Inspector's Report - Appendices

ABP-317292-23

Development	Proposed development of an extension to the existing Drehid Waste Management Facility to provide for acceptance of up to 440,00 TPA of non-hazardous waste material
Location	In the townlands of Timahoe West, Coolcarrigan, Killinagh Upper, Killinagh Lower, Drummond, Drehid, Kilkeaskin, Loughnacush, and Parsonstown, County Kildare.
Planning Authority	Kildare County Council
Applicant(s)	Bord na Mona Plc.
Type of Application	S37E – Strategic Infrastructure.
Observer(s)	Lorraine Quinn Sheila O'Brien Cllr. Brendan Wyse Cllr. Padraig McEvoy.
Date of Site Inspection	20/12/2023.
Inspector	Auriol Considine

1.0 **Appendix 1 - EIA Pre-Screening**

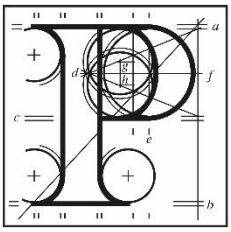
An Bord Pleanála Case Reference	ABP – 317292-23			
Proposed Development Summary	Proposed development of an extension to the existing Drehid Waste Management Facility to provide for acceptance of up to 440,00 TPA of non-hazardous waste material			
Development Address	In the townlands of Timahoe West, Coolcarrigan, Killinagh Upper, Killinagh Lower, Drummond, Drehid, Kilkeaskin, Loughnacush, and Parsonstown, County Kildare.			
1. Does the proposed development come within the definition of a 'project' for the purposes of EIA? (that is involving construction works, demolition, or interventions in the natural surroundings)			**Yes**	**√**
			No	No further action required
2. Is the proposed development of a class specified in Part 1 or Part 2, Schedule 5, Planning and Development Regulations 2001 (as amended) and does it equal or exceed any relevant quantity, area or limit where specified for that class?				
Yes	**√**	Class 11 of Part 2 of the Fifth Schedule: *'Other projects'* *(b) Installations for the disposal of waste with an annual intake of greater than 25,000 tonnes not included in Part 1 of this Schedule.*	EIA Mandatory EIAR required **√**	
No			Proceed to Q.3	
3. Is the proposed development of a class specified in Part 2, Schedule 5, Planning and Development Regulations 2001 (as amended) but does not equal or exceed a relevant quantity, area or other limit specified [sub-threshold development]?				
		Threshold	**Comment (if relevant)**	**Conclusion**
No		N/A		No EIAR or Preliminary Examination required
Yes	**√**	"An installation for the disposal, treatment or recovery of waste with a		Proceed to Q.4

		capacity for an annual intake greater than 100,000 tonnes".		

4. Has Schedule 7A information been submitted?		
No		**Preliminary Examination required**
Yes	**√**	**Screening Determination required**

Inspector: _____ **Date:** _____

2.0 **Appendix 2 – Ecologist Report**



An Bord Pleanála

Report to Inspector
ABP-317292-23

To:	Auriol Considine
From:	Dr Maeve Flynn, Inspectorate Ecologist
Re:	Consideration of previous reasons for refusal- related to Natura Impact Statement and Appropriate Assessment
Date:	20/03/2024

1.0 Background

ABP 317292-23 refers to the development of an extension to the existing Drehid Waste Management Facility in County Kildare to provide for acceptance of up to 440,00 tons per annum (TPA) of non-hazardous waste material. An Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) was submitted with the application.

A previous planning application at the same site (ABP-300506-17) was refused by the Board in 2020. Reasons for refusal included concerns regarding adverse impacts on the River Barrow and River Nore Special Area of Conservation.

From Board Order November 2020:

> (1) On the basis of the information provided with the application documentation and the further information submitted, including the Natura Impact Statement, and in the light of the potential for the proposed development, in combination with other developments in the area, to continue the ongoing degradation of remaining peat within Timahoe Bog resulting in an excess of ammonia and suspended solids in the Cushaling and Figile Rivers, with a consequent impact in preventing these rivers, part of the Barrow Nore catchment, to develop into suitable habitat for salmonid species, the Board is not satisfied that the proposed development individually, or in combination with other plans or projects would not adversely affect the integrity of the

River Barrow and River Nore Special Area of Conservation (Site Code: 002162), in view of the site's Conservation Objectives. In such circumstances, the Board is precluded from granting permission.

