities.

1.164. With regard to the programme of proposed construction activities, including the upfront enabling works, a key consideration is the implication of the works on ecological receptors, including protected species. This is discussed below.

1.165. There is an identified requirement to deliver specified mitigation and compensatory measures in respect of certain species (as set out in the ES package of information). Furthermore, for bats, Badgers, Common Lizard and Smooth Newt, derogation licences will be required. Mitigation proposals in respect of ecological features are discussed within the EcMMP and this includes specific reference to construction stage mitigation with discussion also on licencing requirements and timings for delivery. That detail is not repeated here but clarity is provided in respect of certain key aspects regarding timings of works. Some refinements to the mitigation proposals are also discussed.

1.166. Insofar as (protected species) licensable works are concerned, the following broad sequence of events is relevant to each species for which a licence is required:

1) Prior to an application, planning matters will need to be resolved (e.g. permissions granted and any relevant conditions / obligations discharged);
2) Application made to the statutory authority (NIEA);
3) Review and determination of the licence application;
4) Implementation of any enabling works relevant to the mitigation strategy, such as replacement shelter / breeding provision, and cessation of grazing (activities which do not themselves require licensing);
5) Implementation of the capture / relocation or exclusion programme;
6) Confirmation by the relevant ecologist (party to the licence) that those aspects of the mitigation strategy required to be completed prior to habitat destruction (bat roost, Badger sett, or habitat used by Common Lizard and / or Smooth Newt) are clear of constraint (as relevant to the terms of the licence);
7) Supervised destruction of the habitat having regard to the terms of the licence.

1.167. The above is a guide as to how the process of licensing informs a construction programme. Specifically regarding point 4 above which deals with mitigation enabling works, this will be carefully coordinated between the project ecologist and the construction team.

It should be noted that baseline survey data submitted in support of the licence application must be sufficiently robust and ‘current’ for the purposes of undertaking the impact assessment. Monitoring of those species for which licences are required has been undertaken by the Applicant, with the most recent data from 2024. The baseline is current and could support licence applications in 2025, although the age of the data will be kept under review and updates undertaken if necessary in view of the project timetable (including determination of the planning applications).

1.168. As currently described within the oCEMP, construction works have been split into four 6 month phases (24 month build programme), with enabling works also highlighted to take place in the first two months (see section 3.3 of FEI1 Appendix B2). Specific regard has been had to these early stage works in view the ecological mitigation programme and this is discussed below.

1.169. Section 3.3 of the oCEMP confirms that construction of the (RO) water treatment plant and elements of the surface water drainage system are key early stage activities. It is stated:

"During the first two months, while the RO WTP is under preparation, the main elements of work will be

- *Construction of temporary fuelling stations at proposed infrastructure site entrance and laydown area*
- *Construction of bottomless culvert over the Pollanroe Burn for access road to span stream*
- *Construction of part of the west pond*
- *Excavation of the portal, construct laydown area at portal with pond and associated works*
- *Installation of temporary security fencing (permanent fencing where possible)*
- *Construction of water treatment plant pad/compound and discharge pipe/point*
- *infrastructure. Treatment plant to be manufactured off-site in advance of Phase 1 and delivered for connection and commissioning."*

1.170. Section 3.3.1 describes other works which are proposed to be undertaken during months 1 to 6 of the construction programme and this includes *inter alia*, the construction of the new road and access tracks.

1.171. The construction phasing timing ensures the least amount of disturbance / stress to those species concerned.

1.172. Following from the above, critical to aligning the construction programme with (construction stage) ecological mitigation is the following:

- Establishment of buffer zones around any Badger setts where potential disturbance to Badgers or damage to the sett could occur, coupled with on-going monitoring of the construction footprint and immediate surround land for signs of Badger activity, including the construction of new setts;

- Closure of the single entrance main sett (and any others where this is deemed necessary) at the earliest possible opportunity, noting that this will need to be undertaken in the period July to November in order to avoid the breeding season; and
- Delivery of the Common Lizard and Smooth Newt relocation programme in the earliest possible seasonal window (typically between April and September – weather / temperature dependent). Likely to be targeted on a rolling basis with an initial focus upon clearing supporting habitat associated with drainage and road / access infrastructure and using habitat manipulation techniques to aid the trapping exercise.

1.173. A rolling programme of habitat (including hedgerow) removal will be undertaken, following appropriate survey checks regarding nesting birds where the works cannot be undertaken outside of the breeding season. This work will be commenced at the earliest possible opportunity and will have full regard to overlap with licensable protected species mitigation requirements (i.e. any conflicts). Safeguards will also be put in place to deter nesting in areas where habitat has been cleared (e.g. the use of bunting to act as a visual deterrent), with monitoring of these areas also undertaken to determine whether further clearance is needed over time.

1.174. Regarding the demolition of the existing bat roost at Pollan Rua cottage, as originally proposed, it would be feasible to retain this roost *in situ* during the early stages of construction, maintaining a fenced buffer to the building in order to prevent damage (to the roost) and disturbance (to bats). However, a better solution would be to remove this roost (under licence) as soon as possible, in the first available window to undertake this work (e.g. either September / October or April / May, avoiding the hibernation and maternity periods), noting the requirement for prior delivery of replacement roost features. This approach would remove (as opposed to reduce to acceptable levels) the potential for disturbance of bats at the existing roost during construction activities (e.g. those associated with the berm).

1.175. As currently proposed, construction stage mitigation for foraging bats includes a proposal to maintain light levels below 4 lux along the key foraging areas used by bats, until such time as these habitats are lost to the mine

development. However, in view of current guidance[11] and noting the recorded presence of Myotis species of bat (known to be more sensitive to increased light levels) within the Application Site, it is proposed that light levels will be maintained below 1 lux along key foraging corridors and any commuting habitat linking with Pollan Rua cottage, until such time as the roost is removed under licence. This will be achieved through a combination of:

- Limiting artificial lighting to locations where it is needed;
- Limiting illumination to periods when it is needed, using timers or motion sensors where appropriate;
- Use of LED lamps where possible an avoidance of Metal Halide and compact fluorescent lamps;
- Adopt warm white light sources (2700 Kelvin or lower) where possible to reduce blue light;
- Feature wavelength higher than 550nm;
- Avoid luminaires with upward light ratio; and
- Be mounted horizontally with no light output above 90° and/or no upward tilt.

1.176. Aspects of the proposed construction implementation and early phase works can be undertaken in the absence of triggering licence requirements. In such instances, ecological mitigation would still be needed and this would be carefully coordinated with Ecological Clark of Works (EcOW) supervision adopted.

1.177. The programme detailed in the oCEMP demonstrates the programme to be delivered, however a final CEMP will need to be agreed. Any such CEMP will have full regard to the ecological mitigation requirements and would build in specific detail such as that described above.

[11] GN08/23: Bats and Artificial Lighting At Night (2023), published by the Institution of Lighting Professionals and the Bat Conservation Trust.

9. RESIDUAL EFFECTS

1.178. The table below provides a summary of the criteria used to evaluate the residual impacts and assess the significance of any such impact.

Description	Definition
Direction of impact	Positive (a change that improves the quality of the environment) or Negative (a change which reduces the quality of the environment)
Probability of occurring	Broadly defined on 4 levels: Certain (95% chance or higher), Probable (above 50% but below 95%), Unlikely (above 5% but less than 50%) and extremely unlikely (less than 5%)
Magnitude	Size, amount, intensity and volume of any impact on any particular feature including any severity of effect for example major (> 50% plus feature affected); moderate (25-50% feature affected), minor (<25% feature effected) or negligible (<5% feature effected)
Duration	Effects may be described as Permanent or Temporary in ecological terms (e.g. within the lifetime of the species affected)
Frequency of timing	The number of times an activity will occur and timing of an activity
Reversibility	Whether or not the effect can be reversed from spontaneous recovery or which may be counteracted by mitigation within a reasonable timescale

Table 10: Key Considerations in Characterising Impacts

1.179. A summary of identified residual effects, excluding consideration of effects on the Owenkillew River SAC / ASSI, is presented in the table below. Matters concerning the Owenkillew SAC / ASSI are discussed further below.

Value	Potential Impact	Direction	Probability	Magnitude	Duration	Frequence	Reversibility	Notes	Residual Impact	Probability
Marsh / Marshy Grassland (Species-rich)										
Local (Higher)	Direct loss of 0.8 ha of species-rich marshy grassland habitat	Negative	Certain	Major	Permanent	Once during construction phase	No	Construction Phase: Habitat creation and enhancement of retained habitat in the proposed infrastructure site.	Not significant	Probable
Wet Heath / Acid Grassland Mosaic										
County	Direct loss of 2.62 ha of wet heath / acid grassland mosaic	Negative	Certain	Major	Permanent	Once during construction phase	No	Construction Phase: Habitat creation, restoration and enhancement of retained habitat in proposed infrastructure site and compensation areas (offsite).	Not significant	Probable
Bog IWet and Dry Modified)										

Value	Potential Impact	Direction	Probability	Magnitude	Duration	Frequence	Reversibility	Notes	Residual Impact	Probability
County	Direct loss of 9.05 ha of blanket bog habitat	Negative	Certain	Moderate	Permanent	Once during construction phase	No	Construction Phase: Restoration and enhancement of retained blanket bog habitat in proposed infrastructure site and compensation areas (offsite).	Not significant	Probable
Flush and Spring										
Local (Higher)	Direct loss of 0.03 ha of flush habitat	Negative	Certain	Major	Permanent	Once during construction phase	No	Construction Phase: No mitigation or compensation possible to offset the loss of this habitat.	Significant at Local (Higher) level	Certain
Fen (Valley Mire)										
County	Direct loss of 7.94 ha of valley mire habitat	Negative	Certain	Major	Permanent	Once during construction phase	No	Construction Phase: It is considered that it will not be possible to mitigate and compensate for the loss of this habitat like for like.	Significant at County level	Certain
Standing Water (Ponds)										
County	Direct loss of 3No. ponds (0.15 ha)	Negative	Certain	Major	Permanent	Once during	No	Construction Phase:	Not significant	Certain

Value	Potential Impact	Direction	Probability	Magnitude	Duration	Frequence	Reversibility	Notes	Residual Impact	Probability
						construction phase		Compensatory ponds created as part of the measures required for the protection of smooth newts.		
Running Water (Streams)										
Local (Higher)	Direct loss of 1.68km of stream habitat	Negative	Certain	Moderate	Permanent	Once during construction phase	No	Construction Phase: It is considered that it will not be possible to mitigate and compensate for the loss of this habitat like for like.	Significant at Local (Higher) level	Certain
Local (Higher)	Changes in water quality	Negative	Certain	Major	Temporary	More than once during the construction phase	Yes	Construction Phase: Standard pollution prevention measures to minimise the risk of pollution.	Negligible risk of pollution or increased sedimentation and not significant	Probable
Badgers										
Local (Higher)	Direct loss of 1No. outlier sett and approximately 86 ha of potential foraging habitat	Negative	Certain	Moderate	Permanent	Once during construction phase	No	Construction Phase: Construction of artificial sett (s) and closure of any active sett within the construction footprint.	Not significant	Probable

Value	Potential Impact	Direction	Probability	Magnitude	Duration	Frequence	Reversibility	Notes	Residual Impact	Probability
Local (Higher)	Disturbance from human activity (noise and visual disturbance)	Negative	Unlikely	Moderate	Temporary	Many times during construction phase	Yes	Construction Phase: Maintain a 30m stand-off from any retained badger sett. Where construction activities are required within 30m of an active badger sett works will only be undertaken under an appropriate wildlife licence and under supervision of an EcOW.	Not significant	Certain
Local (Higher)	Disturbance from vibration	Negative	Probable	Major	Temporary	Many times during construction phase	Possibly reversible	Construction Phase: Maintain a 100m stand-off during any above ground blasting from any retained badger sett. Where blasting is required within 100 m of an active badger sett works will only be undertaken under an appropriate	Not significant	Certain

Value	Potential Impact	Direction	Probability	Magnitude	Duration	Frequence	Reversibility	Notes	Residual Impact	Probability
								wildlife licence and under supervision of an EcOW.		
Bats										
Local (Higher)	Direct loss of 1No. confirmed roost used by: common pipistrelle (maternity / hibernation]; soprano pipistrelle (maternity) and brown long-eared bat (day roost)	Negative	Certain	Major	Permanent	Once during construction phase	Possibly reversible	Construction Phase: Replacement alternative roosting sites including: • 1No. purpose built bat houses; and • Installation of bat boxes. Enhancement of foraging habitat in retained areas of habitat.	Not significant	Probable
Local (Higher)	Direct loss of potential foraging habitat and commuting routes	Negative	Certain	Major	Permanent	Once during construction phase	Only in the medium to long term	Construction Phase: Enhancement of foraging habitat in retained areas of habitat but not likely to have any benefits in the short-term.	Significant at Local (Higher) level	Probable
Local (Higher)	Disturbance from human activity	Negative	Probable	Major	Temporary	Many times during	Possibly reversible	Construction Phase:	Not significant	Probable

Value	Potential Impact	Direction	Probability	Magnitude	Duration	Frequence	Reversibility	Notes	Residual Impact	Probability
	(noise and visual disturbance)					construction phase		Establishment of a 50m buffer zone around the Pollan Rua holiday cottage free from all construction activities at all times. No construction at activities will take place within 100 m of the Pollan Rua holiday cottage from October to April inclusive). Where works are required within the buffer zone works will only take place during the month of September and/or subject to a specific working method agreed with an EcOW and under an appropriate licence.		
Local (Higher)	Disturbance from vibration	Negative	Probable	Major	Temporary	Many times during	Possibly reversible	Construction Phase: Establishment of a 50m buffer	Not significant	Probable

Value	Potential Impact	Direction	Probability	Magnitude	Duration	Frequence	Reversibility	Notes	Residual Impact	Probability
						construction phase		zone around the Pollan Rua holiday cottage free from all construction activities at all times. No construction at activities will take place within 100m of the Pollan Rua holiday cottage from October to April inclusive). Where works are required within the buffer zone works will only take place during the month of September and/or subject to a specific working method agreed with an EcOW and under an EPS licence.		
Local (Higher)	Light	Negative	Certain	Major	Temporary	Many times during construction phase	Yes	<u>Construction Phase</u>: Implementation of lighting strategy to maintain construction	Not significant	Probable

Value	Potential Impact	Direction	Probability	Magnitude	Duration	Frequence	Reversibility	Notes	Residual Impact	Probability
								lighting below 4 lux along the key foraging areas used by bats until such time as these habitats are lost to development. A dark area will be maintained around the Pollan Rua holiday cottage and dark commuting routes and foraging areas linking to this building will be established where no lighting will be permitted.		
Bird Assemblage										
Local (Higher)	Direct loss of habitat	Negative	Certain	Major	Permanent	Once during construction phase	No	Construction Phase: Removal of all potential breeding habitat outside the breeding bird season. Installation of a variety of bird boxes.	Not significant	Probable
Common Lizard										

Value	Potential Impact	Direction	Probability	Magnitude	Duration	Frequence	Reversibility	Notes	Residual Impact	Probability
Local (Higher)	Direct loss of habitat	Negative	Certain	Major	Permanent	Once during construction phase	No	Construction Phase: Enhancement of habitats at receptor site. Capture from construction footprint areas and release at safe site.	Not significant	Probable
Smooth Newt										
County	Direct loss of habitat	Negative	Certain	Major	Permanent	Once during construction phase	No	Construction Phase: Construction of alternative breeding ponds; Enhancement of terrestrial habitat at receptor site. Capture from construction footprint and release at receptor site	Not significant	Probable
Common Frog										
Local (Higher)	Direct loss of habitat	Negative	Certain	Major	Permanent	Once during construction phase	No	Construction Phase: As per smooth newt	Not significant	Probable

Table 11 Summary of residual impacts

1.180. Regarding matters concerning the Owenkillew River SAC / ASSI, residual effects are considered to be **positive** at the European / international level and of **major significance**. This is because the proposed approach to the application of discharge limits on key parameters, coupled with the capabilities of the proposed treatment chain (Including the RO plant) will play a key role in the positive movement towards favourable condition for the SAC features, from a degraded baseline position. On the evidence, the Mine project will be making a positive contribution towards favourable condition and meeting the Conservation Objectives of the SAC. This matter is discussed in greater detail within the Statement of Case regarding the Water Discharges applications submitted by the Applicant and also at section 13 of this TR.

10. CUMULATIVE EFFECTS

1.181. The proposed powerline is the subject of separate planning applications (LA10/2019/1386/F and LA10/2019/1000/F), and this is acknowledged by the Applicant as an integral part of the mine project, and has been assessed.

1.182. It is concluded that with the adoption of appropriate and proportionate mitigation and avoidance measures, no adverse cumulative effects arise and no adverse in-combination effects arise in relation to European level designated sites.

11. RESTORATION

1.183. The restoration of the site following closure of the mine is mainly focussed upon delivering landscape benefits. However, the proposals will have benefits for biodiversity. The updated BIA (see **Annex 11**) has calculated that on completion of the mining operations the restoration of the site is anticipated to generate a net gain for biodiversity score of circa 241 units. This is achieved predominantly through the restoration of the dry stack facility.

12. POSITION OF STATUTORY CONSULTEES

1.184. In this section of my TR, I discuss the position of relevant statutory Consultees. To keep this TR as succinct as possible, I do not set out and discuss all comments raised during the consultation on the 2017, 2019 and 2020 submissions. A comprehensive schedule of comments / issues raised by consultees is included at Appendix 6 of the Statement of Case ("SoC") and the reader is referred to this information. In this TR I describe the consultee's current position in broad terms, highlighting any remaining concerns. Any substantive concerns raised by consultees are addressed within the following section of this TR, with reference to the information contained within the ES (and supporting documentation), or by reference to relevant guidance or new information which forms part of the SoC. Where appropriate, I refer the reader to the evidence presented by others on behalf of the Applicant.

1.185. It should be noted that on matters concerning the discharge consent application, further correspondence has been received from NIEA. The most recent position of NIEA is described within a letter dated 5th September 2024. The points raised within that letter are specifically addressed within a sub-section of section TBC of this TR.

Position and key concerns of the respective consultees

DAERA / NIEA

NIEA - Natural Environment Division (NED)

Non-designated features

1.186. Insofar as matters concern (non-designated) Natural Heritage features[12], NED confirmed within its most resent consultation response, dated 8th March 2021, that it has no remaining concerns following the submission of further information. NED is content that the proposed mitigation and compensatory habitat provision are

[12] Broadly, habitats and species issues not related to matters concerning designated sites.

appropriate. It is highlighted by NED, and indeed recognised by the Applicant, that it will be necessary to apply conditions to any planning permission, to secure those measures proposed for the avoidance of adverse impacts on ecological features. For completeness, the response dated 8th March 2021 states:

> *"NED has no concerns regarding impacts to non-designated Natural Heritage features, but as stated in our previous responses, some features will require conditions to be included in the final decision notice to ensure that these features are not adversely impacted. NED will provide these conditions in the final DAERA response."*

Designated sites

1.187. In its most recent response, dated 8th March 2021, NED raise several concerns regarding implications for nearby designated sites. The concerns are focussed upon the Owenkillew River ASSI / SAC and the River Foyle and Tributaries ASSI / SAC. The concerns primarily relate to hydrological / water quality matters.

1.188. That response highlights NED's view that management of both SACs must be based around an integrated, catchment level approach. It is stated:

> *"The Owenkillew River and the River Foyle and Tributaries SAC are not only hydrologically linked but ecologically integrated with smaller tributaries within the catchment of the SAC, which are also very important ecological resources for Atlantic Salmon in particular. Therefore, to ensure protection to the conservation status of the qualifying habitats and species, it is critical that the management of both SACs is undertaken through an integrated, catchment based approach."*

1.189. NED references the "Conservation Management Plan for the Owenkillew River SAC/ASSI 2021-2031" and highlights (at numerous points) the importance of a catchment-based approach to management. It also describes the symbiotic relationship of Freshwater Pearl Mussels and Atlantic Salmon. NED also summarises its interpretation of the relevant Conservation Objectives, with reference to maintaining and enhancing the qualifying interest features (e.g. Freshwater Pearl Mussel and Atlantic Salmon). It is stated:

"This catchment scale approach is essential in order to strive to meet the conservation objectives of the site for both the Freshwater Pearl Mussel and the Atlantic Salmon, which are to maintain and, where possible, enhance the extent and quality of suitable habitats and maintain and if possible expand, existing population numbers and distribution."

1.190. At this point, with reference to NEDs consultation response, I emphasise the very clear and simple point that regarding the populations of (and habitat quality for) Atlantic Salmon and Freshwater Pearl Mussel, these are not concerns which only manifest themselves in the context of the Proposal, but are current and indeed historic concerns that encompass a broad range of issues which impact upon water quality and habitat structure / availability. The need for a "catchment-based approach" arises because things need to happen, or indeed not happen, across a far greater area (the whole catchment) than could be impacted by the Proposal. It is both the actions of others, whether that be land uses / management practices, landowner discharges to water courses and the issuing of consents / permits; or the in-action of others, such as a lack of enforcement where breaches of statute / permits are concerned, or through an inability to initiate protective or restorative measures aimed at species / habitat conservation, which gives rise to the current situation.

