



DOCUMENT CONTROL SHEET

Client	Killarney Waste Disposal					
Project Title	Killarney Waste Disposal Waste Licence Application					
Document Title	Environmental Impact Statement – Vol. III, Technical Appendices					
Document No.	MGE0031RP0008GAZ					
This Document Comprises	DCS	FOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	-	-	-	-

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
F01	Final	S. Aherne	W.Madden	W.Madden	Galway	31/01/05

ENVIRONMENTAL IMPACT STATEMENT

for

Killarney Waste Disposal Ltd.

January 2005

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VOLUME I NON-TECHNICAL SUMMARY

VOLUME II MAIN REPORT

VOLUME III TECHNICAL APPENDICES

Volume III

Technical Appendices

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**RPS-MCOS Ltd.
GEOLOGY & HYDROGEOLOGY**

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DOCUMENT CONTROL SHEET

Client	Killarney Waste Disposal Ltd					
Project Title	Killarney Waste Disposal - Waste Licence Application					
Document Title	Soils, Geology and Hydrogeology Assessment					
Document No.	MGE0031RP0006					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	-	4	-	-	-

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
F01	Final	F. Collins	S. Aherne	W. Madden	Galway	09/09/04

SOIL, GEOLOGY AND HYDROGEOLOGY

1.1 INTRODUCTION

RPS-MCOS were appointed by Killarney Waste Disposal to prepare a Soils, Geology & Hydrogeology chapter, which will form part of the main Environmental Impact Statement to accompany the Waste Licence Application for a proposed Waste Recycling Facility for non-hazardous waste at Aghacurreen, Co. Kerry. The likely significant impacts are identified and measures are proposed to mitigate these potential impacts.

1.2 METHODOLOGY

This report includes a desk study and a summary of the available and relevant data for the area:

- Geological Survey of Ireland (GSI) "Geology of Kerry-Cork" Sheet 21. Scale 1:100,000 (1997) & accompanying report.
- GSI Well records database.
- GSI Quaternary Soils Maps

A site visit was made on 1st July 2004.

This report follows the guidelines set out by the Environmental Protection Agency for Environmental Impact Statements (EPA, 1995 & 2002) and by the Institute of Geologists in Ireland regarding Geology and the EIS Process (IGI, 2002).

1.3 DESCRIPTION OF THE EXISTING ENVIRONMENT

1.3.1 Bedrock Geology

Reference to the Geological Survey of Ireland (GSI) Sheet 21 "Geology of Kerry-Cork" Scale 1:100,000 indicates that the bedrock underlying the site is black shale and sandstone of Upper Carboniferous (Namurian) age.

Depth to bedrock is variable and is reported to reach up to 30 metres, however elsewhere bedrock outcrops locally or is within 1m of the surface. No outcrops were evident on the site.

1.3.2 Soils and Subsoils

The General Soils Map of Ireland indicates that the soil type in the area is podzolic. These are poor, acidic soils, typical of cool, damp climates.

GSI Quaternary maps record Devonian Sandstone dominated Till (boulder clay) at the site location. The thickness of the subsoil deposits in the area reaches up to 30m in places while elsewhere is absent (at outcrop) or less than a metre.

Boulder clay and peat is evident in the dug out drain/stream at the edge of the site.

1.3.3 Hydrogeology

The GSI has classified the shale and sandstone bedrock underlying the site as a locally important aquifer which is moderately productive only in local zones. Such rocks generally have a low permeability with groundwater concentrated in fractures. They are capable of yielding enough water to a well to supply a house or small farm (0.2-0.5 l/s) and may yield more in good fracture zones.

However since the yield often depends on the permeability of the upper few metres of broken and weathered rock, the yield will often decrease markedly in dry spells.

A GSI well database search within a 1 km radius of the site resulted in two wells at Knockasarnet, approximately 1km from the site (refer Figure 1). The wells were drilled approximately 5 metres into the top of the bedrock which was encountered at 30.5 metres depth. The wells are for agricultural and domestic use and have an estimated yield of 22 m³/day, which is classified as a poor yield but is sufficient to provide a domestic or small farm supply. No record of groundwater level was available. A summary of the well details provided by the GSI is included in Table 1.

Table 1: Summary of GSI Well Records within 1km of Aghacureen (E94000, N94000)

Townland	Easting	Northing	Type	Depth to bedrock (metres)	Total Depth (metres)	Usage	Yield (m ³ /d)	Main Aquifer Lithology
Knockasarnet	9500	9381	Bored well	30.5	35.7	Agricultural and Domestic	21.8 Poor	-
Knockasarnet	9500	9376	Bored well	30.5	35.4	Agricultural and Domestic	21.8 Poor	Red Sandstone

According to the GSI Vulnerability map, groundwater vulnerability for the area would be variable ranging from moderate or low (in areas where there are substantial subsoil deposits of low permeability) to high and extreme where overburden is of high permeability, thin or absent. This classification is derived from the vulnerability mapping guidelines presented in Table 2.