(2) Having regard to the complex hydrological and hydrogeological conditions obtaining onsite, to the limited investigation carried out of those conditions and hence to the potentially inadequate mitigation measures associated with the proposed development, it is considered that on the basis of the information submitted with the application documentation and the further information submitted, the development site is unsuitable for a development of the nature and scale proposed, having regard to ongoing excess ammonia concentrations in groundwater and in local watercourses, which include watercourses with potential for salmonid habitat which flow into the River Barrow and River Nore Special Area of Conservation (Site Code: 002162). The proposed development would, therefore, have a significant adverse effect on the conservation and protection of the River Barrow and River Nore Special Area of Conservation (Site Code: 002162), and would therefore be contrary to the proper planning and sustainable development of the area.

2.0 Scope of this report

This report has been prepared in response to a request from the Planning Inspector and provides a professional opinion as to how the pervious matters for refusal have been addressed in the EIAR and NIS for the current application. The report examines the adequateness of the scientific information presented in the NIS in view of the requirements for reaching complete, precise and definitive conclusions with regard to these matters in the Appropriate Assessment.

This examination is focused on the implications of the proposed development in relation to the integrity of the River Barrow and River Nore SAC with particular reference to the previous reasons for refusal. I note that other European Sites are considered in the NIS and while I refer to these sites briefly, they are not the focus of this report. The main points of consideration include the following:

- Interactions between the proposed development and peatland management at Timahoe Bog with regard to contributing to excess of ammonia and suspended solids in the Cushaling and Figile Rivers
- Ecological status of the Cushaling river as the main water receptor and ecological connections to the River Barrow and River Nore SAC downstream-particular reference to salmonids
- Adequacy of impact assessment and mitigation measures included in the Natura Impact Statement (NIS)
- Implications of the proposed development in relation to the integrity of the River Barrow and River Nore SAC

I have examined the following documents prepared by Tobin Consulting Engineers as part of my assessment:

- Natura Impact Statement (May 2023)
- Environmental Impact Assessment Report (May 2023) including Chapters 6 Biodiversity, 7 Soils, Geology and Hydrogeology, 8 Water
- Associated appendices including Drawings, Planning Report (June 2023), Timahoe South Rehabilitation plan, Habitat management and enhancement plan, Construction and Environmental Management Plan -CEMP

In addition, I have had regard to the following:

- Conservation Objectives: River Barrow and River Nore SAC002162 (NPWS 2011, Version 1.0)[1]
- Conservation Objectives: River Boyne and River Blackwater SAC 002299 (NPWS, 2021, Version 1)[2]
- Conservation Objectives: River Boyne and River Blackwater SPA 004232 (NPWS 2022, Version 1)[3]
- The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments[4]
- EPA Maps (https://gis.epa.ie/EPAMaps/ accessed 01/03/2024)

3.0 Key issues

Reasons for refusal related to AA – previous application.

3.1 Interactions between the proposed development and peatland management at Timahoe Bog with regard to contributing to excess of ammonia and suspended solids in the Cushaling and Figile Rivers.

As part of Bord na Móna obligations linked to the IPC license for Timahoe South cutaway Bog (TSB), a *Decommissioning and Rehabilitation Plan* (2022) has been developed as a separate project and details are included in the documentation accompanying the planning application. The plan addresses peatland rehabilitation and environmental stabilisation of the cutaway bog outside of boundary of the proposed development. Key components of the plan include:

- Rewetting areas of industrial peat and reducing areas of bare peat

[1] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002162.pdf

[2] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002299.pdf

[3] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004232.pdf

[4] https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol3_Species_Article17.pdf

- Reduction and stabilisation of key water quality parameters including ammonia, phosphorous, suspended solids, pH and conductivity
- Reducing pressure from peat projection on the local water body catchment
- Optimising hydrological conditions
- Reduction in carbon emissions
- Establishment of mosaic of habitat types and improving biodiversity and ecosystem services.

The TSB decommissioning and rehabilitation plan has clear targets for measuring success of factions, a detailed monitoring scheme and timeframe for delivery. The measures proposed are based on proven and effective actions utilised by Bord na Móna at other sites.

The TSB decommissioning and rehabilitation plan has been considered in relevant EIAR chapters, including Chapter 6 Biodiversity and with particular focus in Chapter 8 Water. The TSB decommissioning and rehabilitation plan is also considered in in the NIS.

