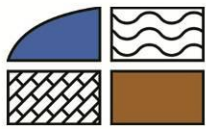


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APPENDIX 8-3

WATER FRAMEWORK DIRECTIVE ASSESSMENT REPORT



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**WATER FRAMEWORK DIRECTIVE ASSESSMENT
PROPOSED SAND AND GRAVEL EXTRACTION, LOMAUNAGHBAUN, CO. GALWAY**

FINAL REPORT

Prepared for:

MKO

Prepared by:

HYDRO-ENVIRONMENTAL SERVICES

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1. INTRODUCTION

1.1 BACKGROUND

Hydro-Environmental Services (HES) was engaged by MKO acting on behalf of Newtown Farming Ltd to complete a Water Framework Directive (WFD) Compliance Assessment for proposed sand and gravel extraction (Proposed Development) at Lomaunaghbaun, Tuam, Co. Galway.

The purpose of this WFD assessment is to determine if any specific components or activities associated with the Proposed Development will compromise WFD objectives or cause a deterioration in the status of any surface water or groundwater body and/or jeopardise the attainment of good surface water or groundwater status. This assessment will determine the water bodies with the potential to be impacted, describe the proposed mitigation measures if such water bodies are identified and define any residual potential impacts.

This WFD Assessment is intended to supplement the EIAR submitted as part of the Proposed Development planning application.

1.2 STATEMENT OF AUTHORITY

Hydro-Environmental Services (HES) are a specialist hydrological, hydrogeological and environmental practice that delivers a range of water and environmental management consultancy services to the private and public sectors across Ireland and Northern Ireland. HES was established in 2005, and our office is located in Dungarvan, County Waterford. We routinely complete impact assessments for hydrology and hydrogeology for a large variety of project types including quarries.

This WFD assessment was prepared by David Broderick and Jennifer Law.

David Broderick P.Geo (BSc, H. Dip Env Eng, MSc) is a hydrogeologist with over 17 years' experience in both the public and private sectors. Having spent two years working in the Geological Survey of Ireland working mainly on groundwater and source protection studies David moved into the private sector. David has a strong background in groundwater resource assessment and hydrogeological/hydrological investigations in relation to bedrock quarries and sand and gravel extraction developments. David has completed numerous land, soil and geology sections for input into EIARs for a range of commercial developments.

Jenny Law (BSc, MSc) is an Environmental Geoscientist holding a first honours degree in Applied Environmental Geosciences from the University College Cork (2022). Jenny has assisted in the preparation of the land, soils and geology and hydrology chapters for various environmental impact assessment reports, hydrological impact assessments, Water Framework Directive Assessment reports and Flood Risk Assessment reports for a variety of projects including wind farm developments, strategic housing developments and quarries.

1.3 WATER FRAMEWORK DIRECTIVE

The EU Water Framework Directive (2000/60/EC), as amended by Directives 2008/105/EC, 2013/39/EU and 2014/101/EU ("WFD"), was established to ensure the protection of the water environment. The Directive was transposed in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003).

The WFD requires that all member states protect and improve water quality in all waters, with the aim of achieving good status by 2027 at the latest. Any new development must ensure that this fundamental requirement of the WFD is not compromised.

The WFD is implemented through the River Basin Management Plans (RBMP) which comprises a six-yearly cycle of planning, action and review. RBMPs include identifying river basin districts, water bodies, protected areas and any pressures or risks, monitoring and setting environmental objectives. In Ireland the first RBMP covered the period from 2010 to 2015 with the second cycle plan covering the period from 2018 to 2021.

The River Basin Management Plan (2018 - 2021) objectives, which have been integrated into the design of the proposed development, include:

- Ensure full compliance with relevant EU legislation;
- Prevent deterioration and maintain a 'high' status where it already exists;
- Protect, enhance and restore all waters with aim to achieve at least good status by 2027; and,
- Ensure waters in protected areas meet requirements;
- Implement targeted actions and pilot schemes in focused sub-catchments aimed at (1) targeting water bodies close to meeting their objectives and (2) addressing more complex issues that will build knowledge for the third cycle.

Furthermore, the Department of Housing, Local Government and Heritage are currently reviewing the submissions made on the Draft River Basin Management Plan (2022 - 2027) which was out for public consultation in Q4 of 2021 and Q1 of 2022. The draft plan will be updated with a view to finalisation and publication in Q3/Q4 of 2022. As of December 2023, the plan has not been published while the draft plan is available to view at <https://www.gov.ie/en/consultation/2bda0-public-consultation-on-the-draft-river-basin-management-plan-for-ireland-2022-2027/>.

2. WATERBODY IDENTIFICATION CLASSIFICATION

2.1 INTRODUCTION

This section identifies those surface water and groundwater bodies and protected areas with potential to be affected by the Proposed Development and reviews any available WFD information.

2.2 SURFACE WATERBODY IDENTIFICATION

The Proposed Development site is located in the Lough Corrib (Corrib_030) surface water catchment within Hydrometric Area 30 of the Western River Basin District (WRBD).

Locally, the Proposed Development site is located in the River Clare sub-catchment (Clare[Galway]_SC_040). The River Clare is located approximately 23km downstream (southwest) of the Proposed Development site, via the Grange River. The downstream distance to Lough Corrib in the River Clare sub-catchment is approximately 50km.

The area of the Proposed Development site drains to the Levally Stream (Levally Stream_010) which is tributary of the Grange River. The Levally Stream flows in a southerly direction approximately 0.7km to the east of the Proposed Development site.