Table 2: Vulnerability Mapping Guidelines

Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (type) and thickness			Unsaturated zone	Karst features
	High permeability (sand/gravel)	Moderate permeability (e.g. sandy subsoil)	Low permeability (e.g. clayey subsoil, clay, peat)	(Sand/gravel aquifers only)	(<30m radius)
Extreme (E)	0 – 3.0m	0 – 3.0m	0 – 3.0m	0 - 3.0m	-
High (H)	>3.0m	3.0 – 10.0m	3.0 – 5.0m	>3.0m	N/A
Moderate (M)	N/A	>10.0m	5.0 – 10.0m	N/A	N/A
Low (L)	N/A	N/A	>10.0m	N/A	N/A

1.4 CHARACTERISTICS OF THE PROPOSAL

Killarney Waste Ltd. currently operate a recovery and recycling facility for non-hazardous waste at Aghacurreen, Co. Kerry. Currently, the plant handles 16,500 tonnes per annum (tpa) of waste. It is proposed to increase the total annual intake to 40,000 tpa. The proposed development of the site will include the construction of:

- A new processing shed/building with a holding tank for process effluent.
- A holding lagoon for stormwater. This is to be lined with butyl rubber.
- A reed bed to treat stormwater from the lagoon. This is to be lined with plastic sheeting laid on top of clay.
- A percolation area to discharge treated stormwater to the ground. The percolation area is to be planted with willows to facilitate evapotranspiration of treated effluent during the growing season (May to October). Willow soakaways are suitable for low porosity soils such as the boulder clays which underlie the site.

An oil and solids separator, which currently operates as part of the stormwater system, will be retained.

Effluent from processing will continue to be collected in a tank and disposed of to Killarney Waste Water Treatment Plant.

1.5 IMPACTS

1.5.1 Soils and Geology

Any future construction activities will require surface soils to be stripped. This is an essential part of development and is an impact that cannot be mitigated.

There is potential for the erosion of soils during construction.

1.5.2 Hydrogeology

Should erosion of soils occur during construction this would result in the loss of soil particles to the local stream which could cause significant pollution of water through the generation of suspended solids.

The construction of a lagoon to store and treat stormwater has the potential to leak to groundwater and contaminate it if an adequate protective liner is not provided.

The construction of a reed bed to treat stormwater has the potential to leak to groundwater and contaminate it if an adequate protective liner is not provided.

The construction of a percolation area for treated stormwater had the potential to contaminate groundwater if not properly sited.

Accidental spillages of any oils or chemicals held on site during construction or operation could contaminate the aquifer via direct percolation or surface water (stream)/groundwater interaction.

The shredding of timber outdoors has the potential to contaminate groundwater if the drainage water from this area is not adequately controlled and treated. Contaminants would depend on the chemicals used to treat the timber and could include for example, creosols (coal tar derived), organochlorine pesticides, metals (copper-chromium-arsenate, boron) and light organic solvents.

Foul sewerage is to be treated via the existing septic tank by a planned puraflo system which is not part of the current proposed development.

1.6 MITIGATION MEASURES

1.6.1 Soils and Geology

Any future construction activities will be scheduled such as to minimise the area and period of time that soil will be exposed.

1.6.2 Hydrogeology

Suitable temporary drainage will be provided to intercept and divert run-off from undisturbed areas surrounding the construction area. Site runoff will be contained and treated. Settlement ponds, silt traps and interceptor drains will be employed to reduce the amount of surface runoff from the site and to trap silt before discharge to surface water.

Stockpiles (e.g. cement, fill material) and spoil heaps will be located as far as possible from drainage ditches, surface water drains and watercourses and should be covered with polyethylene sheeting.

Disturbed areas will be stabilised as soon as construction is finished.

Petroleum products will be stored within enclosed concreted/bunded areas and as far as possible from drainage ditches, surface water drains and watercourses.

A plan will be developed during the construction phase to deal with pollution incidents. The plan will identify the potential risks and sources of pollution and identify a set of measures to mitigating these risks. As part of the plan site staff will be appropriately trained in its implementation. This plan will be retained during the operational phase.

The stormwater holding lagoon and the reed bed will be lined to prevent leakage and to protect groundwater quality.

The percolation area for the reed bed will be appropriately sited accounting for ground conditions, percolation characteristics and proximity to aquifers. The percolation area shall be sited in accordance with relevant EPA Wastewater Treatment Manuals and DoE/EPA/GSI guidelines for groundwater protection.

Leakage to groundwater from the lagoon will be prevented through the use of a butyl rubber liner, and from the wetland through a plastic sheeting and clay liner. Cut off drains are to be installed to prevent clean surface water drainage entering the treatment system. The reed bed system is active year round.

The percolation area will be planted with willows to facilitate the removal of treated effluent/residual nutrients through evapotranspiration during the growing season.

The oils and solids separator will be emptied on a regular basis as appropriate and the contents removed disposed to a suitably licenced landfill.

Timber treatment is to be carried out in the concreted area which will be drained to the oil and solids separator and on to the lagoon/reed bed/willow soakaway system.

1.7 REFERENCES

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Legend

● Well



Project
Killarney Waste Disposal - WLA

Title

Well Location

Figure 1



Carraig House
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Issue Details	Project No.	MGE0031
Drawn: SK	File Ref.	
Checked: FC	Approved: SA	MGE0031M0001FD1
Scale: NTS	Drawing No.	Rev:
Date: 09/07/2004	M0001	FD1

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