Overall, the TSB plan which deals with the cutover peat area outside of the proposed development site combined with the site-specific mitigation measures designed to prevent and reduce impacts of the proposed development including ingress of peat fines and suspended solids into receiving watercourses are the key mechanisms that address the management and reduction in ammonia and suspended solids in Cushaling and Figile Rivers.

I consider that the applicant has comprehensively addressed the interactions between the proposed development and peatland management at Timahoe Bog South throughout the application documentation. One of the main expected environmental effects of the TSB Plan is reduced ammonia and sediment loading to receiving water courses over time as exposed peat is stabilised. Mitigation measures proposed as part of the Drehid landfill project would not therefore be compromised or suffer reduced efficacy as any further degradation of peatland will be halted and rehabilitated.

3.2 Ecological status of the Cushaling river as the main water receptor and ecological connections to the River Barrow and River Nore SAC downstream- particular reference to salmonids.

The majority of the Timahoe South Bog and the entirety of the proposed (landfill) development site is within the River Barrow Catchment with the Cushaling River the primary receiving watercourse. Part of the northern section of the Timahoe South Bog is within the wider Boyne Catchment- via the Mulgeeth stream.

The Cushaling river is not a designated Salmonid River, however consultations with Inland Fisheries Ireland (IFI) identified that Salmon spawning/recruitment occurs in

the Figile River a relatively short distance downstream of the proposed development site. IFI consider that the Cushaling/Figile river system has the potential to provide important spawning grounds for the population of salmon designated within the River Barrow and River Nore SAC located downstream. IFI emphasised that salmon spawning has been impacted by effects of historic commercial peat harvesting, and restoration of spawning and recruitment throughout the river system is important.

The site-specific conservation objective for River Barrow and River Nore SAC in relation to Atlantic Salmon is to *restore favourable conservation condition*. Adult spawning numbers are below the conservation limit for the River Barrow (i.e. the number of adult salmon required to maintain a healthy population). A number of attributes and targets set for this species in the SAC relate to the wider catchment where water quality and number and distribution of spawning redds available in headwaters will support the SAC population. These are identified in the NIS (see table 6.1).

The Cushaling river is currently at poor ecological status as defined by Water Framework Directive criteria with a low numbers and diversity of macroinvertebrates, modifications to the river channel, culverts and presence of in-line silt ponds (EIAR Chapter 8). Aquatic ecology is described in Chapter 6 Biodiversity and in the NIS (4.2.3) based on results of 4 sampling sites. There was no visual evidence of fish species or lamprey species and no suitable spawning or nursery habitats were observed for salmonids, crayfish or lamprey species. Similarly, the Mulgeeth Stream, part of the Blackwater (Longwood river) and a headwater of the Boyne WFD Catchment is also at poor ecological status.

Chapter 8 Water details ongoing monitoring undertaken by Bord na Móna and 8.4.18 presents a summary of key surface water observations providing a comprehensive baseline for ongoing and future monitoring. The TSB decommissioning and rehabilitation plan is the key mechanism that addresses improvements the management and reduction in ammonia and suspended solids in Cushaling and Figile Rivers.

I consider that the applicant has adequately considered the ecological significance of the Cushaling river, its current ecological status and relevance to the wider River Barrow Catchment in terms of supporting Salmon populations and other freshwater species listed as qualifying interest features for the River Barrow and River Nore SAC. The mitigation measures proposed combined with the overall plan for TSB demonstrate that there will be a reduction in relevant pollutants and that the proposed development will not impede the achievement of conservation objectives.

4.0 Adequacy of the Natura Impact Statement:

4.1 Summary of the NIS

The NIS has been prepared by qualified and experienced Ecologists from TOBIN Consulting Engineers to inform Appropriate Assessment in line with standard guidance. The NIS contains a detailed description of the proposed development including phasing and timing of construction and operational aspects, peat stripping and drain blocking, site drainage and surface water management. The preceding screening stage of the AA process determined that the likelihood for significant effects could not be ruled out for the River Barrow and River Nore SAC (0002162), the River Boyne and Blackwater SAC (00229), and the River Boyne and River Blackwater SPA (004232), in view of the sites conservation objectives and that AA was required.