There are no natural or manmade surface water features within the Proposed Development site that drain towards the Levally Stream. All rainfall/runoff infiltrates to ground. The site is underlain by freely draining sand and gravel deposits. All drainage from the proposed site to the Levally Stream is via recharge and groundwater flow.

Levally Lough is located 2.7km to the south of the Proposed Development site. There is no surface water connection between Levally Lough and the Proposed Development site.

The northwestern corner of the site is mapped within the Nanny (Tuam)_010 river sub basin. However, there are no mapped watercourses in the vicinity of the Proposed Development site within this river sub basin, with the nearest being 2.3km away, to the southwest.

Figure A below presents a local hydrology map and identifies those WFD surface waterbodies (SWBs) downstream of the Proposed Development Site.

Table A presents the catchment area of each waterbody downstream of the Proposed Development site as far as Lough Corrib to which the waterbodies drain into. The catchment area for the waterbodies increases progressively downstream as more tributaries discharge into the Grange River, and the River Clare. Therefore, those waterbodies which are located in close proximity to the site are more susceptible to water quality impacts as a result of activities associated with the Proposed Development at Lomaunaghbaun. The potential for the Proposed Development to impact a waterbody decreases further downstream due to the increasing catchment area to the surface waterbody and resulting increase in flow volumes.

Table A: Catchment Area Downstream of Site

WFD River Sub-Basin	Total Upstream Catchment Area (km ²)
Lough Corrib Catchment	
Levally Stream_010	39.93
Nanny (Tuam)_010	15.14
Grange (Galway)_020	93.17
Grange (Galway)_030	104.71
Grange (Galway)_040	125.86

Clare (Galway)_060	706
Clare (Galway)_070	956.65
Clare (Galway)_080	1,001.6
Clare (Galway)_090	1,072.9
Clare (Galway)_100	1,108.2

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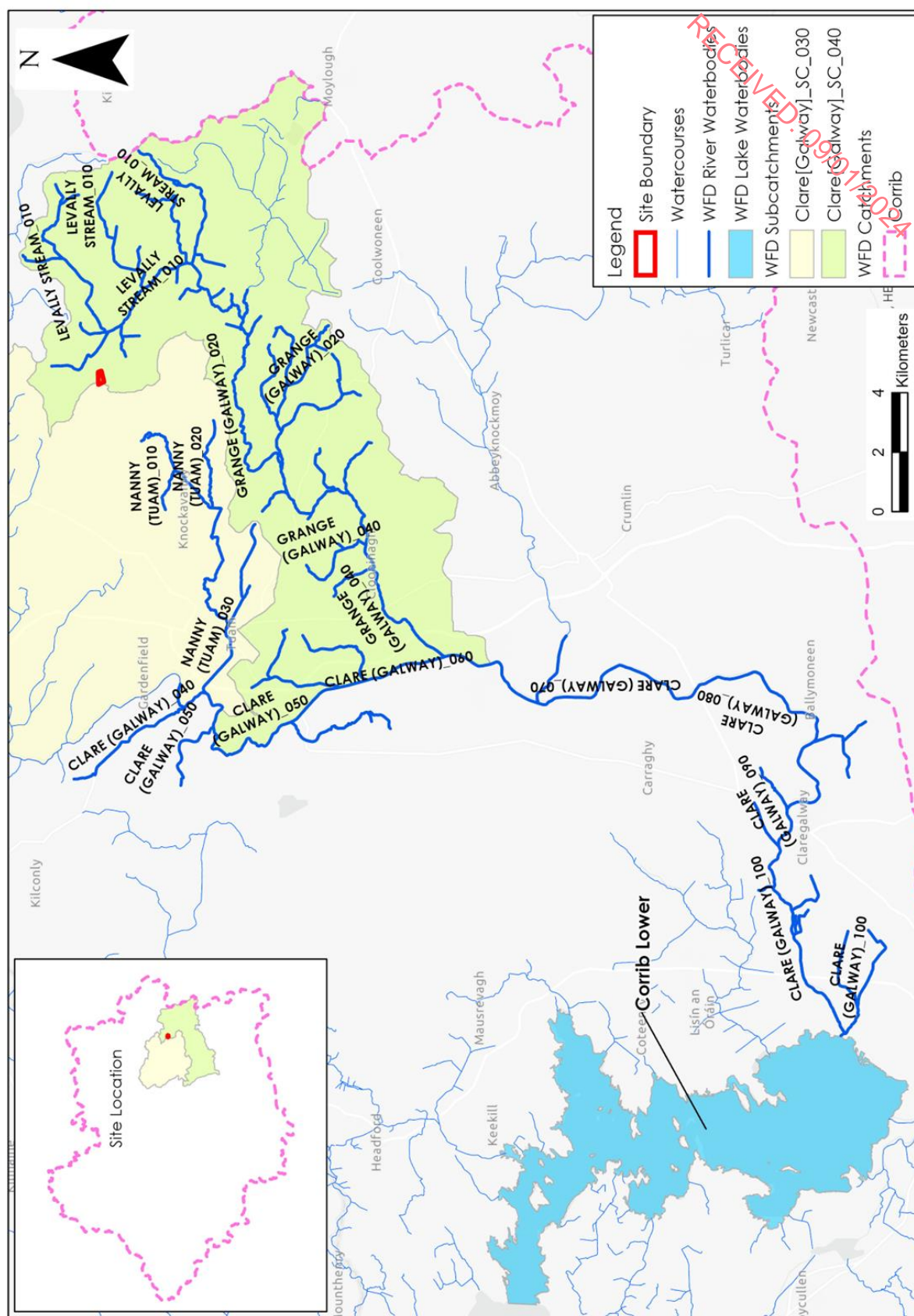


Figure A: Local Hydrology Map

2.3 SURFACE WATER BODY CLASSIFICATION

A summary of the WFD status and risk result for Surface Water Bodies (SWBs) downstream of the Proposed Development Site are shown in **Table B**. The overall status of SWBs is based on the ecological, chemical and quantitative status of each SWB.

