



Mayo County Council

Derrinnumera Sludge Hub Centre & Leachate Treatment Facility

RESPONSE TO SECOND NOTICE IN ACCORDANCE WITH ARTICLE 14(2)(b)(ii) OF THE WASTE MANAGEMENT (LICENSING) REGULATIONS 2004, AS AMENDED

WASTE LICENCE APPLICATION REGISTER NO. W0021-02

October, 2011

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Second Article 14(2)(b)(ii) Response

PROJECT: Derrinnumera Sludge Hub Centre
& Leachate Treatment Facility –
Waste Licence Application Register No.
W0021-02

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DOCUMENT AMENDMENT RECORD

Client:	Mayo County Council
Project:	Derrinnumera Sludge Hub Centre & Leachate Treatment Facility
Title:	Response to Second Notice in Accordance with Article 14(2)(b)(ii) of the Waste Management (Licensing) Regulations 2004, as amended

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Our Ref: MFG/DOS/MMcD 1908/1a

13 October, 2011

Mr Brian Meaney
Inspector
c/o Administration
Environmental Licensing Programme
Office of Climate, Licensing & Resource Use
Environmental Protection Agency, Headquarters
PO Box 3000
Johnstown Castle Estate
County Wexford

**Re: Application Register Number – W0021-02
Response to Notice in accordance with Article 14(2)(b)(ii) of the
Waste Management (Licensing) Regulations 2004, as amended**

Dear Mr Meaney,

The following presents the response from Mayo County Council in response to a notice made under Article 14(2)(b)(ii) of the Waste Management Licensing Regulations 2004, regarding waste licence application W0021-02 in correspondence dated 29 August 2011:-

The following items were required to be addressed.

1. With reference to Article 12(1)(f) of the Waste Management (Licensing) Regulations, provide a revised Table B.7.1 and Table H.1(A).... Identifying the relevant classes of activity according to the Third and Fourth Schedules to the amended Waste Management Acts 1996 to 2011;

Please refer to **Appendix A and B**, containing the revised Tables B.7.1 and H.1(A).

Directors: L.E. Waldron (Chairman) R.F. Tobin (Managing Director) M.F. Garrick J. Colleran B.J. Downes S. Finlay P.J. Fogarty D. Grehan
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2. Provide information to address the requirements of article 12(1)(v) of the Waste Management (Licensing) Regulation, 2004 as amended, in relation to a description of how the waste hierarchy in section 21A of the amended Waste Management Acts 1996 to 2011 is applied. Please have regard to the requirements of section 29(2A) of the amended Acts in addressing this item;

Please refer to **Appendix C** for the requirements of article 12(1)(v).

3. Your reply to this notice should include a revised non-technical summary which reflects the information you supply in compliance with the notice, insofar as that information impinges on the non-technical summary;

Please refer to **Appendix D** for the revised non-technical summary.

Yours sincerely,


Darragh O Shaughnessy

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Appendix A

Revised Table B.7.1

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Table B.7.1: Third and Fourth Schedules of the Waste Management Acts 1996 to 2010

Waste Management Acts 1996 to 2010					
Third Schedule Waste Disposal Operations		Y/N	Fourth Schedule Waste Recovery Operations	Y/N	
D 1	Deposit into or on to land (e.g. including landfill, etc.).	P	<p>R 1</p> <p>Use principally as a fuel or other means to generate energy: This includes incineration facilities dedicated to the processing of municipal solid waste only where their energy efficiency is equal to or above:</p> <ul style="list-style-type: none"> - 0.60 for installations in operation and permitted in accordance with applicable Community acts before 1 January 2009, - 0.65 for installations permitted after 31 December 2008, <p>using the following formula, applied in accordance with the reference document on Best Available Techniques for Waste Incineration:</p> $\text{Energy efficiency} = (E_p - (E_f + E_i)) / (0.97 \times (E_w + E_f))$ <p>where—</p> <p>'E_p' means annual energy produced as heat or electricity and is calculated with energy in the form of electricity being multiplied by 2.6 and heat produced for commercial use multiplied by 1.1 (GJ/year),</p> <p>'E_f' means annual energy input to the system from fuels contributing to the production of steam (GJ/year),</p> <p>'E_w' means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/year),</p> <p>'E_i' means annual energy imported excluding E_w and B (GJ/year),</p> <p>'0.97' is a factor accounting for energy losses due to bottom ash and radiation.</p>	X	
D 2	Land treatment (e.g. biodegradation of liquid or sludgy discards in soils, etc.).		R 2	Solvent reclamation/regeneration.	
D 3	Deep injection (e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.).		R 3	Recycling /reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes), which includes gasification and pyrolysis using the components as chemicals.	X
D 4	Surface impoundment (e.g. placement of liquid or sludgy discards into pits, ponds or lagoons, etc.).	X	R 4	Recycling/reclamation of metals and metal compounds.	X
D 5	Specially engineered landfill (e.g. placement into lined discrete cells which are capped and isolated from one another and the environment, etc.).	X	R 5	Recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials.	X
D 6	Release into a water body except seas/oceans.	X	R 6	Regeneration of acids or bases.	

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Waste Management Acts 1996 to 2010

Third Schedule Waste Disposal Operations		Y/N	Fourth Schedule Waste Recovery Operations		Y/N
D 7	Release to seas/oceans including sea-bed insertion.		R 7	Recovery of components used for pollution abatement.	
D 8	Biological treatment not specified elsewhere in this Schedule which results in final compounds or mixtures which are discarded by means of any of the operations numbered D 1 to D 12.	X	R 8	Recovery of components from catalysts.	
D 9	Physico-chemical treatment not specified elsewhere in this Schedule which results in final compounds or mixtures which are discarded by means of any of the operations numbered D 1 to D 12 (e.g. evaporation, drying, calcinations, etc.).	X	R 9	Oil re-refining or other reuses of oil.	
D 10	Incineration on land.		R 10	Land treatment resulting in benefit to agriculture or ecological improvement.	X
D 11	Incineration at sea (this operation is prohibited by EU legislation and international conventions).		R 11	Use of waste obtained from any of the operations numbered R 1 to R 10.	
D 12	Permanent storage (e.g. emplacement of containers in a mine, etc).		R 12	Exchange of waste for submission to any of the operations numbered R 1 to R 11 (if there is no other R code appropriate, this can include preliminary operations prior to recovery including pre-processing such as, amongst others, dismantling, sorting, crushing, compacting, pelletising, drying, shredding, conditioning, repackaging, separating, blending or mixing prior to submission to any of the operations numbered R1 to R11).	
D 13	Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 (if there is no other D code appropriate, this can include preliminary operations prior to disposal including pre-processing such as, amongst others, sorting, crushing, compacting, pelletising, drying, shredding, conditioning or separating prior to submission to any of the operations numbered D1 to D12).		R 13	Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced).	X
D 14	Repackaging prior to submission to any of the operations numbered D 1 to D 13.				
D 15	Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced).	X			

Operations identified above are described in further detail as follows:

D1 – This operation is identified as the **principal activity** to be undertaken onsite. This operation concerns the continued deposition of non-hazardous waste on land at the Derrinumera landfill site. (*Status: previously licensed - ongoing works*)

This also refers to the proposed Landfilling of dried sludges arising from municipal water treatment plants and the proposed on-site leachate treatment facility.

(Status: Subject to Waste License Review – proposed works)

D4 – This operation concerns the collection, temporary storage and pumping of landfill leachate to an onsite leachate treatment facility. It is proposed that Derrinnumera landfill leachate will undergo its complete treatment at this proposed Leachate Treatment Facility. The leachate treatment facility will also accept leachate produced from the sludge treatment process in the onsite Sludge Hub Centre.

(Status: Subject to Waste License Review - proposed works)

D5 – This operation concerns the disposal of non-hazardous Waste into lined cells at the facility, *(Status: previously licensed - ongoing works);*

The construction of a cut-off wall around the site to prevent groundwater intrusion into waste body, *(Status: previously licensed, works complete);*

The collection and pumping of leachate to a leachate treatment plant, *(Status: Existing Waste Licence W0021-01 already allows for the collection of leachate for subsequent removal for treatment at the Castlebar Sewerage Treatment Works. As part of this Waste Licence Review, an application has been made for the development of an on-site Leachate Treatment Facility at Derrinnumera (subsequent to the previous An Bord Pleanála planning condition to cease leachate imports at the upgraded Castlebar Sewerage Treatment Works.);*

A top cover of low permeability soil on completion of Landfilling. *(Status: previously licensed, future works);*

The collection and flaring of landfill gas. *(Status: previously licensed, flare operational, ongoing works);*

Final shaping of the waste mound and planting to a landscape plan. *(Status: ongoing / future works);*

This also refers to the proposed Landfilling of dried sludges arising from municipal water treatment plants and the proposed on-site leachate treatment facility.

(Status: Subject to Waste License Review – proposed works).

D6 – This operation concerns the collection and discharge of surface water via sedimentation tanks, oil interceptors and surface water lagoons to adjacent streams *(Status: ongoing/proposed works)*

D8 – This operation concerns the treatment of leachate at the onsite leachate treatment facility. There will also be Sludge Hub Centre, which may utilise in-vessel composting for treatment of local authority sludge. *(Status: Subject to Waste Licence Review - proposed works).*

D9 – This operation concerns the treatment of leachate at the onsite leachate treatment facility. There will also be Sludge Hub Centre, which may utilise sludge-drying technology for treatment of local authority sludge.
(Status: *Subject to Waste Licence Review - proposed works*).