Potentially significant Impact mechanisms identified in screening stage include:

- Release of sediments, organic matter, ammonia and construction related pollutants into surface waters from groundworks including site clearance, machinery movements and construction works.
- Accidental spills and leaks of chemical, hydrocarbons and concrete on site and risk of entry to surface water
- Introduction of invasive species

The possibility of significant effects on European Sites from the following impact mechanisms were excluded:

- Habitat degradation due to modification of the drainage network
- Habitat degradation due to air quality impacts
- Impacts to groundwater
- Noise disturbance (to protected species)
- Leachate and Foul water
- Accidental mortality of wildlife from construction machinery

The site-specific conservation objectives of are detailed for each European Site with potential for adverse effects identified (see Table 6.1-6.3 of NIS). The potential for adverse effects (in the absence of any mitigation) on QI features is primarily related to adverse effects on in-stream riparian habitat via uncontrolled ingress of silt laden surface water and construction related pollution. Potential for adverse effects is confined to the following freshwater habitats and species that are within a likely zone of influence of the proposed development or which have a distribution outside of the European site:

River Barrow and River Nore SAC

- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) - restore favourable conservation condition.

- Watercourses of plain to montane levels with the *Ranuncullion fluitantis* and *Callitricho Batrachion* vegetation- restore favourable conservation condition.
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels - maintain favourable conservation condition.
- White-clawed Crayfish (*Austropotamobius pallipes)*- maintain favourable conservation condition.
- Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*Lampetra fluviatilis*)- restore favourable conservation condition.
- Atlantic Salmon (*Salmo salar*) - restore favourable conservation condition.
- Otter (*Lutra lutra*)- restore favourable conservation condition.

The River Boyne and Blackwater SAC and SPA sites were included in the NIS for detailed assessment as the integration of the TBS plan and the proposed development involves modification of the existing drainage network and a larger catchment area draining towards the Mulgeeth Stream a headwater of the Boyne catchment and the applicant considered that the risk of suspended solids and ammonia being carried downstream, in the absence of mitigation, cannot be ruled out.

River Boyne and River Blackwater SAC:

- River Lamprey (*Lampetra fluviatilis*)- restore favourable conservation condition.
- Atlantic Salmon (*Salmo salar*) - restore favourable conservation condition.
- Otter (*Lutra lutra*)- maintain favourable conservation condition.

River Boyne and Blackwater SPA:

- Kingfisher (*Alcedo atthis*)- maintain or restore favourable conservation condition

The focus of mitigation measures proposed are at preventing ingress of pollutants and silt into surface water and receiving watercourses at all stages of the proposed development. This is to be achieved via design measures (avoidance), supervision by an Ecological Clerk of works, application of specific mitigation measures and monitoring effectiveness of measures. Detail is provided on sediment control, concrete and hydrocarbon control, an emergency response plan and general biosecurity measures. NIS Table 7.1 provides a summary of the mitigation measures and measure of confidence in effectiveness.

In combination effects with other projects and plans in the area are considered and adverse effects excluded.

The applicant concludes that:

> ‘Following the application of the detailed mitigation measures, potential significant adverse effects will be avoided or reduced. Consequently, it is determined that there will be no risk of significant adverse effects on qualifying interest habitats and species, or on the overall site integrity, nor in the attainment of their specific conservation objectives for the River Barrow and River Nore SAC, the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA’.

The Board will note that the test for Appropriate Assessment is *exclusion* of adverse effects on the integrity of the European site. That is the case where there is no reasonable scientific doubt remaining as to the absence of such effects.

The applicants’ statement that potential significant adverse effects will *be avoided or reduced* is not the test and the Board should ensure that they are satisfied that this means that any effects are reduced to a non-significant level.

4.2 Consideration of adequacy of the NIS

Overall, I consider that the NIS is adequate, prepared in line with standard practice and the assessment is proportionate to the development type and likely impact mechanisms that could be generated. The NIS addresses issues of key concern from the previous refusal and together with detail from Chapter 8 Water the Planning Inspector and the Board can rely on the information conforming to the requirements of best available scientific knowledge in undertaking the AA.

All potential impacts are indirect and at some distance from the proposed waste facility. Preventative measures which are aimed at interrupting the source-pathway-receptor are targeted at the key pressures within the receiving watercourses including the Cusahling/Frigile system and by arresting these pathways or reducing possible effects to a non-significant level, adverse effects can be prevented. Detailed water quality monitoring will ensure that measures are effective in their aims and it is likely that the water quality of the receiving watercourses will improve over time through the separate but related TSB decommissioning and rehabilitation plan.

