Waterford City WWTP (Sludge Treatment)
Springfield House, Gorteens, Co. Kilkenny
W0244-01

Annual Environmental Report for 2010

May 2011

Waterford City Council

Mott MacDonald

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Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	Feb. 2011	A. Lambe	FMcG	FMcG	Draft Report
B	May 2011	A. Lambe	FMcG	FMcG	Issue following incorporation of WCC comments

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Content

Appendices

1. Introduction

1.1 Licence register number

The Site is licensed under Waste Licence Register No. W0244-01.

1.2 Name and location of the site

The facility is a wastewater treatment plant with sludge treatment for Waterford City and its Environs.

The 18 hectare site is located at Springfield House, Gorteens, Co. Kilkenny approximately 3km east of Waterford City.

1.3 A brief description of the activities at the site

The facility is a wastewater treatment plant for Waterford City and its Environs to cater for domestic and industrial wastewater. It is located approximately 3km east of Waterford City in the townland of Gorteens, County Kilkenny. The facility is operated by Celtic Anglian Water on behalf of Anglian Water International, who are contracted by Waterford City Council to operate the plant 24 hours/day and 365 days/year.

The wastewater treatment process consists of inlet screening, grit and grease removal, primary settlement, activated sludge process and final settlement. The facility includes infrastructure for the treatment of excess sludge generated by the wastewater treatment process. The maximum tonnage of sewage sludge to be treated is 95,100 tonnes per annum. No sludges or other wastes are permitted to be imported for treatment.

The sludge arising from wastewater treatment is thickened, pasteurised, treated in one of two anaerobic digesters and dewatered. Biogas from the digestion process is used for the on-site boilers, with any excess gas being flared. The wastewater preliminary treatment works and sludge dewatering works are located indoors, in the inlet works building and sludge building respectively. These areas are operated under negative air pressure with odours extracted to two odour control units for treatment.

The taking over certificate for the plant was issued on the 2nd July 2010.

1.4 Company organisation chart for Environmental Management

Staffing Structure

The facility will be run on behalf of Waterford City Council by Celtic Anglican Water (CAW).

The structure of management and staff is detailed below.

The Operations Director (CAW) will have overall responsibility for the running of the WWTP.

Responsibilities of the Operations Director are: Client liaison, contract compliance, providing environmental & safety framework for delivering O&M (Operations and Maintenance) services to Waterford City Council (WCC).

The Operations and Maintenance Manager (CAW) will control the daily running of the facility.

Responsibilities of the Operations and Maintenance Manager are: Report to the Operations Director. Day to day management of the operations contract with WCC. Manage the local operations team in the delivery of their duties. Ensure operations are undertaken in compliance with Health & Safety Regulations and good practice. Ensure training is provided and competence is maintained. Provide technical, financial and administrative support. Ensure O&M procedures are in place to ISO 9001, 14001, 18001. Supervise operational staff, craftsmen & subcontractors, to ensure that treatment standards are met, planned plant maintenance is delivered, and breakdowns are promptly fixed. Buy spares parts & contracted services as required.

The operations manager will report to Waterford City Council monthly. Respond to any complaints promptly. Action any remedies to keep plant compliant with effluent, sludge & odour standards.

The Works Technicians will include operators & fitters that will be trained to CAWs in-house Production Qualification standards.

Responsibilities of the Works Technicians are: Report to the O&M Manager. The technicians will undertake the day to day work of cleaning, optimizing, maintaining and monitoring the plant. Daily samples will be analysed to check plant performance. Records and logs kept of maintenance undertaken. Respond on standby to out of hours alarms from telemetry.

2. Summary Information

2.1 Emissions from the Facility

2.1.1 Emissions to Air

Table 2.1: Emissions to Air OCU-1 (Odour Control Unit)

Date	Parameter	Ammonia	Amines	Mercaptans			Volume Flow
				Methyl	Ethyl	Butyl	
Nov-10	Time (mins)	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	m^3/hr
	0-30	<0.6	<3.4	<4.3	<4.3	<4.3	14,487

Table 2.2: Emissions to Air OCU-2 (Odour Control Unit)

Date	Parameter	Ammonia	Amines	Mercaptans			Volume Flow
				Methyl	Ethyl	Butyl	
Nov-10	Time (mins)	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	m^3/hr
	0-30	<0.5	<3.4	<4.3	<4.3	<4.3	5,567

The monitoring of Boiler Emissions was carried out in December 2010. The boilers were running on natural gas, and all processes were running normally during the monitoring period.

Table 2.3: Emissions to Air A-01(a) Boiler 1

Time (mins)	NO_x as NO_2	CO	Total VOC's as C
	mg/m^3	mg/m^3	mg/m^3
0-30	73	55	0.73
30-60	71	59	0.73
ELV	100	60	-

Table 2.4: Emissions to Air A-01(b) Boiler 2

Time (mins)	Nox as NO2	CO	Total VOC's as C
	mg/m^3	mg/m^3	mg/m^3
0-30	73	55	0.73
30-60	71	59	0.73
ELV	100	60	-

2.1.2 Noise Emissions

Noise monitoring was undertaken in April 2010, prior to the issue of the taking over certificate. The report is summarized in Section 4.1 of this report.