1.191. As I will explain in this TR, notwithstanding the clear and accepted need for the proposals to meet the required legislative tests in respect of the Habitats Regulations, the position now being adopted by NIEA is such that were its advice[13] to be followed through fully, the Applicant would be the most heavily 'limited' operation in the catchment by some clear margin. This is against the backdrop of the current situation, described above and in further detail later in this TR, and the fact that the Proposal deliver the most technologically advanced water treatment initiatives possible; considerably more advanced than those sanctioned and used within existing permitted WwTWs, domestic foul waste systems and quarries in the catchment, for example.

1.192. Turning back to the matters of concern raised by NED, these can be distilled as follows:

[13] Regarding water quality / discharge matters

1) Discharge consents should include a limit for Total Suspended Solids (TSS) set at a mean of **<10mgL^{-1}** (as relevant to spawning & nursery grounds for Atlantic Salmon) and applicable to the receiving Curraghinalt and Pollanroe Burns and not the confluences with the main rivers[14].

2) NED acknowledge the submitted Conceptual Closure Plan and also welcome the fact that it will be an 'active plan' that will be revisited during the life of the mine. Reference is made to the Golder Associates peer review and the positive conclusions regarding the post-closure phase. However, it also states that water quality standards for Atlantic Salmon should be met at specific points in both burns (as per point 1 above).

3) Confirmation needed regarding potential changes to the hydrological regime, including potential scouring of suitable Atlantic Salmon habitat within the Curraghinalt and Pollanroe Burns.

4) Concerning the interdependent powerline project, confirmation is requested that the potential impacts on the features of Owenkillew SAC will be considered in – combination.

5) Mitigation measures for spawning Atlantic Salmon should be included within a final CEMP.

1.193. In addition to the above concerns or points for clarification, the consultation response confirms that NED is content on the issue of air quality impacts arising from vehicle emissions, stating that the proposals are in line with DAERA Operational Protocol on Nitrogen Emissions. It is also content on the issue of acid rock drainage. Further, NED confirms that it welcomes the Applicant's commitment to develop a final CEMP with input from NED (prior to commencement of works), including agreement on a suite of reporting parameters and reporting mechanisms.

1.194. The salient points raised, are discussed and addressed in detail further below.

[14] Owenkillew and Owenreagh rivers.

NIEA – Water Management Unit (WMU)

1.195. Comments issued by NIEA WMU are relevant to ecology and nature conservation matters insofar as they concern water quality issues associated with relevant designated sites.

1.196. The WMU response of 9th March 2021 is helpful in that it references the key findings of the peer review into matters concerning surface and ground water assessments (in particular the models used and the results / outcomes of the various assessments). It acknowledges that the peer review was broadly supportive of the assessment work undertaken by the Appellant and also that whilst points are raised with regard to improving the models used, the validity of the outcomes of those used, is not questioned. It is stated:

> *"WMU notes that the Reports are broadly supportive of the conclusions expressed in the relevant impact assessments, presented within the Environmental Statement, and that the modelling is sound and fit for purpose.*
>
> *However, Golders have identified a number of issues which should/could be addressed to improve the robustness of the models. Golders have acknowledged that the current absence of these points being addressed, at this stage, does not call into question the validity of the modelling outcomes."*

1.197. WMU also recognise that the review undertaken by Golders highlighted a few issues where negative planning conditions could be used to address points which could be left to the detailed design stage, though WMU would prefer to see the issues addressed upfront (where possible), ahead of the Inquiry. It is stated:

> *"Whilst Golders have suggested a number of these issues could be addressed at the detailed design stage, this approach may require the use of negative planning conditions. Given that this application is to be subject to a public inquiry, it is WMU's view that these issues should be addressed, as far as practicable, prior to a public inquiry hearing."*

1.198. I do not comment on matters concerning the modelling or assessment work undertaken. That is a matter addressed in the TRs relating to surface and ground water.

1.199. Regarding the post closure phase, comments are largely limited to a description of the Applicant's proposals for active and passive treatment and the timeframes involved. No concerns are raised with the proposals and comments are limited to matters concerning the securing of measures. It is stated:

> *"To maintain ongoing water quality monitoring and to ensure suitable treatment facilities are in place, maintained and monitored at the site during all phases of the development and in all eventualities, an appropriate Financial Guarantee must be in place, in accordance with The Planning (Management of Waste from Extractive Industries) Regulations (Northern Ireland) 2015."*

1.200. The matter of "Statutory Permissions" is of direct relevance to considerations relating to the ecology of receiving water bodies, including the relevant burns and the Owenkillew (ASSI / SAC) and Owenreagh (non-designated section) rivers. Indeed, this is a key issue which the Applicant has sought to resolve with DAERA / NIEA over many years.

1.201. The consultation response goes no further than setting the scene in terms of the need for discharge and abstraction licences to be granted and confirming that applications have been made for each. It is simply stated that:

> *"The processing and determination of these environmental authorisations, discharge consents and abstraction licences, is not currently at a sufficiently advanced stage for WMU to make a substantive comment on the proposed discharge and abstraction related elements of the proposed development, as part of this planning consultation."*

1.202. Regarding discharges, in order to understand and describe the position of DAERA (NIEA NED and WMU) I have had regard to discussions and communications between the Applicant and relevant DAERA representatives and also, importantly, the Legal Opinion which forms part of the Inquiry evidence base.

1.203. In summary, it is the position of DAERA that since the Owenkillew SAC / ASSI is in unfavourable condition, and since the Conservation Objectives require the

'maintenance and restoration (where necessary)' of favourable conservation status in relation to the qualifying features of the SAC. In applying the Integrity test, DAERA suggest that an assumption should be made that the site is in favourable condition (meeting its Conservation Objectives). As a result of that position, any movement away from that (presently hypothetical position of favourable condition) would amount to an adverse effect on Integrity. In order to ascertain the level of effect from discharges and to provide the level of certainty needed in addressing the relevant legal tests (confirming no adverse effect on Integrity), the advice places reliance upon JNCC Common Standards Monitoring (CSM) Guidance. The CSM guidance is advocated (as part of DAERA's case) as the primary source of guidance in terms of setting limit values to be applied for a range of cited parameters of relevance to FWPM and Atlantic Salmon.

1.204. It is also my understanding that DAERA / NIEA require the delivery of betterment in water quality for the SAC through the setting of discharge limits applicable to the two receiving burns with the JNCC CSM guidance being the source of certain key limit values (i.e. the limit value directly reflects the favourable condition target value)**.** NIEA's current position with regard to the discharge consent limits to be applied is described within its letter of 5th September 2024.

1.205. The above matters, including the letter of 5th September 2024, are discussed in detail at section **13**.

DAERA – Marine and Fisheries Division (MFD)

1.206. Following initial concerns raised within its response of 26th March 2018 regarding potential implications for aquaculture operations (fish farm) downstream, DAERA MFD subsequently confirmed that it was content with the information provided by way of response to those concerns. In its response of 25th October 2019 it confirmed that it raised no issues or concerns from an aquaculture perspective so long as the mitigation proposed in the Mine Waste Management Plan is implemented.

Loughs Agency

1.207. As a headline point, Loughs Agency's current position is that both the Pollanroe Burn and Curraghinalt burn are important resources for Atlantic Salmon and Brown Trout. Accordingly, the Loughs Agency have concluded that discharges to these burns must be protective of the fish within the burns. The data underpinning this conclusion and the position taken by the Loughs Agency is discussed further below in tandem with an analysis of the DAERA / NIEA position, given the reliance by NIEA on the Loughs Agency conclusions when considering implications for Atlantic Salmon and the Owenkillew SAC more broadly.

1.208. Turning to the Loughs Agency consultation response of 5th March 2021, the salient points insofar as ecological matters are concerned, are as below.

1.209. Despite previous consultation responses confirming that the Loughs Agency was content with the baseline fisheries and assessment work undertaken and the proposed future monitoring strategy, the March 2021 response presents a different view. For completeness, in December 2019 the Lough Agency stated:

> *"As previously highlighted, the Fisheries and River Habitat Assessment, Biological Water Quality Assessment, and Surface Water Impact Assessment are written to a high professional standard and provide the basis for environmental baseline data that can be used for ongoing monitoring throughout the lifetime of any approved extractive processes, activities or operations as part of the development proposal."*

1.210. In the response of March 2021, the Loughs Agency raise the issue of the two burns being considered suitable for supporting relevant fish species. In the case of the Curraghinalt Burn, the bottom section is cited as being suitable for Salmon parr. The bottom section of the Pollanroe Burn is cited as containing excellent spawning, nursery and holding habitats for Atlantic Salmon, Brown Trout / Sea Trout and possibly lamprey (sps). On this basis the Loughs Agency advocate the undertaking of a targeted and up to date Habitat and Fisheries assessment. It is stated:

> *"Loughs Agency are of the opinion the bottom section of the Curraghinalt Burn is suitable habitat for salmon parr, and an area of approximately 1.2 kilometres on the bottom section of the Pollanroe Burn contains excellent spawning, nursery and holding habitats, suitable for Atlantic salmon and sea trout, as well as indigenous brown trout and possibly lamprey. A targeted and up to date Habitat & Fisheries assessment would be more appropriate in*

terms of fully assessing habitat suitability for salmonids and other designated species which may be utilising these tributaries within the study area."

1.211. At this point I highlight that, subsequent to the consultation response of March 2021, Loughs Agency and the Applicant conducted separate surveys / assessments in respect of the two burns. None of those surveys show the burns to be significant in terms of supporting the populations of salmonid fish species in the catchment. The results of these surveys and assessments are discussed above at section 5, with further analysis discussed below at section 13. .

1.212. Concerns are raised in relation to the proposed removal of peat and the risks associated with peat landslides.

1.213. In relation to landslides, Loughs Agency cites the submitted Peat Landslide Risk Assessment and then briefly highlight the potential impacts of peat entering the (downstream) hydrological environment in the context of implications for spawning beds. However, no criticism of the Risk Assessment, proposals or mitigation are brought forward, nor is any evidence which would necessitate further, more detailed analysis of the point.

1.214. Regarding the removal of peat, Loughs Agency states that the removal of such a large volume of peat "*may increase the velocity of surface water runoff in times of flood and affect resident fish species*". My own understanding of the proposed drainage system is that a greater element of 'control' over surface water runoff will arise through the proposals. As such, the effect of flood events will be reduced. This matter is addressed in detail within the Statement of Case regarding Water Discharge applications and the TR of Dr Michael Stewart and I refer the reader to that evidence.

1.215. Loughs Agency also raises a concern with implications for groundwater base flow. It is stated:

"Any reduction in groundwater base flow, no matter how limited, would be an issue of concern, if considered in conjunction with potential loss of head water streams, and addition of consented discharges, this could lead to negative impacts upon the hydrology and water chemistry of the river system, and as such a potential negative affect on freshwater ecology. There is

limited consideration of the long term impact of the development on the surface water environment post closure."

1.216. The matter of "consent discharges" is discussed in detail further below. Regarding implications for groundwater base flow and the long-term impact on the surface water environment post closure, I refer the reader to the Statement of Case regarding Water Discharge applications and the TR of Dr Michael Stewart.

1.217. Finally, with reference to a hypothesis, Loughs Agency raises the point that potential impacts have not been considered regarding Atlantic Salmon using olfactory cues to return to the Owenreagh River, in the event that water abstraction is from a different catchment. In simple terms, if water from another catchment is imported for use in the mining process, it will have a different (e.g. chemical) composition and if Atlantic Salmon follow a chemical trail during migration, this could affect their ability to relocate their natal river, the Owenreagh. It is stated:

"It has been hypothesized that salmonids use olfactory cues to return to their natal rivers and streams. In the event that abstraction a different catchment is the primary source of water for mining operations, and the water is subsequently discharged to the Owenreagh catchment, the likelihood of any potential impact on Atlantic salmon return to the Owenreagh River has not been considered."

1.218. For clarity, the water to be abstracted for the mining operations is to be from groundwater. The baseline situation is that this groundwater flows into either the Owenkillew or Owenreagh River depending upon the prevailing water tables condition. In the light of this, the water is not from a different catchment. Further detail regarding this matter, is presented in the Statement of Case regarding Water Abstraction and I direct the reader to that information. Also, impacts relating to olfactory cues would arise where those chemical cues are masked or mimicked. My understanding is that the chemical composition of the watercourses will not be altered to the extent that olfactory cues are masked or mimicked.

Shared Environmental Services (SES)

1.219. SES submitted two consultation responses, dated 26th October 2018 and 24th March 2021. No substantive comment is made in either of these responses, with each simply referring to the position of NIEA and its request for clarifications /

further information. SES simply states that it should be reconsulted once NIEA's comments have been addressed. For completeness, in its response of 24th March 2021 SES states:

> *"NIEA in its response of 9/3/21 requested clarification and further information, some of which will inform the Habitats Regulations Assessment. Please re-consult SES on receipt of the further information and of NIEA's response confirming that it has sufficient information for all sections to provide a substantive response."*

RSPB

1.220. In its response dated 1st November 2018, the RSPB raised a number of concerns. These concerns can be summarised as follows:

1) Specific mitigation is required for the loss of Skylark and Meadow Pipit nesting habitat as bird boxes will not mitigate for the loss of nesting habitat for these species.
2) Potential for indirect impacts on other birds and supporting habitats due to impacts on hydrology and hydrogeology;
3) Concerns over long term impacts on groundwater levels;
4) Peatland habitat could be impacted by the lowering of water levels;
5) No mitigation is proposed for the loss of 'flush and spring', valley mire and stream habitats; and
6) Inconsistencies within the ES regarding the life of the project.

1.221. These comments were addressed by the Applicant at Section 5.9 of ES Addendum 2019 and I refer the reader to that information.

1.222. A further consultation response was issued by the RSPB, dated 24th March 2021. This consultation response confirms that the RSPB has no further comments to make in relation to the submitted information. The RSPB states that it remains concerned about proximity and connectivity issues associated with the Owenkillew River SAC / ASSI, but makes no specific points on the matter, deferring to DfI to ensure that the correct expertise is sought in assessing the application and applying the relevant legal tests.

1.223. Matters concerning the Owenkillew River SAC / ASSI (and affected waterbodies more generally) are discussed in detail in the following section of this TR, with reference to the position adopted by NIEA and Loughs Agency.

13. CONSIDERATION OF SUBSTANTIVE ISSUES RAISED BY CONSULTEES

1.224. In view of the statutory consultation responses, further correspondence received from NIEA (e.g. letters dated 11th June 2024 and 5th September) and the position of the relevant bodies, the substantive issues to be addressed all relate, either directly or indirectly to hydrological (water quality and quantity) matters associated with the Owenkillew SAC. Of particular note is the question over the discharge consents and what limit values should be included for various parameters. For ease of reference, I have highlighted below the key points arising from the consultation responses.

1) NIEA's position is that, because the SAC is determined to be in unfavourable condition, the proposed project must not cause any further degradation in water quality (movement away from favourable condition in respect of the interest features).Indeed it considers that the discharges must be consistent themselves with favourable condition (meeting the water quality standards which equate to favourable condition as cited in the JNCC guidance) because in its view, the project could stop the site reaching the favourable condition it would otherwise achieve in the future;

2) Loughs Agency consider the Curraghinalt and Pollanroe burns to represent important Salmonid habitat;

3) Specifically regarding TSS, NIEA's position as described in its consultation response of 8th March 2021 is that this should be set at a mean of **<10mgL^{-1}** and should be and applicable to the Curraghinalt and Pollanroe Burns and not the confluences with the main rivers. With reference to NIEA's letter of 5th September 2024, it would appear that a higher limit of 25mgL is considered appropriate in relation to the Pollanroe burn.

4) Matters concerning the hydrological regime, notably potential scouring of suitable Atlantic Salmon habitat within the Curraghinalt and Pollanroe Burns.

1.225. Points 1 to 3 above are all intrinsically linked and are addressed together in relation to the discharge consent limit values. As previously stated, NIEA's current position regarding limit values to be applied to any discharge consent is contained within a letter dated 5th September 2024. The key principles of NIEA's approach are addressed in the broader discussion below regarding water quality and discharge consent limit values. In addition, detailed consideration of the letter (dated 5th September 2024) is also presented under separate heading.

1.226. In terms of my understanding in relation to the legal tests to be applied and the relevant associated guidance and case law, I refer the reader to section 2 of the Update sHRA (2020).

Discharge Consent limit values

1.227. Within this section of the TR I describe the following:

a) The position as concluded in the Environmental Statement submissions;
b) The Conservation Status of qualifying interest features in the Owenkillew SAC;
c) Defining Appropriate Discharge Water Quality Parameters with reference to available guidance;

Position as concluded in the Environmental Statement submissions

1.228. By way of a headline summary, the position as expressed in the ES submissions is that the proposed discharges are protective of the aquatic environment, including the ASSIs and SAC.

1.229. Limit values were arrived at using a methodology which was discussed with NIEA. The main SAC / ASSI rivers were highlighted as the sensitive receptors and 'back calculations' were undertaken to derive the limit values associated with the discharges. The methodology used Environmental Quality Standards (EQS) to inform the proposals wherever available, with Drinking Water Standards adopted where such a value was more precautionary. Such an approach was consistent with the application of the Water Framework Directive and the assessment approach commonly adopted in England at the time (in the absence of an agreed model for Northern Ireland). Other guidance was also used to inform the process, notably where EQS values are not published (e.g. in respect of Nitrate) and such

guidance included BS EN 16859:2017 (specifically relevant to FWPM) and that published in respect of other countries such as the US and Canada where methodologies were broadly in keeping with those in respect of the Water Framework Directive. The Freshwater Fish Directive (although superseded) was also a key reference source.

1.230. Liaison with NIEA took place in defining the assessment methods to be used and the Applicant was explicit in wanting to proceed using a robust, defendable and recognised methodology. In the absence of any established approach in Northern Ireland, the Environment Agency approach to assessment was used.

1.231. Regarding the Update sHRA of 2020, that assessment report is informed by the calculations and conclusions reported by Kaya Consulting in respect of surface water impacts / discharges (and SRK reporting) with additional reference to WFD assessment information[15], which is cited and summarised (sHRA para 5.84 ff). The sHRA describes the Conservation Objectives in full and copies of all relevant designation documents are appended. The assessment was undertaken in view of that information and a conclusion reached that the proposals would not have an adverse effect on the Integrity of relevant designated sites when considered both alone and in combination.

Conservation status of the Owenkillew SAC

1.232. The qualifying interest features of the Owenkillew SAC are discussed in detail at section 4 of the update sHRA (Ecology Solutions 2020). By way of summary, the relevant interest features are:

a) Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation[16];
b) Old sessile oak woods with Ilex and Blechnum[17];
c) Bog woodland;
d) Atlantic Salmon;
e) Otter; and
f) Freshwater Pearl Mussel.

[15] See in particular paragraphs 5.75 onwards and paragraph 5.84 onwards- Update sHRA 2020.
[16] Vegetation communities including, but not limited to, Water Crowfoot and Starwart species.
[17] Sessile oak dominated woodland with Holly and Harn Fern.

1.233. In view of the consultee comments, and in particular with reference to the position of NIEA and Loughs Agency, the focus in terms of feature condition issues is upon Atlantic Salmon and Freshwater Pearl Mussel populations and water quality (and to an extent, water quantity) effects on these features. Both of these species are well known to require 'good / high water quality', with FWPM reported as being particularly sensitive to certain parameters.

1.234. NIEA has stated that the Owenkillew River SAC is currently classed as being in unfavourable condition. Information relevant to this classification is discussed below for both of these two key interest features.

Freshwater Pearl Mussel

1.235. Regarding Freshwater Pearl Mussel, the 2017 "Condition Assessment"[18] is of relevance as it is understood to be the most up to date, fully reported assessment of its kind. Key points arising from this report are discussed below, with relevant extracts provided at A**nnex 18**.

1.236. In respect of the Owenkillew River SAC, the 2017 report states in the Executive Summary:

> *"The Owenkillew River SAC Condition status remained as Unfavourable – No Change."*

1.237. Also of note, in respect of the Owenreagh River ASSI, the 2017 report states in the Executive Summary:

> *"The Owenreagh River ASSI Condition status remained as Unfavourable – No Change."*

1.238. As an overall, headline position regarding the species status in Northern Ireland, it is stated:

[18] Horton, M., Bell, D., Keys, A. & Mitchell, F. (2018) Freshwater pearl mussel survey of Northern Ireland 2017. Report prepared by Ballinderry Rivers Trust for the Northern Ireland Environment Agency. Northern Ireland Environment Agency Research and Development

"All of Northern Ireland freshwater pearl mussel populations remain imperilled."

1.239. Insofar as matters concern the population within the Owenkillew River SAC (of specific relevance to the project level HRA associated with the Proposal), further detail is provided regarding the assessment process and results at section 4 of the 2017 assessment report. Here it is confirmed that:

"A total of 8434 live mussels were observed (Table 4). This represents a +4.6% increase on the 8062 mussels observed in 2011 (Reid et al.), despite having not surveyed eight of the 21 point transects. This total also represents a +6.3% increase on the combined count of 7931mussels reported in 2004 (EHS) and 2007 (Killen) surveys."