4.3 Implications of the proposed development in relation to the integrity of the River Barrow and River Nore SAC

In order to avoid an adverse effect on site integrity, the conservation status of a habitat or species if favorable must be preserved, and if unfavorable, must not be further harmed or made more difficult to restore to the original condition. The Inspector and the Board should be satisfied that with the application of mitigation measures and the monitoring program that this can be achieved.

I consider that the overall project design, pollution control, mitigation and monitoring with ecological supervision of the construction phase in particular, will effectively prevent the risk of any additional pollution load. The decommissioning and rehabilitation plan set for the wider area of cut over bog comprising Timahoe Bog South will improve local water quality and supports the aims of the conservation objectives for restoration of favorable conservation condition for Salmon and other qualifying interest species listed for

I consider that the applicant has demonstrated that the proposed development will not prevent or delay the achievement of conservation objectives for the River Barrow and River Nore SAC.

Similarly, the proposed development will not prevent or delay the achievement of conservation objectives for the River Boyne and River Blackwater SAC or the River Boyne and Blackwater SPA.

5.0 Conclusion

Based on the information presented on the proposed development in the EIAR and NIS, including likely impact mechanisms, assessment of impacts and mitigation and control measures proposed, I consider that the Board has adequate information to reach clear, precise and definitive conclusions with regard to the Appropriate Assessment.

I consider that the applicant has considered and addressed all previous issues that influenced a refusal of planning permission of a similar development in 2020.

Signed: _____

20th March 2024

Dr Maeve Flynn MCIEEM

Inspectorate Ecologist

3.0 Appendix 3 – Scientist Report

Memorandum

4.0 An Bord Pleanála

ABP-317292-23

To:	**Auriol Considine.**
From:	**Emmet Smyth.**
Re:	**Drehid Waste Facility.**
Date:	**28th March 2024.**

In the Environmental Impact Assessment report submitted in support of this application, and with specific reference to Chapter 7 (Soils, Geology & hydrogeology) and Chapter 8 (Water), whilst being cognisant of the reasons for refusal outlined in the Boards decision 11th November 2020 under PA09.300506, it is my opinion that the applicant has provided sufficient detail to facilitate the Board making a decision on this case in this regard my comments are as follows.

The bedrock formation underlying the subject site can be described as massive, unbedded lime-mudstone (Waulsortian Limestone) with soils and subsoils best described as cut-over raised peat. The aquifer underlying the site is classified by the Geological Survey of Ireland, as a Locally important aquifer with moderately productive bedrock only in local zones. Similarly, the groundwater vulnerability across the site, as mapped by the Geological survey of Ireland, reports low vulnerability across the site effectively meaning clay/silt subsoils depth exceeding ten metres. This changes to moderate vulnerability to the east of the proposed development. Consequently, the associated groundwater recharge coefficient is low at 4% or 18mm/year out of an

effective rainfall for the area of 443mm/year further confirming the low vulnerability of the site.

The nearest public water supplies as reported in the EIAR are the Johnstown (to the northeast) and Robertstown (to the southeast) public water schemes with distances of 4.8km and 7.1km distant from the red line boundary to the source protection zones, respectively. There are a number of private domestic sources all around the proposed development with none within less that a kilometre.

The ground water response matrix for the siting of landfills is R1 and this is based on the low vulnerability rating of the site and the locally important aquifer. This effectively means that it is acceptable subject relevant EPA guidance and waste licence conditions. However, the applicant has adopted a more conservative approach to this matrix by virtue of the presence of sand and gravel lenses in the overlying till and has assigned the $R2_1$ matrix which takes a more stringent approach regarding the protection of groundwaters. In addition to the above controls, special attention should be given to checking for the presence of high permeability zones. Where such zones are present then the landfill should only be allowed if it can be proven that the risk of leachate movement to these zones is insignificant. Special attention shall be given to existing wells down gradient of the site and to the projected future development of the aquifer.

Ground waters.

Ground water flow across the site can be inferred from topography the proposed site is relative to the surrounding land falls slightly to the west and as such the expected groundwater flow will be predominantly in the direction of the Cushaling river this has been confirmed to be the case. The applicant has established a clear groundwater surface water interaction by correlation between the groundwater levels and surface

water levels. The groundwater discharge has been calculated as contributing c.389m^3/day to the main channel and Cushaling river.