2.1.3 Storm Water Emissions

No storm water sampling was conducted in 2010. A storm water sampling chamber is to be installed onsite, to facilitate sampling of storm water emissions from the site.

2.2 Waste Management Record

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer
Within the Country	19 08 01	No	92.0	screenings	D5	Offsite in Ireland	Greenstar Environmental Services Limited,W0165-02	Ballynagran Residual Landfill, Ballynagran Coolbeg and Killandra, County Wicklow, Ireland
Within the Country	19 08 99	No	10.0	wastes not otherwise specified	D5	Offsite in Ireland	Greenstar Environmental Services Limited,W0165-02	Ballynagran Residual Lanfill, Ballynagran Coolbeg and Killandra, County Wicklow, Ireland
Within the Country	19 08 05	No	640.0	sludges from treatment of urban waste water	R10	Offsite in Ireland	Clearpower Ltd.	David Recks Farm, Courtnacuddy, Clonroache, County Wexford, Ireland

*The tonnage per year was estimated on the basis of waste produced during operation of plant from September to December

2.3 Energy and Water Consumption

The energy supplied to the WWTP is from three sources:

- Electricity (from National Grid)
- Biogas from the Anaerobic Digester
- Diesel Fuel

The records for electricity consumption are contained in Table 2.5. No information was available on biogas production or diesel usage.

Table 2.5: Energy Consumption

Month	Monthly Power Consumption kWh	Average Daily Power Consumption kWh
Jul/Aug	331,312	
Sept	237,920	7,931
Oct	213,013	6,871
Nov	198,190	6,606
Dec	181,846	5,866

Table 2.6: Water Consumption

Month	Potable Water Consumption (m^3)
Jul/Aug	51
Sept	212
Oct	175
Nov	31
Dec	55

2.4 Environmental Incidents and Complaints

There were no environmental incidents or complaints.

2.5 AER/PRTR Summary Data Tables

The AER/PRTR spreadsheet was submitted under the Waste Water Discharge No. D0022 for the facility. The tables are included below:

| PRTR# : D0022 | Facility Name : Waterford City Waste Water Treatment Plant | Filename : D0022_2010(2) (2).xls | Return Year : 2010 |

Guidance to completing the PRTR workbook

AER Returns Workbook

Version 1.1.11

REFERENCE YEAR	2010

1. FACILITY IDENTIFICATION

Parent Company Name	Waterford City Council
Facility Name	Waterford City Waste Water Treatment Plant
PRTR Identification Number	D0022
Licence Number	D0022-01

Waste or IPPC Classes of Activity

No.	class_name
90.4	General

Address 1	Maritana Gate
Address 2	Canada Street
Address 3	Waterford City
Address 4	Co. Waterford
	Waterford
Country	Ireland
Coordinates of Location	
River Basin District	IESE
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Ray Mannix (D0022)
AER Returns Contact Email Address	rmannix@waterfordcity.ie
AER Returns Contact Position	Senior Engineer
AER Returns Contact Telephone Number	051-849563
AER Returns Contact Mobile Phone Number	
AER Returns Contact Fax Number	051-879124
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
5(f)	Urban waste-water treatment plants

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	
Have you been granted an exemption ?	
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

4.1 RELEASES TO AIR Link to previous years emissions data | PRTR# : D0032 | Facility Name : Waterford City Waste Water Treatment Plant | Filename : D0032_2010(0) (2).xls | Return Year : 2010 | 05/04/2011 10:15

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
		Method Used						
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
01	Methane (CH4)	E	ESTIMATE	EPA UWWTP Tool v4.0	48340.8	48340.8	0.0	0.0
02	Carbon monoxide (CO)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.0	0.0	0.0	0.0
03	Carbon dioxide (CO2)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.0	1136359.2	0.0	1136359.2
05	Nitrous oxide (N2O)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.0	7.0	0.0	7.0
07	Non-methane volatile organic compounds (NMVOC)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.0	0.0	0.0	0.0
08	Nitrogen oxides (NOx/NO2)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.0	0.0	0.0	0.0
11	Sulphur oxides (SOx/SO2)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column II) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
		Method Used						
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column II) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
		Method Used						
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column II) then click the delete button

4.2 RELEASES TO WATERS Link to previous years emissions data | PRTR# : D0022 | Facility Name : Waterford City Waste Water Treatment Plant | Filename : D0022_2010(2) (2).xls | Return Year : 2010 | 05/04/2011 10:46

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS Data on ambient monitoring of storm/surface water or groundwater, conducted as part of your licence requirements, should NOT be submitted under AER / PRTR Reporting as this only concer