D15 – This operation concerns the storage of waste at the existing civic waste facility for eventual disposal, as well as the storage of waste not acceptable for disposal at the landfill pending its dispatch from the site to an alternative disposal facility.
(Status: *previously licensed, ongoing works*);

This also refers to the temporary storage of unacceptable sludge in the sludge quarantine area pending its dispatch from the site to alternative waste disposal facilities.
(Status: *Subject to Waste Licence Review - proposed works*).

R1 – This operation concerns the possible use of landfill gas or exhaust gases from the sludge treatment process as a fuel for the generation of energy.
(Status: *Subject to Waste Licence Review - proposed works*).

R3 – This operation concerns the reclamation of organic wastes within the civic waste facility.
(Status: *previously licensed, ongoing works*);

This also refers to the composting of treated municipal sludge as a possible second facility to thermal drying of sludge.
(Status: *Subject to Waste Licence Review - proposed works*).

R4 – This operation concerns the reclamation of metals and metal compounds within the civic waste facility.
(Status: *previously licensed, ongoing works*).

R5 – This operation concerns the reclamation of inorganic materials arising from the waste disposed at the civic waste facility.
(Status: *previously licensed, ongoing works*).

R10 – This operation concerns the use of a dried sludge product or compost as daily cover on the landfill or incorporated with soil and subsoil and used as final capping material or on earthen embankments at the Derrinnumera Landfill (i.e. as a soil supplement to encourage vegetation).
(Status: *Subject to Waste Licence Review - proposed works*).

R13 – This operation concerns the storage of wastes arising from the waste disposed at the civic waste facility for the purpose of recovery.
(Status: *previously licensed, ongoing works*).

Appendix B
Revised Table H.1(A)

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Table H.1(A: Quantities of Waste in Relation to Each Class of Activity Applied for

Waste Management Acts 1996 to 2010 3rd Schedule (Disposal) Operations		Waste Management Acts 1996 to 2010 4th Schedule (Recovery) Operations	
Class of Activity Applied For	Quantity (tpa)	Class of Activity Applied For	Quantity (tpa)
Class D 1	41,464	Class R 1	72,580
Class D 2		Class R 2	
Class D 3		Class R 3	32,580 & see H.1(A)
Class D 4	Refer to H.1(A)	Class R 4	Refer to H.1(A)
Class D 5	41,464	Class R 5	Refer to H.1(A)
Class D 6	Refer to H.1(A)	Class R 6	
Class D 7		Class R 7	
Class D 8	32,580	Class R 8	
Class D 9	32,580	Class R 9	
Class D 10		Class R 10	32,580 & see H.1(A)
Class D 11		Class R 11	
Class D 12		Class R 12	
Class D 13		Class R 13	Refer to H.1(A)
Class D 14			
Class D 15	Refer to H.1(A)		

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Appendix C

Requirements of Article 12(1)(v)

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Article 12(1)(v) of the Waste Management (Licensing) Regulations 2004, as amended, requires that the application shall "describe how the waste hierarchy in section 21A of the Act is applied".

Section 21A (1) of the Act requires that the following waste hierarchy "shall apply as a priority order in waste prevention and management legislation and policy:

- (a) Prevention;
- (b) Preparing for re-use;
- (c) Recycling;
- (d) Other recovery (including energy recovery); and
- (e) Disposal

Section 29(2A) goes on to state:

- (a) It shall be the duty of waste producers and holders to ensure that waste undergoes recovery operations in accordance with sections 21A and 32(1)
- (b) A person who contravenes paragraph (a) shall be guilty of an offence
- (c) The Agency and the local authorities, in carrying out their functions under this Act and related waste management legislation and policy, shall take the necessary measures to ensure that waste undergoes recovery operations in accordance with this section and sections 21A and 32(1).

Prevention

- It is Mayo County Council's policy in accordance with the Connaught Waste Management Plan to promote the prevention and minimisation of waste generation which will be reflected in the quantities of non-hazardous waste and dried sludge arriving at the facility.
- Following the construction of a cut-off wall to prevent groundwater intrusion into the waste body, there is also a programme of works in place to minimise the volume of leachate being generated by capping the areas inside the cut-off wall where leachate is generated and diverting the rainfall to the surface water infrastructure.

Preparing for Re-use

- Daily and intermediate cover material is re-used on site without processing.

Recycling

- The civic waste facility provides for the recycling of organic, inorganic, metals and metal compounds.
- It is proposed to compost treated municipal sludge.

- It is proposed that the dried sludge product or compost be used as daily cover on the landfill or incorporated with soil and subsoil and used as final capping material or on earthen embankments.

Other Recovery (including energy recovery)

- The possible use of landfill gas or exhaust gases from the sludge treatment process is to be investigated as a fuel for the generation of energy.

Disposal

- At the lowest end of the hierarchy the Landfilling of non-hazardous waste and flaring of landfill gas will continue
- Landfilling of dried municipal sludges, and treatment of leachate is proposed.

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Appendix D

Non-Technical Summary Revised

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ATTACHMENT A.1

NON-TECHNICAL SUMMARY (REVISED)

This non-technical summary is prepared in accordance with Article 12(l)(u) of the Waste Management (Licensing) Regulations, 2004 (S.I. 395 of 2004).

Article 12(l)

1.1 ARTICLE 12(L)(A)

The name, address and contact details of the applicant are:

Applicant Details: Mayo County Council,
Aras an Chontae,
The Mall,
Castlebar,
County Mayo.
Tel: 094-9024444
Fax: 094-9023937

Correspondence Details: Michael F. Garrick, Director,
Tobin Consulting Engineers,
Market Square,
Castlebar,
County Mayo
Tel: 094-9021401
Fax: 094-9021534

Address of registered or principal office of Body Corporate:
Not applicable.

1.2 ARTICLE 12(L)(B)

The name of the planning authority in whose functional area the relevant activity will be carried on:

The planning authority in whose functional area the activity will be carried out on is Mayo County Council. An application for approval for the proposed development has been sent to An Bord Pleanála.

1.3 ARTICLE 12(L)(C)

The name of the sanitary authority in which the sewer is vested or controlled:

The sanitary authority relevant to the proposed development is the Water Services Department of Mayo County Council.

1.4 ARTICLE 12(L)(D)

Location and national grid reference of the facility to which the application relates:

The location of the proposed development is at Derrinnumera Landfill Site, Derrinnumera / Drumilra (Townlands), Newport, County Mayo. The National Grid Reference for the proposed development is E1044, N2936

1.5 ARTICLE 12(L)(E)

Nature of the facility concerned including capacity:

Mayo County Council seek the review of Waste Licence W0021-01 to include a Sludge Hub Centre and Leachate Treatment Facility at the site of Derrinnumera Landfill Facility. The proposed development will consist of the following elements:

- *County Mayo Sludge Hub Centre (SHC)*

A **County Mayo Sludge Hub Centre (SHC)** at the existing landfill facility, which is required for the fulfilment of the Mayo Sludge Management Plan, adopted by the Elected Members in 2001, and the amended Mayo Sludge Management Plan, 2003. The SHC shall be utilised for the collection, drying, temporary storage and sustainable re-use or disposal of treated municipal sludge collected from municipal treatment plants throughout County Mayo, with design loadings of 24,731 tonnes per annum (tpa) (3,365 tDS) of wastewater sludge and 7,846 tpa (1,412 tDS) of water treatment sludge (design loadings for Year 2020). It is expected that a small amount of sludge will be imported as liquid sludge to the Sludge Hub Centre (SHC), from smaller treatment plants; the remainder will arrive at the SHC as sludge cake. Both a sludge-drying unit and a tunnel composting system are proposed for the sludge treatment process.

- *Interim Sludge Drying/Lime-Dosing System*

Interim Sludge Drying/Lime-Dosing System: The Council wish to include within the review, the option to temporarily relocate to Derrinnumera, an existing interim sludge drying/lime-dosing system, should the need arise for a short term fallback, prior to commissioning of the SHC permanent plant. The maximum expected operation period of the Interim Plant at Derrinnumera would be 3 years, processing an estimated 27,844 tonnes per annum (tpa) of sludge on start-up (but not exceeding Year 2020 design loadings listed above). This temporary plant would be retired upon commissioning of the Sludge Hub Centre permanent plant.

- *Leachate Treatment Facility*

Leachate Treatment Facility: The Council wish to implement leachate treatment at Derrinnumera, in preparation for compliance with an An Bord Pleanála instruction to cease leachate imports to Castlebar WWTP. The facility will cater for the treatment of 500 m³/day of leachate as a daily maximum. It is

proposed that landfill leachate will undergo its complete treatment at this proposed Leachate Treatment Facility. It is then proposed to pump the Leachate Treatment Facility effluent, via a pumped rising main, to the outfall of the proposed Newport Wastewater Treatment Plant.

1.6 ARTICLE 12(L)(F)

Specify classes of activity concerned, in accordance with the third and fourth schedules of the Act:

The relevant activities to which this application relates as specified in the Third and Fourth Schedule of the Waste Management Acts 1996 to 2010 are detailed below:

The principal activity to be undertaken is covered by:

Third Schedule, Class D1- 'Deposit into or on to land (e.g. including landfill, etc.)'