The site is situated within the Kildare groundwater body (IE_SE_G_077) which has an overall good status and not deemed to be at risk, either chemically or quantitatively. In short meeting the objectives of the water framework directive.

Peat extraction in the commercial sense, except for private supply, has been finished for some time in an around the facility with the remaining peat being significantly degraded and drained. The common issues with this business would be sedimentation and ammonium losses with ammonium being liberated by peat breakdown when the water table in the peat has been lowered for the purposes of drainage. Total Ammonium concentrations, in both groundwaters and surface waters have been shown to be elevated across the Timahoe South bog, this also includes areas of the bog that are beyond the area of the waste facility. The applicant has shown results in remote areas of the bog showing elevated levels in periods prior to the waste management facility at the site and after. In remotely located wells c.1.5km from the waste management facility have also shown elevated prior to the waste facility being operated and after. This would certainly be indicative of naturally occurring elevated ammonia leaching from the Timahoe south bog.

The applicant references the importance of pH as a baseline parameter by virtue of its exerted influence in the hydro-chemical processes that occur within groundwaters, with reference to the form of ammonia that is present. Results show that across the Timahoe South bog in the peat wells the pH ranged between 5.8 and 7.1 averaging at 6.38. pH values across the quaternary and bedrock wells averaging out at 7.25 and 7.53, respectively. This lower pH value would be expected within the peat soils.

The applicant references Chloride levels as a useful indicator given its high solubility and stability in the groundwater environment. Typically, chloride levels within

leachates are elevated with chloride levels up to 4,963mg/L demonstrated by the applicant within the leachate holding tanks from the facility. Chloride levels in the groundwaters are consistently <20mg/L across the TSB as a whole with occasional spikes above this within a number of wells. The applicant has demonstrated similar levels prior to the operation of the waste management facility. The European Union Environmental Objectives (Groundwater)(Amendment) Regulations 2016 has an overall threshold value range between 24-187.5mg/L for chloride. These threshold values were established for pollutants threatening groundwater quality. Chloride levels within groundwaters sampled are well within this overall threshold value range.

The European Union Environmental Objectives (Groundwater)(Amendment) Regulations 2016 has stipulated an overall threshold value range for Specific Electrical Conductance (SEC) between 800-1875mS/cm @25^{o}C. These threshold values were established for pollutants threatening groundwater quality. Electrical conductivity within groundwaters sampled are well within this overall threshold value range. The applicant has stated that the historical data has shown conductivity ranges between 200-1200 mS/cm. all well within the threshold value range.

Sodium levels sampled within both leachate tanks ranged from 207-3490mg/L. In the groundwater samples both historically and presently levels have been demonstrated to be relatively consistent and falling well below the parametric value as referenced in the European Union (Drinking Water) Regulations 2023 of 200mg/L. Levels have been typically consistent and falling below 20mg/L within the area around the waste management facility and across the Timahoe South Bog generally.

The following trace metals, Arsenic, Barium, Manganese and Nickel observed within the groundwaters which have been highlighted as showing exceedances in both quaternary and bedrock wells across the bog. The European Union (Drinking water) Regulations 2023 specify the following limits for the above-mentioned trace metals. Arsenic 10mg/L, Barium is referenced in the European Communities (Quality of

Waters intended for Human Consumption) Regulations 1988 and the EPA document towards setting Guideline values for the protection of groundwater in Ireland at 500 mg/L. Manganese (50 mg/L) and Nickel (20 mg/L) limits are specified in 'The European Union (Drinking water) Regulations 2023'.

Regarding arsenic historical data indicates that elevated levels have been observed primarily within the area of the Waste facility in both the quaternary and bedrock wells. But it must also be noted that these elevated levels were present in groundwaters prior to the development of the original waste facility and naturally occurring.

Regarding Barium concentration ranged from 100 to 900 mg/L in wells in proximity to the facility but also within wells located beyond the hydrogeological footprint of the waste facility.
Regarding Manganese it would appear from supporting data that these elevated levels were present in groundwaters prior to the development of the original waste facility.

In similar format to the above metals, nickel levels have exceeded the 20 mg/L parametric value in wells both in proximity to the waste facility and at remote wells both before the waste facility commenced and after.