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT			Method Used		QUANTITY			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
		E	ESTIMATE	EPA UWWTP Tool v4.0	0.035	0.035	0.0	0.0
34	1,2-dichloroethane (EDC)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.577	0.583	0.0	0.006
25	Alachlor	E	ESTIMATE	EPA UWWTP Tool v4.0	0.12	0.121	0.0	0.001
61	Anthracene	E	ESTIMATE	EPA UWWTP Tool v4.0	0.122	0.123	0.0	0.001
17	Arsenic and compounds (as As)	E	ESTIMATE	EPA UWWTP Tool v4.0	11.52	11.633	0.0	0.113
27	Atrazine	E	ESTIMATE	EPA UWWTP Tool v4.0	0.743	0.75	0.0	0.007
91	Benzo(g,h,i)perylene	E	ESTIMATE	EPA UWWTP Tool v4.0	0.046	0.046	0.0	0.0
18	Cadmium and compounds (as Cd)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.62	0.626	0.0	0.006
28	Chlordane	E	ESTIMATE	EPA UWWTP Tool v4.0	0.023	0.023	0.0	0.0
30	Chlorfenvinphos	E	ESTIMATE	EPA UWWTP Tool v4.0	0.012	0.012	0.0	0.0
79	Chlorides (as Cl)	E	ESTIMATE	EPA UWWTP Tool v4.0	2869004.9	2897172.4	0.0	28167.5
31	Chloro-alkanes, C10-C13	E	ESTIMATE	EPA UWWTP Tool v4.0	2.422	2.446	0.0	0.024
19	Chromium and compounds (as Cr)	E	ESTIMATE	EPA UWWTP Tool v4.0	4.251	4.293	0.0	0.042
20	Copper and compounds (as Cu)	E	ESTIMATE	EPA UWWTP Tool v4.0	20.439	20.64	0.0	0.201
82	Cyanides (as total CN)	E	ESTIMATE	EPA UWWTP Tool v4.0	20.147	20.345	0.0	0.198
33	DDT	E	ESTIMATE	EPA UWWTP Tool v4.0	0.124	0.125	0.0	0.001
70	Di-(2-ethyl hexyl) phthalate (DEHP)	E	ESTIMATE	EPA UWWTP Tool v4.0	14.447	14.589	0.0	0.142
36	Dieldrin	E	ESTIMATE	EPA UWWTP Tool v4.0	2.394	2.418	0.0	0.024
37	Diuron	E	ESTIMATE	EPA UWWTP Tool v4.0	1.088	1.099	0.0	0.011
38	Endosulphan	E	ESTIMATE	EPA UWWTP Tool v4.0	0.072	0.073	0.0	0.001
65	Ethyl benzene	E	ESTIMATE	EPA UWWTP Tool v4.0	0.921	0.93	0.0	0.009
88	Fluoranthene	E	ESTIMATE	EPA UWWTP Tool v4.0	0.159	0.161	0.0	0.002
83	Fluorides (as total F)	E	ESTIMATE	EPA UWWTP Tool v4.0	4032.74	4072.33	0.0	39.59
40	Halogenated organic compounds (as AOX)	E	ESTIMATE	EPA UWWTP Tool v4.0	27.52	27.79	0.0	0.27
42	Hexachlorobenzene (HCB)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.012	0.012	0.0	0.0
43	Hexachlorobutadiene (HCBD)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.012	0.012	0.0	0.0
89	Isodrin	E	ESTIMATE	EPA UWWTP Tool v4.0	0.677	0.684	0.0	0.007
23	Lead and compounds (as Pb)	E	ESTIMATE	EPA UWWTP Tool v4.0	11.47	11.583	0.0	0.113
45	Lindane	E	ESTIMATE	EPA UWWTP Tool v4.0	0.029	0.029	0.0	0.0
21	Mercury and compounds (as Hg)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.757	0.764	0.0	0.007
68	Naphthalene	E	ESTIMATE	EPA UWWTP Tool v4.0	5.281	5.333	0.0	0.052
22	Nickel and compounds (as Ni)	E	ESTIMATE	EPA UWWTP Tool v4.0	89.394	90.272	0.0	0.878
64	Nonylphenol and Nonylphenol ethoxylates (NP/NPEs)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.764	0.771	0.0	0.007
69	Organotin compounds (as total Sn)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.115	0.116	0.0	0.001
48	Pentachlorobenzene	E	ESTIMATE	EPA UWWTP Tool v4.0	0.012	0.012	0.0	0.0
71	Phenols (as total C)	E	ESTIMATE	EPA UWWTP Tool v4.0	142.447	143.846	0.0	1.399
50	Polychlorinated biphenyls (PCBs)	E	ESTIMATE	EPA UWWTP Tool v4.0	0.095	0.096	0.0	0.001
72	Polycyclic aromatic hydrocarbons (PAHs)	E	ESTIMATE	EPA UWWTP Tool v4.0	9.303	9.394	0.0	0.091
52	Tetrachloroethylene (PER)	E	ESTIMATE	EPA UWWTP Tool v4.0	5.162	5.213	0.0	0.051
73	Toluene	E	ESTIMATE	EPA UWWTP Tool v4.0	1.349	1.362	0.0	0.013
12	Total nitrogen	E	EN 12260:2003	Lab Tests - projections	107000.0	108498.38	0.0	1498.38
76	Total organic carbon (TOC) (as total C or COD/3)	E	ESTIMATE	EPA UWWTP Tool v4.0	397053.9	400952.1	0.0	3898.2
13	Total phosphorus	E	ESTIMATE	Lab Tests - projections	21000.0	21403.93	0.0	403.93
57	Trichloroethylene	E	ESTIMATE	EPA UWWTP Tool v4.0	0.875	0.884	0.0	0.009
77	Trifluralin	E	ESTIMATE	EPA UWWTP Tool v4.0	0.02	0.02	0.0	0.0
75	Triphenyltin and compounds	E	ESTIMATE	EPA UWWTP Tool v4.0	0.023	0.023	0.0	0.0
60	Vinyl chloride	E	ESTIMATE	EPA UWWTP Tool v4.0	0.577	0.583	0.0	0.006
78	Xylenes	E	ESTIMATE	EPA UWWTP Tool v4.0	3.226	3.258	0.0	0.032
24	Zinc and compounds (as Zn)	E	ESTIMATE	EPA UWWTP Tool v4.0	410.328	414.357	0.0	4.029