Local Groundwater Body (GWB) and Surface water Body (SWB) status information is available from www.catchments.ie.

As stated above the Proposed Development Site is located within the Levally Stream_010 WFD river sub basin. The Levally Stream_010 SWB achieved "Good" status in the last 2 no. WFD cycles (2013-2018 and 2016-2021). Further downstream the Grange River (Grange (Galway)_020, _030 & _040) is of "Good" status.

The Levally Stream_010 and the Grange River (Grange (Galway)_020, _030 & _040) downstream of the Proposed Development have all been declared as being "not at risk" of failing to meet their WFD objectives by 2027.

The Grange River then feeds into the Clare (Galway)_060 river waterbody which achieved "Poor" status in the latest WFD Cycle. Further downstream the Clare (Galway)_070 river waterbody achieved "Good" status, whilst the remaining lower reaches of the Clare River (Clare (Galway)_080, _090 & _100) achieved "Moderate" Status.

Of the downstream Clare River, the Clare (Galway)_070 river segment is the only waterbody that is declared as being "Not at Risk". The Clare (Galway)_060, Clare (Galway)_080 and Clare (Galway)_090 river waterbodies are each deemed to be "At risk" due to hydromorphological significant pressures. The risk status of the Corrib Lower Lake waterbody is currently under "review".

The Nanny (Tuam)_010 river waterbody achieved "Moderate" status in the latest WFD cycle and is currently under "Review" with regards to its risk status.

The SWB status for the 2016-2021 WFD cycle are shown on **Figure B**.

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09/01/2024**Table B: Summary WFD Information for Surface Water Bodies**

SWB	Waterbody Type	Overall Status (2010-2015)	Overall Status (2013-2018)	Overall Status (2016-2021)	Risk Status (3 rd Cycle)	3 rd Cycle Pressures
Levally Stream_010	River	Moderate	Good	Good	Not At Risk	-
Nanny (Tuam)_010	River	Unassigned	Good	Moderate	Review	-
Grange (Galway)_020	River	Good	Moderate	Good	Not At Risk	-
Grange (Galway)_030	River	Good	Good	Good	Not At Risk	-
Grange (Galway)_040	River	Good	Good	Good	Not At Risk	-
Clare (Galway)_060	River	Moderate	Moderate	Poor	At Risk	Hydromorphology
Clare (Galway)_070	River	Good	Good	Good	Not a Risk	-
Clare (Galway)_080	River	Moderate	Moderate	Moderate	At Risk	Hydromorphology
Clare (Galway)_090	River	Moderate	Moderate	Moderate	At Risk	Hydromorphology
Clare (Galway)_100	River	Unassigned	Moderate	Moderate	Under Review	-
Corrib Lower	Lake	Moderate	Good	Good	Not At Risk	-

2.4 GROUNDWATER BODY IDENTIFICATION

The Groundwater Body (GWB) in which the Proposed Development site is located is called the Clare-Corrib GWB (IE_WE_G_0020) comprising pale grey clean skeletal limestone of the Burren Formation. These limestones are classified by the GSI as a Regionally Important Aquifer Karstified (conduit), (Rkc).

The limestone encountered during the drilling investigations (refer to Section 7.3.9 of the EIR) was noted to be strong to very strong with only rare to occasional fractures. Overall, the bedrock below the Proposed Development shows very little karstification.

2.5 GROUNDWATER BODY CLASSIFICATION

The Clare-Corrib GWB achieved "Good" status in all 3 no. WFD cycles (refer to **Table C** and **Figure B**). These GWB has been deemed to be "at risk" of failing to meet its WFD objectives as agricultural activities have been found to be a significant pressure on the GWB.

Table C: Summary WFD Information for Groundwater Bodies

GWB	Overall Status (2010-2015)	Overall Status (2013-2018)	Overall Status (2016 – 2021)	3 rd Cycle Risk Status	Pressures
Clare - Corrib	Good	Good	Good	At risk	Agriculture

2.6 PROTECTED AREA IDENTIFICATION

The WFD requires that activities are also in compliance with other relevant legislation, as considered below. Nature conservation designations, bathing waters, Nutrient Sensitive Areas (NSA's), shellfish protected areas and Drinking Water Protected Area's (DWPA) within the vicinity of the Proposed Development are looked at as part of the assessment.

2.6.1 Nature Conservation Designations

Within the Republic of Ireland designated sites include Natural Heritage Areas (NHAs), Proposed Natural Heritage Areas (pNHAs), Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSAC) and Special Protection Areas (SPAs).

Ramsar sites are wetlands of international importance designated under the Ramsar Convention (adopted in 1971 and came into force in 1975), providing a framework for the conservation and wise use of wetlands and their resources.

There are no designated sites mapped within the Proposed Development site boundary. The nearest designated site is Drumbulcan Bog pNHA (Site Code: 000263), approximately 0.6km west of the site.

Other designated sites within 10km radius include:

- Levalley Lough SAC and pNHA (Site Code: 000295), approximately 2.7km south of the site
- Lough Corrib SAC (Site Code: 000297), approximately 3.0km to the south and downstream of the site via the Levalley stream.

