



3.6 HYDROGEOLOGY – GEOLOGY, GROUNDWATER AND SOILS

3.6.1 Introduction

This section of the EIS deals with hydrogeology which consists of the topics relating to geology, groundwater and soils. This section has been compiled and prepared by the following specialist:

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3.6.2 Existing Environment

3.6.2.1 Introduction

The following report provides a hydrogeological description of the Groundwater at the site and provides information relating to the local Bedrock Geology; Aquifer Classification; and Groundwater Vulnerability Rating relating to the existing soil recovery site at Tallagh. The soils of the site are discussed here as well but are described in greater detail within the Agronomic Report contained in **Figure 2.20.1** of Section 2 of this EIS.

The following references/sources were consulted during the preparation of this report and associated Aquifer Classification and Groundwater Vulnerability Map:

- Daly, D. (1995). "Groundwater Protection Schemes In Ireland: a proposed approach", Internal Report Series, Geological Survey of Ireland, 38pp.
- Daly, D. and Warren W.P. (1994). "G.S.I Guidelines on Groundwater Vulnerability and Vulnerability Mapping", Groundwater Newsletter, Geological Survey of Ireland, No.25.
- Geological Survey of Ireland at www.gsi.ie - online Groundwater Mapping GIS package for Bedrock data; Aquifer Classification and Groundwater Vulnerability.
- EPA – ENVision online GIS Maps for Soil Data
- Carton Rural Consultants – Agronomic Report for the Tallagh Site – Soils information
- Licence Review Application for Waste Licence W056-01

Information retained by the Geological Survey of Ireland (GSI) and Environmental Protection Agency (EPA) was accessed to provide the hydrological and hydrogeological setting of the site.

This report has been prepared using the recommendations set out in the Environmental Protection Agency (EPA) document 'Guidelines on Information to be contained in Environmental Impact Statements' (2002). The guidelines and recommendations of the Institute of Geologists of Ireland (IGI) publication 'Geology in Environmental Impact Statements – A Guide' was also taken into account in the preparation of the hydrogeological aspects of this section.



3.6.2.2 Bedrock

The bedrock geology of the Tallagh area is classified as PQGS – Precambrian Quartzites, Gneisses and Schists – see **Figure 3.6.2.2**. This information has been sourced from the Geological Survey of Ireland.