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					QUANTITY			
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
238	**Ammonia (as N)**	M	OTH	Lab Tests - projections	23000.0	25725.04	0.0	2725.04
303	BOD	M	OTH	Lab Tests - projections	84000.0	110517.88	0.0	26517.88
306	COD	M	OTH	Lab Tests - projections	442000.0	499240.14	0.0	57240.14
362	Kjeldahl Nitrogen	M	OTH	(enter method)	0.0	4586.4	0.0	4586.4
327	Nitrate (as N)	M	OTH	(enter method)	0.0	4586.4	0.0	4586.4
372	Nitrite (as N)	M	OTH	(enter method)	0.0	43.92	0.0	43.92
332	Ortho-phosphate (as PO4)	M	OTH	Lab Tests - projections	41000.0	41390.03	0.0	390.03
240	Suspended Solids	M	OTH	Lab Tests - projections	146000.0	175457.88	0.0	29457.88

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

4.3 RELEASES TO WASTEWATER OR SEWER

Link to previous years emissions data

| PRTRr : D0022 | Facility Name : Waterford City Waste Water Treatment Plant | Filename : D0022_ 05/04/2011 10:46

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

4.4 RELEASES TO LAND Link to previous years emissions data | PRTRit : D0022 | Facility Name : Waterford City Waste Water Treatment Plant | Filename : D0022_2010(2) (2).xls | Return Year : 2010 | 05/04/2011 11:02

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND					Please enter all quantities in this section in KGs		
POLLUTANT		METHOD					QUANTITY
			Method Used				
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO LAND					Please enter all quantities in this section in KGs		
POLLUTANT		METHOD					QUANTITY
			Method Used				
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE | PRTI# : D0022 | Facility Name : Waterford City Waste Water Treatment Plant | Filename : D0022_2010(2) (2).xls | Return Year : 2010 | 05/04/2011 11:04

Please enter all quantities on this sheet in Tonnes

8

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste : Name and Licence/Permit No of Recovar/Disposr	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recovar/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	19 08 01	No	92.0	screenings	D5	E	Weighed	Offsite in Ireland	Greenstar Environmental Services Limited,W0165-02	Ballynagran Residual Lanfill,Ballynagran Coolbeg and Killandra,,,County Wicklow,Ireland		
Within the Country	**19 08 99**	**No**	10.0	wastes not otherwise specified	D5	E	Volume Calculation	Offsite in Ireland	Greenstar Environmental Services Limited,W0165-02	Ballynagran Residual Lanfill,Ballynagran Coolbeg and Killandra,,,County Wicklow,Ireland		
Within the Country	19 08 05	No	640.0	sludges from treatment of urban waste water	R10	E	Weighed	Offsite in Ireland	Clearpower Ltd,.	David Recks Farm,Courtnacuddy,Clonroache,County Wexford,Ireland		

Please enter details below then click the OK button

Name of Recoverer / Disposer / Next Destination Facility	Clearpower Ltd
Licence / Permit No. of Recoverer / Disposer / Next Destination Facility	.
Address of Recoverer / Disposer / Next Destination Facility	
Address 1 / Street name	David Recks Farm
Address 2 / Building number	Courtnacuddy
Address 3 / City name	Clonroache
Address 4 / Postcode	County Wexford
Country	Ireland

Please
field if

Alternatively, please select from previously entered details by clicking on the row below then click OK