- Knockavanny Turlogh pNHA (site code 000289) approximately 5.0km southwest of the site
- Richmond Esker Nature Reserve pNHA (Site Code: 000323), approximately 5.4km southeast of the site;
- Derrynagran Bog and Esker NHA (Site Code: 001255), approximately 6.3km southeast of the site;
- Derrinlough (Cloonkeenleananode) Bog NHA (Site Code: 001254) and SAC (Site Code: 002197), approximately 7.5km southeast of the site.
- Slieve Bog NHA (Site Code:000247), approximately 7.7km northeast of the site;
- Summerville Lough pNHA (Site Code: 001319) approximately 9.8km southeast of the site.

2.6.2 Bathing Waters

Bathing waters are those designated under the Bathing Water Directive (76/160/EEC) or the later revised Bathing Water Directive (2006/7/EC).

There are no bathing water sites located in the vicinity of the Proposed Development Site. The closest designated bathing water is Ballyloughane Beach (PA3_0132) and is located 37km to the southwest of the site.

2.6.3 Nutrient Sensitive Areas

Nutrient Sensitive Areas (NSA) comprise Nitrate Vulnerable Zones and polluted waters designated under the Nitrates Directive (91/676/EEC) and areas designated as sensitive areas under the Urban Wastewater Treatment Directive (UWWTD)(91/271/EEC). Sensitive areas under the UWWTD are water bodies affected by eutrophication associated with elevated nitrate concentrations and act as an indication that action is required to prevent further pollution caused by nutrients.

There are no mapped Nutrient Sensitive Areas in the vicinity or downstream of the site. There are no NSA's within the Corrib WFD Catchment.

2.6.4 Shellfish Waters

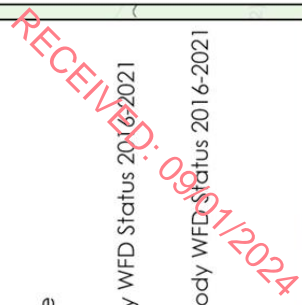
The Shellfish Waters Directive (2006/113/EC) aims to protect or improve shellfish waters in order to support shellfish life and growth.

There are no Shellfish Protection Areas within vicinity or downstream of the Proposed Development Site.

2.6.5 Drinking Water

The Corrib Lower lake waterbody downstream of the application site is a DWPA listed under Article 7 Abstraction for Drinking Water. The DWPA objectives have been met for the Corrib Lower Lake DWPA according to the 3rd Cycle Draft Corrib Catchment Report (HA 30).

The Proposed Development site is mapped by the GSI to be inside Gallagher Group Water Scheme source protection area. However, hydrogeological investigations completed at the Proposed Development site have revealed that local groundwater flow is to the east towards the Levally Stream. Groundwater from the area of the Proposed Development site will not flow towards the source of the GWS which is to the southwest. Therefore, the Proposed Development site is not located inside the Gallagher GWS SPA and can be ruled out for further assessment.



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3. WFD SCREENING

As discussed in **Section 2**, there is a total of 10 no. river water bodies and 1 no. lake waterbody located downstream of the Proposed Development Site. The Proposed Development Site is also underlain by 1 no. groundwater body. Furthermore, several designated sites are located in the vicinity of the Proposed Development Site, including Lough Corrib SAC.

3.1 SURFACE WATER BODIES

During the operational stage there will be no discharge or runoff to the Levally Stream_010. The only pathway for potential contaminants from the Proposed Development site to reach the Levally Stream is via groundwater baseflow as no drains or watercourses are present. This limits the potential for significant surface water quality effects.

All other downstream river waterbodies (Grange (Galway)_020 through to Grange (Galway)_040 and Clare (Galway)_060 through to Clare (Galway)_100) have been screened out due to the nature of the Proposed Development, and the increasing volumes of water within the River Grange and River Clare further downstream (associated with the increased catchment area as outlined in **Table A**). The Proposed Development has no potential to cause a deterioration in status of these SWBs and/or jeopardise the attainment of good surface water status in the future.

A very small section of the Proposed Development Site is located in the Nanny (Tuam)_010 sub-basin, but there is no surface water connections between the Proposed Development site and the Nanny (Tuam)_010 river waterbody. Therefore, Proposed Development has no potential to cause a deterioration in status of these SWBs and/or jeopardise the attainment of good surface water status in the future and the Nanny (Tuam)_010 waterbody has been screened out.

The Corrib Lower Lake waterbody downstream from the Proposed Development has also been screened out, due to the large catchment area and volume of water within the lake and because of its significant distance downstream from the site (>30km). The Proposed Development has no potential to cause a deterioration in status of these SWBs and/or jeopardise the attainment of good surface water status in the future.

3.2 GROUNDWATER BODIES

The Clare - Corrib GWB is carried through to the WFD Impact Assessment due to its location directly underlying the Proposed Development Site. Due to the high groundwater vulnerability given to the quarry area and the nature of the underlying aquifer (regionally important karst aquifer) it is important to consider the risks to possible contamination of the groundwater. The Proposed Development must not in any way affect the status of this GWB or prevent it from meeting its WFD objectives in the future.

3.3 PROTECTED AREAS

3.3.1 Nature Conservation Designations

Groundwater underlying the Proposed Development site flows in an easterly/southeasterly direction as baseflow to the (Levally Stream) which forms part of the Lough Corrib SAC approximately 3km downstream of the Proposed Development site.

All other nearby designated sites are not hydrologically connected to the Proposed Development (i.e. Drumbulcan Bog pNHA and Levally Lough SAC). There is no hydrogeological connection to the Proposed Development site and therefore they cannot

be impacted by the Proposed Development. The lack of hydrological connectivity has been demonstrated by site investigations.

Lough Corrib SAC is downstream of the site via the Levally Stream therefore the SAC has been screened into the assessment.