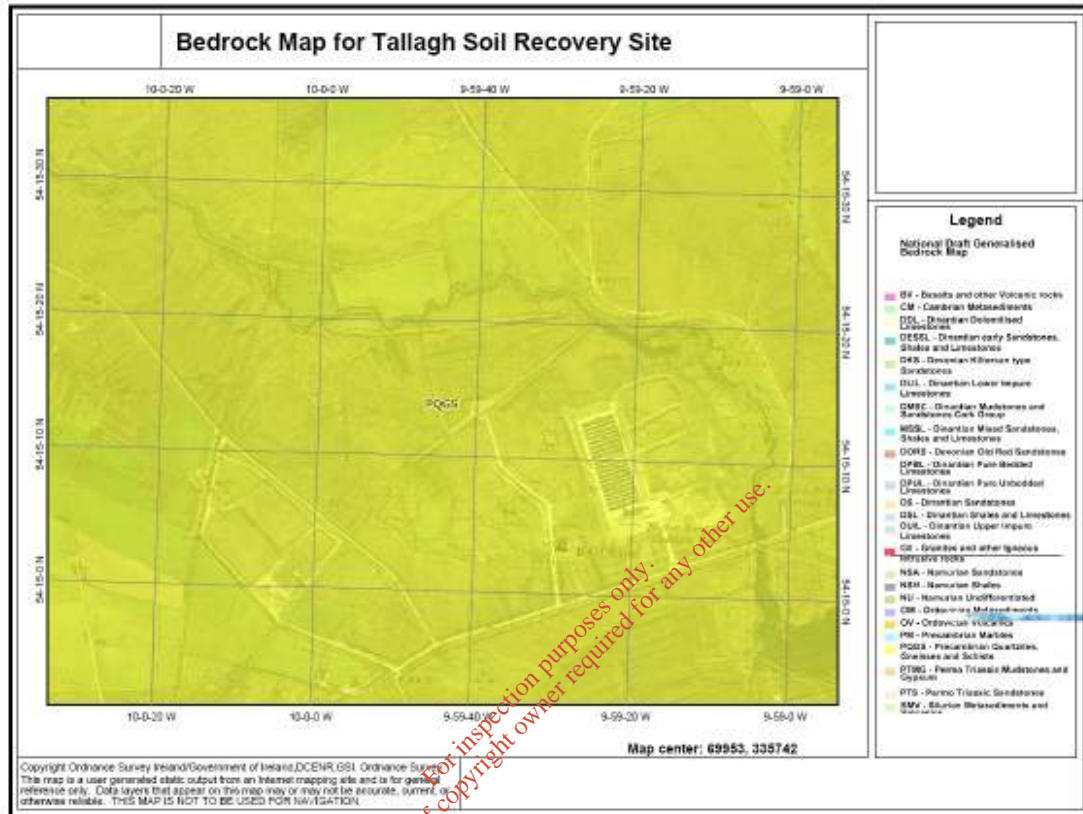


Figure 3.6.2.2: Bedrock Geology of the Tallagh Site (Source: GSI)

3.6.2.3 Bedrock Aquifer Classification and Groundwater Vulnerability

The information contained in this section is available for interactive viewing at www.gsi.ie. This plan provides the Aquifer classification (type) and also the groundwater vulnerability rating for the Tallagh area. The DEHLG, EPA, and GSI have produced guidelines on vulnerability mapping that aims to represent the intrinsic geological and hydrogeological characteristics that determine how groundwater quality may be affected by surface activities.

A combination of the aquifer type and the vulnerability rating provides the groundwater protection zone (GPZ) rating. The following provides the groundwater information for the Tallagh site:

- **Aquifer Type:** The bedrock aquifer type at the site is given the code **PI** – Bedrock which is generally unproductive, except for local zones. This is shown in **Figure 3.6.2.3.1**.
- **Vulnerability Classification:** Groundwater vulnerability is a term used to determine the geological and hydrogeological conditions that will determine the ease with which groundwater can become impacted upon by surface activities (i.e. by contamination).



The groundwater vulnerability rating for the Tallagh Site is shown in **Figure 3.6.2.3.2** and is moderate to high.

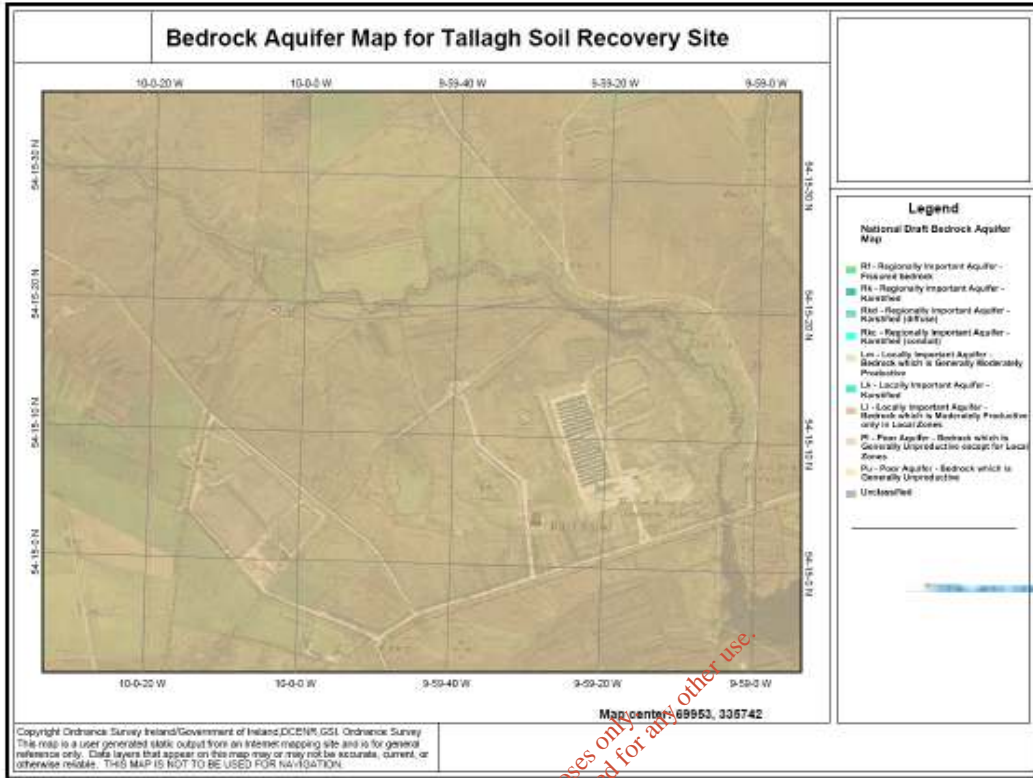


Figure 3.6.2.3.1: Bedrock Aquifer for the Tallagh Site (Source: GSI)