Name and License / Permit No.	Address of Recoverer / Disposer / Broker
Greenstar Environmental Services	Ballynagran Residual Lanfill,Ballynagran Coolbeg and Killandra,.,County Wicklow,Ireland
Clearpower Ltd,.	David Recks Farm,Courtnacuddy,Clonroache,County Wexford,Ireland

3. Management of the Activity

3.1 Schedule of Environmental Objectives and Targets/ Environmental Management Programme Report (2011)

Complete all environmental monitoring required

Task	Details	Due Date	By Whom	Status
1	Conduct monitoring	Dec 2011	WWTP Manager	Ongoing

Energy and resource efficiency

Task	Details	Due Date	By Whom	Status
2	Monitor electricity diesel and biogas usage	Dec 2011	WWTP Manager	Ongoing
3	Efficiency test on boilers	Dec 2011	WWTP Manager	Ongoing
4	Monitor water usage	Dec 2011	WWTP Manager	Ongoing

Waste handling and reduction

Task	Details	Due Date	By Whom	Status
5	Retain records of all waste production and collection onsite	Dec 2011	WWTP Manager	Ongoing
6	Review process to identify waste reductions	Dec 2011	WWTP Manager	Ongoing

The following development/ infrastructural works are also proposed at the facility

- Biogas meter
- CO monitors and SCADA connection
- Biogas Monitor for Flare Stack
- Storm water sampling chamber

4. Licence Specific Reports

4.1 Noise Monitoring Report Summary

A noise monitoring survey was undertaken by Bord na Mona at the newly commissioned WWTP in April 2010 during the tests on completion phase and prior to the taking over of the facility.

Noise monitoring was carried out during daytime and night-time hours on the North, East and Western boundaries of the site for 15 minute durations. The nearest Noise Sensitive Locations (NSLs) were also monitored for 15 minute durations during daytime and night-time hours. This procedure was repeated over two consecutive days.

Monitoring was conducted at fourteen different locations in total; 5 on facility boundaries, 4 at nearest NSL and a further 5 NSL locations on Little Island.

The monitoring locations specified in the Waste Licence are described below. Three locations were not monitored during the noise survey undertaken in 2010.

Table 4.1: Noise Monitoring Boundary Locations

Station	Location
NM-06	North west corner of site
NM-07	Midway along northern site boundary
NM-08	North east corner of site
NM-10	Midway along eastern site boundary
NM-11*	Adjacent to administration building
NM-12	Midway along western site boundary

*no noise monitoring at this location

Table 4.2: Noise Monitoring Sensitive Locations

Station	Location
NM-01	Residential Area to west of site
NM-02	Residence at top of road leading to Prospect House, 200m from northwest corner of site
NM-03*	Residential Area to northeast, approx. 750m from northeast corner of site boundary
NM-04*	Residential Area to northeast, approx. 500m from northeast corner of site boundary
NM-05	Nearest residence to northeast, approx. 250m from northeast corner of site boundary
NM-09	Adjacent to the eastern boundary stream, approx 250m from the northeast corner of the proposed site boundary

*no noise monitoring at this location

Daytime noise measurements were conducted between the hours of 9:00 and 18:00 and night-time noise measurements were conducted between the hours of 22:00 and 03:30.

The following are extracts from the Noise Monitoring Survey:

Day-time Boundary Results

The results recorded from each boundary daytime monitoring event were within the EPA guideline limits of 55dB(A). Tonal noise was detected at the Western boundary (NM-12) on the 27th April and was identified as 160 Hz and may be attributed to the faint hum of the aeration drive. Tonal noise was not detected at the remaining boundary locations.

Day-time Noise Sensitive Location Results

The results from each day-time NSL monitoring event were within the EPA guideline limits of 55 dB(A). Site activity was not audible from any of the NSL monitoring locations. Tonal noise was detected at NM-5 on the 27th April, this was identified as 160 Hz. Tonal noise was not located at the other noise sensitive locations.

Night-time Boundary Results

The north west of the site (NM-6) slightly exceeded the EPA guideline limit for the night-time noise on the 28th April, but did not exceed on the 27th April. This exceedance may be attributed to the aeration drive and the continuous hum from the odour control unit No. 1 which was running constantly during the monitoring period. All remaining night-time boundary recordings were within the EPA guideline limit of 45 dB(A) for night-time noise. Tonal noise was not detected at any of the boundary monitoring locations.

Night-time Noise Sensitive Location Results

The northern car park of the holiday homes on Little Island (NL-1) slightly exceeded the EPA guideline limit for night-time noise on the 26th April, but did not exceed on the 27th April. It should be noted that site activity was not audible during this monitoring event. All remaining night-time NSL recordings were within the EPA guideline limit of 45 dB(A) for night time noise. Tonal noise was not detected at any of the boundary monitoring locations.

Overall Results

The results of the monitoring survey suggest that operations within the WWTP are not causing nuisance noise to the surrounding environs. All day-time boundary results were within the EPA guideline limit and no site activity was audible at the NSL locations. All night time results were within the EPA guideline limits and no tonal noise was detected.