1.240. Regarding water quality, at section 4 of the 2017 assessment report it is stated:

"Analysis of the results (Table 6) shows that phosphorus, nitrogen-nitrate and BOD were all above the target thresholds for freshwater pearl mussel (JNCC, 2015). Only suspended solids were generally lower than the threshold of 10mg/l, although on several occasions, during winter months, rose above this threshold at each site."

1.241. The 2017 assessment report concludes that the preferred host fish species in the Owenkillew is Atlantic Salmon, evidenced by specific glochidia encystment surveys. It is stated at section 4 of the report:

"Atlantic salmon are the preferred host in the Owenkillew River, confirmed through gill inspection for glochidia encystment in this survey.

Electrofishing was undertaken at Monanameal Bridge (H 6146 8467). A 20-metre length of river was fished, upstream of Monanameal Bridge, with an average channel width of 12 metres; the area fished was therefore 240m2. In total, 192 salmonids were captured comprising 172 salmon and 20 trout of various age classes.

Size-frequency analysis of the salmon population (Fig. 6) revealed that all 175 of the salmon were 0+ and 1+ age classes resulting in a density of 0.73 salmon/m2."

1.242. Regarding glochidia infection rates, these are confirmed to be "high" as evidenced through specific surveys. At section 4 of the 2017 assessment report, it is stated:

"Of the 175 salmon captured during electrofishing, 104 were infected with glochidia (Fig. 7). This represents a 59.4% infection rate of available host salmonids in the electrofished stretch. Glochidia infection rates were high, typically 50-100 glochidia per fish. Both 0+ and 1+ year class fish were infected."

1.243. Whilst the report states that the survey work found no evidence of threats / pressures from non-native species, stock transfers, river drainage or pearl fishing, issues regarding livestock are specifically highlighted. It is stated at section 4 of the report:

"A lot of the fields lining the SAC are not fenced off to exclude livestock. As a result cattle can access the rivers at many points. Typically, one bank fenced whilst the opposite one is not or has the remnants of an old fence.

The cattle urinate and excrete in the river adding to the excess nutrient problem as well as causing trampling of banks leading to siltation. There was evidence of direct mussel trampling by cattle at two locations in the SAC. Freshly dead mussels were found upstream of both Monanameal Bridge and Crouck Bridge at livestock drinking points.

The Owenkillew Community Development Company have created a development plan for the area, which includes the erection of riverside fencing and closing off of livestock watering points. If this project is deployed it would have great benefit to the mussel population in the Owenkillew.

There were no signs of river drainage in the surveyed sections."

1.244. Table 8 of the 2017 report summarises the results of the Condition Assessment for the Owenkillew SAC FWPM population. This table is included in the extracts provided at **Annex 18**, but is reproduced in full below for convenience.

Attribute (* = discretionary)	Target	Actual	Pass/Fail
POPULATION			
a. Spatial extent	Should reflect distribution under near-natural conditions.	Extensive beds of mussels with more than 100 individuals but areas of suitable habitat in-between with few or no mussels	FAIL
b. Population density	≥ 5 mussels per m^2 within sample transects.	T1 - 2 individuals/m^2 T2 - 11.3 individuals/m^2 T3 - 0.5 individuals/m^2 T4 and 1.04 individuals/m^2 **AVERAGE – 3.72 individuals/m^2** **ABUNDANCE CODE - C**	FAIL
c. Age structure	i. At least 20% of population ≤65mm	2% (2 individuals)	i. FAIL
	ii. At least one mussel ≤30mm.	None	ii. FAIL
d. Dead shells	<1% of population per year and scattered distribution.	44 dead, 8434 living (0.5%)	PASS

WATER QUALITY			
Phosphorus	Mean P of <0.005 mg L^{-1}	0.02 mg L^{-1} (range 0.01-0.09)	FAIL
Nitrogen - Nitrate	Annual median value of <0.125 mg L^{-1} N	0.17 mg L^{-1} (range 0.003-0.44)	FAIL
BOD	Mean BOD <1.0 mg L^{-1}	1.59 mg L^{-1} (range 1.0-2.9)	FAIL
FLOW	Ideally, flow targets included in the CSM Guidance for Rivers should be used, as these are intended to support a healthy, naturally	No impediment to flow upstream	PASS

Attribute (* = discretionary)	Target	Actual	Pass/Fail
	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.		
HABITAT STRUCTURE			
a. Fine sediment (redox)	There should be no pronounced difference in redox potential (typically <20%) between open water and interstitial water at 5 cm depth*	Range 37-39%	FAIL
b. Fine sediment (siltation)	The PSI targets in the CSM Guidance for Rivers should be used.	Not Assessed	Unknown
c. Filamentous algae	<5% cover across assessment units.	<5% cover across assessment units.	PASS
d. Fish host populations: native juvenile salmonid densities (0+ and 1+ year classes)	1. Should be abundant: > 0.1 native juvenile host salmonids per m^2.	0.73 salmon/m^2	PASS
	2. Should be able to find fish infected with glochidia between September and May.	175 (59.4%) of salmon were infected with glochidia	PASS
e. Alien/locally non-native species	No non-native species likely to cause impairment of freshwater pearl mussel populations.	None	PASS
*** f. Stocking transfers of other species**	No inappropriate stocking/translocation of fish species.	None	PASS
*** g. Introduction/ transfers of freshwater pearl mussel**	No introduction/transfers of freshwater pearl mussel unless agreed to be in the best interests of the population.	None	PASS
*** h. Pearl fishing**	No evidence of pearl fishing.	None	PASS
*** i. In-stream activities**	No evidence of damage of existing mussel beds.	Cattle trampling of river banks; mussels trampled by cattle	FAIL
OVERALL CONDITION: UNFAVOURABLE - NO CHANGE			

1.245. As can be seen from the summary table above, despite an increase (over previous surveys) in the total numbers of FWPM observed, “fails” were recorded in respect of several attributes, including those related to population size, extent and age class, and those associated with water quality (phosphorous, nitrate, BOD and fine sediment).

1.246. Notably, a "pass" is recorded in respect of "filamentous algae", where less than 5% cover (estimated) is recorded across the assessment units. I highlight this fact, because a proliferation of filamentous algae often indicates that nutrient (e.g. phosphate and nitrate) levels are high. Table 3 of the 2017 report describes the criteria used to assess conservation status (of FWPM) and in respect of filamentous algae it is stated:

> *"Filamentous algal cover should be measured during the pearl mussel survey. In oligotrophic conditions nutrient levels should never be high enough to allow dense mats of filamentous algae to grow. The persistence of filamentous algae is an indication that nutrient levels may be too high for sustainable Margaritifera populations, but may also indicate low flow problems."*

1.247. Whilst it is necessary nonetheless to assess chemical water quality issues in more detail (see further below), it is significant that the recorded levels of coverage of filamentous algae would not point to a cause for concern regarding nutrient levels in respect of FWPM.

Freshwater Pearl Mussel - historic condition assessments

1.248. Information regarding previously recorded feature condition (pre-2017) is detailed within the report titled "Freshwater pearl mussel survey of Northern 2011" [19]. Relevant extracts are provided at Annex 19. Key findings are summarised below.

1.249. The 2011 report confirms that the previous (2007) survey recorded the three subject SACs (including the Owenkillew) were all in "unfavourable declining" condition. It is stated within the executive summary:

> *"Initial condition assessments for the three SAC rivers were carried out by Killeen (2007) and populations were found to be in "Unfavourable declining" condition."*

[19] Reid, N., Preston, S.P. & Keys, A. (2011) Freshwater pearl mussel survey of Northern 2011. Report prepared by the Natural Heritage Research Partnership, Quercus, Queen's University Belfast for the Northern Ireland Environment Agency. Northern Ireland Environment Agency Research and Development Series No. 10/XX.

1.250. For the 2011 assessment, the overall conclusion regarding the populations across all three SACs was that the condition was “Unfavourable no change”. It is stated within the executive summary:

> *“A total of 12,947 freshwater pearl mussels were recorded on SAC designated rivers (Ballinderry, Owenkillew and Swanlinbar). Whilst there was a +4.1% increase in the numbers of mussels recorded, there was no significant temporal trend in abundance and populations judged to be stable since the previous survey. Nevertheless, water quality and other factors resulted in an overall condition assessment for 2011 judged to be “Unfavourable no change”.*

1.251. It is of note that the 2011 report also includes data for some non-SAC rivers, including the Owenreagh River, which whilst now designated as an ASSI, was at that time a proposed ASSI. Regarding the Owenreagh, it is stated:

> *“A total of 9,032 freshwater pearl mussels were recorded on the Tempo ASSI and Owenreagh and Waterfoot proposed ASSIs. Most notably, 8,195 mussels of these mussels were recorded on the Owenreagh proposed ASSI representing the first baseline survey of this river.”*

1.252. Mindful that the condition assessment conclusion cited above, is one that encompasses all three SAC rivers, it is necessary to focus in on the assessment for the Owenkillew. In the light of the fact that this River contains the largest population of the species in Northern Ireland, negative results elsewhere could result in a distorted picture for the Owenkillew.

1.253. Specifically, regarding the Owenkillew River SAC, the survey recorded an increase in mussel numbers when compared to the previous (2007) assessment. It is stated:

> *“A total of 8,474 live mussels were observed (Table 6). This represents a +6.4% increase on the 7,931 mussels observed during previous surveys.”*

1.254. The report goes on to state:

> *“A total of 147 dead shells were collected. No mussels <65mm were recorded and the frequency distribution of shell size suggested that the population was composed predominately of aged adults (Fig. 6). Nevertheless, several juvenile mussels including one estimated to be <5 years old were identified*

by NIEA staff during an 'emergency response' in late March 2011 (Tony Waterman pers. comms.). This may suggest that some recruitment has occurred during the past 5-10 years."

1.255. In terms of water chemistry, the report states the following:

"Water *chemistry* was assessed at Monanameal Bridge (H614848) which was dowstream of the pearl mussel population for the period of January 2007 - March 2011 (Fig. 7). Orthophosphate levels ranged from 0.003 to 0.02mg/l (mean = 0.009). Nitrate levels ranged from 0.003 to 0.806mg/l (mean = 0.22). Levels of suspended solids were generally below 10mg/l but rose above this level on a number of occasions, most notably up to a maximum of 34mg/l during July 2008. BOD ranged from 1-3.6mg/l (mean = 1.61)."

1.256. As with the 2017 report, the condition assessment results are summarised in a table format, and this is reproduced below.

Attribute	Target	Actual	Pass/Fail
Mussels			
Density	Potentially suitable habitat at capacity (or at least 10 mussels/m^2)	Some dense beds but large areas of suitable substrate devoid of mussels	Fail
Number of live individuals	No decline since most recent survey	+6.4% increase in numbers since previous survey (NIEA 2004; Killeen 2007)	Pass
Numbers of dead shells	<1% of population	147 dead : 5467 alive (2.7%)	Fail
Age structure 1	At least 20% of population ≤65mm	Several individuals thought to be <5-10 years old found by NIEA (2011)	Fail
Age structure 2	At least some mussels ≤ 30mm	None	Fail
Water Quality (2007-2010)			
Orthophosphate	0.005mg/l (<0.030)	0.009mg/l (range 0.003-0.020)	Fail
Nitrate	0.125mg/l (<0.500)	0.22mg/l (0.003-0.806)	Fail
Suspended Solids	<10mg/l	Generally <10mg/l (max = 34)	Pass
BOD	<1.40mg/l	1.61mg/l (1.00-3.60)	Fail
Substrate Condition			
Siltation	No plumes of silt when substrate kicked to 10cm depth	Some plumes of silt present especially in slow water	Fail
Redox measurements	Measurements <20% loss in redox value at 5cm depth	Not assessed	Unknown
Macrophytes		*Ranunculus* in places	Not assessed
Filamentous algae	None (<5% cover)	Present but <5%	Pass
Adjacent Land Use Issues		Cattle poaching, severe bank erosion due to winter floods & coniferous forestry	Fail
Evidence of pearl fishing	None	No exploitation evident	Pass
			OVERALL CONDITION: No change

1.257. As can be seen in the table above, insofar as population-based criteria are concerned, whilst recorded numbers showed an increase over the previous survey, a “fail” was recorded for density, the number of dead shells and age structure.

1.258. Regarding water quality, a “pass” is recorded for suspended solids, however the criteria are failed in relation to orthophosphate, nitrate and BOD.

1.259. As with the more recent 2017 assessment, passes are recorded for filamentous algae and pearl fishing (lack of), but a fail is reported for adjacent land uses, with cattle poaching, bank erosion and coniferous forestry all cited as being relevant pressures.

1.260. The condition assessment for the Owenkillew is concluded as being Unfavourable – no change.

1.261. It should be noted that the next round of condition assessment reporting is understood to be due in 2025. Interim population survey results held by NIEA have been shared with the Applicant and these have been discussed above in section 5. Given the overall picture of the SAC in view of information shared with the Applicant, including that relating to water quality, it is expected that the next reporting cycle will confirm the condition as being Unfavourable - no change.

Atlantic Salmon

1.262. As a headline point, it is well documented that the Atlantic Salmon is in decline within UK waters in general. Specifically, regarding the situation in Northern Ireland, the 2019 Article 17 report[20] relating to Atlantic Salmon (as submitted as part of the six-year Habitats Directive reporting cycle) is of relevance. A copy is included at Annex 20, with key points discussed below.

1.263. Whilst the data collected and analysed over the reporting period (2013 to 2018) has been concluded to show that the range of the species in Northern Ireland

[20] European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC). Fourth Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2013 to December 2018. S1106 - Atlantic salmon (*Salmo salar*) Northern Ireland

waters has not changed, the trend direction for the species population/s was determined to be “decreasing”. Further explanation in relation to the decreasing population is given within the explanatory notes associated with the report (at page 12 – see Annex 20). Here it is stated:

> *“We have assessed the population as decreasing. Note that the figure for returning adults at 6.4 has been taken from the 2013 Report. Since then (although the picture for individual rivers has varied somewhat), there has been a continuing decline in returning adults to NI rivers - see 6.16 below for more detail.”*

1.264. Key to the maintenance and / or enhancement of Atlantic Salmon stock levels in rivers, are the numbers of adults returning to breed as well as (river) habitat conditions meeting various life stage requirements.

1.265. Regarding numbers of returning fish, the 2019 report confirms that those returning to the River Foyle system (relevant to the Owenkillew River) have not been recorded in sufficient numbers to pass management targets and conservation limits since 2009. For this reason, the short-term trend regarding the population has been assessed as decreasing. It is stated:

> *“The fish counters on the River Roe and Faughan have annually recorded sufficient returning salmon to ensure that the Management Targets and Conservation limits for these rivers have been achieved during this reporting period. In contrast, the counter on the River Mourne (which is used to measure the returning salmon to the River Foyle) last recorded sufficient numbers passing the Management Targets and Conservation Limits in 2009. Hence, short term trend in population assessed as decreasing.”*

1.266. In the explanatory notes (page 12 of the report) it is stated:

> *“We have assessed the population as decreasing. Note that the figure for returning adults at 6.4 has been taken from the 2013 Report. Since then (although the picture for individual rivers has varied somewhat), there has been a continuing decline in returning adults to NI rivers - see 6.16 below for more detail.”*

1.267. Further detail is given under the heading “Change and reason for change in population size” at page 13 of the report. It is stated:

> *“In summary, population trends and juvenile recruitment display very varied trends over time between rivers and regions. However, looking at data for the*

period 2002-2017, it appears that, in the longer term, numbers of returning adults have shown a very marked decline, ***despite the introduction of several management control measures*** *(e.g. ban on net fishing in Foyle 2009; various catch and release schemes). For example, the 5 year average figures for the* ***Mourne and Finn Rivers shows a steep decline from 2006****; the River Faughan shows a steep decline from 1996, then a partial recovery before a further decline in 2006. Only in the River Roe have numbers remained at a fairly stable level since 2001. Hence population assessed as decreasing."*

[emphasis added]

1.268. Regarding river / habitat conditions, the 2019 report is helpful in providing a general overview in relation to key river systems (which would include the Foyle system / Owenkillew), however it lacks detailed discussion on individual rivers. At page 13 it is stated:

"Salmon habitat has been assessed in ***almost all key river systems*** *using the Life Cycle Unit System (LCUS) developed on the River Bush (Kennedy, 1984; O'Connor & Kennedy 2002). However the LCUS is a descriptive and mapping method based on habitat classification and quality; it has not been used to produce a generalised assessment of habitat quality for the region, although summaries for Index Rivers are produced in Anon (2012) and NASCO (2009). Overall habitat quality is therefore unknown, but expert opinion would suggest that* ***general quality is moderate to good****."*

[emphasis added]

1.269. Following directly from the above, the report cites the Water Framework Directive Fish Population Assessment for 2017 which corroborates the stated "expert opinion" regarding habitat quality:

"This assessment is supported by the Water Framework Directive Fish Population Assessment for 2017 (Niven and Donnelly, 2018). Nine Water Framework Directive fish surveillance monitoring stations were surveyed within the Loughs Agency jurisdiction in 2017. All nine sites were within Northern Ireland. ***22% of sites surveyed were classified as high status, 33% as good status and 45% as moderate status****."*

[emphasis added]

1.270. The "threats and pressures" associated with the species population/s are discussed in detail on page 14 of the report. Water quality and the hydrological regime are discussed, with specific attention being drawn to matters such as, pollution / eutrophication arising from agricultural operations, waste water

treatment and quarries (sediment release), and activities or infrastructure which act as barriers to migration. It is stated:

> *"Threats and Pressures associated with a wide range of issues. Clearly water quality and hydrology are key factors for the species' survival in rivers. Pollution/eutrophication from both point and diffuse sources is therefore a major factor (e.g. slurry and fertiliser run-off; leakages from septic tanks, sewage and water treatment works; silage effluent spillages; sediment release from quarries and forestry operations; etc.). Changes in hydrology are also critically important and include such factors as dredging, drainage, impacts from reservoirs, weirs, fish farms and small hydro schemes - some of which may also act as barriers to migration."*

1.271. The impacts of cattle grazing, fishing (in particular poaching) and non-native invasive species are also discussed. It is stated:

> *"Intensive cattle grazing can cause poaching of riverbanks with damage to riparian zone and silt inputs to river channels. Legal fishing is well regulated, but illegal poaching continues. Non-native invasive species are a particular issue in freshwater systems and can cause a threat to native species through competition, spread of disease, etc. For example, Asian Clam has recently been discovered on the tidal River Foyle."*

1.272. Regarding climate change and the important issue of migration, in particular the return of adult (breeding) fish, the following is stated:

> *"Climate change is currently a pressure and is likely to become even more significant in the future. Earlier migration of salmon smolts has been linked to ambient river temperature patterns and may reduce subsequent marine survival pattern to one sea-winter adult return (Kennedy & Crozier, 2010). Additional climate change factor listed under Xe - Threats and pressures from outside the EU territory. This refers to the survival of the species at sea."*

1.273. The report goes on:

> *"Marine survival* continues *to be of significant concern throughout the southern range of Atlantic salmon in the North East Atlantic. Marine survival rates for One Sea Winter (1SW) grilse pre the mid 1990's was around 30%, in recent years this has fallen as low as 2.4%. A marine survival rate of 3.76% has been calculated for the 2016 cohort returning to the river in 2017. This is a decrease from the 6.66% marine survival rate recorded for the 2015 cohort, and is well below historic highs. These* ***extremely low marine survival rates*** *are possibly the result of altered marine food webs and oceanic prey*

distribution - all in the context of climate change."

[emphasis added]

1.274. The issue of marine survival is clearly critical, with a significant / drastic drop from the mid 1990's. Regarding future prospects for the population/s, it is stated on page 14 of the report:

> *"The effect of rising sea temperatures resulting from climate change has been shown to have an impact on the species' survival at sea. It is uncertain if the proactive management currently being undertaken in Northern Ireland will be sufficient to protect the region's native salmon stock."*

1.275. Specifically, regarding the strength of the Atlantic Salmon population in the Foyle catchment, the 2018 Status Report (see extract at Annex 21) states at section 2.7:

> *"As outlined above Atlantic salmon have a complex lifecycle which can be impacted upon by many factors. The impacts cannot always be quantified making it difficult to accurately estimate the number of returning adult salmon/grilse to our rivers each year. An analysis of cohort/age class strength throughout its lifecycle from egg to spawning adult is complicated by numerous factors. These include varying egg survival rates, differing age at smolting, marine survival rates, time spent at sea/age at spawning and number of spawning migrations made.*
>
> *It is extremely difficult to infer from one life history stage or stages what the strength of any returning cohort will be. This is currently exacerbated by* ***extremely low marine survival rates*** *possibly as a result of altered marine food webs and oceanic prey distribution all in the context of climate change."* [emphasis added]

1.276. It is also relevant to note that whilst net fisheries appear not to have operated (legally) in recent years, angling is still undertaken throughout the catchment. The 2018 Status Report states at section 2.0:

> *"Total declared Atlantic salmon rod catch for the Foyle and Carlingford area in 2018 was 1598. Voluntary catch and release for the Foyle and Carlingford areas was 66%."*

1.277. This equates to a reported release (not guaranteed survival) of 1055 Atlantic Salmon, with 543 taken.

1.278. Data regarding relevant fish stock numbers over recent years was requested from Loughs Agency. This data is principally in the form of submitted catch returns. The table below, provided by Loughs Agency shows Atlantic Salmon catch return data for the Owenkillew for the period 2008 to 2023. The data shows a fluctuation in the number of Atlantic Salmon caught, with peaks in the periods 2008 to 2012 (accepting the low number in 2009) and then again in 2020 to 2021. It is noted that the percentage of those subject to catch and release shows a general trend upwards, from 50% in 2011 to in excess of 90% in the most recent years.