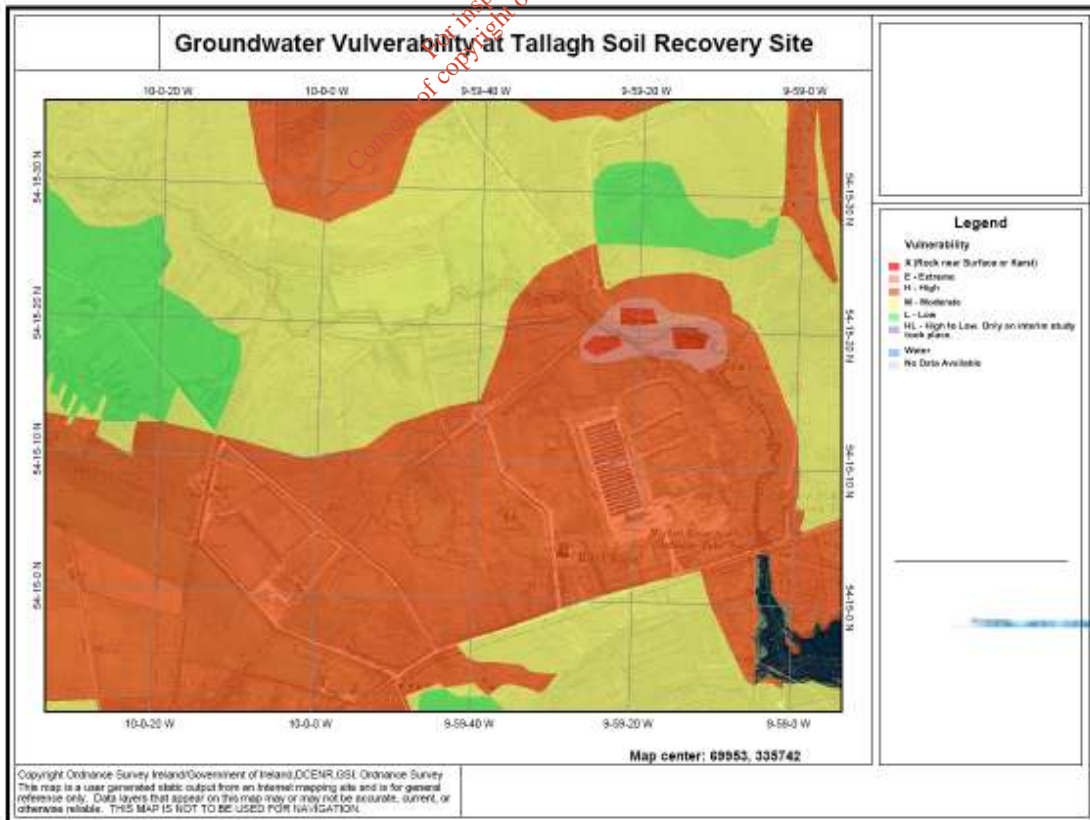


Figure 3.6.2.3.2: Groundwater Vulnerability for the Tallagh Site (Source: GSI)



- **Groundwater Protection Zone Rating:** The groundwater protection zone rating for the area of the site is **PI/H** (based on the precautionary principle).
- **Source Protection Areas:** There are no source protection areas either at or near to the site.
- **Wells:** The soil recovery facility, licensed per licence W0256-01, does not have existing or proposed extraction wells from Groundwater. No groundwater wells were identified in close proximity to the site supplying water for domestic and animal needs.

3.6.2.4 Soils

The soils of the site are discussed here as well but are described in greater detail within the Agronomic Report contained in **Figure 2.20.1** of Section 2 of this EIS.

The soils on the site and in the vicinity of the site were identified using data from the Geological Survey of Ireland (GSI), An Foras Taluntais, National Soil Survey of Ireland-Soil Map of West Mayo, scale 1:(126,720).

The land reclamation site is predominately made up of drained, cut-away peat land with the soil recorded as Blanket Peat -soil series Glenamoy Cutover on the soil maps for the area.