Overall, the main points that can be taken from the data as presented in chapter 7 would be that elevated ammonia in the groundwaters is linked to leaching from the peat across the full extent of the Timahoe South Bog. In addition, trace metals and elevations of same can be attributable to their natural occurrence within the quaternary sediments and the bedrock and leaching from same. It is reasonable to reach the conclusion that in the event of groundwaters directly being impacted by leachate from the waste facility greater levels of the indicator parameters would be observed in the groundwaters and based on the data submitted this would not appear to be the case.

Further discussion is put forward regarding the impact of the existing waste management facility on groundwater quality. Regarding the under-cell drainage system, groundwater is lowered, to prevent the potential hydraulic heave, and this in effect will draw in lower pH waters from the surrounding peat soils. In addition, the attenuation ponds collect both stormwaters from the swale and captured groundwaters are discharged to the main channel south of the facility and ultimately the Figile_010 (Cushaling) and given the groundwater surface water interactions leading to changeable water quality and possible changes in hydrochemistry as observed in well GW9. This influence is graphically illustrated showing a stable trend of ammonia over the period. As referenced earlier you can see the alteration of pH by virtue of drawing in lower pH waters from the surrounding grounds. Chloride variability is attributed to the influence of stormwaters in and south of the lagoon.

The new facility will operate in a similar fashion to the existing facility. The leachate collection system is fully lined, and all collected will be removed for off-site treatment and disposal. Stormwaters collected in a perimeter swale will be discharged to the new attenuation lagoons and an ICW system, this then discharges directly to the Figile_010 (Cushaling) via the main channel. As alluded to earlier permeability of the existing and the expansion site is of low permeability, with the presence of lenses of sands and gravels, with groundwater flow in the direction of the figile_010 (Cushaling). Shallow groundwaters in the area support the bog conditions and contribute baseflow in the region of up to 20% of the average estimated flow of the Cushaling.

Surface waters

The Timahoe South Bog has been delineated into two sub catchments. One includes the existing waste facility, and the proposed development and waters drain to the Cushaling river (Figile_010), The development as proposed is located solely within this sub-catchment. The second drains the area to the North of the Waste Management Facility to the Mulgeeth stream or Blackwater (Longwood) _010. As part

of the TSB decommissioning and rehabilitation plan the development will become linked by virtue of a new planned drain. In essence, the primary waterbody at risk from the proposed development is the Cushaling (Figile_010).

Figile (Cushaling)_10.

This waterbody is of poor status (medium confidence) and deemed to be at risk of not meeting the objectives under the Water Framework directive, based on biological monitoring. The EPA has assigned further characterisation action to assess multiple sources in multiple areas for the waterbody overall.

Total Ammonia, as N levels within this waterbody are far from the threshold but trending upwards for the period 2013-2018, with a moderate indicative quality at Derrinturn, and at the bridge south of Ticknevin bridge has a moderate indicative quality with downward trending Ammonia Total as N and far from the threshold. Under the European Union Environmental objectives (Surface Waters) (Amendment) regulations 2019, whereby good status is Total Ammonia, as mg N/L mean ≤ 0.065 and 0.140 (95%ile). For the period 2016-2021 the waterbody is of poor ecological status attributable to moderate levels of nitrate and orthophosphate and high Ammonium levels which are most likely attributable for the poor invertebrate status.

The EPA catchment assessment report identifies a number of significant pressures from urban wastewater discharges, Section 4 and EPA licensed facilities, extractive industry and the channelisation and embankment works on river channels. Both Inland Fisheries Ireland and biological monitoring as part of the Industrial Emissions licence has identified significant issues regarding river works characterised by deep channel, low flow velocities, high siltation and shaded river corridors leading to conditions incompatible with favourable invertebrate habitat conditions. Historical data would also point towards pre facility issues within the waterbody.

Presently the Cushaling (Figile_010) receives surface waters from the drainage of the TSB, groundwater base flows from quaternary sediments and the bedrock and discharges (licensed) from the existing waste facility and will receive additional captured waters from the proposed development.

The remaining surface waters in and around the proposed facility can be summarised as follows.
Immediately to the east is the Blackwater (Longwood)_010, to the North of the facility is the Blackwater (Longwood)_020, to the East and to the Southeast the south the Abbeylough_010.

Blackwater (Longwood)_010.
This waterbody is of poor status (medium confidence) and deemed to be at risk based on biological monitoring.