Other activities are as follows:

Third Schedule, Class D4- 'Surface impoundment (e.g. placement of liquid or sludgy discards into pits, ponds or lagoons etc.)'

Third Schedule, Class D5- 'Specifically engineered landfill (e.g. placement into lined discrete cells which are capped and isolated from one another and the environment etc.)'

Third Schedule, Class D6- 'Release into a water body except seas/oceans.'

Third Schedule, Class D8- 'Biological treatment not specified elsewhere in this Schedule which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D12'

Third Schedule, Class D9- 'Physico-Chemical treatment not specified elsewhere in this Schedule which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D12 (e.g. evaporation, drying calcinations, etc.)'

Third Schedule, Class D15- 'Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced)'

Fourth Schedule, Class R1- 'Use principally as a fuel or other means to generate energy'

Fourth Schedule, Class R3- 'Recycling /reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes), which includes gasification and pyrolysis using the components as chemicals.'

Fourth Schedule, Class R4- 'Recycling/reclamation of metals and metal compounds.'

Fourth Schedule, Class R5- 'Recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials.'

Fourth Schedule, Class R10- 'Land treatment resulting in benefit to agriculture or ecological improvement.'

Fourth Schedule, Class R13- 'Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced).'

1.7 ARTICLE 12(L)(G)

Specify, by reference to the relevant European waste catalogue codes, the quantity and nature of wastes, which will be treated, recovered or disposed of:

At present the existing Derrinnumera Landfill Facility is licensed to accept a quantity of waste not exceeding 40,000 tonnes per annum. The original Application submitted to the Agency for a Waste Licence at Derrinnumera (February 1998) presented the following Waste Inputs at Derrinnumera Landfill:

Table A1.1: Waste Inputs at Derrinnumera Landfill (Table abstracted from original application for Waste Licence at Derrinnumera (Feb. 1998))

Waste Inputs at Derrinnumera Landfill (Table abstracted from original application for Waste Licence at Derrinnumera (Feb. 1998))		
Waste Type	Tonnes per Annum	EWG Code ¹
Household	17,000	20 03 01
Commercial	5,800	20 03 01
Sewage Sludge	3,400	19 08 05
Construction and Demolition	2,000	17 09 04
Industrial Non-Hazardous Solids	1,750	20 03 01

Existing Waste Licence No. W0021-01 allows for the following Waste Acceptance and Handling, as stated under Condition 5 of same;

Condition 5.1 of Licence W0021-01 states:

'No hazardous waste shall be disposed of in the landfill. From the date of grant of this licence, unless otherwise agreed by the Agency, no liquid or sludge waste shall be accepted for disposal to landfill (except non-hazardous sludge and silt produced from on-site activities).'

¹ European Waste Catalogue Codes

Condition 5.2 of Licence W0021-01 states:

'Subject to Condition 5.1 only those waste types listed in Table E.1.3 of the application shall be disposed of in the landfill unless prior agreement of the Agency has been obtained.'

Condition 5.3 of Licence W0021-01 states:

'Unless otherwise agreed by the Agency, only waste types specified in Drawing No.002034/11/628 "Plan and Sections of Proposed Civic Amenity Site" shall be accepted at the civic waste facility. Household hazardous waste shall only be accepted at the facility once the requirements of Condition 4.14.3 have been satisfied.'

Condition 5.6 of Licence W0021-01 states:

'The quantity of wastes to be accepted for disposal to landfill at the facility shall not exceed 40,000 tonnes per annum, unless otherwise agreed in advance with the Agency.'

1.7.1 Current Situation:

The development is sited on an existing landfill facility, which is currently licenced for 40,000 tpa of non-hazardous waste for disposal to landfill. The municipal waste accepted here includes both household and commercial waste. According to the 'Replacement Waste Management Plan for the Connaught Region 2006-2011', 64% of municipal waste produced in Mayo is household waste and 36% is commercial waste.

Therefore, it can be assumed that out of 40,000 tpa of non-hazardous landfill waste:

64% = Household Waste = 25,600 tpa
36% = Commercial Waste = 14,400 tpa

It should be noted however, that although the sum of above amounts account for the maximum amount licensed (i.e. 40,000 tpa), the actual amount of non-hazardous landfill waste accepted at Derrinmera Landfill varies annually. (Refer to Section 1.1 of the EIS for actual waste acceptance values).

1.7.2 Proposed Development:

The following is the nature and quantity of the waste, which will be treated/recovered/disposed at the proposed development (above landfill figures should also be included when considering total future quantities of waste to be accepted at the facility as a whole):

Table A1.2: Waste Inputs for Proposed Development of a Sludge Hub Centre and Leachate Treatment Facility at Derrinumera

Waste Inputs for Proposed Development of a Sludge Hub Centre and Leachate Treatment Facility at Derrinumera		
Waste Type	Tonnes per Annum	EWC Code ²
Waste Water Treatment Sludge	24,731 tpa	19 08 05
Water Treatment Sludge	7,846 tpa	19 09 02
(Include for sludge from LTF itself)	289 tpa	19 08 12
Landfill Leachate	500 m ³ /day (max.)	19 07 03

1.8 ARTICLE 12(L)(H)

Specify the raw and ancillary materials, substances, preparations, fuels and energy, which will be utilised in or produced by the activity:

The table below presents an estimate as to the consumption of materials used on-site. The final raw materials, substances, preparations and energy requirements for each facility will be agreed with the Agency prior to construction of each facility.

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² European Waste Catalogue Codes

Table A1.3: Estimation of Raw Material, Substances, Preparations and Energy Requirements for Proposed Facilities

Estimation of Raw Materials, Substances, Preparations and Energy Requirements for Proposed Facilities			
Material/Resource	Sludge Hub Centre	Leachate Treatment Facility	Comments
Hydraulic Oil	c. 3,650 litres/annum	c. 1,000 litres/annum	Exact quantities not available at present
Electricity	Power Consumption not available at present until processes and technologies to be used are outlined*	Power Consumption not available at present until processes and technologies to be used are outlined	Electricity usages will include pumps and aeration systems in leachate treatment and powering permanent sludge drying plant and dewatering presses* (including small quantity for domestic usage).
Diesel	Interim sludge drier will be diesel fuelled	Diesel unlikely to be used as fuel for this facility	Quantities not available at present, banded storage area will be provided
Water	Water usage not available at present, cooling water will be required for drying process**	Water usage not available at present	Main usage is likely to be domestic usage within SHC Administration Building of c. 1000 m ³ /annum

* It is anticipated that natural gas will be the main fuel source for the permanent sludge drier. The consumption rate is unavailable at present. The potential to use landfill gas as an auxiliary fuel shall be investigated, and used if found feasible and cost effective, subject to regulatory requirements. Microturbine options that generate power and heat from natural gas shall also be considered in the context of the overall heat balance and energy requirement of the Hub Centre.

** Water used for cooling will be recycled insofar as possible.

1.9 ARTICLE 12(L)(I)

Describe the plant, methods, processes, ancillary processes, abatement, recovery and treatment systems and operating procedures for the activity:

It is proposed to develop two facilities, i.e. a Sludge Hub Centre (SHC) and a Leachate Treatment Facility (LTF) as one individual contract at the site of the Derrinurera Landfill Facility. The facilities will be developed as a Design Build and Operate Contract, with both facilities being developed and operated by a single private contractor. The whole facility will be covered by a single planning approval and waste licence, with Mayo County Council being the licence and permission holders.

The exact nature of the treatment processes or technologies will emerge from the procurement process and thus have yet to be agreed. The following is a brief description of the processes to be carried out at each facility.

1.9.1 Sludge Hub Centre (SHC):

The Sludge Hub Centre will be constructed and operated under contract for the collection, drying, temporary storage and sustainable re-use or disposal of treated municipal sludge collected from wastewater and water treatment plants throughout County Mayo. The method of production of bio solids will be subject to assessment of tenders, however the most probable option will be thermal drying, with sludge composting as a second facility. The successful tenderer will have to submit a design incorporating the best practicable technology that demonstrates minimal environmental effects during the construction and operation of the facility.

It is proposed that the Sludge Hub Centre will be fenced off at the existing Derrinnumera Landfill Site, and it is envisaged that the Sludge Hub Centre will accept an estimated 27,844 tonnes per annum on start-up. This figure has been estimated to rise to 32,580 tonnes per annum (sewage sludge and waterworks sludge) by 2020. These sludge quantities take into account sludges arising from wastewater and water treatment plants in County Mayo at the expected tonnages when entering the SHC.

For the sludge treatment process both a sludge-drying unit and a tunnel composting system is proposed. The most likely treatment outcome is that 80% of the sludge intake will be treated by the permanent sludge drier and 20% of the intake will go to the composting facility. The principal elements involved in the SHC at Derrinnumera will include:

- Sludge Reception and Handling;
- Sludge Thickening and Dewatering;
- Permanent Sludge Drier;
- Tunnel Composting System;
- Interim Sludge Treatment (may be required prior to commissioning of Permanent Sludge Drier); and
- Finished Product Transportation.

1.9.1.1 Sludge Thickening and Dewatering:

It is expected that a small amount of sludge will be imported as liquid sludge to the SHC, from smaller treatment plants, the remainder will arrive at the SHC as sludge cake. The dewatering system will produce a dewatered sludge with a minimum dry solids content of 17.5% or within a suitable range above this point consistent with the landfill licence. The proposed dewatering system will be provided complete with a fully enclosed dewatered sludge handling system.