Year	OWENKILLEW	OWENKILLEW 5 Year Average	Owenkillew Number Caught and Released	Owenkillew % Catch and Release
2008	151	151		
2009	47	99		
2010	128	109		
2011	143	117	72	50
2012	160	126	125	78
2013	68	109	21	31
2014	37	107	26	70
2015*		102		
2016	52	79	32	62
2017	66	56	58	88
2018	33	47	29	88
2019	57	52	43	75
2020	133	68	118	89
2021	106	79	97	92
2022	70	80	69	99
2023	52	84	48	92
*error in data reporting for 2015. No catchment breakdown available				

Table 12: Loughs Agency catch return data

1.279. In the context of all the above, the following key points arise:

- Salmon stock numbers show a downward trend across Northern Ireland, with a significant reduction in the number of returning (breeding) adults. This is despite habitat (river) conditions being assessed as being of good to moderate quality and ‘stable’;

- A broad range of pressures affecting population numbers are documented. Water quality (pollution / eutrophication) issues are highlighted along with a host of other pressures;
- Very low marine survival rates are pointedly emphasised;
- There is uncertainty as to whether the (proactive) management currently being undertaken will be sufficient to protect the stock; and
- Atlantic Salmon continue to be fished for under licence from Loughs Agency.

1.280. The evidence means that the decline in Atlantic Salmon stocks goes well beyond considerations regarding water quality, or indeed any single parameter. Given the significant issue of marine survival rates, something which is not relevant to considerations regarding the acceptability of the proposed Mine, and cannot be addressed within the proposals, the reported position is that the regime of species conservation (management) measures may not be successful in reversing the downward trend.

1.281. Whilst the cited broad range of threats / pressures and the significance of marine survival rates are very important for context, it still remains necessary to demonstrate that the proposals will not compound the fate of the species. Indeed, it is important to approach the assessment in this way such that when assessed in combination / cumulatively, the proposals can be clearly identified as not adversely affecting the Integrity of the SAC, having regard to the fact that the formal Conservation Objectives require the maintenance and restoration (where necessary) of favourable feature condition.

1.282. In considering ‘restoration of the feature’ there are clearly many aspects which cannot be influenced through the proposals. However, not retarding the ability for the feature to reach favourable condition is an important consideration. Further, any measures which seek to redress the balance and help to pave the way for a return to favourable condition, should be seen as a benefit of the proposals, being fully in step with the Conservation Objectives themselves.

1.283. Specifically regarding, the Pollanroe and Curraghinalt burns and the position of NIEA that these features are considered to be functionally linked to the SAC, I comment as follows.

1.284. First, the simple fact that the burns are connected hydrologically is not sufficient for them to be functionally linked in terms of addressing the Habitats Regulations. In order to adversely affect the Integrity of the SAC an effect on the burns would need to be such that implications for Atlantic Salmon (e.g. loss of that habitat, or loss of the fish themselves), would need to be significant in terms of the population for which the site is designated. That is simply not borne out by the evidence. The Curraghinalt burn is of no value to Atlantic Salmon and none have been recorded within it. Regarding the Pollanroe Burn, Atlantic Salmon parr have been recorded at the southern end of the burn only, closest to the confluence with the Owenreagh River. There is no evidence that it is used as a spawning site and habitat assessments have recorded it as failing in this regard. It is therefore concluded that the burn is used by juvenile Atlantic Salmon in low numbers, when conditions allow.

1.285. Even if the Pollanroe Burn was rendered unsuitable for Atlantic Salmon (which would not be the case given the Applicant's proposed approach to discharges), it is not the case that the population of the catchment (including the SAC) would be significantly affected. Atlantic Salmon parr would continue to utilise other habitat within the catchment and may exploit new areas. Further, if it were the case that losses of individual Atlantic Salmon were seen as a risk or threat to the Integrity of the SAC population, then fishing for the species would need to cease completely because of the risk of a fatality or injury. It is abundantly clear that such a position is not being adopted by Loughs Agency or NIEA.

Defining Appropriate Discharge Water Quality Parameters

1.286. In defining what were considered to be appropriate discharge limit values associated with the Discharge applications liaison with NIEA took place. In the absence of an agreed standard assessment approach being available for use in Northern Ireland, the Environment Agency approach to assessment was promoted for use by the Applicant. This assessment approach is based around the use of Environmental Quality Standards (EQS) and the methodology was agreed with NIEA and taken forward to inform the discharge consent applications and the work which supported the Environmental Statement (including the Update sHRA of 2020) for the Mine application. The approach and methodology is described within

the Surface Water TR of Mr Stewart of Kaya Consulting and I refer the reader to that document for such details.

1.287. As already discussed, in the light of information provided by Loughs Agency regarding the suitability of habitat for salmonid fish within the Pollanroe and Curraghinalt burns, NIEA concluded that the discharges should be protective of salmonid fish within the burns as opposed to 'protection' being demonstrated for such fish within the main receiving watercourses (the Owenkillew and Owenreagh Rivers), where mixing and dilution occur to a greater extent. Effectively this equates to the protective values being applied at 'end of pipe'.

1.288. The published DAERA advice note dated 31st July 2023 draws two key conclusions in relation to the setting of discharge values for relevant parameters, as follows:

1) JNCC Common Standards Monitoring guidance must be used to inform the thresholds; and
2) Since the Freshwater Pearl Mussel (FWPM) feature of the SAC (and ASSI) is recorded as being in unfavourable condition, it must follow that thresholds are set which ensure "no deterioration in the key water quality attributes".

1.289. It is also my understanding that DAERA now considers that when addressing the legal tests of the Habitats Regulations, as relevant to the discharge consent/s, the discharges themselves must be consistent with favourable condition. Its position is therefore that the discharges must meet the water quality standards which equate to favourable condition.

1.290. Key points arising from the above are discussed below with reference to DAERA's position and relevant guidance, including the CSM Guidance. This is a matter which is also discussed within the Statement of Case regarding the Water Discharge applications. A detailed response specific to matters raised within NIEA's letter of 5th September 2024 is presented towards the end of this section of the TR.

Consideration of Common Standards Monitoring Guidance

1.291. As previously discussed, NIEA seek to place sole reliance upon CSM guidance in defining limit values for certain key parameters in assessing the discharge consent applications and this guidance is discussed below. Following discussion of the relevant CSM guidance, this TR discusses other relevant guidance and the approach of other country agencies in relation to the protection of the aquatic ecosystem and Freshwater Pearl Mussel populations.

1.292. CSM Guidance is published to help define the condition of an interest feature by reference to targets or target ranges (i.e whether it is in favourable condition and therefore meeting its conservation targets). It is to be used as an assessment and management tool and it also serves reporting purposes in relation to designated sites (e.g. ASSIs, SSSIs and European / Ramsar sites).

1.293. It is accepted that the CSM guidance can be used to assist in the setting of discharge consent values, and it is certainly helpful in highlighting certain key parameters for assessment. Its purpose is however, first and foremost to provide a standardised mechanism for assessing whether conservation targets are being met at designated sites. I remind the reader that the Pollanroe burn sits well outside of any such designation and discharges into the undesignated lower section of the Owenreagh River ASSI. The Curraghinalt burn discharges into the Owenkillew River SAC / ASSI and the lower section of the burn is designated as part of the SAC, although this is on account of the woodland habitat and not for aquatic species interest. From the evidence, neither burn supports Freshwater Pearl Mussel and neither burn represents spawning habitat for salmonid species (e.g. Atlantic Salmon).

1.294. The application of CSM guidance, including its possible use in other circumstances is discussed at Section 4 of the CSM “Introduction” document[21] (see extracts provided at Annex 22), where it is stated:

> *“While common standards monitoring was designed for SSSIs, ASSIs, cSACs, SPAs and Ramsar sites, in principle the approach could be applied to any defined area holding species features of conservation interest (e.g. statutory voluntary nature reserves), although consideration of the level of targets set may be necessary.”*

[21] Common Standards Monitoring Introduction to the Guidance Manual (2004), JNCC

1.295. Whilst the guidance states that it is possible to apply the guidance to areas outside of the specific designated sites (such as other, lower tier designated sites), there is clearly no implication that it *should* be applied. Further, in such circumstances where the CSM approach to monitoring is adopted, the guidance gives a firm steer that different targets should be considered (e.g. reflecting the lower position in the hierarchy of conservation significance).

1.296. Other guidance in relation to implications for relevant habitats and species, and importantly the setting of discharge limit values (to protect aquatic ecosystems) is published. I refer to this where relevant below.

1.297. I turn now to the specific CSM guidance of relevance to matters concerning water quality (discharge parameters) at the Owenkillew and Owenreagh Rivers (SAC and ASSI respectively). The focus in terms of water quality issues from a nature conservation perspective is upon Atlantic Salmon and Freshwater Pearl Mussel given the cited sensitivity of these species and also in view of the consultation responses of NIEA and the Loughs Agency.

1.298. The relevant guidance documents are as follows:

a) CSM for Rivers (2016)[22]
b) CSM for Freshwater Fauna (2015)[23]

1.299. Relevant extracts of each of these two documents are provided at Annex 23.

<u>Atlantic Salmon</u>

1.300. In respect of water quality targets for Atlantic Salmon, CSM Freshwater Fauna states, at page 51 (See Annex 23):

"Targets included in the CSM Rivers should be used."

[22] Common Standards Monitoring Guidance for Rivers (2016), JNCC
[23] Common Standards Monitoring Guidance for Freshwater Fauna (2015), JNCC

1.301. Sedimentation (linked to Total Suspended Solids- TSS) is cited as a separate attribute, however, again the reader is referred to CSM Rivers guidance.

1.302. Targets specifically associated with water quality in CSM Rivers are given for:

a) Organic pollution;
b) Phosphorus;
c) "Other pollutants";
d) Acidification; and
e) Siltation.

Organic Pollution

1.303. Regarding organic pollution (BOD and ammonia) CSM Rivers gives the following information at Table 4 of that document (see Annex 23):

Attribute	Target
10%ile DO (% saturation)	85
Mean BOD (mg L^{-1})	1.5
90%ile total ammonia (NH_3-N, mg L^{-1})	0.25
95%ile un-ionised ammonia (NH_3-N, mg L^{-1})	0.025

Phosphorous and inorganic nitrogen

1.304. It should be noted that the discharge consent applications did not contain proposed limit values for phosphorous on the basis that this would not be present within mine waste and it would be effectively removed by the proposed WwTW. However, it is a parameter which NIEA considers will need to be included and enforced against.

1.305. Table 6 of CSM Rivers gives the following information:

River type			Headwater	River	Large river
High altitude (>80 metres)	Low alkalinity (<50 mg L^{-1} $CaCO_3$)		10	20	30
	High alkalinity (>50 mg L^{-1} $CaCO_3$)		15	25	40
Low altitude (<80 metres)	Low alkalinity (<50 mg L^{-1} $CaCO_3$)		30	40	50
	High alkalinity (>50 mg L^{-1} $CaCO_3$)	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.)

Nitrogen

1.306. Inorganic nitrogen (as relevant to Nitrate) is also referenced in CSM Rivers. It is stated:

> *"Targets for total inorganic nitrogen (TIN) can be applied where there is site-specific evidence for nitrogen-mediated eutrophication that is not amenable to control by applying phosphorus targets in isolation. As a guide, values of TIN of around 10 times greater than the SRP target applicable to the river stretch are likely to provide equivalent control of nutrient availability to proposed phosphorus targets."*

1.307. With reference to the above information relating to phosphorous, working on the basis we are dealing with a high altitude, low alkalinity river (precautionary basis) that would give a target of 200 µg L-1 (0.2 mg/L) for inorganic nitrogen.

Other pollutants

1.308. Regarding "Other pollutants" at paragraph 4.2.5 of CSM Rivers, it is stated:

> *"Data on the chemical status of individual water bodies are available from the environment agencies. Good chemical status is the target for any pollutant listed on Annex X of the WFD and not specifically considered above."*

1.309. Therefore, inherent within the JNCC CSM guidance is a need to review data against the WFD assessment requirements, notably the list of priority substances in the field of water policy (Annex X of the WFD).

Acidification

1.310. Regarding acidification it is stated at Table 7 of CSM Rivers:

Targets for acidification	**Method of assessment**
ANC: Mean ANC for all waters > 80 pH (Clear waters with DOC<10 mg L^{-1}) : mean > 6.54 pH (Humic waters with DOC>10 mg L^{-1}): mean > 5.1	Analysis of water chemistry data from environment agencies. At least 36 samples (3 years of data) are required, which must include winter samples.

1.311. I have included this information for completeness. However, it should be noted that the proposals will not give rise to any adverse effect in relation to acidification. The pH of any discharges can be easily and effectively controlled to mimic baseline conditions and this is proposed.

Siltation

1.312. No guidance is given specifically in relation to Total Suspended Solids (TSS), a parameter which is to be included in any discharge consent. Guidance is however given in relation to siltation. CSM Rivers states at paragraph 4.4.1

> *"Siltation within and on top of coarse beds is a major threat to interest features (including species such as salmon and freshwater pearl mussel) and is poorly measured by existing WFD tools. For river types characterised by extensive Ranunculus beds, there should be a predominance of 'clean' gravels, pebbles and cobbles with relatively low cover by silt dominated substrates. Localised accumulations of silt on the inside of bends or in back channels do not necessarily indicate a problem."*

1.313. The CSM guidance refers to River Habitat Surveys (RHS) and River Hydromorphological Assessment Technique (RHAT) (NIEA, 2009), being used to inform an assessment. Table 14 of CSM Rivers gives the following information:

Targets for siltation	**Method of assessment**
No unnaturally high levels of siltation as indicated by: (a) 'silting' highlighted in section P of the RHS form ('Overall characteristics – major impacts') OR (b) one-third or more of the total number of RHS spot-checks in the assessment unit have silt (SI) as the predominant channel substrate	Field observations and site specific information derived from RHS.

1.314. Further guidance is provided within the CSM Freshwater Fauna (Atlantic Salmon specific guidance). This includes specific commentary on siltation (at page 53 of that document – see Annex 23). It states:

> *"No unnaturally high levels of siltation. Siltation targets included in the CSM Guidance for Rivers may be appropriate."*

Freshwater Pearl Mussel

1.315. Specific water quality targets for certain parameters are given for FWPM within CSM Freshwater Fauna. However, it is stated that:

"Generally targets within the CSM Guidance for Rivers should be used."

1.316. Targets cited in CSM Rivers are discussed above in relation to Atlantic Salmon.

1.317. However, within CSM Freshwater Fauna (FWPM section[24]) it is stated that:

"For freshwater pearl mussel, organic pollution, reactive phosphorous, acidification and other nutrients are particularly important."

1.318. It is also stated[25] that:

"In addition to habitat-based targets, some more stringent targets for pearl mussel are listed below."

1.319. Specific targets for the following parameters are given:

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

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

1.321. These cited parameters and the associated targets are discussed below.

[24] See column 1 of the Favourable Condition Table at page 15 of CSM Freshwater Fauna
[25] See column 2 of the Favourable Condition Table at page 15 of CSM Freshwater Fauna

Phosphorous

1.322. From "Favourable Condition Table 1", at page 15 of the CSM guidance (see **Annex 23**), when setting targets, if the baseline is less than 5 ug/L, the target should be 5ug/l. If the river exceeds that, the more stringent of high status values for SRP under the WFD or the SRP target for CSM river habitat is to be used.[26]

1.323. It is noted that 5ug/l is the benchmark used when undertaking favourable condition monitoring and this is evident from the 2017 Freshwater Pearl Mussel monitoring report (as discussed previously), and more broadly by DAERA for example, within the Consultation on Significant Water Management Issues relevant to the 3rd Cycle River Basin Management Plan. SRP relating to CSM Rivers and UK TAG Guidance give a higher threshold of **20ug/l** (see extract at Annex 24).

Nitrate

1.324. Targets for nitrogen are given in the Favourable Condition Table, on page 16 of the CSM guidance (see Annex 23). The following is cited:

> *"Annual median value of <0.125 mg L-1 N in line with CSM Freshwater Fauna"*

BOD

1.325. In respect of BOD, the Favourable Condition Table, on page 16 of the CSM guidance (see Annex 23) gives the follow target:

> "Mean less than *1mg* L-1".

Sedimentation

1.326. Regarding sedimentation, as relevant to TSS, the following information is given[27]:

[26] Emphasis added to highlight key information from CSM guidance.
[27] See Favourable Condition Table at page 17 of CSM Freshwater Fauna

Attribute (* = discretionary)	Target	Method of Assessment	Comments
OTHER ATTRIBUTES			
a. Fine sediment (redox)	There should be no pronounced difference in redox potential (typically <20%) between open water and interstitial water at 5 cm depth.*	Redox measurements collected in open water and river bed, at or around population transect locations.	Excessive delivery of fine sediment, from the catchment or artificially enhanced bank erosion, may lead to a range of problems relating to surface siltation, the compaction or concretion of river beds and to the in-filling of substrate interstices. This affects oxygen supply and exchange within the substrate as well as the ability of juvenile mussels to burrow. Infiltration by fine sediments is one of the main causes of decline in juvenile recruitment for pearl mussel populations. * The infiltration of high loads of fine sediment typically results in low oxygen supply to the interstices of the substrate. Redox measurements provide a reliable estimate as a surrogate for the oxygen level within the interstices of the substrate compared with the open water.
b. Fine sediment (siltation)	The PSI targets in the CSM Guidance for Rivers should be used.	Macroinvertebrate data collected and analysed by environment agencies.	PSI (Proportion of Sediment-sensitive Invertebrates) is an index developed to measure the impact of fine sediment on river-bed invertebrates (Extence *et al.*, 2013). It complements the methods suggested in the siltation section, although it is recommended as a more cost-effective, accurate and easily measurable target.

1.327. Regarding sedimentation / siltation, CSM Rivers states:

> *"Siltation within and on top of coarse beds is a major threat to interest features (including species such as salmon and freshwater pearl mussel) and is poorly measured by existing WFD tools. For river types characterised by extensive Ranunculus beds, there should be a predominance of 'clean' gravels, pebbles and cobbles with relatively low cover by silt dominated substrates. Localised accumulations of silt on the inside of bends or in back channels do not necessarily indicate a problem."*

1.328. It is noted that in relation to TSS, NIEA has stated, as explained previously, that the discharge consents should include a limit set at a mean of **<10mgl^{-1}** ("as relevant to spawning & nursery grounds for Atlantic Salmon") and be applicable to the Curraghinalt and Pollanroe Burns. This is a matter discussed in further detail below.

Ammonia

1.329. For completeness, a target for ammonia is not given in relation to FWPM in the guidance. 0.25mg/l in line with CSM for Rivers, is considered to be relevant.

<u>Consideration of other relevant guidance and the approach taken in other jurisdictions</u>

1.330. As I have explained, in addition to the CSM guidance, which has a specific purpose (monitoring and setting of condition targets for designated sites), other guidance is available in relation to the setting of targets and benchmarks used for protecting the aquatic environment and associated species of conservation value. It is also relevant to consider the approaches taken to protecting water quality and

Freshwater Pearl Mussel populations in other jurisdictions. The following are discussed below:

a) British Standard: BS EN 16859:2017
b) Environmental Quality Standards (EQS)
c) SEPA Guidance on the application of environmental standards
d) European Commission Guidance on Mixing Zones (2010)
e) The Republic of Ireland (ROI) approach to Freshwater Pearl Mussel conservation
f) The US and Canadian approach to water quality protection and Freshwater Pearl Mussel conservation

BS EN 16859:2017

1.331. I draw the reader's attention to the fact that BS EN 16859:2017 is guidance which is specifically relevant to FWPM. This guidance includes reference to various scientific studies and effectively pools information regarding conditions in which populations of the species are being maintained. Whilst it does not prescribe specific targets, it gives ranges for parameters (based on field observations as opposed to true toxicity studies) which can be shown to be 'acceptable' in view of the species requirements regarding water quality.

1.332. It is of note that the evidence base described in BS EN 16859:2017 has been used to inform the relevant CSM guidance, albeit a precautionary approach has been adopted, with the lower end of ranges used at all times to set various targets.Environmental Quality Standards (EQS)

1.333. With reference to The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017, Environmental Quality Standards (EQS) are set for specific substances. Concentration thresholds are set, below which no adverse impact is likely, taking account of available dilution at different discharge locations. EQSs concern the environmental receptor, without reference to the sources of emissions. EQS is a widely adopted means of assessing risk and delivering protection to the surface water environment when considering water discharges.