The cut-away peat land has been recolonised naturally with mosses, rushes, knot grass and other herbaceous weed species. The site has been used for land reclamation activity for the consequential benefit to agriculture since January 2006. A relatively small portion of the site has been infilled satisfactorily to date as part of this process, and the remainder of the area is currently being used to graze a low number of sheep.

The subject lands have little or no agricultural benefit at present due to the poor nutritional value of the grass present on the site and the fact that historic peat extraction on the site has left the topography of the ground uneven and unsuitable for agricultural machinery.

Since the site is not currently used for intensive agriculture, there will be no negative agricultural impact of the land reclamation activity on the immediate site area. In fact, since the land reclamation activity involves land levelling, reinstatement of topsoil and reseeded with a good quality grass seed mixture, the end result will be beneficial to the area from an agronomy perspective.

From a groundwater protection perspective, the spreading of suitable soil and stones over the site will provide an additional ca. 1 metre of protective soil cover which will have a positive impact upon the protection of groundwater in the area.

The soil types in the surrounding area of the Tallagh site consist of Blanket Peats, Gleys and Dry Podzols. Moisture holding capacity in these soils is good. A number of field units in the surrounding area have been reclaimed and improved in the past as evidenced on the ground. The use range of these soils depends largely on slope and altitude but generally they are most suitable for grazing stock and production of hay and silage.



3.6.3 Potential Impacts

The soil recovery facility, licensed per licence W0256-01, does not have existing or proposed Emissions to Groundwater any and does not propose to have Emissions to Groundwater through the application for a Review of the Waste Licence.

There is no sewerage system (existing or proposed) associated with the site. As undertaken under the existing waste licence, a portoloo is installed and managed on the site.

No groundwater wells were identified in close proximity to the site supplying water for domestic and animal needs.

Given that the materials to be deposited are non-leachate forming and given the mitigation measures proposed, the impact of groundwater contamination on farming in the area during operation and upon completion of the project will be negligible.

Fuel is not stored on site and there are no proposals to store fuel on site. A Fuel Tanker will visit the site on a weekly basis (or when required) to fill the onsite plant (Hitachi 200 excavator) and generator (for Portocabin). Refuelling takes place on the hardstanding area of the site access road, adjacent to the site office. Booms and spill kits are kept adjacent to this.

The inert nature of the soil material accepted at the facility would not contain any potential contaminants to groundwater. Therefore, an 'Assessment of Ground and/or Groundwater Contamination' is not required.

The potential impacts from the proposal to increase the annual tonnage from 24,900 tonnes to 90,000 tonnes poses no change in the scope of the activity, the nature of the activity or potential emissions from the activity (as presently licensed).

- The development sequence will still be to fill the site progressively (as presently licensed).
- The lands are presently marginal agricultural land and will be restored using imported soil and stones to more productive agricultural land thereby having a consequential benefit to agriculture (as presently licensed).
- The exact same proposed activity will occur as licensed i.e. a total of 265,000 tonnes of soil and stones but over a shorter time span (i.e. ca. 2.5 – 3 years). The activity will just take a shorter time span to complete and fully restore to beneficial agricultural use.
- The site survey drawings submitted with the Waste Licence Review remain unaltered as there will be no change whatsoever in the proposed topographical levels based on the reclamation of the site occurring over a shorter time period. Therefore there is no change to finished site survey drawings.
- Therefore the proposed licence review creates no proposed change to the content, nature, composition or volume of materials intended for recovery by deposition at the site,



and the overall tonnage of 265,000 tonnes for which the existing license was issued remains unaffected.

The site has been up and running for the past ca. 2 years without any complaints or enforcement issues relating to water or water pollution or impacts upon ecology as proven by Agency records. Furthermore, the compliance monitoring is all up to date and is all compliant with the license requirements. All in all, it is considered that Lennon Quarries Ltd. operate an extremely well run and well-monitored licensed soil recovery facility

From a groundwater protection perspective, the spreading of suitable soil and stones over the site will provide an additional ca. 1 metre of protective soil cover which will have a positive impact upon the protection of groundwater in the area.