1.9.1.2 Permanent Sludge Drier:

To the extent that this is a Design Build Operate Contract, the appointed Contractor will have relative freedom in designing the drying process units that he feels are most appropriate for the project in terms of economic design from both the constructional and operational perspective. There are many variants of thermal driers, but all require energy input to release the molecular entrained water. Drying is

achieved either by convection drying when hot gas / air is blown through the sludge or by conduction drying whereby the sludge is brought into contact with a heated surface.

The sludge drier will be capable of providing a minimum 90% DS final product in a 2-5mm hard round pellet form. Atmospheric emissions from such a drying system would be required to comply with TA Luft 2002 requirements.

Biosolids produced from the drying of sludge arising from wastewater treatment plants will have a beneficial re-use as fertiliser to be transported off-site and landspread.

The SHC will be required to dry waterworks sludge (along with surplus sludge generated from the leachate treatment process itself) on a batchwise basis (separately from municipal wastewater treatment plant sludge) in order to minimise the end volume of sludge and to improve stability and handleability. This dried sludge will then be placed on the adjacent landfill.

1.9.1.3 Tunnel Composting System:

To the extent that this is a Design Build Operate Contract, the appointed Contractor will have relative freedom in designing the composting process units that he feels are most appropriate for the project in terms of economic design from both the constructional and operational perspective. An in-vessel composting system, such as tunnel composting, hangar composting or container composting, is best suited amongst biological treatment options for the treatment of municipal sludge. Of the in-vessel composting technologies, the tunnel composting system is the most efficient, reliable and flexible. A typical tunnel composting facility will comprise a fully enclosed dedicated warehouse-type building, with all treatment processes, including acceptance of waste, composting, refinement and storage of final products carried out within the building.

The main features of a tunnel composting system would be:

- Composting tunnels, usually constructed with reinforced concrete;
- The dimensions of each tunnel are typically 30m in length, 6m in width and 6m in height;
- The front end of each tunnel typically comprises an air-tight retractable steel door;
- A concrete aeration floor, through which air is blown, is installed underneath each tunnel, with aeration channels embedded in the concrete floor. These channels would also collect any leachate and process water;
- An air blower/ventilator would be installed at the back of each of the composting tunnels, to supply air to the individual aeration floors of each of the tunnels. The ventilators feed the aeration floors via channels connected through the concrete retention wall;
- An air collection duct would be installed over the middle of the compost in the tunnels to collect the process air. The collected air would be fed to an air treatment system, i.e. air scrubber and biofilter.

The compost can be either utilised on-site for landscaping and restoration purposes, or bagged for re-sale.

1.9.1.4 Interim Sludge Treatment:

The Council wish to include within the review, the option to temporarily relocate to Derrinnumera, an existing interim sludge drying/lime-dosing system, (currently located at Ballina WWTP), should the need arise for a short term fallback, prior to commissioning of the SHC permanent plant. This temporary plant would be retired upon commissioning of the Sludge Hub Centre permanent plant.

The interim plant would be approximately 4 to 5 years old and would consist of initial lime dosing by auguring of slaked lime into dewatered sludge cake at 11-12% DS. The lime/sludge mixture would then be passed through a diesel-fuelled drum drier, with temperatures varying from 180°C to 400°C. The residence time in the drier would be approximately ten minutes.

The final dried sludge/lime product typically reaches a dry solids content of up to 65% DS, with a lime content of 10% expressed by wet cake weight. It can be reused as a cover material and as a soil supplement to encourage vegetation on earthen embankments at the Derrinnumera Landfill. It would be intended to carry out this practice for the interim period.

1.9.1.5 Dried Product Handling and Storage:

Dried product will be cooled and stored in a safe manner in dried product storage silos or equivalent ground bins. The dried product storage capacity shall be at least equivalent to one week's production at average throughput rates. Dried product will be transported off site either in bulk, or in bagged form. A bagging unit shall be provided adjacent to the dried product storage area, linked to the storage bins or silos by means of conveyors.

The design of the SHC and ancillary works shall be in accordance with Best Available Techniques (BAT) and shall be such as to facilitate the operation, monitoring, sampling and maintenance of all processes and equipment. The process and equipment chosen shall have been used successfully in similar sized plants treating similar type sludges.

The SHC and ancillary works shall be designed and constructed in accordance with best national and international practices, and shall be operated to the requirements set out in the Contract Documents.

1.9.2 Leachate Treatment Facility (LTF):

Mayo County Council wish to include leachate treatment in the scope of the DBO Contract at the proposed SHC. As this is a Design Build and Operate (DBO) project, the exact nature of leachate treatment processes or technologies will emerge from the procurement process and thus have yet to be agreed.

The contractor will be required to design, build and operate a suitable and complete secondary and tertiary treatment system. The following process options will be considered for effective treatment of the leachate.

- Air stripping/aeration in lagoons or SBR processes;
- Reed beds;
- Rotating biological contactors;
- Membrane filtration;
- Chemical precipitation;
- Electrolytic oxidation;
- Reverse osmosis;
- Other proven systems.

The tendering contractor will offer the system that he considers to be the most economically advantageous, and which consistently achieves the required treated leachate standards.

However, no leachate treatment process will be acceptable from the procurement process that is not based on proven technology. A process based on proven technology is defined as a process which:

- Has been demonstrated to have at least three (3) years satisfactory use at reference sites with stable process conditions;
- Has been employed successfully on at least three leachate treatment plants of similarly sized loadings and modules as proposed, treating a similar effluent to that of Derrinnumera and achieving the effluent standards required;

For the leachate treatment process the EIS describes a sequencing batch reactor (SBR), since activated sludge processes work well with this type of leachate, but it shall include further polishing such as precipitation or membrane technology in order to achieve the required standards.

The design of the LTF and ancillary works, including any such elements of the existing leachate handling works as are retained, shall be in accordance with Best Available Techniques (BAT) and shall be such as to facilitate the operation, monitoring, sampling and maintenance of all processes and equipment. The process and equipment chosen shall have been used successfully in similar sized plants treating similar type leachates. The LTF and ancillary works shall be designed and constructed in accordance with best national and international practices, and shall be operated to the requirements set out in the contract documents.

To ensure that the optimal process control is maintained, monitoring equipment and sampling facilities shall be provided. The influent flow from the leachate lagoon and effluent from the leachate treatment works shall be monitored and automatically sampled as specified. Sampling facilities (for "grab" samples) shall be provided after every process step in the liquid stream and in the sludge stream.

All contaminated stormwater from the waste acceptance area, and runoff from the circulation roads and hard surfaces, which is not to be discharged to the surface water system around the landfill, and has been designated as 'grey water' by the EPA, shall be included in the leachate collection system.

The DBO Contractor will be expected to manage the balancing capacity of the lagoon and holding tanks, so as to permit any necessary priority to be given to such stormwater flows as the pumping stations that handle it may require. On the basis of water balancing of the landfill, the leachate volume

to be treated has been calculated at 500m³ as a daily maximum. The contractor will be required to provide an appropriate volume of storage on-site, which will also allow any leachate discharges to tankers in the event of process failure or planned maintenance downtime of the Leachate Treatment Facility.

It is proposed to deliver the treated leachate to the outfall of the proposed Newport WWTP via a pumped rising main on the selected route shown on Drawing No. 1908-2403. The treated leachate pipeline will terminate at the head manhole on the outfall of the Newport WWTP treated effluent discharge. The pipeline will be constructed in 200mm Nominal Diameter HPPE or HDPE, and will be laid in trench in the road margin over most of its route.

It should also be noted that it is not proposed that leachate be treated in the proposed Newport Waste Water Treatment Plant as appropriate treatment facilities will be provided at Derrinnumera Leachate Treatment Facility in accordance with Environmental Protection Agency requirements enforced through the Waste Licence for the landfill.

1.10 ARTICLE 12(L)(J)

Provide information for the purpose of enabling the agency to make a determination in relation to the matters specified in paragraphs (a) to (g) of section 40(4) of the act:

All aspects of the management of the Derrinnumera SHC and LTF will be committed to the principle of 'Best Available Techniques (BAT).

The facilities at the SHC and LTF will be operated in accordance with the relevant EPA BAT Guidelines and the following operational principles will apply:

- All waste handling operations will take place on hardstand areas;
- All equipment will be manufactured to the highest modern standards by a reputable manufacturer, incorporating elements such as a high degree of power efficiency and noise abatement;
- Each facility will be kept clean at all times and there will be regular checks for any evidence of litter outside all the main buildings;
- All the foul wash water generated during daily activities, i.e. daily cleansing of the hardstand areas, will be collected and either discharged following attenuation and interception or will be diverted to the foul sewer,
- The site will landscaped in a manner appropriate to the area; and
- The facility will be consistent with the objectives of the 'Replacement Waste Management Plan for the Connaught Region 2006-2011';

1.11 ARTICLE 12(L)(K)

Give particulars of the source, location, nature, composition, quantity, level and rate of emissions arising from the activity, and where relevant, the periods during which such emissions are made or are to be made:

1.11.1 Emissions to Surface Water:

The development of the proposed SHC and LTF will result in additional stormwater run-off generation from the impermeable surfaces on the site. This will result in increased run-off to drainage. The total impermeable area of the proposed development is unknown (this will be established under the DBO Contract), however, it is likely that much of the proposed area will be paved. Surface run-off from roads and hardstandings within the facility will be fed through a grit tap and petrol/oil interceptors. The runoff will then be diverted through settlement lagoons prior to outfall to the surface water drainage network.