1.334. EQS has been used in the approach to assessment and in the defining of proposed limit values insofar as the Curraghinalt Project is concerned. Such matters are described in detail within the TR in respect of Surface Water prepared by Dr Stewart and the Water Discharges Statement of Case.

SEPA Guidance on the application of environmental standards

1.335. It is also relevant to consider guidance published by the Scottish Environment Protection Agency (SEPA) titled; "Supporting Guidance (WAT-SG-90) Application of environmental standards in assessing risks to river and loch Natura 2000 interests" (October 2016), a copy of which is included at Annex 24. This guidance describes the process which SEPA will follow when assessing likely significant effects relating to interest features of SACs / SPAs, including Atlantic Salmon and FWPM. This document is available on the SEPA website as part of its "Guidance" resource. The following key points arise:

1) Table 1(a) presents a series of step-wise tests associated with determining whether likely significant effects can be ruled out in relation to FWPM. With the exception of 'test 1' all other steps consider a situation where water quality standards are exceeded (to varying degrees) within the SAC, yet at these further steps it still remains possible to conclude no significant effect.
2) Table 1(a) specifically considers (at step 6) the use of existing discharge locations (relevant to the Curraghinalt burn) and continuity in terms of the length of the mixing zone (step 7), with no likely significant effect concluded where the answer to both questions is 'yes'.
3) Table 1(a) also recognises at steps 8 and 9, that an absence of suitable habitat for FWPM or positive evidence of no FWPM presence, allow a conclusion of no likely significant effect.
4) In relation to outfall design (page 9) it is confirmed that improved initial mixing is encouraged in order to shorten the mixing zone length. It is stated that:

“The mixing zone length over which environmental standards are exceeded can be shortened by maximising initial mixing. SEPA will:

I. consider proposals to improve initial mixing where it would otherwise conclude that a discharge would be likely to have a significant effect on freshwater pearl mussels; and

II. *in all cases, encourage developers to take such steps as are reasonably practical to promote rapid initial mixing of continuous discharges."*

5) The quotation above, emphasises the point that localised exceedances of environmental standards can be acceptable in HRA terms.
6) In the case of the project (discharge application) the discharge to each burn will deliver reduced point concentrations at the main rivers (e.g. the Owenkillew) when compared to a direct discharge to the main river. This is similar to the 'initial mixing' as actively encouraged by SEPA within its guidance.

European Commission Guidance on Mixing Zones (2010)

1.336. Specific technical guidance on mixing zones was issued by the European Commission in 2010 [28]. Several important points arise and these are discussed below.

1.337. A key principle of this guidance is that that measures, compliant with best available techniques (BAT), must be taken. Specifically, regarding this approach, I note at this point that the proposed Reverse Osmosis (RO) plant accords with BAT, and in addition, the proposal to locate the discharge points outside of the main rivers themselves (SAC / ASSI as relevant) also accords with BAT.

1.338. Specifically, regarding mixing zones, on pages 9 and 10 of the EU guidance it is stated:

"Restriction of the extent of the mixing zone should also be considered if the exceedance of the EQS for substance in Annex A of Directive 2008/105/EC has a negative impact on sensitive area such as a spawning area for fish. In Paragraph 5.3 this is further elaborated. The potential for, extent, degree,

[28] Technical Guidelines for the Identification of Mixing Zones Pursuant to art. 4(4) of the Directive 2008/105/ec, European Commission (2010)

duration and reversibility of any adverse effects within the mixing zone (e.g. on amenity value or on any of the quality elements of 2000/60/EC (Annex V)) are key elements in the decision making process. The aim should be to limit adverse effects in the mixing zone especially any acute impact from the discharge concerned."

1.339. On page 11 of the EU guidance, it is stated:

"The Competent Authority is responsible for the designation and development of mixing zones under Directive 2008/105/EC and will need to deliver a risk-based, proportionate approach such that all relevant factors are considered in appropriate detail."

1.340. In the case of the Curraghinalt project, when viewed in tandem with the proposed discharge limits (see below), the following key points must all be considered when applying a risk-based, proportionate approach as advocated by the EU guidance:

1) The absence of Salmon (at any life stage) in the Curraghinalt Burn;
2) The lack of access for fish in the Curraghinalt Burn, outside of spate conditions;
3) The lack of optimal spawning habitat in both burns,
4) The absence of Freshwater Pearl Mussel both in the burns;
5) The absence of Freshwater Pearl Mussel at the main river confluences with the burns, and
6) The mixing and dilution which will occur in the main rivers.

Approach to Freshwater Pearl Mussel conservation in the Republic of Ireland

1.341. It is noted that within the Republic of Ireland (ROI), there exists specific legislation concerning the protection and conservation of Freshwater Pearl Mussel, namely The European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009. Further, in September 2011, the National Parks and Wildlife Service (NPWS) published “A Strategy for Conservation of the Freshwater Pearl Mussel in Ireland”, which is understood to be the current adopted strategy in relation to the national (ROI) conservation aims for this species. Separate guidance is also available in relation to diffuse impacts on Freshwater Pearl Mussel through forestry operations. Additionally, a pilot agro-environment

programme has been established, entitled “The Pearl Mussel Project”, the stated aim of which is to improve the quality of watercourses in order to benefit Freshwater Pearl Mussel in the ROI.

1.342. The legislation, guidance and strategies are discussed below. Discussion of the ROI approach is directly relevant because it provides a clear example of how other national governments and associated departments / agencies deal with the issue of conserving / protecting this species.

The European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009

1.343. These Regulations support the achievement of favourable conservation status for Freshwater Pearl Mussels in ROI.

1.344. Regulation 4 *states*:

“In accordance with Articles 11 and 17 of the Habitats Directive, the Minister shall, at least once every six years, carry out or cause to be carried out monitoring, and assessment of the conservation status, of freshwater pearl mussel populations listed in the First Schedule to these Regulations, and the pressures impacting on that status. The conservation status of the freshwater pearl mussel shall be assessed using, inter alia, the criteria set out in the Third Schedule to these Regulations.”

1.345. Regulation 5 states:

“For the purpose of assessing the ecological status of a surface water body in accordance with Schedule IV to the European Communities Environmental Objectives (Surface Waters) Regulations 2009, the Agency shall, in the case of those surface water bodies identified under the First Schedule to these Regulations, assign a status of ‘less than good ecological status’ where, on the basis of specialist surveys undertaken, or caused to be undertaken, by the Minister to assess conservation status, the freshwater pearl mussel is found to be in unfavourable conservation status owing to water quality or hydrology in that water body. The monitoring and assessment required under Regulation 4 of these Regulations shall be such a status assessment.”

1.346. Regulation 6 states:

"For each water body listed in the First Schedule to these Regulations, the Minister shall, commencing in 2009, carry out or cause to be carried out:

(a) baseline monitoring of those ecological elements identified in the Third and Fourth Schedule to these Regulations,

(b) investigative monitoring to, where necessary, identify the pressures and their sources, which have led to unfavourable conservation status of the freshwater pearl mussel.

The Minister shall communicate the results of such monitoring to the public authorities listed in the Second Schedule to these Regulations where relevant to the performance of their functions."

1.347. Regulations 7 to 11 are concerned with the preparation, monitoring and subsequent review of required sub-basin management plans for relevant waterbodies.

1.348. The First Schedule lists those waterbodies specified as representing Freshwater Pearl Mussel habitat for the purpose of the Regulations.

1.349. The Second Schedule lists "Relevant Public Authorities".

1.350. The "Third Schedule" sets out the criteria for the assessment of conservation status of Freshwater Pearl Mussel populations. This is reproduced in the table below.

Criterion	Target to pass	Notes
Numbers of live adults	No recent decline	Based on comparative results from the most recent surveys
Numbers of dead shells	<1% of population and scattered distribution	1% considered to be indicative of natural losses
Mussels shell length 65mm	At least 20% of population 65mm in length	Field survey of 0.5 X 0.5 m quadrats must be carried out in suitable habitat areas for juveniles
Mussels shell length 30mm	At least 5% of population 30mm in length	Field survey of 0.5 X 0.5 m quadrats must be carried out in suitable habitat areas for juveniles

Table 13: Third Schedule of The European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009.

1.351. The Fourth Schedule sets out the Ecological Quality Objectives for Freshwater Pearl Mussel Habitat. This is reproduced in the table below.

Element	Objective	Notes
Macroinvertebrates	EQR 0.90	High status
Filamentous algae(Macroalgae)	Absent or Trace (<5%)	Any filamentous algae should be wispy and ephemeral and never form mats
Phytobenthos(Diatoms)	EQR 0.93	High status
Macrophytes — rooted higher plants	Absent or Trace (<5%)	Rooted macrophytes should be absent or rare within the mussel habitat
Siltation	No artificially elevated levels of siltation	No plumes of silt when substratum is disturbed

Table 14: Fourth Schedule of The European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009.

1.352. With reference to tables 10 and 11 above, it is clear that this ROI legislation mandates that the assessment of conservation status for Freshwater Pearl Mussel populations must be undertaken against results of surveys targeted at the animals themselves. That is to say, the numbers of live mussels present, also factoring in evidence of dead mussels and the shell size (maturity) of the live mussels recorded.

1.353. Secondary to this, is a series of Ecological Quality Objectives, which detail the habitat objectives required to protect the populations. Five, very focussed parameters are considered, which include indicators of water quality in addition to "siltation", which is known to be a critical factor for the species given.

1.354. Of note, with the exception of sedimentation, there is no reference to specific water quality parameters or associated target values.

Freshwater Pearl Mussel Conservation Strategy

1.355. It is understood that this (2011) conservation strategy remains current, with no version superseding it. Indeed, in relation to the species conservation measures in the ROI, in terms of an overarching species strategy, the NPWS website provides a specific electronic link to this document. Links are also provided for relevant legislation, Draft River Basin Management Plans and reports on specific projects / studies. For completeness and ease of reference, a copy of the 2011 strategy document is provided at Annex 25.

1.356. As confirmed in the introduction / summary of the 2011 strategy:

> *"The objective of this strategy is to ensure the long-term survival of the species in Ireland, while maintaining its broad geographic range. The strategy sets out a prioritised approach to the implementation of measures necessary to conserve the species."*

1.357. It is also confirmed in the introduction / summary of the 2011 strategy that:

> *"The measures required to restore pearl mussel habitat in the 27 catchments are resource-hungry, in terms of staff, money and expertise. Many of the measures are new and will require testing and further development. It is neither possible nor desirable to implement all necessary measures across the 27 catchments in this first planning cycle.*
>
> *The national conservation strategy advocates the full implementation of measures in those catchments where:*
>
> 1) *The largest pearl mussel populations occur.*
> 2) *The mussel population is closest to favourable conservation status and, thus, has the greatest chance of demonstrating a recovery (using the criteria set out in the Third Schedule to S.I. 296 of 2009).*

3) *The mussel habitat is most likely to demonstrate improvements in the ecological quality objectives set out in the Fourth Schedule to S.I. 296 of 2009.*
4) *The impacting pressures are best understood and, therefore, the measures are expected to be effective."*

1.358. The strategy therefore presents a focussed approach to conservation management, targeting measures at locations and populations where the greatest benefit for the species can be achieved, with consideration also given to 'value for money' in terms of resource use. Regarding this targeted approach, the 2011 strategy states:

> *"It is clear that it will not be possible to restore some of the 27 populations, because of the low number and poor condition of the remaining mussels, the bad status of the mussel habitat and the magnitude of the pressures in the catchment. It is now evident that such problems existed even at the time of some designations.*
>
> *The proposed conservation strategy aims to achieve the maximum conservation outputs, in terms of numbers of mussels and populations sustained over the long-term, for the restoration effort."*

1.359. With reference to the above, there is an acceptance that:

a. Some populations cannot be restored due to small population size, poor quality habitat or the severity of pressures on the population;
b. The futility of conservation efforts targeted at such populations arises because of historic issues;
c. Conservation gains for the species are best achieved when focussed on viable populations, with the result that 'accepted losses' occur.

1.360. Following from the above, in the case of the Mine proposals, it is important to have regard to the survey data regarding the locations of Freshwater Pearl Mussels (as recorded in the data supplied by NIEA from 2021 and 2022). No mussel bads were recorded within the Owenreagh River. In the Owenkillew River, the larger (more significant) mussel beds recorded, are located well upstream of the Owenkillew's confluences with the Owenreagh River and the Curraghinalt burn. The 2021 Survey Sites 1 – 3 are all in close proximity with 1150, 230, 367 mussels recorded respectively. Slightly further downstream (but upstream of the confluence with the Curraghinalt Burn), 2021 Survey Site 4 returned a record of 430 mussels. No other Survey Site from either 2021 or 2022 returned records of this scale, with two

locations downstream of the confluence with the Owenreagh holding circa 100 mussels and one site holding 170 mussels well downstream of the confluence, at the downstream extent of the survey. The very low numbers of mussels recorded at points between the higher densities are likely to be representative of mussels being dislodged during fast flow conditions. The simple point here is that if one were to apply the principles contained within the very logical approach to Freshwater Pearl Mussel conservation management as adopted by ROI, then, on the evidence of the surveys, efforts / resources would have a focus on the upstream parts of the Owenkillew catchment (e.g. 2021 Survey Sites 1 to 4).

1.361. The 2011 strategy references work which informed the Sub-basin Management Plan Project, undertaken by Dr Evelyn Moorkens. Notably, another body of work undertaken by Dr Moorkens, which centred around a desk-based study of European populations of the species, was used to inform the JNCC CSM approach in relation to the species and also BS EN 16859:2017, both of which have been discussed above.

1.362. Regarding Dr Moorkens work to support the Sub-basin Management Plan Project, at section 1.3.2 of the 2011 strategy, it is stated:

> *"Dr Evelyn Moorkens has recently published a paper (attached), based on work conducted under the Sub-basin Management Plan Project, that proposes a prioritisation system and grapples with the need for a conservation strategy. The overall aim of the paper was to develop a conservation strategy to ensure the long-term survival of the species on the island of Ireland and, thus, the maintenance of an important part of the species' natural biogeographic range. A secondary aim was to maintain the broad geographical and genetic range within Ireland. The paper advocates:*
>
> 1) *Prioritisation of the largest populations, in order to maintain the largest possible portion of the national population;*
> 2) *Prioritisation of those populations with the greatest range of age classes, which will increase resilience in terms of their expected survival,*
> 3) *Prioritisation of those populations with the greatest occupancy of potential habitat so that catastrophic events are likely to have less severe impacts;*
> 4) *Prioritisation of those populations where measures are most likely to lead to improvements in habitat conditions in sufficient time to allow the population to recover naturally,*
> 5) *Prioritisation of those populations with the most manageable pressures.*

For each of the five prioritisations above, a filter was developed. Applying each filter, a population was prioritised or rejected, unless it lay between the prioritisation and rejection thresholds, or the required data were unavailable. The result was a table (Table 9 of Moorkens, 2010) listing the number of prioritisations and rejections and assigning a "priority class" (See also Appendix I). The priority classes are presented in Table 1 below, listing each population by name."

1.363. The screening exercise undertaken in respect of location / population prioritisation is described in detail at section 1.3.3 of the 2011 strategy (pages 6 to 8). Justification for the strategy is described at section 1.3.4 on page 10 of the 2011 strategy. That detail is not reproduced here, instead the reader is directed to Annex 25 for such information.

1.364. Importantly, there is no mention of the water quality parameter limits cited in JNCC CSM guidance (and based upon studies previously undertaken by Dr Moorkens). The ROI approach to the protection of the species is a step away from generic (non site-specific) guidance, and more focussed in nature.

1.365. Section 2 of the 2011 strategy details measures proposed in respect of the diffuse agricultural pressures in the eight priority freshwater pearl mussel catchments (and the Nore catchment), which are focussed around the production and implementation of site specific "farm plans". It is stated that:

"For the eight priority pearl mussel catchments, the principal agricultural measure in the Sub-basin Management Plans is to develop specific farm plans for target areas of the catchment. The target areas are to be defined based on a combination of high risk physical settings and high risk agricultural land uses/intensity. Target areas for riparian measures along the River Nore will be identified adjacent to and upstream of the extant population. The development of such farm plans requires significant work and collaboration between the National Parks and Wildlife Service of the Department of Arts, Heritage and the Gaeltacht and the Department of Agriculture, Fisheries and Food.

The flow diagram in Figure 1 outlines the process required to develop and implement the farm plans.

The key measures are:

1) *The employment of a team of dedicated farm advisers, and*
2) *The availability of funding for the necessary plans."*

1.366. Regarding the funding and delivery of site specific (farm plan) projects focussed upon addressing agricultural impacts on Freshwater Pearl Mussel within the ROI, “The Pearl Mussel Project” is of relevance. This is discussed further below.

The Pearl Mussel Project (ROI)

1.367. The Pearl Mussel Project, as referenced above, was set up as a pilot agri-environment programme which seeks to improve the quality of watercourses to benefit Freshwater Pearl Mussel in the ROI. It is stated as being “locally adapted, results-based and focuses on the top eight freshwater pearl mussel catchments in Ireland.” The project is funded by the Department of Agriculture, Food and the Marine as part of Ireland's Rural Development Programme 2014-2020. It has a budget of €10million and was set to run until December 2023.

1.368. Farmers within the scheme receive financial rewards based upon the quality peatland, grassland and woodland habitats (used as indicators) present on their land. The quality of watercourses on the farm also affects the level of payment.

1.369. A results-based payment system generates higher income rates where improvements are made to previously poor scoring habitats, providing an incentive to deliver enhancements. In addition, a floodplain payment is made to farmers who maintain floodplains and riparian habitats along Freshwater Pearl Mussel rivers. Payment rates vary according to recorded habitat quality. In order to determine the final payment an adjustment is made for the ‘results payment’ using the outcomes from a ‘whole farm assessment’ (based on overall habitat quality at the farm), with additional payments made where the farmer implements measures over the course of the scheme which are aimed at improving habitat quality and reducing the risk of impacts on downstream watercourses.

1.370. The Betterment Plan included at **Annex 13**, includes measures which are in line with the aims of the Pearl Mussel Project and the enhancements to farmland which are prescribed.

The US and Canadian approach to water quality protection and Freshwater Pearl Mussel conservation

1.371. Regard has also been had to the approach taken in Canada and North America, given that Fresh Water Pearl Mussel populations are present and are afforded protection.

1.372. In the US and Canada, effects-based water quality guidelines are set which are based on toxicology data. Guidance on site-specific assessment of secondary effects associated with eutrophication are also provided to support the identification of site-specific management targets. By way of example, for ammonia, the US Environmental Protection Agency (EPA) has a recommended effects-based guideline, but also recommends Ambient Water Quality Criteria for nutrients (including nitrogenous nutrients) in rivers and streams that are based on various ecoregions across the country. This published guidance for nutrients are not laws or regulations, but instead represent guidance that State and Tribal authorities may draw on as a starting point for setting water quality criteria that consider the various water management objectives for aquatic systems. As an example, Ecoregion VIII, which includes all or portions of nutrient-poor, largely glaciated upper Midwest and Northeast states of Maine, New Hampshire, Vermont, Massachusetts, New York, New Jersey, Pennsylvania, Michigan, Wisconsin, and Minnesota, as well as ecoregion XIV, which includes all or portions of the Eastern Coastal Plains associated with the South Carolina, North Carolina, Georgia, Virginia, Maryland, Delaware, New Jersey, New York, Connecticut, Rhode Island, Masschuset, New Hampshire, and Maine, represent the two ecoregions that encompass the known US extent (**Figure 5**) of Eastern Pearlshell Mussels (*Margaritifera margaritifera*, Linneaus 1758; Pennsylvania Fish and Boat Commission, 2011). Guidance to support management and target development for Ecoregion VIII and Ecoregion XIV are provided in US EPA (2001)[29] and EPA (2000)[30], respectively.

[29] US EPA. 2001. Information Supporting the Development of State and Tribal Nutrient Criteria for Rivers and Streams in Nutrient Ecoregion VIII. US Environmental Protection Agency, Office of Water, Office of Science and Technology, Health and Ecological Criteria Division, Washington, DC. December 2001. EPA 822-B-01-015.

[30] US EPA. 2000. Information Supporting the Development of State and Tribal Nutrient Criteria for Rivers and Streams in Nutrient Ecoregion XIV. US Environmental Protection Agency, Office of Water, Office of Science and Technology, Health and Ecological Criteria Division, Washington, DC. December 2001. EPA 822-B-00-022.