There have been no noise complaints received since completion of Plant commissioning and taking over in July 2010.

4.2 Odour Management Programme Summary

An odour monitoring survey was undertaken within and around the newly constructed WWTP in April 2010.

Odour monitoring was carried out at several locations at the WWTP boundaries (N,E & W), nearby receptors (<2km) and on Little Island to the south of the WWTP over two days. The Hydrogen Sulphide levels recorded on the 26th-28th April 2010 ranged from 2ppb to 3ppb which is considerably lower than the

proposed baseline (3.41 ppb determined from hydrogen sulphide testing conducted in March 2007 and November 2008).

The odours generated by the sludge treatment works and the inlet works (and primary settlement tanks) are monitored to ensure that the maximum allowable odour emission rates are not exceeded.

There are 2 no. Odour Control Units (OCUs) within the facility, one for the sludge treatment works and one for the inlet works (and primary settlement tanks).

The odour control units are designed to extract odour from the specified areas. The odour extraction from these areas will create a negative pressure in these areas so that no odour can escape. In addition, U-traps are provided on all drain points for the OCUs to further ensure that odours will not escape.

Duty / standby fans will extract air continuously from the following sources:
- Preliminary treatment
- Preliminary treatment building
- Primary settlement tanks
- Picket Fence thickener
- Secondary Sludge thickener
- Sludge dewaterer
- Sludge dewatering building
- Return liquors pumping station
- Sludge holding tanks
- Pasteuriser tanks

In addition the aeration system at the plant is a diffused aeration system which minimises the potential of odour from the activated sludge process.

Operation and Maintenance of OCUs

The odour control units are checked weekly by site personnel and the results are recorded. Any maintenance to the odour control units is recorded and reported in Monthly Status Reports.

If an issue was noted in relation to odour assessment it would be recorded in the site logbook.

There have been no odour complaints received since the completion of the Plant commissioning and taking over in July 2010.

4.3 Sludge Register

Table 4.3: Sludge Cake Testing (NMP 2011)

Date Sampled/ Received by Laboratory	20/07/2010	27/07/2010	29/07/2010	21/09/2010	07/10/2010
%Dry Solids			18.77	17.91	19.67
Organic matter				70.4	
pH				7.3	
Total Nitrogen %				5.4	
Ammonium-N (mg/kg)				5200	
Total Phosphorus (mg/kg)				16660	
Total Potassium (mg/kg)				4483	
Magnesium (mg/kg)				5909	
Faecal Coliforms (cfu/ml)				0	
Faecal Coliforms (cfu/g)	1	0			0
Salmonella sp.				Negative	
Zinc (mg/kg)		1636			
Copper (mg/l)		406			
Nickel (mg/kg)		21.4			
Cadmium (mg/kg)		1.5			
Lead (mg/kg)		710			
Mercury (mg/kg)		0.99			
Chromium (mg/kg)		51			

A summary of sludge disposal records is contained in Appendix C.

4.4 Ambient Monitoring Summary

Clearpower carried out soil sampling for the T&A Byrne Farm in September 2010 as part of the Nutrient Management Plan. Soil analysis for the land plots (field locations and associated soil references included in Table below) was carried out by FBA Laboratories Ltd. of Cappoquin Co. Waterford. Soil samples were tested for phosphorous and potassium nutrient levels, pH, and the seven heavy metals (cadmium, chromium, copper, mercury, nickel, lead and zinc) and taken in accordance to the Teagasc Code of Practice for Soil Sampling.

A summary of the monitoring data is presented in the Table below.

Table 4.4: Ambient Monitoring of Clearpower Landbanks (T&A Byrne, Clonroche, Enniscorthy, Co. Wexford.)