Blackwater (Longwood)_020.
This waterbody is of poor status (medium confidence) and deemed to be at risk based on biological monitoring. Total Ammonia, as N levels within this waterbody are near to the threshold but trending downwards for the period 2013-2018, with a good indicative quality. Under the European Union Environmental objectives (Surface Waters) (Amendment) regulations 2019, good status is Total Ammonia, as mg N/l mean ≤ 0.065 and 0.140 (95%ile).

Abbeylough_010.
This waterbody is of moderate status (low confidence) and deemed to be at risk based on modelling. This waterbody is not part of the monitoring programme.

As part of the Timahoe South Bog decommissioning and rehabilitation Plan re-wetting of the bog will lead to reduced ammonia and suspended solids leaching from the bog and thereby having a positive impact on the chemical status of the receiving waters.

Surface water entering the Cushaling under the Industrial Emissions Licence.

There are 3 surface water monitoring stations operated under the existing licence, referred to hereafter as **SW4** (2km downstream of the facility on the Cushaling), **SW5** (outfall of the old settlement ponds, surface water leaving the landholding) & **SW6** (existing ICW outflow). The following parameters are analysed Total Ammonia (licence ELV is for ionised ammonium (NH_4+)), suspended solids, Conductivity, BOD, pH, and Chloride. The levels of Ammonia (NH_3) and Ammonium (NH_4) in waters are determined by the pH and the temperature of the waters.

The applicant presented the annual averages based on multiples of samples for Total Ammonia concentrations across a period of 9 years across the above 3 compliance points. The European Union Environmental Objectives Surface water (Amendment) Regulations 2019 reference good status as Total Ammonia, as mg N/L mean ≤ 0.065 and 0.140 (95%ile). All compliance points have shown an upward trend since 2018 which the applicant has attributed to the ammonia coming from the peatlands as seen in SW5 which breached the EQS as referenced above, which is the outfall of the old settlement ponds and surface waters leaving the landholding. The applicant references the fact that the form of ammonia present is determined by two variables, both pH and temperature. Given that the pH values are between 7 and 8 most of the ammonia is in the ionised form or NH_4 as N.

Unionised ammonia or NH_3 is more toxic to aquatic life than the ionised form. Given the fact that both pH and temperature can influence the form of ammonia present the applicant has demonstrated, based on both pH and temperature, the levels of the unionised form of ammonia (NH_3) present in SW5 is below the threshold value of

≤0.02mg/L quoted for un-ionised ammonia in the European Communities (Quality of Salmonid Waters) Regulations 1988.

Over the same 9-year period the suspended between January 2014-23 suspended solids have been largely within the required emission limit value as required under the terms of the waste licence. The obvious exception being during the winter months 2021-22 where suspended solids reading spiked at 124.4mg/L. This spike coincided with excavation works, and dredging works within an area of the Timahoe South Bog that drains towards the Cushaling. The nature of these works would be expected to generate such spikes in suspended solids.

Specific Electrical Conductivity levels are not specified within the European Union Environmental Objectives (Surface Water) (Amendment) Regulations 2019, however for all the compliance sampling points are well within the range specified within the European Union Environmental Objectives (Groundwater)(Amendment) Regulations 2016 between 800-1875mS/cm @25^{o}C. In the natural environment conductivity values vary massively. Conductivity values are reflective of the presence of various substances found in the soils, subsoils, and bedrock that the water encounters during its flowpaths which in turn form ions when dissolved, and there is a large variation across the different geological settings.

The absence of other indicator parameters at elevated levels within the groundwaters and surface waters would serve to indicate that the main influence on the groundwaters and surface waters leaving the Timahoe South Bog is from the peat land itself and not from the existing waste management facility. The example cited by the applicant selects the parameter Chloride as an indicator of contamination from leachate. In the event that leachate was contaminating the groundwaters or surface waters Chloride levels would be expected to far exceed the levels returned in the surface monitoring carried out between 2021-22, in addition to a multitude of other elevated parameters, such as trace metals, ammonia etc., this is not the case based

on the evidence submitted. In further support to this, similar conditions and nutrient levels are reflected throughout the Timahoe South Bog further supporting the position taken by the applicant that the major influence on groundwaters and surface waters is the peatland itself, rather than the existing waste management facility. Given the evidence submitted and the in-situ mitigation measures presently being utilised and being proposed and the fact this facility is and will be licensed by the Agency I am satisfied that the applicant has submitted sufficient evidence regarding the potential for environmental impact to support the development as proposed.