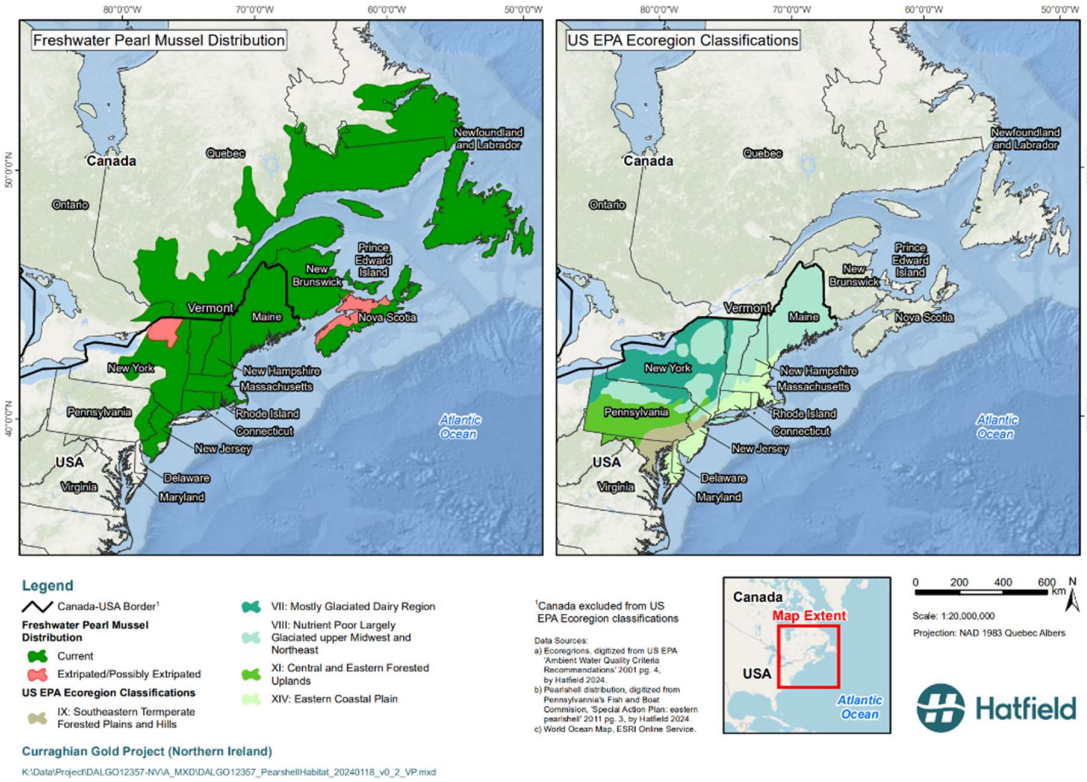

Figure 5. Comparison of North American Freshwater Pearl Mussel (*M. margaritifera*) distribution (reproduced from NatureServe 2010; left figure) relative to US EPA Ecoregion classifications for ambient water quality criteria for nutrients (reproduced from US EPA 2000; 2006; right figure).

1.373. As outlined in Figure 1, the known extent of *M. margaritifera* populations extend north into the eastern provinces of Canada. Similar to the US approach, federally, Canada recommends effects-based water quality guidelines for nitrate, ammonia, and total suspended sediments. These are summarised in Tables 15 and 16 below. As outlined in CCME (2007[31]), the purpose or guiding principles of these effects-based water quality guidelines are:

- *"Guidelines represent generic national recommendations that are based on the most current scientific information available at the time of their derivation (i.e., they do not directly consider site-specific, technological, socioeconomic, or management factors that may influence their implementation.*
- *Guidelines are meant to protect all forms of aquatic life and all aspects of the aquatic life cycles, including the most sensitive life stage of the most sensitive species over the long term, from the negative effects of*

[31] Canadian Council of Ministers of the Environment. 2007. A protocol for the derivation of water quality guidelines for the protection of aquatic life 2007. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, 1999, Winnipeg.

anthropogenically altered environmental parameters (e.g., pH, temperature, and dissolved oxygen) or exposures to substances via the water column.

- *In deriving these science-based guidelines, all higher components of the aquatic ecosystem (e.g., algae, macrophytes, invertebrates, and vertebrates [fish, amphibians, etc.]) and their aquatic life stages are considered, if the data are available.*
- *National guidelines can be the basis for the derivation of site-specific guidelines (i.e., derived with site-specific scientific data) and objectives (i.e., derived with site-specific scientific data as well as consideration of technological, site-specific socioeconomic, or management factors).*
- *Provincial jurisdictions may aim for greater or lesser levels of protection (i.e., certainty and margins of safety) depending on circumstances within each jurisdiction."*

Constituent	CCME (Acute [mg/L])	CCME (Chronic [mg/L])
Ammonia	0.016* (unionized)[1]	-
Nitrate	124 (NO_3^- as N)	3.0 (NO_3^- as N)
Total suspended sediments	Maximum increase of 25 mg/L that of background when background levels are between 25 and 250 mg/L. Should not increase more than 10% of background levels when background is ≥250 mg/L.	Maximum average increase of 5 mg/L that of background.

Notes: ***unionized ammonia in mg/L reported in the CCME WQGPAL was converted to unionized ammonia in mg/L (as N) for comparison to discharge criteria;** [1] The CCME WQGPAL is based on unionized ammonia, with total ammonia guidelines calculated based on pH and temperature, as outlined in Table13, to maintain unionized concentrations less than the unionized guideline NO_3^- as N = nitrate as nitrogen.

Table 15. CCME Water Quality Guidelines for protection of aquatic life for nitrate, ammonia, total suspended sediments.

Temp (°C)	pH							
	6	**6.5**	**7**	**7.5**	**8**	**8.5**	**9**	**10**
0	190	60	19	6	1.919	0.617	0.206	0.035
5	126	39.8	12.6	3.986	1.268	0.413	0.142	0.028
10	84	26.7	8.48	2.685	0.856	0.282	0.100	0.024
15	57	18.1	5.75	1.828	0.589	0.197	0.073	0.021
20	40	12.5	3.97	1.268	0.411	0.141	0.055	0.020
25	28	8.7	2.78	0.889	0.292	0.103	0.044	0.018
30	20	6.2	1.97	0.632	0.211	0.077	0.035	0.017

Table 16. CCME total ammonia guidelines, adjusted by pH and temperature to reflect predicted concentration of un-ionized ammonia (reproduced from CCME 2010 but adjusted to mg/L as N using a conversion factor of 0.8235).

1.374. Canada also has guidance to support site-specific assessments for determining nutrient concentrations protective of secondary effects associated with primary productivity. The Guidance Manual for Developing Nutrient Guidelines for Rivers and Streams[32] (2016) is clear that the adoption of a standardised approach to guidelines (i.e., target setting) is not appropriate given site-specific influences that control primary productivity in aquatic receiving environments (e.g., light penetration depth, turbidity, nutrient ratios/limiting nutrients, temperature, etc.). Instead, the recommended approach is to use location specific data to inform regional guidelines. It is stated within the Executive Summary that:

> *"There is no ideal "one-fits-all" approach to nutrient guideline development, because each region and jurisdiction has a unique combination of natural features, economic and intellectual resources, and existing data monitoring programs"*

1.375. This reference to the use of location specific data is particularly poignant in the case of the Mine proposals and the issue of applying the JNCC CSM guidance in relation to nutrients (e.g. Nitrates and Phosphorus).

[32] Guidance Manual for Developing Nutrient Guidelines for Rivers and Streams (2016), Canadian Council of Ministers of the Environment

Summary conclusions in view of the Guidance

1.376. In view of the above, it is clear that there is range of guidance available to assist in the setting of appropriate discharge limits.

1.377. Whilst it is relevant to have regard to the CSM guidance in helping to define discharge limit values, that guidance has a specific purpose, that of a monitoring tool for designated sites. That guidance must not be viewed as the 'last word' in defining acceptable water quality for sustaining populations of FWPM or protecting the aquatic environment more generally. None of the other approaches discussed in relation to Freshwater Pearl Mussel protection / conservation apply JNCC CSM Guidance, or an equivalent set of designated site monitoring guidelines.

1.378. The approach to protecting water quality and associated ecological functions is well defined through the Water Framework Directive and through this statutory framework the application of EQS values are advocated as the means by which protection is afforded.

1.379. The approach to the protection and conservation of FWPM in ROI is logical and grounded in sound ecological and economic principles. Legislation mandates a focus on assessing mussel numbers to determine the conservation status along with five very focussed habitat objectives. The adopted species conservation strategy accepts losses of unsustainable populations and targets efforts at populations where benefits for the species can be realised and a conservation project has been defined, funded and implemented.

1.380. The approach to setting water quality targets in Canada and North America is based around actual (recorded) toxicological effects, and site-specific data regarding baseline conditions for water chemistry. By contrast, the CSM guidance for FWPM derives its targets from an observational, desk-based study regarding water quality in rivers supporting populations of FWPM, the same study which informs BS EN 16859:2017.

1.381. The approach to defining the revised discharge limits, as proposed by the Applicant, has regard to the CSM guidance, but the overall strategy recognises that the 'one size fits all' approach based on observational data, is not scientifically robust. Further, the approach adopted by the Applicant, as described in the

following section, fully meets the tests of the Habitats Regulations, ensuring no adverse effect on Integrity, a movement towards favourable condition in terms of water quality issues and no retardation of the ability of the Owenkillew River reaching favourable condition.

Discussion regarding appropriate and proportionate discharge consent limits

1.382. First and foremost, it must be remembered that for the discharge consent applications, we are dealing with a consenting regime which sets thresholds / benchmarks at which Enforcement action can be taken. These are measured values (through monitoring / testing) where exceedance can lead to prosecution. That is very different to the actual residual effect, post mitigation, of the scheme proposals, modelled or otherwise. In other words, in setting a discharge value for compliance purposes, it does not follow that the discharge will be at that level. In fact, because the discharge will be an enforcement limit, the applicant would ensure that measures (e.g. relevant technology) are in place to give rise to discharges which will be as low as possible when compared to the limits, to avoid any breaches of the consent.

1.383. In terms of what those discharge limits should be, they should, in short, be protective of the aquatic environment, including those qualifying interest features of the relevant SAC / ASSIs. Insofar as the Owenkillew SAC is concerned, they should be at a level which does not undermine the sites Conservation Objectives.

1.384. The relevant conservation objective for the SAC is to maintain, or restore (where appropriate) the qualifying interest features to favourable condition, and the SAC is reported as currently being in unfavourable condition. On this basis, when applying the tests of the Habitats Regulations, it would be appropriate to take measures which ensured no further deterioration in water quality attributes of importance to the qualifying interest features. That is to say, the project should not make things worse. Further, it is also necessary to demonstrate that the project will not retard the ability of the feature/s to reach favourable condition.

1.385. It is important however not to conflate discharge limits with actual discharges and it is equally important to have regard to the fact that current ‘failings’ in relation to

water quality parameters (contributing to the unfavourable condition of the SAC) arise from a multitude of activities in the catchment, including many which are themselves consented (e.g. residential and WwTW discharges) and many which are not regulated to the degree necessary to stem the rise in nutrient inputs (agriculture).

1.386. The proposed mine will, in simple terms, circulate water from within the catchment. It will be using water of existing baseline quality, which has been highlighted by NIEA as not meeting targets set in relation to features attaining favourable condition.

1.387. With the exception of a 'baseline condition' discharge of water from the freshwater pond (collecting water from upstream of the proposed infrastructure site), designed to ensure baseflow levels in the Pollanroe Burn is maintained / enhanced, mine water will be passed through an advanced Reverse Osmosis water treatment plant. The process is non-selective and as a result the system will be screening (removing) levels of parameters associated with baseline water quality as well as any additions associated with the mine processes. Therefore, as part of the project water treatment process, baseline water will be cleaned.

1.388. Regarding baseline water quality, it is well documented that agricultural practices have a significant adverse impact on water quality in the catchment, with run-off containing fertilisers, slurry and silts being a prime example. A lack of regulation and enforcement is understood to be a critical issue in this regard. However, there are also examples of consenting process which have allowed permits to be issued for discharges well in excess of those values put forward by the Applicant. The sources relevant to water quality impacts in the SAC and the various management plans which have been published to try and redress the issues are discussed in detail within the Betterment Plan included at Annex **13**.

1.389. Following from the above, as one example, the Greencastle WwTW discharges into water which holds FWPM. This has discharge limits for BOD and total ammonia and these are set at 35 mg/L (95%ile) and 10 mg/L as N (95%ile) respectively. These concentrations are significantly in excess of JNCC CSM target values. Regarding this and other such examples, the reader is directed to section 6 of this TR.

1.390. In view of the above, whilst it is considered relevant to have regard to the CSM guidance in helping to define discharge limit values, it would be a disproportionate, and indeed irrational response to force the Applicant to accept discharge limits (for certain key parameters relevant to the protection of FWPM and Atlantic Salmon) which were aligned directly with the CSM guidance. That would effectively place the designated site monitoring values at 'end of pipe', well removed from the designated site boundaries, any population of FWPM and key habitat for Atlantic Salmon (noting that spawning habitat has not been identified in the burns and only Salmon parr have been recorded (only then at the southern end) in the Pollanroe burn.

1.391. In addition, the Applicant would by default be compensating for the permitted discharges of the Greencastle WwTW and other projects in the catchment (e.g. housing schemes) where discharge consents have been issued. Issues then arise in relation to non-discrimination and consistency of approach, with reference to the application of the precautionary principle.

1.392. The effect of relevant discharge limits being aligned directly with the CSM guidance would be to mandate betterment for the catchment by focussing attention on the proposed Mine project. In those circumstances, not only would the Proposal (unequivocally) be deemed not have an adverse effect on the Integrity of the SAC in relation to water quality issues, but it would be directly addressing the historic and on-going problems caused by others. This goes well beyond the 'polluter pays' principle, and also well beyond what is required by the legislative provisions of the Habitats Regulations.

1.393. As can be drawn from the Freshwater Pearl Mussel Favourable Conservation Status assessments discussed previously, and also from the various management plans and the risks highlighted in the SAC Conservation Management Plan, all discussed within the Betterment Plan at Annex **13**, there are a range of intractable factors / processes acting upon the SAC and determining feature condition. Water quality is just one aspect of that range of factors. Therefore, on this basis alone, it is not correct to proceed with an HRA on the basis of an entirely hypothetical scenario, whereby the SAC is deemed to already be in favourable condition, in

order to demonstrate reaching favourable condition is not to be retarded by the project.

1.394. Even when focussing purely on water quality issues as part of a favourable condition assessment, I am not aware of any proposals for WwTWs to be upgraded to match, or even get anywhere close to, the efficiency of the plant proposed by the Applicant. There is also no evidence to suggest that nutrient (nitrate and phosphate) inputs from agriculture is being or will be effectively regulated to the extent that the JNCC favourable condition limits will be reached.

1.395. The Habitats Regulations require the decision taker to reach a conclusion that the project will not give rise to an adverse effect on the integrity of the site. That decision should be taken in view of the conservation objectives, which require maintenance or restoration of favourable condition if applicable. The existing baseline is important in any such consideration.

1.396. With regard to the requirement for restoration, if the proposals can be regulated through discharge limits which ensure that there is no further deterioration and, where possible, movement towards favourable condition, then it cannot be held that the proposals fail the tests of the Habitats Regulations.

1.397. I now turn to consider what is proposed to ensure no deterioration in water quality (as relevant to the key parameters), and ensure that the proposals will not undermine the SAC Conservation Objectives, including considerations relating to not retarding the prospect of the SAC reaching favourable condition.

Revised proposed discharge limits

1.398. The Applicant proposes a revision to those discharge limits sought under the discharge consent applications. This decision has been taken in the light of the position of NIEA, the available evidence regarding water quality associated with the relevant designated sites, the species population data and cited threats / pressures impacting on these species. The approach demonstrates an abundance of caution and fully accords with the precautionary principle.

1.399. I draw the reader's attention to the evidence presented within the TR of Dr Stewart of Kaya Consulting for matters of detail regarding the proposed discharge criteria. However, I summarise the proposals below and discuss why this approach is both appropriate and proportionate, with particular regard to the tests of the Habitats Regulations.

1.400. As discussed previously, in view of the legislation, available guidance and the baseline information, it is important to demonstrate that the project will not give rise to further deterioration of water quality and that the proposals will not retard the potential for the relevant interest features to attain favourable condition (noting the current unfavourable status).

1.401. Following from the above, if the discharge criteria are set at a level consistent with baseline concentrations associated with the interest feature populations in the main rivers (Owenkillew and Owenreagh), then it can be concluded that the project will not be making things worse in terms of water quality. In this light, the Mine would not be exacerbating any perceived deleterious water quality impacts on interest features associated with the designated sites. Further, because we are dealing with enforcement values, discharges would be below those levels and thus betterment would be achieved for the catchment.

1.402. I deal below with the relevant key parameters.

Phosphorus

1.403. The issue of phosphorous is covered in further detail within the Geochemistry Characterisation Studies Technical Report, produced by SRK Consulting. For this detail I refer the reader to section 11 of that TR. For convenience, the salient points can be distilled as follows:

1) Three minerals which contain phosphate have been identified in the Curraghinalt deposit, but in trace amounts only;

2) The phosphate present would be insoluble in the Curraghinalt water chemistry;

3) BS EN 16859:2017 (FWPM specific guidance) confirms that:
   - "…**phosphorus in any of its forms is not directly toxic to pearl mussels**";

- It is a "…key concern in Margaritifera catchments, as it is normally the limiting nutrient for algal and plant productivity"; and
- "…it is directly **linked to eutrophication**, resulting in several adverse effects for the species'.

4) Unlike for nitrate and ammonia, BS EN 16859:2017 does not present actual water quality guideline concentrations for phosphorus. Instead, it cites the need to demonstrate consistently "very low MRP and total P in conjunction with no evidence of eutrophication (e.g. algal growth)". It recommends a mean or median MRP or total P level for all FWPM rivers consistent with high status under the WFD. This was the approach taken by the Applicant submitting the discharge consent licence applications.

5) The phosphorus standards suggested in Moorkens 2006 (i.e. median of 0.005 mg/L or 5 µg/L, orthophosphate) are not reproduced in the British Standard guidance. However I note that they were taken forward in the JNCC CSM guidance for FWPM.

6) It is unlikely that the Moorkens / JNCC CSM target of **0.005 mg/L or 5 µg/L**, represents a concentration which could be accurately measured.

7) From a review of laboratory capabilities undertaken as part of the 2017 Surface Water Baseline Report, the lowest detection limit was **0.01 mg/L (10 µg/L)**, which is twice the JNCC CSM target value and is also understood to be the detection limit threshold for NIEA data.

8) CSM Rivers guidance gives a relevant target of **10 µg/L** (SRP) in instances where current phosphorus concentrations are below that threshold (as an annual and growing season mean) and where it is feasible to comply with it. However, a proposed maximum of **0.02 mg/L (20 µg/L)** SRP should normally be adopted where the baseline value is higher.

9) Of the available laboratory testing methodologies, only "ICP dissolved phosphorus analysis" is readily capable of delivering concentration resolutions that are directly comparable with the FWPM target **(0.005 mg/L or 5 µg/L)** for soluble reactive phosphorus. There is uncertainty regarding the results due to the possibility of overestimating concentrations through the inclusion of 'non-reactive' phosphorus.

10) For all orthophosphate as PO4 at upstream monitoring locations in the Owenkillew (SW05, SW07, SW23 and SW24) and Owenreagh (SW10 and SW11), between 2011 and 2024 median concentrations are less than the detection limit.

11) The Project sewage treatment plant is the only source of phosphate from the proposals and all resulting effluent will be further treated by passing it through the RO plant. The RO plant removes a further ~99% of all solutes (see Annex D, 2020 Surface Water Impact Assessment). The result is that the treated

sewage effluent typically has a subsequent **minimum of 100 times dilution** and **a further ~99% concentration reduction** before discharge to the environment.

12) Given the purported sensitivity of FWPM to phosphorous and the fact that the Owenkillew and Owenreagh Rivers already have concentrations that are deemed excessive, it is proposed that the discharge limit is set to prevent exceedance of the average upstream (receiving) background concentration already flowing over the FWPM beds. Thus, the discharge will be regulated to match / dilute the baseline concentrations over an annual period.

13) The average background phosphorus concentration is approximately 0.02 mg/L. It is proposed that this value be applied as an annual mean to end of pipe compliance criteria.

1.404. In view of the above and with reference to the Geochemistry Characterisation Studies TR, the only discernible addition of phosphorus into discharges from the mine proposals themselves, comes from the Project sewage treatment plant. The arising concentrations will be negligible and given the effectiveness of the proposed treatment chain (WwTW followed by RO) the situation can be viewed as follows. The phosphorus from the mine project is fully removed from the discharges and in addition, a proportion of phosphorus in the baseline water is also removed because of the external water coming into the treatment ponds and the RO Plant. Assigning a discharge consent threshold of 0.005 mg/L or 5 µg/L (in line with JNCC FWPM CSM guidance) would be wholly disproportionate, over-precautionary and inappropriate. Further, given the issues identified regarding detection limits, it would not only be impractical, but also non-transparent and prejudicial to impose such limits. There would always be a significant level of doubt / uncertainty regarding measured values and this is not appropriate when the assessment is effectively dealing with judgments on whether enforcement action should be taken.

1.405. Treating to a level in line with a compliance threshold of current baseline (e.g. 0.02 mg/L / 20 µg/L) would ensure no further deterioration in water quality, would be measurable giving confidence in the results of monitoring and would be consistent with CSM Rivers guidance.