Area	Field ID	Sample	Organic Matter %	pH	Clay Content %	Total P (mg/l)	Total K (mg/l)	Cadmium (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)	Mercury (mg/kg)
Clonroche	Y13003027	SS1	8.4	5.3	82	2.7	157.7	0.12	25.22	37.55	20.75	77.03	0.04
		SS2	11.6	5.2	14	1.9	129	0.15	20.65	29.17	22.29	76.15	0.05
Ballygalvert	Y12901206	SS3	8.1	6.7	80	4.2	144.3	0.16	20.88	24.91	23.88	75.95	0.07
	Y12901148	SS4		6.7		3.8	136.9	0.3	34.9	29.2	37.63	142.8	0.1
		SS5	8.5	6.8	53	5.3	100.3	0.24	19.23	25.59	24.94	72.84	0.1
	Y12901182	SS6	10.4	6.7	14	3.9	139.8	0.23	19.67	26.6	27.48	77.5	0.1
	Y12901113	SS7*		6.2		1.9	122.4	0.25	24.86	30.16	36.73	85.58	0.11
		SS8		5.4		2.1	105.5	0.21	27.99	33.32	30.22	103.2	0.09
	Y12901183	SS9		6.6		12.9	143.9	0.19	23.74	28.68	26.29	90.76	0.07
		SS10		6.3		15.6	158.2	0.21	24.59	30.19	27.19	93.74	0.08
		SS11		6.9		13.3	109.9	0.21	23.08	29.96	23.21	91.17	0.07
Chapel	Y13002052	SS12		6.2		4.8	152.4	0.28	21.3	30.28	27.88	94.59	0.07
		SS13	9.4	6.3	82	6.8	177	0.29	22.71	28.49	26.28	100.2	0.07
		SS14*		6.3		2.2	63.2	0.2	20.57	30.83	23.03	116.5	0.07
Tominearly	Y13013086	SS15		5.9		1.8	50.1	0.2	18.59	32.83	27.7	93.5	0.07
	Y13013087	SS16	9	6.4	63	3.3	46.5	0.21	23.36	27.2	27.86	97.74	0.09
	Y13013098	SS17		5.8		3.5	33.2	0.18	17.49	30.9	22.59	75.66	0.04
		SS18	8.9	6	76	2.5	98.9	0.18	24.04	30.08	27.93	96.07	0.07
Growtown Upper	Y15012056	SS19	8.9	5.6	60	2.7	39.1	0.1	8.65	12.71	15.21	35.73	0.04
	Y15012057	SS20A	9.4	6.4	35	9.1	65.4	0.13	9.88	11.85	16.62	38.85	0.05
		SS20B	12.2	6.4	44	3.3	42.1	0.11	12.16	12.37	16.58	33.96	0.04
	Y15012014	SS21*		6		4.3	79.1	0.17	17.11	14.94	23.11	55.37	0.06
	Y15012007	SS22	6.4	6.4	82	2.5	127.8	0.15	8.93	8.97	16.1	35.01	0.05
	Y15012053	SS23	8.8	6.2	46	5.2	65.1	0.15	13.12	12.95	22.94	58.42	0.06
	Y15012054	SS24	10.5	5.8	85	3.6	69.6	0.15	11.5	11.29	17.53	47.59	0.06
Clonroche 2	Y13003106	SS25*		6.4		2.2	64.3	0.24	22.5	26.87	26.37	81.88	0.08
		SS26	7.1	6.6	78	2.8	97.2	0.18	21.92	29.92	29.82	83.92	0.1
		SS27*		6.6		2.8	69.7	0.19	22.22	25.1	30.84	80.28	0.08

Area	Field ID	Sample	Organic Matter %	pH	Clay Content %	Total P (mg/l)	Total K (mg/l)	Cadmium (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)	Mercury (mg/kg)
		SS28*		6.5		3	66.2	0.22	23.35	24.43	31.82	78.84	0.1
Ardenagh Great	Y11601057	SS29*		6.8		12	139.1	0.31	25.11	24.81	34.46	90.57	0.08
	Y11601041	SS30		5.8		11.6	106.1	0.28	20.89	21.83	26.71	77.82	0.07
	Y11601026	SS31		6.7		11.6	99.5	0.26	25.39	19.22	34.32	81.84	0.07
	Y11601048	SS32	9.2	6.8	72	6.4	105.9	0.27	6.72	7.61	13.38	36.1	0.06
	Y11601044	SS33	9	6.9	72	6.2	106.3	0.24	21.62	16.41	32.9	72.97	0.06
	Y11601039/ Y11601052	SS34		5.6		10.9	118.9	1.95	22.43	48.44	22.21	100.1	0.1
	Y11601052	SS35		7.4		>30	77	0.79	26.11	13.47	33.13	102.9	0.07
	Y11601018	SS36	8.2	5.4	60	1.6	78.7	0.39	24.91	22.06	25.95	71.65	0.06
	Y11614014	SS37		5.9		3.4	246.8	0.27	23.66	21.64	32.36	81.22	0.07
	Y11601020	SS38	9	6.5	71	6.3	117	0.18	10.1	15.15	22.9	45.4	0.03
	Y11601012	SS39	8.2	5.7	71	5.6	191.3	0.29	22.79	21.56	30.31	87.85	0.06
	Y11601012	SS40	8.4	6.5	79	3.9	105.7	0.26	22.35	19.39	31.66	76.8	0.06
	Y11601028	SS41	10	6.3	66	8.6	113.9	0.32	27.39	22.04	35.98	97.3	0.07
	n/a	SS42		6.7		10.9	108.1						
	Y11601027	SS43		6.8		6.7	97.6	0.27	48.52	20.76	31.92	87	0.07
	Y11601021	SS44	9.7	6.8	100	4.8	89.6	0.32	20.33	17.67	29.81	76.58	0.07
	Y11601017	SS45	10.2	6.3	100	8.3	158.4	0.32	34.04	22.43	40.89	99.27	0.07
	Y11601050	SS46		7.4		>30	90.4	0.51	24.29	17.57	29.84	140.6	0.08

*lands identified as not suitable for landspreading by the hydrological assessment undertaken for the NMP (NMP 2011)

4.5 Tank and Pipeline Testing and Inspection Report

Tank and pipelines were integrity tested during the commissioning of the plant which was completed in 2010.