1.11.2 Emissions to Groundwater:

There will be no emissions to groundwater as a result of operations at the proposed SHC and LTF.

1.11.3 Noise Emissions:

The nature and scale of the proposed development is such that noise emissions will arise during daytime from a number of fixed and mobile sources. In addition, there will be noise emissions arising during night-time from certain items of equipment, including the LTF.

The final design and the operation of the proposed SHC and LTF will proceed with regard to the need to mitigate noise emissions. However, the overall development is unlikely to cause any significant noise impact at any noise sensitive location. Provision of the mitigation measures outlined in the EIS will ensure the proposed development will proceed with negligible noise impact to the surrounding community.

There will also be noise emissions generated from the traffic delivering sludge, etc. to the various facilities on-site and from bringing materials off-site.

1.11.4 Dust Emissions:

The construction of the SHC and LTF has the potential to create a problem in relation to dust emissions. Wind blown dust emissions may arise during the construction phase of the proposed developments, although given the significant distance of at least 1km to the nearest dwelling, it is envisaged that there will not be a negative impact on these residents. Mitigation measures implemented during the construction phase will ensure that there will be no significant dust emissions.

During the operational phase, dust emissions will be negligible due to the nature of the materials to be handled and the fact that material handling will take place indoors.

1.11.5 Odour Emissions:

An odour impact assessment was carried out using latest odour measurement techniques. Five scenarios were chosen to estimate the worst-case potential odour impact from the current/proposed Derrinmera Site.

In summary of the assessment, a worst-case odour-modelling scenario was chosen to estimate worst-case odour impact from the proposed site. Results from the modelling confirm that, provided best practice techniques are employed at the proposed facility, no significant odour impact will be perceived in the vicinity of the operated Derrinnumera site, with all residents perceiving an odour concentration of less than $1.0 \text{ Ou}_E \text{ m}^{-3}$ for 175 hours in a worst-case meteorological year. It is predicted that identified residents will perceive an odour concentration of between $0.1 \text{ Ou}_E \text{ m}^{-3}$ and $0.7 \text{ Ou}_E \text{ m}^{-3}$ for 175 hours in a worst-case meteorological year. In accordance with odour annoyance criterion (as detailed in Section 4.7 of the EIS), and in keeping with current recommended odour annoyance criterion in this country, the Derrinnumera proposed site operations will in all likelihood not lead to odour nuisance.

1.11.6 Emissions to Sewer:

It is proposed that Derrinnumera effluent and landfill leachate will undergo its complete treatment at the LTF prior to discharge to the outfall of the proposed Newport WWTP. The Derrinnumera final effluent will combine with Newport WWTP final effluent prior to discharge to the proposed Newport WWTP outfall location.

The nature of the final emission to the receiving water is dealt with in both the accompanying EIS (Section 4.4) and in the Newport Sewerage Scheme EIS, which has been published in parallel with this application.

The maximum volume of treated leachate to be discharged per day will be $500 \text{ m}^3/\text{d}$. The estimated volumetric contribution of the site emissions to the total volume to be discharged from the Newport combined outfall will be 47%.

1.12 ARTICLE 12(L)(L)

Give details and assessment of effects of existing or proposed emissions to the environment, including any environmental medium other than that into which emissions are made, or are to be made, and of proposed measures to prevent or eliminate or, where that is not practicable, to limit or abate such emissions:

1.12.1 Human Beings:

1.12.1.1 Effect of Traffic on Population: Construction Phase

The delivery of building materials will lead to an increase in traffic volumes during the construction of the facility, however the effects will be short term and will be similar in scale to any medium construction project.

The construction of a pumped rising main for transfer of treated leachate from Derrinnumera Leachate Treatment Facility to Newport will have a short-term impact on traffic patterns in the affected area.

1.12.1.1.1 Mitigation Measures:

Traffic management plans will be compiled in accordance with the requirements of the Chapter 8: Traffic Signs Manual, Department of Environment, 2006 to ensure the smooth and safe flow of traffic along the pipeline route.

In the interests of avoiding interruptions in traffic flow the Contractor will be required to phase the works so that a maximum of 100m of pipework can be constructed at any one time. Complete Road closures will not be permitted, and access will be maintained at all times for private entrances and business premises affected by or adjacent to the works.

1.12.1.2 **Effect of Traffic on Population: Operational Phase**

The main concerns regarding the operation of the proposed development is the increase in traffic volumes at the site and on the adjoining road network. However, a reduction in HGV traffic must also be considered due to the future discontinuity of tanker transport of leachate from the site with the introduction of the Leachate Treatment Facility. As the current landfill has been in existence for over three decades, the proposed Sludge Hub Centre should not unduly impact on the population, especially when the distance to the nearest habited dwelling is taken into account (1km).

1.12.1.2.1 Mitigation Measures:

Overall, it is expected that the decrease in HGV traffic will effectively cancel out any increase in HGV traffic volume, thus preserving the present traffic situation at Derrinmera.

1.12.1.3 **Possible Effects of Sludge Transportation Vehicles on Population**

The transportation of sludge to the site has the potential to impact on the population as a result of spillages of dewatered sludge from vehicles.

1.12.1.3.1 Mitigation Measures:

In order to combat this licensed contractors will transport the sludge to the site using vehicles that are sealed, roadworthy and that meet the relevant standards for sludge transport vehicles.

1.12.1.4 **Impacts on Agriculture and Landuse**

The proposed development, during its construction and operational phases will have no impact on any agricultural lands, as the development is to be located on the site of the existing landfill and land use in the immediate area is deemed negligible. The impacts of the proposed development have the potential to be significant, in a worst-case scenario, as a result of fugitive emissions.

Mitigation Measures:

Current landfill activities do not adversely affect farming operations. The treatment facility will be operated under best practice guidelines at all times so that negative impacts shall not be felt in the surrounding areas as a result of the development.

1.12.1.5 Effects on Amenities and Tourism

The proposed development has the potential to impact negatively on the amenities and tourism in the area, though; there is no major tourist attraction within 9km of this development. The nearest walking route is located 3km from the site. The current landfill however has been in operation for over three decades and has not impacted on the popularity of this walking route.

1.12.1.5.1 Mitigation Measures:

The on-site surface water collection system limits the potential of pollution to the associated water channels. Therefore the amenities at Beltra Lough and Newport River will not be impacted upon.

Since the proposed Sludge Hub Centre and Leachate Treatment Facility is to be sited at the existing landfill site behind Cell 1, the visual impact of the proposed development will not cause any significant impact.

1.12.1.6 Effects on Traffic and Construction Traffic on Property

The main potential impacts on dwelling houses will occur during the construction phase of the development from increases traffic and related noise. However, traffic increases will be negligible due to the constant history of landfill activity, construction and capping over the last few years at this site.

In relation to the possibility of devaluation of residential and other properties adjacent to the site it is concluded that, when the development is built and operated in accordance with the proposed plans, that any adverse impact on the overall value of the property in the area will be negligible.

1.12.1.6.1 Mitigation Measures:

The visual impact of the proposed Sludge Hub Centre and Leachate Treatment Facility at the existing landfill site is also limited due to its location behind Cell 1.

1.12.1.7 Safety and Security

On site impacts regarding the health and safety of this proposed development, relate primarily to concerns about individuals either straying or trespassing into the subject area. In the case of workers and visitors to the site, the day to day operation of this development, including any activities associated with site machinery and on-site vehicles, and additionally how visitors are to present and conduct themselves when engaging with the proposed SHC and LTF, will be undertaken in compliance with all health and safety legislation pertaining to such.

Health and safety concerns also relate to treated leachate pipeline construction along the R311 public carriageway.

1.12.1.7.1 Mitigation Measures:

The proposed SHC and LTF will be designed, constructed and operated in accordance with in accordance with relevant health and safety legislation. Site Specific Health and Safety Plans shall be provided and adhered to for both construction and operational phases in accordance with relevant legislation.

Fencing shall be put in place around the proposed Sludge Hub Centre and Leachate Treatment Facility so as to maximise safety and security at the site. Only people depositing sludge or involved in monitoring or otherwise authorised by Mayo County Council will be permitted to enter the SHC or LTF site. Access to the site outside of normal operational hours is not permitted unless specifically authorised and supervised by Mayo County Council.

Prior to the commencement of the pipeline construction works the Contractor will be required to provide detailed traffic management plans, compiled in accordance with the requirements of Chapter 8: Traffic Signs Manual, Department of Environment, 2006 (or any subsequent amendments thereof).

In the interests of public safety, all appropriate traffic control and safety measures will be put in place and maintained on a continuous basis, i.e. traffic cones, traffic cylinders, temporary traffic signage and lighting. The Contractor will be required to appoint a Traffic Safety and Control Officer to liaise with the Gardai and put into immediate effect any traffic measures considered necessary to ensure the safety of the public.