The remaining designated sites in the vicinity of the Proposed Development include Knockavanny Turlogh pNHA, Richmond Esker Nature Reserve pNHA, Derrynagran Bog and Esker NHA, Derrinlough (Cloonkeenleananode) Bog NHA /SAC, Slieve Bog NHA and Slieve Bog NHA. All designated sites mentioned here have been screened out as there are no direct or indirect surface water pathways to these designated sites and as groundwater connectivity will be limited due to separation distances (all greater than 5km), the presence of intermediate rivers acting as hydraulic boundaries, elevation differences and shallow depth of proposed extraction works.

3.3.2 Bathing Waters

The Ballyloughane Beach bathing waters have been screened out due to its distal location from the Proposed Development Site. Therefore, the Proposed Development has no potential to impact bathing waters at Ballyloughane Beach.

3.3.3 Drinking Waters

The Corrib Lower DWPA downstream from the Proposed Development has been screened out, due to the nature of the Proposed Development, the large catchment area and volume of water within the lake and because of its significant distance downstream from the site (50km). The Proposed Development has no potential to cause a deterioration in status of this DWPA.

3.4 WFD SCREENING SUMMARY

A summary of WFD Screening discussed above is shown in **Table D**.

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Table D: Screening of WFD water bodies located within the study area.

Type	WFD Classification	Waterbody Name/ID	Inclusion in Assessment	Justification
Surface Water Body	River	Levally Stream_010	Yes	Due to close proximity to the Proposed Development but limited to groundwater flowpath connection due to the absence of runoff potential from the Proposed Development site.
		Nanny (Tuam)_10	No	While the extreme northwest of the Proposed Development Site is located in the Nanny (Tuam)_010 sub-basin. There are no mapped watercourses in the vicinity of the site within this sub basin (nearest being 2.3km away). Therefore, the Proposed Development has no potential to impact the status of this SWB.
		Grange (Galway)_020	No	The Grange (Galway)_020 SWB has been screened out due to the nature of the Proposed Development, and the increasing volumes of water within the River Grange further downstream (associated with the increased catchment area as outlined in Table A). Therefore, the Proposed Development has no potential to impact the status of this SWB.
		Grange (Galway)_030	No	The Grange (Galway)_030 SWB has been screened out due to the nature of the Proposed Development, and the increasing volumes of water within the River Grange further downstream (associated with the increased catchment area as outlined in Table A). Therefore, the Proposed Development has no potential to impact the status of this SWB.
		Grange (Galway)_040	No	The Grange (Galway)_040 SWB has been screened out due to the nature of the Proposed Development, and the increasing volumes of water within the River Grange further downstream (associated with the increased catchment area as outlined in Table A). Therefore, the Proposed Development has no potential to impact the status of this SWB.
		Clare (Galway)_060	No	The Clare (Galway)_060 SWB has been screened out due to the nature of the Proposed Development, and the increasing volumes of water within the River Clare further downstream (associated with the increased catchment area as outlined in Table A). Therefore, the Proposed Development has no potential to impact the status of this SWB.
		Clare (Galway)_070	No	The Clare (Galway)_070 SWB has been screened out due to the nature of the Proposed Development, and the increasing volumes of water within the River Clare further downstream (associated with the increased catchment area as outlined in Table A). Therefore, the Proposed Development has no potential to impact the status of this SWB.
		Clare (Galway)_080	No	The Clare (Galway)_080 SWB has been screened out due to the nature of the Proposed Development, and the increasing volumes of water within the River Clare further downstream (associated with the increased catchment area as outlined in

				Table A). Therefore, the Proposed Development has no potential to impact the status of this SWB.
		Clare (Galway)_090	No	The Clare (Galway)_090 SWB has been screened out due to the nature of the Proposed Development, and the increasing volumes of water within the River Clare further downstream (associated with the increased catchment area as outlined in Table A). Therefore, the Proposed Development has no potential to impact the status of this SWB.
		Clare (Galway)_100	No	The Clare (Galway)_100 SWB has been screened out due to the nature of the Proposed Development, and the increasing volumes of water within the River Clare further downstream (associated with the increased catchment area as outlined in Table A). Therefore, the Proposed Development has no potential to impact the status of this SWB.
	Lake	Corrib Lower	No	Corrib Lower is screened out of the assessment due to the nature of the proposed development, its significant downstream distance from the site, its increased catchment area and large volumes of water within the lake. The proposed development has no potential to affect Corrib Lower.
Ground water Body	Groundwater	Clare - Corrib	Yes	The Proposed Development Site is located inside this GWB. Due to the karst nature of the bedrock in this area any groundwater contamination would also be able to spread fast within this GWB. Therefore, an assessment is required to consider the impacts of the Proposed Development on this GWB.
Protected Areas	Nature Conservation Area	Drumbulcan Bog pNHA	No	Screened out as there is no groundwater or surface water connection to this pNHA.
		Levalley Lough SAC/ pNHA	No	Screened out as there is no groundwater or surface water connection to this SAC/pNHA.
		Lough Corrib SAC	Yes	Lough Corrib SAC is downstream of the site via the Levally Stream therefore the SAC has been screened into the assessment.
		Knockavanny Turlogh pNHA	No	Knockavanny Turlogh pNHA has been screened out as there are no direct or indirect surface water pathways to the site and as groundwater connectivity will be limited due to separation distances (5km), elevation differences and the depth of proposed extraction works above groundwater level.
		Richmond Esker Nature Reserve pNHA	No	Richmond Esker Nature Reserve pNHA has been screened out as there are no direct or indirect surface water pathways to the site and as groundwater connectivity will be limited due to separation distances (5.4km), the presence of the Levally Stream acting as a hydraulic boundary, elevation differences and the depth of proposed extraction works above groundwater level.
		Derrynagran Bog and Esker NHA	No	Derrynagran Bog and Esker NHA has been screened out as there are no direct or indirect surface water pathways to the site and as groundwater connectivity will be limited due to separation distances (6.3km), the presence of the Levally Stream acting as a hydraulic boundary, elevation differences and the depth of proposed