Nitrate

1.406. As discussed above, the JNCC CSM guidance for FWPM sets a target value of 0.125 mg/L based upon Moorkens (2006). However, the CSM guidance also references the fact that different thresholds have been proposed in scientific literature, for example 0.5 mg/L in central Europe (Bauer 1988) and 1 mg/L for the UK (Oliver 2000). It also references the fact that a UK population showing some recent recruitment has a median value of 0.338 mg/L. The JNCC guidance has taken a precautionary approach and applied the lowest limit value from the cited literature.

1.407. Like phosphate, nitrate is linked to eutrophication, and it is this which is recognised in terms of adverse effects on FWMP (and other aquatic life) as opposed to direct toxicity being linked to nitrate. However, it is significant that phosphorus, and not nitrate is cited as being the key limiting nutrient for algae / plant growth in FWPM catchments, as stated in BS EN 16859:2017.

1.408. In terms of the reported effects of eutrophication within the catchment, as opposed to the reported concentration levels of nitrate (or phosphate) one can take some comfort from the favourable condition monitoring data. Looking at the condition assessment data / reports from both 2011 and 2017 (see above), in both instances less than 5% coverage of filamentous algae (within assessment units) was recorded. This is in line with the guidance and therefore that criteria was recorded as a ‘pass’.

1.409. Whilst the CSM monitoring targets (set at a precautionary level) are not met, the evidence available from the filamentous algae surveys, does not demonstrate eutrophication as being at a level which could be harmful to the FWPM populations.

1.410. Notwithstanding the above points, since nitrate is linked to eutrophication and that is a known pressure for FWPM populations, it is appropriate that nitrate levels continue to be monitored and that limits are set in relation to any discharges into the catchment.

1.411. Unlike with phosphorus, the Mine proposals do result in a direct pathway for increases in nitrate loading, notably from the use of explosives as part of the mining process. However, again the issue of baseline water quality is relevant and in setting appropriate and proportionate enforcement levels one has to be mindful of the fact that the RO plant will be treating water which already has an existing level of nitrate arising from other sources within the catchment (both regulated and unregulated).

1.412. It would be both appropriate and proportionate to set the enforcement / limit value in line with the baseline value for nitrate as applicable in the main river. In this way, the Applicant will be regulated to ensure no worsening of the situation and in real terms therefore, with actual discharges below this value, the baseline will be improved through dilution and a trajectory towards favourable condition will result.

1.413. The matter of existing Nitrate loading within the main rivers and the Applicant's proposals to deliver additional benefits in terms of a reduction in agricultural sources of nitrate in the rivers, is specifically discussed within the Betterment Plan appended to this TR.

BOD

1.414. JNCC CSM guidance for FWPM gives a target of < 1 mg/L (mean). With reference to the 2017 FWPM condition monitoring data / report (see above), this criterion was failed on the basis of a recorded mean of 1.59 mg/L. The TRs in relation to Surface Water and Water Discharges provide detailed discussion regarding the baseline position for BOD and I direct the reader to the information included in that report for further information.

1.415. It is proposed that the enforcement / limit value should be set in line with the baseline value for BOD as applicable in the main river FWPM habitat. As with other relevant parameters the Applicant will be regulated to ensure no worsening of the situation and with actual discharges below this value, the baseline will be improved through dilution and a trajectory towards favourable condition will result.

Siltation / TSS

1.416. Regarding TSS and potential implications for aquatic habitats / species (including FWPM and Atlantic Salmon), as already discussed above, JNCC CCSM guidance does not set specific target values for siltation. For redox, CSM guidance for FWPM states that "*there should be no pronounced difference in redox potential (typically <20%) between open water and interstitial water at 5cm depth*". The 2017 FWPM condition monitoring report states that for redox a fail was recorded, the cited range of recorded data being 37% to 39% between open water and interstitial water.

1.417. NIEA has stated that the discharge consents should include a limit set at a mean of <10mgl-1 ("*as relevant to spawning & nursery grounds for Atlantic Salmon*") and applicable to the Curraghinalt and Pollanroe Burns. The following points arise.

1.418. First, it should be noted that this is an issue which is principally limited to the construction phase of the proposals, where silts / soil are likely to be mobilised, with run-off causing elevated levels of TSS within water to be discharged. Any perceived effects would be short-term and reversible. During the operational phase of the project there will be no discernible discharge of TSS, given the treatment processes. During closure, again silts / soil are likely to be mobilised and run-off could give rise to elevated levels of TSS, however again such effects would be short term and reversible. Context is also important here and I am mindful that TSS within the rivers and more minor watercourses will vary significantly throughout the year depending on prevailing weather conditions. TSS loading will be 'naturally' high after prolonged rainfall, falling as conditions stabilise and flow rates decrease. Thus, short term elevated TSS levels are a natural and common occurrence and are not something which has the potential to cause significant or irreparable damage.

1.419. Second, evidence does not point to either the Pollanroe or Curraghinalt burns being important habitat for Atlantic Salmon. There is no evidence of use of the Curraghinalt burn by the species (following detailed surveys by the Loughs Agency and the Appellant) and habitat scoring assessments have demonstrated it to be sub-optimal. Regarding the Pollanroe burn, whilst Atlantic Salmon parr have been

recorded as present in low numbers, there is no evidence that spawning is supported.

1.420. The TR of Dr Stewart (Kaya Consulting) regarding Water Discharges describes what is proposed as appropriate and proportionate in respect of limit values. Those being fully protective of the aquatic environment and the Atlantic Salmon / FWPM populations within the catchment.

NORM / Radon

1.421. Naturally Occurring Radioactive Materials (NORM) and Radon Gas are not specifically cited by any statutory consultees in relation to perceived potential implications for ecological receptors. However, for completeness the matter has been considered. Detail is presented in the report titled TR - NORM and Radon Gas for the Curraghinalt Project, prepared by Aurora Health Physics Services Ltd. I direct the reader to that report for further information, but summarise the findings here.

1.422. The premise of the analysis conducted is that industrial activities such as mining can lead to increased concentration levels of NORM. In relation to radon, this occurs naturally in air and readily emanates from the ground. Legislative provisions in place to protect people from radon gas exposure at increased concentrations within buildings and confined spaces such as mines, and within drinking water.

1.423. With reference to the TR in respect of NORM and Radon Gas, baseline concentrations of NORM were established for the local geology, surface water and ground water. Processed material from the exploratory mine (representing that material which would be discharged to the environment through the proposals) was analysed.

1.424. NORM concentrations in the processed materials were found to be not significantly different from baseline NORM levels. Furthermore, in all instances, recorded levels were well below the Out of Scope Limits (OOSLs) specified in the Radioactive Substances Act 1993 (as amended). The recorded levels of NORM in the processed materials were such that they are not considered to be radioactive for

regulatory purposes and no further control measures are required in respect of the NORM content of the materials.

1.425. Regarding radon, as confirmed within the Technical Report in respect of NORM and Radon Gas, within water radon readily outgasses during water movement caused by pressure, temperature differences and turbulent mixing. From the analysis undertaken, the discharge from the WwTW is below 20 Bq/L, while the regulated drinking water limit is 100 Bq/L, and the level would continue to fall after discharge due to further outgassing of radon to the atmosphere. Thus, the water at the discharge point would qualify as drinking water with regard to the water quality regulations.

1.426. Whilst it is accepted that limits in relation to (human) drinking water quality are perhaps not directly relevant to ecological receptors, in the absence of other available guidance or specific limits or targets, it is considered that they represent are an appropriate proxy. The continued outgassing of radon to the atmosphere, with subsequent dispersion (a natural occurrence) gives further comfort in the matter.

1.427. No potential adverse implications on any ecological receptors been identified in relation to NORM or radon associated with the proposals.

Metals / other parameters to be subject to enforcement

1.428. For other, non-key parameters (with reference to the more sensitive FWPM), such as metals, EQS standards to be applied at end of pipe (on a precautionary basis), are appropriate in protecting the aquatic environment. For the Curraghinalt Burn, Maximum Allowable Concentration (MAC) EQS is proposed on the basis of the poor quality of habitat, and absence of Atlantic Salmon and Freshwater Pearl Mussel. For the Pollanroe Burn, noting the presence of fish, including Atlantic Salmon in part of the burn, both MAC and Annual Average EQS are proposed. For the Pollanroe Burn therefore, both acute and long-term effects are protected against.

Consideration of matters concerning olfactory cues

1.429. As described previously, 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.

1.430. In this matter I would simply point to the fact 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. It is important to keep in mind that 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).

1.431. I also reiterate the significant evidence that neither the Curraghinalt nor Pollanroe burns are considered to be spawning grounds. The proposals are protective of the fish and aquatic life more generally and thus in respect of salmonid species there would be no adverse change from baseline.

Discharge consent related betterment

1.432. Notwithstanding the considerations of the discharge issues above, the Applicant will commit to a water discharge betterment plan that will deliver measures specific to water discharge, and that is separate to the mitigation requirements associated with the Proposal.

1.433. Included at A**nnex 13** is an Outline Betterment Plan that seeks to secure further improvements to current baseline water and riparian / river channel quality associated with the Owenkillew River. As recognised by the statutory authorities, and reported within the sHRA (2020), pollution from agricultural practices is a significant (and unregulated) contributor to degraded water quality in the

catchment. The Proposal involves the complete removal of agricultural activity (grazing / fertiliser inputs) across in excess of 240 hectares of agricultural land under the direct control of the Applicant. These proposals will further the stated conservation aims for the SAC.

1.434. The proposed plan goes further than the management / control of agriculture and includes measures which will deliver further betterment in terms of catchment water quality and riparian habitat betterment. In defining these measures, specific regard has been had to the Owenkillew River Protected Site Conservation Management Plan (Nov 2023), such that the Applicant will be directly delivering measures cited as being required to improve upon baseline conditions and help move the SAC towards favourable condition and then maintain such condition long-term. These measures are all in addition to the proposed Discharge Consent enforcement limits, which as explained, themselves can be seen as part of the 'solution' in terms of addressing the existing failings in relation to water quality effects on the SAC, moving the features back towards favourable condition.

Detailed consideration of NIEA's letter of 5th September 2024

1.435. In a letter dated 5th September 2024, NIEA Water Regulation Unit described its current position regarding water discharge applications TC 80/20 and TC 81/20. Attached to that letter is a document providing further detail on its approach to setting discharge standards for the applications. It is stated that

> *"This has been prepared in line our understanding of the legal requirements under both the Habitats Regulations and the Water Framework Regulations applicable in Northern Ireland."*

1.436. The letter confirms that these standards are very likely to be formally adopted, forming part of the Supporting Advice linked to Northern Ireland SAC rivers Conservation Objectives. It is stated:

> *"You may wish to note that the Conservation Objectives (Supporting advice Annex) for all Northern Ireland SAC rivers are in the process of being updated and will likely reflect these standards. The updated documents will be published very shortly."*

1.437. In the light of the above, it is likely that the information contained within the letter and attached document will represent NIEA's formal position at the conjoined Inquiry, and also possible that the approach will be formally adopted, to be used as part of the assessment process associated with discharge consent applications (potentially) affecting Northern Ireland SAC rivers (i.e. broader than considerations relating solely to the Owenkillew River SAC).

1.438. As a headline point, the overall approach to setting discharge limits as described by NIEA in its most recent correspondence is fundamentally flawed. It is baseless in view of the scientific evidence regarding the lack of use of the Curraghinalt Burn by Atlantic Salmon, limited use of Pollanroe Burn by that species and the absence of Freshwater Pearl mussel from both. It is also categorically unworkable in a practical sense due to issues with detection limits, the suggestion that mixing modelling is to be undertaken for the burns and the fact that for some (broadly non-harmful) parameters, no increase (above baseline) would be possible. The outcome of such an approach will likely be that it will not be possible for anyone who discharges water into the catchment to fully comply with discharge consents which align with the new guidance. All set against a background where current conditions within the rivers have arisen through a lack of proper regulation and a lack of delivery in terms of projects and mechanisms identified by stakeholders as being required to address issues concerned with maintaining / restoring the favourable conservation status of the Owenkillew River SAC. These broad points are expanded upon below with reference to the information contained within NIEA's letter.

1.439. Whilst the detail regarding approach to setting discharge limit values is contained within an attached document, the letter itself highlights some key points and these are discussed below.

1.440. Paragraph 5 confirms that NIEA's approach has been to use a combination of EQS annual average, EQS Maximum Allowable Concentration (MAC) and background water quality. It is stated:

> *"In the attached document we have made the case for a range of suitable standards based on EQS annual average, MAC and background water quality based on the availability of applicable published standards and the relative toxicity of the components of the proposed discharge in the*

aquatic environment. Where a max allowable concentration is published e.g. for Cadmium, this will be considered in setting end of pipe standards. For e.g. Nickel, there is no published Max allowable EQS and as such, the Annual average EQS is applicable."

1.441. Whilst there remains a disagreement in relation to which parameters should be subject to standards derived from EQS annual average, EQS MAC and background water quality, it is agreed that all three should be used in the setting of the limit values. The Applicant proposes to discharge at better than baseline for key parameters (with reference to Freshwater Pearl Mussel), MAC EQS for other relevant parameters in the Curraghinalt Brun and both MAC EQS and AA EQS for other relevant parameters in the Pollanroe Burn (given the recorded presence of Atlantic Salmon parr).

1.442. Paragraph 6 confirms that NIEA is of the view that (on its understanding) Dutch, Canadian and US standards cannot be used to guide the setting of limit values because they are not widely adopted by other European Agencies or have been subject to the same level of scrutiny and consultation as EQS values. It is stated:

"We note you have outlined the reasoning behind the proposition that Dutch (for barium), Canadian and US standards should be applicable. As far as we are aware, these standards have not been widely adopted by other European Agencies or been subject to the same level of scrutiny and consultations process, prior to adoption, that the published EQS's have and therefore their applicability to this context is not demonstrated."

1.443. The Applicant has reviewed a range of guidance considered relevant to the setting of discharge limits. In the case of Barium (cited specifically by NIEA) the Applicant drew reference to Dutch guidance which was considered appropriate. The approach of NIEA, as discussed below, is to apply JNCC values in respect of certain key parameters, EQS on the remainder where an EQS is available, then a 'no increase from upstream baseline' for any not caught by JNCC or EQS. As discussed below, there is no scientific basis at all for imposing a 'no increase from baseline' enforcement value on parameters which are not recognised (e.g. through EQS) as being a risk to the aquatic ecosystem. The approach by the Applicant is logical and can be characterised as looking more widely, drawing reference to other studies or processes to inform the position. NIEA's approach is illogical and

unworkable, for reasons discussed further below in relation to the 'no increase from baseline' point regarding certain parameters.

1.444. Paragraph 8 concerns the Applicant's proposition that certain parameters need not be taken forward for regulation on the basis that they are not likely to be present in the discharge. On this point NIEA request further evidence that the elements (Aluminium and Sodium are cited) will not be present within the discharge.

1.445. It is correct that the Applicant has sought to remove some parameters from regulation through the discharge consenting process. Whilst some will be present within the discharge (rainwater for example contains sodium), the important point is that some parameters are not going to be at levels which are in any way significant in terms of impacts on water quality / aquatic life, noting for example that no EQS is given. Reference is drawn to Table 9-25 (at page 137) of the Surface Water Impact Assessment (October 2020) (App C4_of the Second Addendum to the ES). In respect of Aluminium, the reported average baseline value in Pollanroe Burn is 59 µg/L, whereas the sum value for project sources is 9.1 (1.6 + 1.5 + 1.1 + 4.9), before treatment. For Sodium, the reported average baseline value in Pollanroe Burn is 6.1 mg/L and whilst the sum value for project sources is greater (22.5mgL) this is an element which could occur at significantly higher concentrations without causing any deleterious effects in water quality terms. This is a matter discussed in more detail further below.

1.446. Paragraph 9 concerns the Applicant's proposition that Silver and Chromium should not be taken forward for regulation on the basis of limits of detection. NIEA consider that detection limits are not an issue for these elements. It is stated:

> *"There appears to be an order of magnitude difference which should not limit assessment. We have therefore continued to include standards for these in the attached tables. Once end of pipe standards are calculated we may revisit this aspect."*

1.447. In relation to the removal of parameters (from the discharge consent) due to limits of detection, there is a concern that NIEA are misguidedly placing a reliance upon half detection limits in some instances. In this context, "half detection limit" applies to a situation where, in order to generate data which can be used for analytical purposes, all recorded data with a value which is "less than detect" is halved. This

ensures that a set of data is available for statistical analysis (where it would otherwise be disregarded), but the data does not comprise true values. It is imperative that any limits being set can be robustly measured against, so including limits below the level of detection is not appropriate.

1.448. Paragraphs 11 and 12 confirm NIEA's rational behind a need for the regulation of Phosphorus within the discharges, that being on the basis that treated sewage effluent is proposed to be discharged into the Pollanroe Burn.

1.449. Detailed discussion regarding Phosphorus is presented above within this TR. The simple point on this matter is that the actual discharge of Phosphorus attributable to the Mine project after treatment, will be negligible. It is the baseline catchment water, recirculated as part of the project which has a bearing on the discharged water. Regulation on Phosphorus would, on the face of it, appear an acceptable approach to setting the discharge consent limits, but in setting the enforcement limit, due regard must be had to the baseline situation because the Applicant will be treating baseline water as part of the water treatment process. The result of this approach is that the catchment baseline water is being regulated (and potentially enforced against) and not the mine proposals. That approach cannot be justified.

1.450. Paragraph 13 concerns the proposed use of chemicals on site (e.g. sodium hypoclorite, citric acid, descalant, sulphuric acid, sodium hydroxide, sodium bisulphite and flocculants) and NIEA request clarification on how these chemicals are to be used, details of the Chemical safety data sheets and the pollution prevention and storage arrangements.

1.451. In this matter I draw attention to the fact that following the removal of cyanide use from the project, a Hazardous Substance Consent (HSC) determination was submitted to DfI. It was concluded that an HSC was not required. Since no permit is required, the management / control of chemicals on site can be detailed within operational management plans, secured by condition where necessary.

1.452. As discussed above, the detail of NIEA's proposed approach is set out within the attachment to the latter (5th September 2024). This is discussed below.

1.453. At paragraph 1 of the attachment NIEA references JNCC (CSM) standards for the protection of FWPMs applying in respect of water quality and it cites Favorable condition table 1 included at page 15 of JNCC CSM Guidance for Freshwater Fauna. Specifically regarding Phosphorus, that table (also discussed above within this TR) states that where the baseline value for Phosphorus exceeds 5 ug/l, "*the more stringent value of either a high ecological status values for SRP under the WFD or the SRP target for the CS river habitat"* should be used.

1.454. NIEA notes accompany the table and these explain that, in relation to a high ecological status value for WFD purposes, high to good status is calculated at 15ug/l for the Owenkillew at Drumlea and 17 ug/l at Trinamadden Bridge. With reference to the JNCC CSM Guidance for Rivers, values between 5-40 ug/l are applicable, depending on alkalinity, altitude and substrate, with the relevant standard (from table 6 of the CSM Guidance) being 20ug/l.

1.455. At this point, it should be noted that the value proposed by NIEA to be taken forward in relation to Phosphorus is 15/17 ug/l. This is despite the fact that JNCC CSM Guidance for Rivers specifically states that

> *'Where a reach is not compliant with the relevant target in Table 6, this target should normally be adopted in conservation objectives'*.

1.456. With reference to the TR in respect of Surface Water, data shows that the relevant background value for Phosphorus is circa 20 ug/L, therefore it is considered that 20 ug/L should be taken forward as both the relevant discharge limit value and the target for CSM assessment. The JNCC target of 5 ug/l is clearly not relevant, as now accepted by NIEA. There is also the obvious risk that a feature is consistently recorded as being in unfavourable condition due to a failing on Phosphorous levels, where in fact the elevated levels are simply a facet of the baseline and no harm is evidenced. Regarding the later point, I refer back to the fact that increased levels of Phosphorous do not have a toxicity effect. Effects are secondary and linked to increased filamentous algae cover, which is positively concluded not to be an issue for the SAC Freshwater Pearl Mussel population.

1.457. Paragraph 2 of the attachment concerns Atlantic Salmon. It is stated that:

"Standards to protect Salmon apply to the lower reaches of the Curraghinalt Burn and to the Pollenroe Burn where Salmon *have been identified, habitat suited to salmonid fish has been identified and the functional links between this habitat and that within the SAC has been established."*

1.458. To be clear and with reference to the survey findings presented in this TR, there is no evidence that Atlantic Salmon use the Curraghinalt Burn (indeed there is positive evidence that they do not), and whilst juvenile Atlantic Salmon have been recorded within the Pollanroe Burn, there is no evidence that this is a spawning site. This is a matter discussed further below in relation to TSS.