1.12.2 *Ecology*

1.12.2.1 **Development Site:**

The Sludge Hub Centre and Leachate Treatment Facility will be constructed at the Derrinmera landfill in an area that has been cleared of vegetation and potential habitats, therefore the potential impact on flora and fauna is negligible. The proposed development will be in the catchment of the Newport River cSAC, however, during operation there will be no release of pollutants, siltation or leachate to watercourses in the area. Therefore indirect impacts on the cSAC will be very unlikely with appropriate water quality control measures in place.

Consideration will be given to avoidance and reduction of impacts on the ecological environment at all stages, however, as with all development, some degree of impact is inevitable.

1.12.2.1.1 Mitigation Measures:

Detailed mitigation measures are set out in order to lessen the potential impact, which will include appropriate handling, storage and treatment of all hydrocarbons used during the construction stage, surface runoff from roads and hard standings, leachate, and silt-laden runoff, thus avoiding potential

adverse impacts on watercourses. In periods of warm weather, the spraying of insecticides may augment fly control, however this will be carried out using best practice techniques and kept to a minimum at all times.

The Sludge Hub Centre and Leachate Treatment Facility are to be located in the grounds of an existing landfill thus mitigating against the need to construct the development in a green field site. There will be no removal of trees or other areas of semi-natural habitat during construction.

1.12.2.2 Pipeline Construction

Pipeline construction impacts on ecology will include habitat disturbance due to trench excavations. Apart from a relatively short length of hedgerow along the route, there are no hedgerows or tree lines of note. None of these habitats are of significant conservation value and disturbance by the development is rated as an impact of Minor significance.

The Newport River cSAC is an important site for the pearl mussel (*Margaritifera margaritifera*) and the Atlantic salmon, species that are listed on Annex II of the EU Habitats Directive. Other important species such as otter and kingfisher also occur. As pollution incidents during construction could affect the food supplies of these important species, suitable mitigation measures to counteract this occurrence will be enforced.

1.12.2.2.1 Mitigation Measures:

If disturbance of any of the ground between the Newport River and existing road this sensitive area is necessary, works will be strictly supervised by an ecologist. Any native species disturbed during pipeline construction shall be replaced with a similar species (probably mostly hawthorn and ash), whilst non-native species such as sycamore should be replaced with ash or oak. Banks and ditches that are disturbed shall also be re-instated.

During the construction phase, strict pollution control measures will be taken to prevent run-off or other pollutants from entering the Newport River and potentially affecting the food supplies of otter and kingfisher, and to prevent potential run-off from reaching the three small lakes close to the R311 (Doogan Lough, Tully Lough, Cuilmore Lough).

Given that the extent of the pipeline proposed to run along the Newport River (up to 1.5km), and the fact that it coincides with the main concentration of the mussel population, all reasonable efforts will be made to keep the pipeline trench as great a distance as possible from the bankside of the Newport River. Where this is not possible, the contractor will be required to provide proposals for stringent siltation prevention along the pipeline route and to provide contingency planning in regards to the risk attached to pipe laying as regards siltation episodes.

Where the pipe crosses the river, it is intended to sleeve the pipe with a larger diameter pipe laid beneath the riverbed, with the sleeve terminating in a chamber on each side of the river. Consultations will be undertaken with the National Parks and Wildlife Service in advance of this construction. It is proposed an ecologist will strictly supervise that river crossing works.

1.12.2.3 Treated Leachate Pipeline Operation:

In terms of risks associated with the treatment of the leachate, and transfer of treated leachate to the outfall, these risks can be broadly categorised as follows:

- Power Failure or Mechanical Failure at the Leachate Treatment Plant or at Newport WWTP;
- Bursting or blockage of the treated leachate pumped pipeline;
- Accidental damage to the treated leachate pumped pipeline;
- Low-level leakage from the pipeline.

(a) Power Failure or Mechanical Failure:

In terms of mechanical reliability, or in the event of a power failure, raw leachate collected from the unlined waste-body (below the lined cells) will continue to flow to the lagoon as it does at present. Similarly, leachate pumps, which would normally lift leachate from wells within the lined cells directly to the treatment plant, will automatically shut down, allowing leachate levels to temporarily accumulate within the cells, which is permitted to a depth of 1 metre on the base liner. A suitable emergency valved bypass facility (to be installed) will intercept any leachate, which has to be pumped to remain within this temporary storage constraint. Intercepted leachate will then flow gravitationally to the lagoon for storage. The lagoon will be kept drawn down as its' normal condition, so that this storage capacity will be available when needed.

The Lagoon pumps will not lift leachate for treatment on power failure, and neither will the treated leachate pumps deliver into the pipeline, while power supplies are out. A SCADA signal on power failure will in any case prevent the treated leachate pumps at Derrinnumera starting up. Equally, in the event of power interruption at the municipal treated effluent pumps at Newport WWTP, a SCADA signal will prevent the treated leachate pumps at Derrinnumera starting up. Therefore, for the duration of a power or mechanical failure at either treatment plant, treated leachate will not be pumped to Newport, and balancing facilities will be utilised in Derrinnumera to accommodate this leachate.

(b) Bursting or blockage of the treated leachate pumped pipeline:

The leachate treatment process will have a clarification phase as a minimum and may also include a filtration stage. The risk of blockage of the treated leachate pipeline is therefore small. Nonetheless it will be equipped with Scour Valves at the lowest points of its longitudinal section, with the scour discharge taken into sealed offline chambers from which scoured washdown of the line would be removed by tanker.

The impacts associated with bursting of the treated leachate pumped pipeline, would result in an accidental release of treated leachate to the surrounding lands and watercourses and at worst case entering Newport River, which is a water supply source for Newport Village and its environs. Treated Leachate in this pipeline will already meet standards as described below. Mitigation measures for this risk are outlined below.

(c) *Accidental damage to the treated leachate pumped pipeline:*

Accidental damage to the treated leachate pipeline again could also result in an accidental release of treated leachate. Mitigation measures for this risk are outlined below.

(d) *Low-level leakage from the pipeline:*

It is possible that low-level leakage could also occur as a result of minor accidental damage to the pipeline, short of a visually noticeable burst. This would lead to an accidental release of treated leachate to the surrounding environment. Mitigation measures for this risk are outlined below

The treatment of leachate being discharged into Clew Bay will be to an appropriate standard based on limits specified in Irish legislation. The design philosophy has been to comply with the Urban Waste Water Treatment Regulations, 2001 and to otherwise treat the leachate such that the environmental quality standards specified in the Water Quality (Dangerous Substances) Regulations, 2001 and European Communities (Quality of Shellfish Waters) Regulations, 2006 are already attained in the pipeline prior to discharge to the receiving environment. The Environmental Protection Agency have a key role in establishing discharge standards for the treated leachate at Derrinnumera landfill as part of the Waste Licence review which is currently being conducted.

The accidental release of a leachate, which has been treated to these very high standards, would have a minimum impact on the environment into which it leaks. Nonetheless it is very important to ensure that accidental releases of treated leachate does not occur, therefore numerous mitigation measures will be put in place along the entire route of the pipeline

A Pipeline Construction Methodology was prepared as a proposed mitigation measure to prevent against potential impacts from treated leachate pipeline construction and operation. The methodology includes such elements as: the isolation of pipeline sections for leakage detection purposes; the use of marker posts and marker tape, which will be responsive to electronic detection equipment, used at the surface to locate the position of the pipeline (this would alert any machine driver as to the presence of the pipeline, it would also prevent accidental misinterpretation of it as a watermain or other service); sleeving of pipelines where the pipeline crosses a stream or river to prevent accidental release of treated leachate to watercourses, etc.

Welding of pipelines to be carried out by specialist pipeline welders, each certified as competent to do this work, under controlled conditions.

In terms of pipeline bursting, this would be evident from the change in pressure conditions as experienced at the pumping station for any burst which occurred close to that station, if it were not evident by visual means near the burst site. In accordance with normal flow monitoring at both Derrinnumera and Newport, two flow meters will be installed on the pipeline, one at the treated leachate pumping station at Derrinnumera, and the other immediately prior to the combined outfall at Newport WWTP. In the case where there is a detected instantaneous difference in flow-rate, greater than 15%, showing up on the two flow meters, (thus indicating a possible significant loss of leachate along the pipeline route), an investigation to determine the cause of this deviation will be carried out immediately and an automatic shutdown facility will be immediately triggered. Similarly, if the sum of the daily bulk

flows differs from meter to meter by more than 10% on any one day, this will again warrant an immediate investigation. The treated leachate pipeline would be a continuously welded pipeline, pressure tested at the time of its construction, and before being commissioned to carry treated leachate. If low-level leakage were subsequently suspected, the pipeline can be divided into convenient lengths for testing purposes by closure of valves along it, in a sequential manner, until the section unable to sustain a test pressure is identified. If it is found that a leakage of leachate is the probable cause for these anomalies in flow readings, step testing of the pipeline between valve chambers will be undertaken to identify the location of the leak. Again the lagoon at the headworks would provide sufficient balancing capacity to interrupt the discharge, repair the burst or leak, and if necessary mobilise tankers to transport the treated leachate on a temporary basis to the Westport Main Drainage system.

1.12.3 Impacts on Soil, Geology and Hydrogeology:

Removal of peat, unconsolidated subsoils and some bedrock is deemed necessary to facilitate construction of the proposed Sludge Hub Centre and Leachate Treatment Facility, which will be a direct and permanent effect. However, this is not considered to be a significant negative impact.