				extraction works above groundwater level.
		Derrinlough (Cloonkeenleananode) Bog NHA and SAC	No	Derrinlough (Cloonkeenleananode) Bog NHA/SAC has been screened out as there are no direct or indirect surface water pathways to the site and as groundwater connectivity will be limited due to separation distances (7.5km), the presence of the Levally Stream acting as a hydraulic boundary, elevation differences and the depth of proposed extraction works above groundwater level.
		Slieve Bog NHA	No	Slieve Bog NHA has been screened out as there are no direct or indirect surface water pathways to the site and as groundwater connectivity will be limited due to separation distances (7.7km), presence of intermediate rivers acting as hydraulic boundaries, elevation differences and the depth of proposed extraction works above groundwater level.
		Summerville Lough pNHA	No	Summerville Lough pNHA has been screened out as there are no direct or indirect surface water pathways to the site and as groundwater connectivity will be limited due to separation distances (9.8km), presence of intermediate rivers acting as hydraulic boundaries, elevation differences and the depth of proposed extraction works above groundwater level.
	Bathing Waters	Ballyloughane Beach	No	The Ballyloughane Beach bathing waters have been screened out due to its distal location (37km) from the Proposed Development Site. The Proposed Development has no potential to impact these bathing waters.
	Drinking Water Protected Areas	Corrib Lower	No	Corrib Lower DWPA is screened out of the assessment due to the nature of the proposed development, its significant downstream distance from the site, its increased catchment area and large volumes of water within the lake. The proposed development has no potential to affect Corrib Lower DWPA.

4. WFD COMPLIANCE ASSESSMENT

4.1 PROPOSALS

The Proposed Development being applied for under this current planning application includes for the extraction of sand and gravel over almost the full site area (i.e. 6.2ha). There will be no extraction of the limestone bedrock below the sand and gravel deposits. Aggregate will be processed on-site.

Water usage for the washing element of the sand processing plant during the operational phase will be contained within a closed loop system. As all water will be reused on a continuous basis within the material processing plant there will be no requirement for the installation of settlement ponds or any licenced groundwater or surface discharges. All drainage from the Proposed Development site to the Levally Stream is via recharge and groundwater flow only.

Initial preparation/construction work requirements at the Proposed Development site will be minimal and will mainly be site enabling works that will last approximately 1 month.

The total daily demand for aggregate washing, wheel wash and dust suppression is expected to be under 25m³/day and will be sourced from a proposed on-site well.

The spoil/fines from the aggregate processing will be stored in cells constructed in in-situ sand and gravel deposits. All domestic wastewater will be contained and taken off-site for treatment.

A full description of the Proposed Development is provided in Chapter 2 of this EIAR.

4.2 POTENTIAL EFFECTS

4.2.1 Site Preparation Phase (Unmitigated)

4.2.1.1 Potential Surface Water Quality/ Quantity Effects

The removal of any topsoil from the proposed extraction areas or other works areas has the potential for the generation of suspended solids in surface water runoff. Earthworks and the stockpiling of such material (creating the proposed boundary berms) will be a potential source of sediment laden water.

Such activities can result in the release of suspended solids to nearby surface waters. However, as described above, there are no direct hydrological connections between the Proposed Development site and nearby surface waters. The only potential for surface water quality effects is through groundwater recharge and the lateral migration of groundwater and its eventual discharge as baseflow into local streams.

Given the permeable nature of the subsoil sands and gravels present at the Proposed Development site, all water generated within the site will infiltrate to ground. The subsoil sand and gravels are an excellent natural filter and will remove any suspended solids before the water reaches the underlying groundwater table.

Enabling works at the Proposed Development site will be completed using machinery. Such machinery are powered by diesel engines and operated using hydraulics. Unless managed carefully such plant and machinery have the potential to leak hydraulic oils or cause fuel leaks during refueling operations. Concrete pouring will also be required during the site preparation works.

Only small volumes of fuel/oils and concrete will be present on-site and therefore no significant effects are expected as long as standard mitigation is implemented.

A summary of potential status change to SWBs arising from surface water quality impacts from earthworks during the construction phase of the Proposed Development in the unmitigated scenario are outlined in **Table E**.

Table E: Potential Surface Water Quality/Quantity Effects during Site Preparation (Unmitigated)

SWB	WFD Code	Current Status	Assessed Status Change	Potential
Levally Stream_010	IE_WE_30L070100	Good	Good	

4.2.1.2 Potential Effect on Groundwater Quality

The site preparation works will involve the removal of soil and overburden from the Proposed Development site. Earthworks could result in elevated suspended solid concentrations entering groundwater.

Given the permeable nature of the subsoil sands and gravels present at the Proposed Development site, all water generated within the site will infiltrate to ground. The subsoil sand and gravels are an excellent natural filter and will remove any suspended solids before the water reaches the underlying groundwater table.

The accidental spillage of hydrocarbons or concrete has the potential to negatively affect local water quality at the site. Due to the absence of direct surface water pathways and high recharge rates, local groundwater quality is susceptible to pollution.

A summary of potential status change to GWBs arising from potential groundwater quality impacts during the construction phase of the Proposed Development in the unmitigated scenario are outlined in **Table F**.