1.459. Table 2a sets out the water quality standards relevant to the protection of Atlantic Salmon as presented within the JNCC guidance for freshwater fauna (Favourable condition Table 5 at page 51 of that guidance). Table 2b relates to the JNCC CSM guidance for rivers (2016) and it is stated that the information presented in the table incorporates (relevant) information taken from a number of tables throughout the Water Quality section pages 11-15. The table is reproduced below:

Attribute	*Target*
Mean BOD	1.5 mg/l
90%tile total ammonia (NH3-mg/l)	0.25
Soluble reactive phosphorous (ug/L)	* 15 ug/l (rivers) and 7 ug/l (headwaters)
Acidification: Mean ANC pH (Humic waters, with DOC>10 mg/l	 >80 >5.1

* high alkalinity and high altitude values for Rivers (apply to Owenreagh and Owenkillew) and headwaters (apply to Curraghinalt Burn and Pollanroe Burn)

1.460. Specifically regarding Phosphorus, two points arise. First, it is made plain within the CSM guidance that these are 'generic targets'. Second, with reference to the footnote to the table, NIEA have seemingly, incorrectly considered the rivers to represent high alkalinity (and high altitude rivers). From available evidence (e.g. see Tables 6-7 regarding water chemistry in the 2017 Surface Water Baseline report), the rivers are classified as low alkalinity. For Phosphorus, therefore, as discussed above, it is determined with reference to JNCC CSM Guidance for

Freshwater Fauna, and background water quality data, that 20 ug / l would be the appropriate target.

1.461. Again with reference to the table reproduced above, the footnote states that for the purpose of setting the limit values, the Curraghinalt Burn and Pollanroe Burn are classed as 'headwaters'. It is notable that previously Natural Environment Division of NIEA has confirmed that it does not consider the Pollanroe Burn to meet the criteria applicable to headwaters. It stated in correspondence regarding the Addendum to the ES that:

> *"NED are satisfied that the Pollanroe Burn does not meet the criteria of a headwater and due its highly modified current state and are content that to the extent possible the watercourses will be naturalised after the operational phase in accordance with the conceptual Closure Plan Appendix B5 and the Landscape Restoration Plan."*

1.462. Paragraph 3 concerns EQS values. It is stated:

> *"Environmental Quality Standards to protect water quality in respect of certain priority substances are published in the 2015 WFD regs (Water Framework Directive (Classification, priority substances and Shellfish waters Regulations (Northern Ireland) 2015). Standards outlined in table 47 (of the 2015 regs) (priority substances) are applicable in the small burns, the remaining values are applicable at water body scale."*

1.463. Table 3 then sets out the EQS standards which NIEA considered are applicable to the proposed application. I simply highlight here that there would appear to be errors within this table, for example 95%ile is not applicable to mercury and this should also be referred to as a bioavailable concentration. For zinc, this should be "bioavailable plus ambient background".

1.464. Paragraph 4 concerns NIEA's proposed approach to regulating parameters where there are no relevant published standards. The approach being "no deterioration" in the existing baseline water quality. Table 4 then sets out, with reference to data presented by the Applicant in the ES, upstream water quality data relevant to the Curraghinalt and Pollanroe burns. Paragraph 4 states:

"Where there are no relevant published standards, maintenance of the existing water quality i.e. no deterioration, is the relevant standard."

1.465. This approach is not logical and cannot be taken forward in a practical manner. In real terms it would deliver higher protection for parameters not listed as priority substances (i.e. they are low toxicity) under the WFD. As an example, SEPA guidance (2020)[33] gives a non-statutory (not taken forward into the legislation) annual mean EQS for sulphate at 400 mg/L as being protective of the freshwater environment. In contrast, the test proposed by NIEA is 'no deterioration' on upstream water quality. With reference to Table 4 of the NIEA document that would mean a discharge of <2.5 mg/L. That is substantially below groundwater quality, which already discharges naturally into the rivers as baseflow.

1.466. NIEA go on to state that based on the principles discussed, the RQP tool (Monte Carlo) model will be used in order to calculate the discharge limits, to be measured for compliance purposes at end of pipe. It is stated:

"Based on these principles and applying the RQP tool (Monte Carlo) model, discharge limts will be calculated, which would form conditions of the Consent. These would be measured for compliance purposes at 'end of pipe".

1.467. This approach is misguided and cannot practically be implemented. Mixing modelling cannot be applicable to the burns and EA guidance[34] is very clear on this point. Section 5.2 states:

"In some situations, an effluent will be discharged to a small receiving water, tributary or dry ditch where dilution is very limited. In this situation, modelling is likely to show that some or all of the substances in an effluent will require a numeric emission limit"

1.468. Following this the guidance states that Best Available Technology (BAT) treatment technology should apply and it refers to the 'main river' being the focus in terms of not being adversely impacted. Specifically regarding this point, the Applicant has

[33] Supporting Guidance (WAT-SG-53) Environmental Quality Standards and Standards for Discharges to Surface Waters (2020)
[34] LIT 10419 Modelling: surface water pollution risk assessment risk assessment (2014), Environment Agency.

of course followed the BAT approach in proposing the RO plant, by way of an example.

1.469. Monte Carlo modelling is used to determine criteria which will not increase the background or baseline concentration by 10% of the environmental quality standard. Importantly, where there is little or no dilution (such as in the burns) this means that the discharge criteria will end up at about 10% of the environmental quality standard. This creates the perverse situation where the burns would be determined to have far more restrictive discharge criteria than would be applicable if the discharge was direct to the SAC.

1.470. To illustrate the absurdity of this situation, it is highly likely that discharge of water taken from the Owenreagh River directly into the Pollanroe Burn would not comply with criteria derived in this manner and it is certain that the discharge of groundwater would not comply. There is no logical rational to apply Monte Carlo modelling in the manner seemingly proposed by NIEA.

1.471. Table 5 of the NIEA document presents the “in river” standards which NIEA consider to be applicable to discharges to the Curraghinalt and Pollanroe Burns. Subject to review “to ensure there is no significant change in water quality since this time” the stated values are those which are proposed to be used in setting the consent limits. It is also confirmed, ahead of presenting the proposed ‘in river’ limit values, that NIEA has taken direction from Loughs Agency regarding TSS, with the advice being that NIEA should adhere to JNCC CSM Freshwater Fauna parameters *“to ensure continuity in mitigating negative environmental impacts on salmonids in the Foyle and Carlingford Catchments”*.

1.472. Several points arise in relation to the values presented and these are discussed below.

1.473. Regarding TSS, a value of 10 ug / l is given for the Curraghinalt Burn and 25 ug / l for the Pollanroe Burn. 10 ug / l cannot be substantiated in this instance. The only guidance which the Applicant is aware of which references such a value is that from 2003 titled “Siltation in Rivers. 3: Integrated Assessment Procedure[35]”. However, this concentration is linked to spawning Atlantic salmon only. As

[35] Smith B, Naden P & Cooper D (2003). Siltation in Rivers. 3: Integrated Assessment Procedure. Conserving Natura 2000 Rivers Conservation Techniques Series. English Nature, Peterborough

previously discussed, there is no evidence that either Curraghinalt Burn or Pollanroe Burn are, or have been, used by Salmon to spawn and Atlantic Salmon have never been recorded in the Curraghinalt Burn.

1.474. In relation to TSS, it is also important to keep in mind that TSS impacts are focussed on the construction stage, with impacts being temporary and reversible, and no worse than 'natural' background levels during flood events. Once the Mine is operational, the water treatment process (which includes the RO plant) will screen out almost all TSS.

1.475. Regarding Nitrate, NIEA have adopted the JNCC target value as relevant to FWPMs (0.125). Both Pollanroe and Curraghinalt Burns are unsuitable habitat for FWPMs and there is no evidence of their presence. Further, with reference to NIEAs table 4, baseline concentrations are already at / exceeding this value. The corollary of this is plainly that, not only will the Applicant need to deal with its own discharges, but it will be expected to clean the existing baseline water quality.

1.476. With reference to Chloride, NIEA state that the limit value will be based upon a no deterioration criteria, with a value of 8.28/9.6 given. With reference to SEPA guidance (2020), by way of example, a non-statutory Annual mean EQS is given as 250 mg/L. Discharges of chloride of a significant order of magnitude higher than NIEA's proposed 8.28/9.6 limit, would have no adverse effect on the aquatic environment. To put this in context, NIEA's approach would have serious repercussions for the winter salting of roads if this no deterioration criteria were wider reaching. If increases above baseline are a real, rather than fanciful issue for water courses, it is hard to see how the application of road salt could ever be sanctioned. However, the salting of roads can of course continue, because it does not give rise to the effects which NIEA appear to be attempting to mitigate, in the absence of any supporting evidence.

1.477. Matters concerning Phosphorus have already been discussed above. Limit values of 15 and 17 are proposed by NIEA in respect of the Curraghinalt and Pollanroe burns. This does not take proper account of the JNCC guidance which NIEA place so much weight upon and nor does it account properly for the existing baseline position. As discussed elsewhere within this SoC, the Mine proposals will effectively re-circulate existing baseline water and through the proposed water

treatment process add nothing discernible in relation to Phosphorus. As previously explained the Applicant will be expected to clean the existing baseline water quality.

Summary conclusions in relation to water quality matters

1.478. As I have already explained, the discharge limit values should be viewed as Enforcement values, where breaches / exceedances will trigger actions which could well include prosecution. As such, the Applicant would be treating to well below the thresholds set through any consent to avoid a breach. In short, with the maximum allowable discharge value for relevant parameters set at the baseline level, the actual discharge value will be below this.

1.479. In real terms, this represents a betterment over the current situation and delivery of a shift towards favourable condition (in water quality terms). The effect is that the Mine project will not only be fully mitigating its own effects, but it will be 'cleaning' baseline water in the catchment.

1.480. This cleaning of baseline water quality is particularly apparent in considering phosphorus. As I have explained, phosphorous is cited as a key parameter in relation to FWPM and currently the baseline values in the catchment exceed monitoring targets set through the JNCC guidance in relation to FWPM. The Mine will use this baseline water and effectively re-circulate it, adding nothing by way of a discernible value as a result of the project. The discharge of any phosphorus would result from that present in the baseline water used. Thus, the removal of phosphorous through the water treatment processes associated with the mine, is purely and simply a benefit for the catchment.

1.481. The Applicant has proposed a series of limit (enforcement) values which are fully protective of the aquatic environment, including Freshwater Pearl Mussel and Atlantic Salmon. The approach has regard to JNCC guidance and EQS, but crucially it recognises the reality of the existing baseline position in terms of water quality and qualifying species populations, with due regard had to that evidence. Conversely, NIEA's position has little grounding in evidence, is ill-conceived and unworkable.

Matters concerning the hydrological regime

1.482. Insofar as matters concern the hydrological regime, changes relating to flows, specifically concerning the Owenkillew River (SAC) have been assessed. A summary of the conclusions is presented at Section 10.2.3 of the Surface Water Impact Assessment (2020). For all phases of the project, impacts are assessed as negligible.

1.483. There would be no significant deviation from existing baseline flows and specific mitigation is included in order to reduce high flow and low flow effects within the Pollanroe Burn, through active flow control. In this context it is considered that there would be no potential for adverse effects to arise in relation to any qualifying interest features of the Owenkillew River SAC, or qualifying interest features of other downstream European / Ramsar designated sites.

1.484. No adverse effect on the integrity of the Owenkillew River SAC or any other designated site, would arise in relation to effects from changes to the hydrogeological and hydrological regime.

14. CONSIDERATION OF ISSUES RAISED BY OBJECTORS

1.485. I have reviewed the objections raised by third party objectors. Broadly the key concerns which arise relate to the follow insofar as ecology and nature conservation is concerned are:

1. Water quality implications for relevant designated sites and supported species;
2. The sHRA does not consider in-combination matters; and
3. Implications for the Black Bog Ramsar site, notably in respect of air quality (dust) issues.

1.486. The concerns raised by third party objectors do not give rise to any significant issues beyond those raised by Statutory Consultees. I have addressed matters in relation to water quality at length within this TR and refer the reader to that information and also the information contained within the Water Discharge Statement of Case.

1.487. Regarding in-combination effects associated with the HRA process. I confirm that the only relevant project identified for in-combination assessment is the Power Line project, which is itself integral to the Mine project proposal. This is discussed in detail at the end of Section 5 of the Update sHRA (2020), as relevant to the planning application submitted pursuant to that proposed route. It is concluded that subject to the adoption of appropriate mitigation measures, no adverse effects on the integrity of the relevant designated sites would occur when that project is considered alone, or in-combination with the Mine proposals.

1.488. In relation to concerns regarding implications for the Black Bog Ramsar site, I comment as follows.

1.489. I am aware of correspondence, dated May 2024, sent to the Ramsar Organisation, along with officers from the Department of Environment, Food and Rural Affairs (DEFRA), the JNCC and the Wildfowl and Wetlands Trust (WWT). It was copied to the PAC.

1.490. The email refers to a report prepared by a Dr Emerman, and goes on to highlight two key concerns relating to the Mine proposals, the first being the potential for a cone of depression to form over time, and the second being air quality / dust impacts on the Ramsar site, arising from wind-blown Mine waste. On my reading, the purpose of the email is to raise awareness of the project among the recipients and invite additional comments / objections.

1.491. Before I briefly address the matters raised, I should state that I am not aware of any correspondence from the recipients of the email which indicates a shared concern.

1.492. Regarding the matter of a cone of depression forming over time and adversely impacting the Ramsar Site, this is not an issue which has been identified through the detailed and extensive studies undertaken as part of the EIA process, nor is it a matter raised by the relevant statutory authorities. The most relevant associated pathways for significant effects to arise, would be through changes to the hydrological regime, an issue addressed within the Statements of Case submitted by the Applicant in relation to Abstraction and Water Discharge applications. Consideration of the ‘cone of depression’ point, raises no new issue/s.

1.493. Specifically regarding the issue of dust impacts, in qualifying his concerns, reference is made to Sahara dust being transported over large distances and deposited over the UK.

1.494. I make the following points in response.

1.495. The assertion is that because dust can travel to the UK from the Sahara, it follows directly that the Ramsar site will be affected by the Mine proposals. As explained below, it is not appropriate to use the Sahara dust phenomenon as a proxy to describe how dust arising from the Mine proposals will affect the Black Bog Ramsar site.

1.496. The deposition of Sahara dust over the UK is a well known phenomenon, which, whilst considered relatively common, occurs as a result of a specific set of circumstances.

1.497. In simple terms, my understanding is that when strong winds blow over the desert, dust and sand can be lifted high into the sky and where these clouds of dust reach very high altitudes, they can be carried over significant distances. If the winds in the upper part of the atmosphere are blowing in a northerly direction, the dust can be carried to the UK. If it then rains, the dust particles are transported from the atmosphere to ground and as the rainwater evaporates, a layer of dust is left behind.

1.498. For context it is important to keep in mind that the Sahara covers a vast area of north Africa, reportedly some 9.2 million square kilometres. There is therefore a huge resource, of dust and sand, which strong winds impact upon to form these high altitude 'dust clouds'. Such a resource is in no way comparable to the area of exposed substrate which will arise at any point during the construction or operation of the proposed Mine.

1.499. The Sahara is the world's largest hot desert and it is one of the driest places on earth, receiving little or no precipitation on an annual basis. It is widely reported that the region receives between 0 and 3 inches (0mm to circa 76mm) of rain annually. Rainfall is scarce in the northern and southern fringes of the desert, and almost zero elsewhere, with some locations devoid of any rainfall for periods lasting several years. It is the arid nature of the Saharan region which gives rise to the volume of dust available to be transported (by wind).

1.500. The climatic conditions associated with the Application Site contrast starkly with those associated with the Sahara. Information available from the Met Office website[36] confirms that the Application Site is located in one of the 'wettest' parts of Northern Ireland, which itself is well known to have a generally cooler and wetter climate than many parts of the UK. The Atlantic weather systems result in higher average rainfall in the western counties of Fermanagh, Londonderry and Tyrone, with the Sperrin Mountains specifically cited as being one of the wettest areas, with higher ground receiving average annual total rainfall of around 1600 mm.

1.501. Met Office data also shows that for the higher ground (relevant to the Application Site), it is normal in winter (December to February) for the number of days with a

[36] https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/weather/regional-climates/northern-ireland_-climate-met-office.pdf

rainfall total of 1mm or more ("wet days") to be in excess of 55 days, with in excess of 45 wet days in summer (June to August)[37].

1.502. From detailed assessment work undertaken on behalf of the Applicant it has been concluded that no impacts on any sensitive receptors, including designated sites will arise as a result of dust emissions. I draw the reader's attention to paragraphs 5.31 to 5.42 of the Update sHRA (2020) and to the updated Air Quality Impact Assessment (October 2020) submitted as part of FEI2.

1.503. Dust emissions will be 'naturally' mitigated to a large extent by the prevailing weather conditions and in any event, where necessary, 'damping down' techniques could be employed in order to mitigate dust emissions from the Application Site, a measure which can be secured through the CEMP. Such measures are considered as standard within the construction industry and are widely employed.

1.504. By way of summary conclusion, the issues raised are unfounded and simply addressed.

[37] Note that comparisons are made between winter and summer, but no data is given for spring and autumn

15. SUMMARY AND CONCLUSIONS

1.505. In this TR I have described the significant amount of survey and assessment work which supports the planning and water discharge applications. That body of work spans a significant number of years and where necessary update surveys have been undertaken to support the applications, ensuring that the baseline is current for assessment purposes.

1.506. I have described the baseline in relation to habitats, species and designated sites and I have summarised the impacts on ecological features which are considered to arise. In addition, I have explained the proposed approach to mitigation for the various phases associated with the Mine proposals.

1.507. In relation to the position of consultees, it is evident that the only substantive concerns relate to Water Discharge matters, with NIEA maintaining concerns regarding implications for the Owenkillew River SAC (and the populations of Atlantic Salmon and Freshwater Pearl Mussel) and Loughs Agency maintaining a concern regarding impacts on Atlantic Salmon. Taking advice from Loughs Agency in relation to the standards / limits to be applied in relation to Atlantic Salmon, NIEA has described its position in relation to the approach to be adopted in setting the limit values. The approach, as described in detail within a letter of 5th September 2024 is considered to be fundamentally flawed and out of step with the requirements of the Habitats Regulations.

1.508. I have explained, with reference to survey data that concerns regarding Atlantic Salmon are unfounded. Both burns into which discharges will occur have been classified as failing (sub-optimal) in relation to spawning habitat.

1.509. The Curraghinalt Burn is particularly unsuitable for salmonid presence, with poor habitat scores throughout and a significant barrier to fish passage near its confluence with the Owenkillew River which renders it impassable (to fish) outside of very high water levels. No Atlantic Salmon have been recorded in this burn during any survey. Only very low numbers of Brown Trout have been recorded and it is considered that these individuals have entered the burn during a flood event and remained trapped as levels drop, a scenario which may happen from time to time.

1.510. Regarding the Pollanroe burn, a low number of Atlantic Salmon parr and Brown Trout have been recorded as present within the lower reach of the burn, close to the confluence with the Owenreagh River. However, there is no evidence that this burn is of conservation significance to salmonid species. Even in an extreme scenario where the burn is lost to the fish, such an effect would not be deleterious to the population because of the huge resource in terms of habitat available elsewhere in the catchment.

1.511. Regarding Freshwater Pearl Mussel, this species is not present within the burns or the relevant downstream section of the Owenreagh. However, the data shows mussels being recorded at various locations along the Owenkillew River, with the more significant numbers occurring well upstream of the Curraghinalt Burn discharge point and the Owenreagh's confluence with the Owenkillew. Some records do exist for the downstream section of the Owenkillew, where discharges could impact upon concentrations of several parameters. In many instances, very low numbers of mussels were recorded (e.g. those downstream of the discharge points) and this is indicative of mussels being washed down the river channel after being dislodged from the main mussel beds upstream.

1.512. Recognising the sensitivity of Freshwater Pearl Mussel in particular and in view of the position being adopted by NIEA, the Applicant has proposed revised discharge consent limits. These limits are fully protective of the aquatic environment. The approach has regard to JNCC guidance and EQS, but crucially it recognises the reality of the existing baseline position in terms of water quality and qualifying species populations, with due regard had to that evidence. Given the proposed water treatment process, which will deliver discharges below the proposed limits (to avoid enforcement), 'better than baseline' for key parameters will be achieved. In this light the approach would directly assist in delivering a movement towards favourable condition insofar as water quality in the SAC is concerned.

1.513. Conversely, as I have explained NIEA's position has little grounding in evidence, is ill-conceived and unworkable.

1.514. Insofar as matters concern the Applicant's revised proposed discharge limit values, it can be safely concluded that the proposals will not undermine the

relevant Conservation Objectives and that no adverse effect on the Integrity of the SAC arises should these limit values be adopted.

1.515. Notwithstanding that the proposed discharge limit values are fully protective of the aquatic environment and that through the proposals a movement towards favourable condition will be achieved at the SAC, further betterment is also proposed. A package of measures are proposed which will deliver improvements in water and habitat quality in the catchment, with a focus on land under the direct control of the Applicant. Key to this, is the removal of livestock farming across the Applicants lands, with the direct result that nitrate inputs into the catchment will be removed. It has been calculated that this action alone would off-set the nitrate generated by the Mine proposals, but is proposed as an additional benefit.

1.516. In addition to giving detailed consideration to the position of statutory consultees, I have also had due regard to the position of third parties. Whilst, no additional matters of significance arise, I have addressed specific points where I felt it appropriate to do so. None of those matters alter my conclusions in relation to the acceptability of the proposals from an ecology and nature conservation perspective.