Mitigation Measures:

Any water ingress encountered by removal of subsoils and bedrock during the construction phase will be intercepted and diverted to an existing drainage channel.

Permanent groundwater monitoring wells exist at the landfill site; from which routine sampling will be carried out during both the construction phase and the operational phases to ensure that no adverse impact occurs that is associated with its development.

1.12.4 Impacts on Water (Development Site):

1.12.4.1 Construction Phase - Runoff from Development Site

During the construction phase of the proposed development, it is likely that peat washings and a high content of suspended solids will be added to the drainage channels that drain the subject site. This is not considered to be a significant negative impact as the drainage channels flow to a settlement pond prior to discharge to the Glaishty River, enabling settlement of any peat washings and suspended solids prior to discharge. Furthermore this impact is short-term and temporary, during the construction phase only.

1.12.4.2 Groundwater/Surface Water Resource Protection

The proposed development would have potential to cause groundwater and surface water contamination from vehicular fuel spillages and accidental sludge spillages on the sludge reception area, or from potential spillages from material storages on site.

1.12.4.2.1 Mitigation Measures:

The proposed development is to be founded on a concrete hardstand and it is proposed that any surface water runoff on the concrete hardstand area will be diverted to the existing surface water collection network to ensure that no contaminants discharge from the site. It is not envisaged that implementation of the proposed development will have any increased impact on the quality of the underlying groundwater resources.

1.12.4.3 **Stormwater Runoff**

The development of the proposed Sludge Hub Centre and Leachate Treatment Facility will result in additional stormwater runoff generation from the impermeable surfaces on the site. However, it is likely that much of the proposed development will be paved. This will reduce the amount of effective rainfall infiltrating the soil and bedrock aquifers.

1.12.4.3.1 Mitigation Measures:

This is a direct, long-term effect but is not considered to be a significant negative impact given that there is an existing stormwater management system at the landfill site that can accommodate this additional runoff. Stormwater collected from roofs can be collected and used as process water in the operations of the proposed Sludge Hub Centre.

1.12.5 *Impacts on Water (Proposed Pipe-Laying)*

1.12.5.1 **Construction Phase – Pipe-laying of Treated Leachate Rising Main**

The provision of a treated leachate rising main between Derrinnumera Leachate Treatment Facility and Newport WWTP combined outfall will involve a pipe-crossing of the Newport River in a location upstream of Newport Town, along with the pipe-crossing of several streams on route. In addition, there are a number of small loughs, which, although will not be directly affected by excavation works, are in close proximity to the pipeline route. The primary impact associated with pipe laying is the potential occurrence of silt pollution events.

1.12.5.1.1 Mitigation Measures:

Stringent mitigation measures will be put in place for the prevention of such an event. During the construction phase, strict pollution control measures will be taken to prevent run-off or other pollutants from entering the Newport River, and to prevent potential run-off from reaching the three small lakes close to the R311 (Doogan Lough, Tully Lough, Cuilmore Lough).

1.12.5.2 **Potential Impacts from Accidental Spillages/Breakages of Treated Leachate Pipeline**

As stated in the 'Treated Leachate Pipeline Operation' in the Impacts on the Ecology Section of this document, the impacts associated with bursting, blockage or accidental damage to the treated leachate pumped pipeline, would result in an accidental release of treated leachate to the surrounding lands and

watercourses and at worst case entering Newport River, which is a water supply source for Newport Village and its environs.

1.12.5.2.1 Mitigation Measures:

A risk assessment with mitigation measures for the proposed transfer of treated leachate to the outfall at Newport is provided in the *Impact on Ecology Section*.

1.12.6 *Impacts on Water (Proposed Outfall from Leachate Treatment Facility):*

1.12.6.1 **Potential Impacts on Receiving Waters from Marine Discharge of Treated Leachate**

The discharge of a treated leachate to the marine environment in inner Newport Bay has the potential to impact negatively on the surrounding habitats and species. The results of the impact could include the loss of species and their habitats, with the contamination of water, sediment and biota. Given the environmental significance of the receiving environment, the mitigation strategy that will be adopted to protect that environment and its inhabitants will be through the adoption of adequate discharge standards in the leachate treatment process.

The treatment of leachate being discharged into Clew Bay will be to an appropriate standard based on limits specified in Irish legislation. The design philosophy has been to comply with the Urban Waste Water Treatment Regulations, 2001 and to otherwise treat the leachate such that the environmental quality standards specified in the Water Quality (Dangerous Substances) Regulations, 2001 and European Communities (Quality of Shellfish Waters) Regulations, 2006 are already attained in the pipeline prior to discharge to the receiving environment. The Environmental Protection Agency have a key role in establishing discharge standards for the treated leachate at Derrinumera landfill as part of the Waste Licence review which is currently being conducted.

In addition to the monitoring requirements for the treated leachate as specified by the Environmental Protection Agency in the Waste Licence for Derrinumera landfill, biannual monitoring of the receiving waters, sediment, fish and shellfish at a matrix of sites adjacent to the proposed discharge and other representative sampling stations moving away from the discharge will be implemented to safeguard the ecological integrity and in particular the favourable conservation status of the receiving environment in the short, medium and long-term. The development and implementation of this monitoring programme will be conducted in consultation with the relevant state and semi-state bodies (i.e. Environmental Protection Agency, Department of the Environment, Heritage and Local Government and the Department of Communications, Marine and Natural Resources [including the Marine Institute]) with input from local stakeholders.

It should be noted that the results of this Monitoring Programme will be forwarded to the Environmental Protection Agency for consideration as part of their Waste Licence enforcement activity at Derrinumera Landfill.

Ultimately the Environmental Protection Agency will establish the discharge standards for the leachate being discharged from Derrinumera landfill and outline monitoring frequencies as part of the Waste Licence Review process, which is currently on going.

1.12.7 Impact on Air (Noise Emissions):

The nature and scale of the proposed development is such that noise emissions will arise during the daytime from a number of fixed and mobile sources of noise. In addition, there will be noise emissions arising during nighttime from certain items of equipment, including the leachate treatment facility. The final design and the operation of leachate treatment facility and Sludge Hub Centre will proceed with regard to the need to mitigate noise emissions.

Mitigation Measures:

During the construction stage of the development all plant and machinery used on site will comply with the EC (Construction Plant and Equipment) Permissible, Noise Level Regulations.

With regard to transportation noise, road vehicles will comply with the EC (Construction Plant and Equipment) Permissible, Noise Levels Regulations. Traffic noise from the leachate treatment facility and Sludge Hub Centre will not give rise to any nuisance or significant impact, however, simple mitigation measures (such as good maintenance; switching off idling machines and avoiding unnecessary revving of engines) will help to minimise any potential impacts.

1.12.8 Impact on Air (Dust Emissions):

Dust emissions have the potential to adversely impact the environment and amenity of the lands surrounding the proposed Sludge Hub Centre and Leachate Treatment Facility. Potential sources of dust include those arising during the construction phase of the proposed developments from stockpiles of construction materials, that dispersed from construction vehicles, as well as generation of dust from the handling of the dried bio solids product.

Mitigation Measures:

To mitigate impacts of dust dispersion during the construction phase the following will be put in place; a wheelwash at the entrance to the facility to prevent dust dispersion from vehicles exiting the site, spraying of access routes and other exposed areas during periods of dry weather, vegetation of stockpiles and embankments immediately following placement to reduce the surface area open to the environment.

Overall there will be no anticipated impact from dust emissions during the operation phase of the proposed development, though a complaints register will be maintained on site to deal with any complaints should they arise.

1.12.9 Impact on Air (Odour Emissions):

Odour emission rates were calculated using Olfactometry data. The predicted overall odour impact of the following five scenarios was calculated to determine the potential odour impact of the proposed development:

- Existing landfill operation assuming input capacity
- Existing landfill operations (maximum capacity) and proposed leachate treatment on site utilising SBR diffuse fine bubble aeration
- Existing landfill, leachate treatment and operation of existing proprietary engineered diesel fuelled sludge drier situated in Castlebar WWTP
- Existing landfill, leachate treatment and operation of new sludge drying system (generic at this stage of development)
- Existing landfill, leachate treatment and proposed tunnel composting system.

A worst-case odour-modelling scenario was chosen to estimate worst-case odour impact from the proposed site. Results of the modelling scenario indicated that no significant odour impact would be perceived in the vicinity of the operated Derrinnumera site for scenarios 1 to 5. In keeping with current recommended odour annoyance criterion in this country, the Derrinnumera site operations will be unlikely to cause odour nuisance.

1.12.10 *Effects on Climate:*

No potential impacts are expected on the local climate of the area. Carbon dioxide resulting from the bioconversion of bio waste is not considered a net contributor to greenhouse gas emission, since the carbon is stored in the biomass for a limited number of years whereas in the case of fossil fuels the carbon is stored for millions of year. Therefore, there will be no net contribution to greenhouse gas emission, thus aiding efforts to reach the targets set out by the Kyoto Protocol.

The effects of climate change are not considered relevant with regard to existing and future landfill operations at Derrinnumera, as when the noticeable effects of climate change on rainfall begin to occur, landfill cells will already be sealed off from the atmosphere, and leachate generation will no longer be dependent upon rainfall patterns.