Table F: Potential Groundwater Quality Effects during the Site Preparation (Unmitigated)

GWB	WFD Code	Current Status	Assessed Status Change	Potential
Clare - Corrib	IE_WE_G_0020	Good	Moderate	

4.2.1.3 Potential Effects on Protected Areas

Drumbulcan Bog pNHA

No groundwater or surface water connectivity to this pNHA.

Levally Lough SAC/ pNHA

No groundwater or surface water connectivity to this SAC/pNHA.

Lough Corrib SAC

Lough Corrib is situated to the north of Galway city and is the second largest lake in Ireland, with an area of approximately 18,240 ha. A number of rivers are included within the SAC as they are important for Atlantic Salmon. These rivers include the Clare and Grange Rivers downstream of the Proposed Development.

However, due to the nature of the Proposed Development (i.e. no licenced discharges and lack of surface water drainage to river waterbodies), and the increasing volumes of water within the River Grange and the River Clare further downstream (associated with the increased catchment area as outlined in **Table A**), the likelihood of any significant effects occurring on the Lough Corrib SAC is extremely low.

4.2.2 Operational Phase (Unmitigated)

4.2.2.1 Potential Surface Water Quality/Quantity Effects

Hydrocarbons will also be used on-site throughout the operation phase. Accidental spillage of oils/fuels is a common pollution risk to surface waters at all quarry sites.

However, there is no surface water drainage pathways will occur between the Proposed Development Site and downstream SWBs. During the operational phase there will also be no discharge to surface watercourses. All surface water within the Proposed Development Site will either be recycled and reused on-site (wheel wash etc.) or will infiltrate to ground. The potential to affect surface water quality is only through hydraulic continuity with groundwater.

A summary of potential status change to SWBs arising from surface water quality impacts from earthworks during the operational phase of the Proposed Development in the unmitigated scenario are outlined in **Table G**.

Table G: Potential Surface Water Quality/Quantity Effects during Operational Phase (Unmitigated)

SWB	WFD Code	Current Status	Assessed Potential Status Change
Levally Stream_010	IE_WE_30L070100	Good	Good

4.2.2.2 Potential Groundwater Quality/Quantity Effects

The risks to groundwater quality are the same as those described in the **Section 4.2.1.2** and include the accidental spillages of hydrocarbons and entrainment of suspended solids in drainage.

There will be no groundwater quantity/level effects as the proposed extraction will be above the local groundwater table and no dewatering will be required. Groundwater usage for washing and processing will be minimal (<25m³/day).

Excavations, aggregate extraction and storage of fines/silts have the potential to release sediments into the groundwater system, particularly in karst environments where the groundwater vulnerability rating is often "Extreme" and particularly where conduit flow pathways potentially exist.

However, the drilling investigations carried out at the site demonstrates the limestone bedrock below the site is very competent. Groundwater flowpaths between the Proposed Development site and the Levally Stream are likely to be mainly along the top of bedrock (i.e. bedrock / subsoil interface) rather than rapid flow via solutional enlarged bedding planes, fissures and conduits. Based on these finding there is not likely to be potential for rapid recharge of silt laden surface water into the groundwater system.

A summary of potential status change to GWBs arising from potential groundwater quality impacts during the operational phase of the Proposed Development in the unmitigated scenario are outlined in **Table H**.

Table H: Potential Groundwater Quality/Quantity Effects during the Operational Phase (Unmitigated)

GWB	WFD Code	Current Status	Assessed Status Change	Potential
Clare - Corrib	IE_WE_G_0020	Good	Moderate	

4.2.2.3 Potential Effects on Protected Areas

Due to the fact that there are no direct surface water connections to the Levally Stream, no significant on Lough Corrib SAC are likely.

All other nearby designated sites are not hydrologically connected to the Proposed Development (i.e. Drumbulcan Bog pNHA and Levally Lough SAC). There is no hydrogeological connection to the Proposed Development site and therefore they cannot be impacted by the Proposed Development. The lack of hydrological connectivity has been demonstrated by site investigations.

4.2.3 Restoration Phase

The restoration plan involves returning the Proposed Development site to grassland by spreading/contouring previously stripped overburden over the extraction area.

No impacts on the hydrological or hydrogeological regime are expected during the restoration or post restoration phase. However, the restoration will have a positive effect in terms of reduced groundwater vulnerability.

4.3 MITIGATION MEASURES

In order to mitigate against the potential negative effects on surface and groundwater quality, mitigation measures will be implemented during the Proposed Development. These are outlined below.

4.3.1 Construction / Site Preparation Phase

4.3.1.1 Mitigation Measures to Protect Surface Water Quality

Due to the local hydrogeological regime, no specific mitigation measures are required to protect surface water quality. There is no direct pathway between the Proposed Development and downstream SWBs. Surface water quality may be indirectly affected by the lateral migration of groundwater from the Proposed Development site to the Levally Stream only. Mitigation measures for the protection of groundwater quality will also ensure that there is no deterioration in surface water quality.

4.3.1.2 Mitigation Measures to Protect Groundwater Quality

Given the permeable nature of the subsoil sands and gravels present at the Proposed Development site, all water generated within the site will infiltrate to ground. The subsoil sand and gravels are an excellent natural filter and will remove any suspended solids before the water reaches the underlying groundwater table.

Mitigation measures proposed to avoid the release of hydrocarbons at the site include:

- All plant and machinery will be serviced before being mobilised to site;
- Refuelling will be completed in a controlled manner using drip trays (bundled container trays) at all times;
- All fuels will be stored in the existing bunded fuel storage areas at the site workshop;
- Only designated trained operators will be authorised to refuel plant on site; and,
- Procedures and contingency plans will be in place to deal with emergency accidents or spills (spill kits including high absorbency mats will be available on-site).