The Carton Rural Consultants, Agronomy Report contained within **Figure 2.20.1** of Section 2 of this EIS concludes that:

*The existing and proposed land reclamation works will have a three fold **beneficial impact upon agriculture**: Firstly, the lands will be reclaimed to more productive agricultural lands which will result in a higher potential stocking rate of livestock; greater grass yields and therefore greater potential agricultural benefit. Secondly, the rental value of the land will increase as a consequence of the improvements to the terrain, soils and drainage which will therefore have a consequential benefit to agriculture. Thirdly, the value of the reclaimed land as good agricultural grazing lands will increase as a consequence of the recovery activity which will have a long term agricultural benefit.*

I am satisfied that the works carried out to date are recovery works for the benefit to agriculture and that the proposed works (i.e. the filling of the rest of the site as proposed in the waste licence application) will in my professional opinion have a consequential benefit to agriculture by virtue of the improved land and its increased agronomic value, as it is progressively reclaimed.

3.6.4 Mitigation Measures

With regards to ensuring that there are no significant impacts upon groundwater, the following mitigation measures will ensure that the continued operation of the soil recovery facility at Tallagh will not impact upon groundwater:

- The plant machinery is refuelled using a Mobile Fuel Bowser. No fuel is stored on the site. This eliminates the risk of potential fuel leakages from storage tanks and prevents any environmental impact on groundwater.
- Spill kits are provided, in the unlikely event of a spillage, that the spillage is confined to the immediate area.
- As part of the Environmental Management System on site, Emergency Response Procedures have been put in place to deal with emergencies.



- In the unlikely event of a larger fuel spillage, either from the site plant or refuelling tanker, the emergency procedures listed below will be followed:

In the event of a threat to surface water the following is to be implemented:

- Inform the North Western Fisheries Board and the EPA;
- Contain any spillage within the perimeter drain locally, as far as possible, by damming with excavated material or booms;
- Pump water held back by the dams into tanker or lined cell;
- Detect source and carry out necessary remedial works;
- Monitor situation hourly until threat is removed.

In the event of a threat to groundwater:

- Inform the EPA;
- Detect source and carry out necessary remedial works;
- Monitor situation daily until threat is removed.

In the event of a threat to outside the site:

- Detect source;
 - Inform the EPA;
 - Monitor extent of contamination;
 - Inform public if risk is posed;
 - Take appropriate action to alleviate situation.
- No chemicals (e.g. Insecticides, Herbicides, Rat Poisons, Cleaning Agents, Water Treatment Chemicals, Cooling Water/Boiling Water Additives, Laboratory Chemicals, etc.) are required or accepted at the facility and there is no change in this regard in the application for the Technical Review.
 - The only Waste Arising at the facility are those materials moved to/stored in the Waste Quarantine Area (e.g. wood, plastics, metals, etc.) and wastes from the facility portacabin (office, canteen & store).
 - The wastes from the Quarantine skips are removed by authorised Waste Collection Permit Holders for disposal or recovery to authorised waste facilities.
 - The waste arisings from the portacabin are small, due to the limited nature of the operation (i.e. only one Deputy Facility Manager/Machine Operative onsite). All wastes in the portacabin are divided into 'Recyclable Waste' and 'Landfill Waste' and appropriately disposed of/recovered.
 - As undertaken under the existing waste licence, the Deputy Facility Manager/Machine Operative will inspect each load, as it is being deposited, to ensure the material is fully compliant with the Waste Licence. If the material is non-compliant, the Deputy Facility Manager/Machine Operative will insist that the material is reloaded onto the haulage truck and removed from the site, for authorised disposal elsewhere. Once the haulage trucks



deposit their material, along the perimeter of the hardcore area, the excavator shifts the inert material, from where it is deposited by the haulage trucks and spreads it over the area of the deposition site, in compliance with the Waste Licence. If waste objects are identified within the inert material (whilst shifting/reclaiming the material), which are not compliant with the Waste Licence (eg. pieces of wood, plastic, metal), they are removed and transported to the Waste Quarantine skips, located adjacent to the site office.

- All machinery will be regularly serviced and checked to ensure there are no leakages of fuel or hydraulic liquids. All routine servicing of plant and equipment will, insofar as possible be undertaken off-site. Emergency repairs to plant and equipment will ensure that drip trays and oil catcher tanks are employed to collect hydraulic or oil lubricant liquid.

3.6.5 Conclusions

There will be no significant impacts upon the groundwater environment as identified in this section of the EIS as there will be no emissions to either the ground or groundwater.

All appropriate mitigation measures have been forward and are implemented for a soil recovery site of this nature. This site is a low risk activity which poses little or no threat to hydrogeology, groundwater, geology or soils. As a consequence it is not proposed to monitor groundwater.

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