The development of the Sludge Hub Centre and Leachate Treatment Facility will result in additional stormwater runoff generation from the impermeable surfaces on site. This is not considered to be a significant impact as additional stormwater will be collected and used as process water or will be diverted to the existing stormwater management system on site which is capable of handling such an amount of additional runoff. (Refer to Section 4.4.4)

1.12.11 *Impacts on Existing Landscape:*

The proposed Sludge Hub Centre and Leachate Treatment Facility are to be located on the western side of the existing landfill site, adjacent to Cells 1 and 2, and behind the existing civic amenity site and site accommodation building. The principal visual impact of the overall site and proposed development is on the Newport/Castlebar Road (R311) to the south. This road constitutes a popular tourist route; therefore there is potential for significant negative visual impact on the landscape. However, because the proposed facility will be effectively masked by the existing landfill cells and site infrastructure from views from the R311 to the south, it is anticipated that the visual impact will be negligible.

1.12.12 Material Assets (Road Infrastructure and Traffic):

Future traffic volumes will vary as a net result of the following:

- Increased traffic due to importation of sludges to the Sludge Hub Centre
- Increased traffic due to the importation of fuel for the sludge drier
- Reduced traffic in discontinuing the tanker transport of leachate to Castlebar
- Increased traffic of employees and service vehicles associated with the Sludge Hub Centre
- Increased traffic associated with exports of bio solids from the Sludge Hub Centre.

The following table provides a summary of the estimated annual existing and proposed traffic movements to the Derrinnumera Landfill Facility.

Table 4.10 –Estimation of Existing and Proposed Traffic Movements to and from Derrinnumera Landfill Facility.

	Traffic In	Traffic Out	Total
Existing Traffic *			
Leachate Transportation	4,266	4,266	
Other HGVs	3,592	3,592	
Civic Amenity Traffic	65,097	65,097	
Sub-total	72,955	72,955	
Total traffic movements per annum (existing)			145,910
Future Traffic			
Leachate Transportation	0	0	
Other HGVs	3,592	3,592	
Civic Amenity Traffic	65,097	65,097	
Import Sludge Cake	2748	2748	
Import Liquid Sludge	639	639	
Import Drier Fuel	1	1	
Export Biosolids	397	397	
Additional Staff Vehicles	6	6	
Sub-total	72,480	72,480	
Total traffic movements per annum (future)			144,960

* (Based on latest counts from Derrinnumera On-site Records (2005))

It is envisaged that during the construction of the Sludge Hub Centre (SHC) and Leachate Treatment Facility (LTF), the volume of traffic is expected to increase slightly, however, the local road network is in good condition and will easily cater for the slight increase in traffic volumes.

Increased HGV movements will occur as a result of sludge importation to, and biosolids exportation from, the proposed facility. However, the discontinuation of tanker transport of leachate to Castlebar as a result of the proposed development, will in all likelihood cancel out any increases in HGV traffic at the site and may actually lead to a net decrease in the annual HGV movements to and from the site.

Therefore, it is not envisaged that the proposed SHC and LTF will result in any negative impacts on HGV traffic volumes.

The number of car movements at the site will increase by 12 movements per day due to the additional six staff, which will be required to run the SHC and LTF. Based on current car movements at the facility, this will lead to an approximate 6% increase in car movements. It is not considered that this minor increase in car movements will have a negative impact on the community.

1.12.12.1 Effect of Pipe-laying on Traffic

The construction of a pumped rising main for transfer of treated leachate from Derrinnumera Leachate Treatment Facility to Newport will have a short-term impact on traffic patterns in the affected area. Traffic management is a key issue for sewer construction in narrow rural roads and therefore will be a key issue for this element of the development. Traffic management plans will be compiled in accordance with the requirements of Chapter 8: Traffic Signs Manual, Department of Environment, 2006 to ensure the smooth and safe flow of traffic along the pipeline route. It is envisaged that the pipeline construction will have a very minor short-term negative impact on traffic patterns during the construction period.

1.12.13 Material Assets (Archaeological and Cultural Heritage):

The development of the Sludge Hub Centre and Leachate Treatment Facility will have no affect on the local cultural heritage. The archaeological sites found during the clearing of the borrow area (location of proposed development) have been logged and removed, and no other sites were found in the vicinity.

In terms of pipeline construction, the dedicated treated leachate rising main will not intercept any areas of archaeological interest or possible archaeological interest over its entire length, from the Derrinnumera Leachate Treatment Facility outfall to the Newport WWTP outfall.

With regard to the combined outfall pipeline, to be constructed from the Newport WWTP at Caulicaun to the final discharge location north of Rosmore, the crossing of an inter-tidal area between Caulicaun and Lisduff has the potential to impact on three identified known Recorded Monuments and Places (all within one area of constraint), therefore this crossing will be relocated north so that it is not within the area of archaeological constraint.

It is not envisaged that the proposed inter-tidal crossing will have a negative impact on the identified Recorded Monuments and Places, as the pipeline route will be relocated accordingly so that the tidal crossing will not be located within the area of archaeological constraint. As an additional mitigation measure, any section of the proposed rising that do not run through and alongside the existing road shall be field walked prior to the commencement of any works.

1.13 ARTICLE 12(L)(M)

Identify monitoring and sampling points and indicate proposed arrangements for monitoring of emissions and the environmental consequences of same:

All environmental monitoring will be carried out under the conditions of the revised waste licence for the facility issued by the EPA. Emission Limit Values (ELV) have/will be set by the EPA for many of the parameters to be monitored. Exceeding these values will be judged by the EPA to be a non-compliance with the Waste Licence. It is proposed to monitor/sample dust, odour, surface water- ecology, groundwater and surface water quality, noise and fowl sewer discharge. Results of the various monitoring programmes will be detailed in the Annual Environmental Report for the site. The monitoring programme may be changed by the conditions of the revised Waste Licence or due to the final operations to be carried out at the facility.

1.14 ARTICLE 12(L)(N)

Describe any proposed arrangements for prevention, minimisation and recovery of waste arising from the activity concerned:

An estimation of energy used or generated by the proposed activities is not possible at present, as the processes and technologies to be utilised are currently unknown given the DBO nature of the project.

The potential to use landfill gas as an auxiliary fuel shall be investigated, and used if found feasible and cost effective, subject to regulatory requirements. Microturbine options that generate power and heat from natural gas shall also be considered in the context of the overall heat balance and energy requirement of the Hub Centre.

Depending on the final contract, there may be a potential to produce electricity from Combined Heat and Power (CHP) plant in the Sludge Hub Centre.

1.15 ARTICLE 12(L)(O)

Describe any proposed arrangements for off-site treatment or disposal of solid or liquid wastes:

It is estimated that up to 1,412 tDS per year of waterworks sludges will be dried at the SHC. In accordance with the 'Management of Water Treatment Sludges' Circular, dated February 2005, the SHC will be required to dry waterworks sludges on a batchwise basis (separately from municipal wastewater treatment plant sludges) in order to minimise the end volume of sludge and to improve stability and handleability for disposal to landfill. A small volume of surplus sludge arising from the leachate treatment process will also be dried batchwise. In accordance with best environmental practice, dried waterworks and LTF sludges will be placed on the landfill at Derrinnumera.

1.16 ARTICLE 12(L)(P)

Describe existing or proposed measures, including emergency procedures, to prevent unauthorised or unexpected emissions and minimise the impact on the environment of any such emissions:

The Operators of the Sludge Hub Centre and Leachate Treatment Facility will be required to develop policies in relation to accident prevention and emergency response, depending on the treatment process to be used. Details of their policies will be agreed with the Agency prior to construction and operation, particularly in relation to the Leachate Treatment Facility. All facilities will have to comply with the latest Health & Safety Regulations.

In terms of the proposed facility, there are 6 contingencies that must be allowed for:

1. Operational failure of plant and equipment;
2. Industrial action by operational staff;
3. Untreated leachate discharge within or outside the site;
4. Accidental fuel spillage outside the bunded area;
5. Fire in the facility;
6. Any other event, which might pose a significant threat.

An Environmental Liabilities Risk Assessment for the facility will be drafted and agreed with the Agency.

1.17 ARTICLE 12(L)(Q)

Describe proposed measures for the closure, restoration, remediation or aftercare of the facility concerned, after the cessation of the activity in question:

It is the intention that the facilities at the Derrinnumera Sludge Hub Centre and Leachate Treatment Facility will continue in operation for the foreseeable future. An Environmental Liabilities Risk Assessment will be carried out and decommissioning plan written prior to commencement of operation at the site. Prior to commencement of operation, an Aftercare Plan will be developed.

1.18 ARTICLE 12(L)(R)

In respect of landfilling of waste, provide particulars of (i) such financial provisions as is proposed to be made by the applicant and (ii) such charges as are proposed or made:

This section is not relevant to the application.

1.19 ARTICLE 12(L)(S)

State whether the activity is for the purposes of an establishment to which the European communities (control of major accident hazards involving dangerous substances) regulations 2000 apply:

No, not applicable to this application.

1.20 ARTICLE 12(L)(T)

In the case of an activity which gives rise or could give rise to an emission to an aquifer containing list i and ii substances specified in annex to council directive 80/68/EEC, describe existing/proposed arrangements necessary to give effect to articles 3, 4, 5, 6, 7, 8, 9 and 10 of the aforementioned council directive:

This section is not relevant to the application.

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