Mitigation measures in relation to cement based compounds:

- No batching of concrete will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place.
- Raw or uncured waste concrete shall be disposed of by removal from the site;
- Wash down water from exposed aggregate surfaces, cast-in-place concrete and from concrete trucks shall be impounded in lined lagoons and treated in accordance with the dewatering discussed above.
- Only the chute of the concrete delivery truck will be permitted to be cleaned on site, using the smallest volume of water necessary;
- Concrete trucks will be directed back to their batching plant for full washout; and,
- Concrete pour sites shall be free of standing water to mitigate the risk of run-off being polluted with cementitious material. Furthermore, concrete pours shall be avoided where prolonged periods of heavy rain are forecast, and covers shall be available and used for freshly placed concrete to avoid the surface washing away in heavy rain.

4.3.2 Extraction Phase

4.3.2.1 Mitigation Measures for the Protection of Surface Water Quality

No specific mitigation measures are required during the extraction phase as there will be no discharges or drainage to any surface water course. During the extraction phase all drainage will be directed into the quarry void and will infiltrate to ground.

4.3.2.2 Mitigation Measures for the Protection of Groundwater Quality

The main mitigation with regard potential groundwater quality effect from sediments is that aggregate will not be extracted down to bare bedrock (i.e. the underlying bedrock will not be exposed). Thereby leaving a protective layer of natural sand and gravels over bedrock for the filtration of any surface water runoff that might be generated at the site during extraction phase or following restoration phase.

Secondly, the spoil/fines from the aggregate processing will be stored in cells constructed within in-situ sand and gravel deposits. All runoff from spoil/fine storages areas will be contained and directed to ground within the cell, thereby the underlying sand and gravels will filter out any fines.

The main mitigation with respect groundwater quality protection during the extraction phase will be employment of best practice measures with respect to oil usage and refuelling of plant and machinery:

- All site refuelling will be carried out in a designated refuelling area in the eastern section of the site. This designated area will be marked by signage;
- The refuelling area will be comprised of concrete hardstanding. A hydrocarbon/oil interceptor will capture and treat runoff from the refuelling area;
- All plant and machinery will be serviced before being mobilised to site, and regular leak inspections will be completed during the site operations;
- No plant maintenance will be completed on site, any broken-down plant will be removed from site to be fixed;
- An emergency spill kit with oil boom, absorbers etc. will be kept on-site for use in the event of an accidental spill;
- Drip-trays will be used for fixed or mobile plant such as pumps and generators in order to retain oil leaks and spills. The drip tray will have a holding capacity of 110% of the volume contained within the machine/ generator; and,
- Only designated trained and competent operatives will be authorised to refuel plant.

4.4 RESTORATION PHASE

The mitigation measures relating to oils and fuels during the restoration phase will be the same as those outlined below for the construction and operational phase.

4.4 POTENTIAL EFFECTS WITH THE IMPLEMENTATION OF MITIGATION MEASURES

A summary of the WFD potential status change to the SWBs and the GWB arising from surface water and ground water quality impacts during the construction, operation and restoration phase of the Proposed Development, in unmitigated and mitigated scenarios, are outlined in **Table I**.

Table I: Summary of WFD Status for Unmitigated and Mitigated Scenarios

WFD Water Bodies	WFD Code	Current Status (2016-2021)	Assessed Status - Unmitigated	Assessed Status with Mitigation Measures
Surface Water Bodies				
Levally Stream_010	IE_WE_30L070100	Good	Good	Good
Groundwater Bodies				
Clare - Corrib	IE_WE_G_0020	Good	Moderate	Good

5. WFD ASSESSMENT CONCLUSION

WFD status for SWBs (Surface Water Bodies) and GWBs (Groundwater Bodies) hydraulically linked to the Proposed Development Site are defined in **Section 2** above.

The Proposed Development does not involve any quarrying below the groundwater table or discharge to surface watercourses. Therefore, the quantitative status (i.e., the available quantity (volume) of groundwater and surface water locally) to the receiving waters will remain unaltered during all phases of the Proposed Development.

There is no direct surface water linkage between the Proposed Development Site and downstream receiving surface waters. Due to the local hydrogeological regime, which is characterised by low rates of surface water runoff and high rates of groundwater recharge, the only potential pathway between the site and downstream watercourses is via groundwater recharge and the lateral migration of groundwater.

Mitigation for the protection of groundwater during the construction, operation and restoration phases of the Proposed Development will ensure the qualitative status of the receiving groundwaters will not be altered by the Proposed Development.

There will be no change in GWB or SWB status in the underlying GWBs or downstream SWBs resulting from the Proposed Development. There will be no change in quantitative (volume) or qualitative (chemical) status, and the underlying GWBs are protected from any potential deterioration from chemical pollution.

As such, the Proposed Development will not impact upon any surface water or groundwater body as it will not cause a deterioration of the status of the body and/or it will not jeopardise the attainment of good status.

As such, the Proposed Development:

- will not cause a deterioration in the status of all surface and groundwater bodies assessed;
- will not jeopardise the objectives to achieve 'Good' surface water/groundwater status;
- does not jeopardise the attainment of 'Good' surface water/groundwater chemical status;
- does not jeopardise the attainment of 'Good' surface water/groundwater quantity status;
- does not permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies within the same river basin district;
- is compliant with the requirements of the Water Framework Directive (2000/60/EC); and,
- is consistent with other Community Environmental Legislation including the EIA Directive (2014/52/EU), the Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC) (Note that a full list of legislation complied with in relation to hydrology and hydrogeology is included in Section 7.22 to 7.25 of the EIAR).

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