4.6 Energy Efficiency Audit Report Summary

The Energy Efficiency Audit Report was not available at the time of compiling the AER.

However, a summary of Energy Efficiency Measures (design) are outlined below:

Biogas from Anaerobic Digesters to Fuel Boilers

The boilers (which provide hot water for the pasteurization process) are designed to utilize the biogas (from the anaerobic digestion process) as the primary energy source for this process.

The anaerobic digestion process will produce approximately 2208.3 MJ/hr, which is 0.6 MW. This 0.6 MW is then available to fuel the boilers. Diesel will be a back-up fuel to power the boilers.

Secondary Treatment – Use of Blowers in secondary treatment

As part of the secondary treatment, the 5 no. blowers which supply air to the four IBA (Inclined Bubble Aeration) tanks operate on a duty/standby basis. Blowers are only turned on once the dissolved oxygen level within each tank drops below a certain level, thereby conserving energy use.

Use of Equipment/Plant

All pumps and plant items for the facility are on duty/standby system, whereby they will only be in operation “as required/on demand”. Therefore, the supply is not constant and the energy used by the process is thus minimized.

All plant items were selected based on a number of criteria, one of which was the efficiency of the motor/plant, in order to reduce the energy demand as much as possible.

Lighting Efficiencies

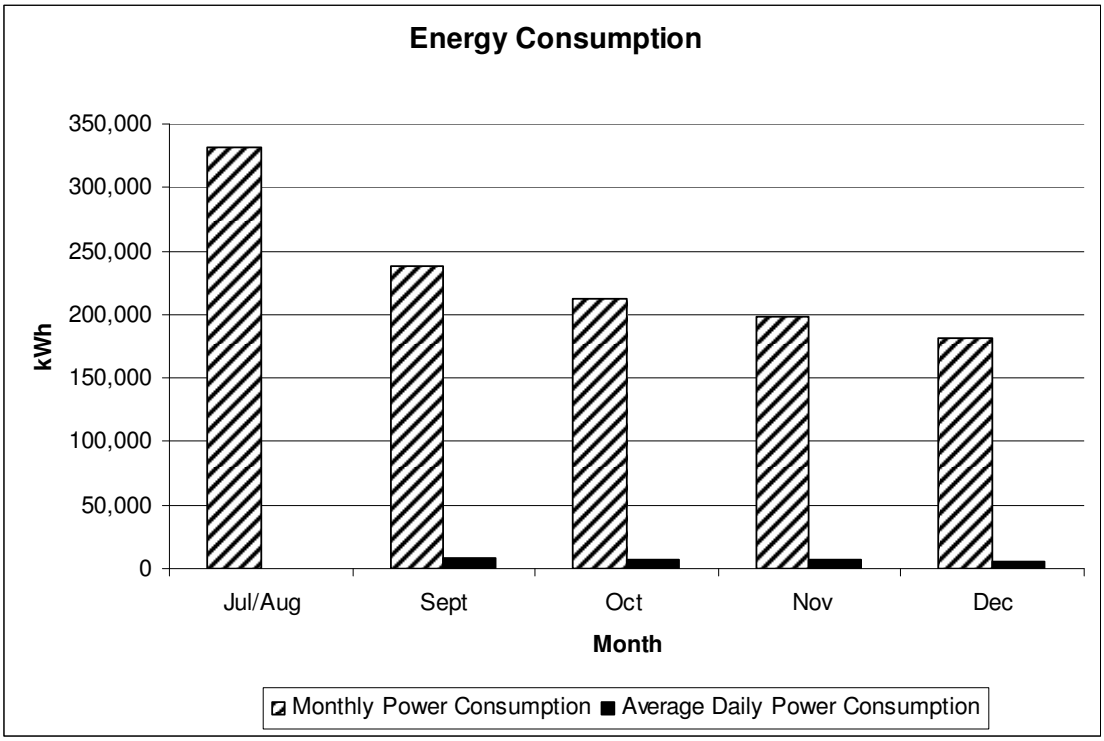
The lighting plan for the site was designed in order to reduce the amount of lighted areas required and to reduce the amount of time that artificial lighting is required within the WWTP buildings and across the overall site. Some areas of lighting could not be reduced, either for security reasons, or for health and safety reasons (or both).

4.7 Report on the Assessment of the efficiency of use of Raw Materials in Processes and the Reduction in Waste Generated

The raw materials used are the fuel for the facility; biogas, electricity and diesel and polyelectrolytes for sludge thickening and dewatering.

The electricity usage for the plant are shown in Figure 4.1.

Figure 4.1: Energy Consumption (Electricity)



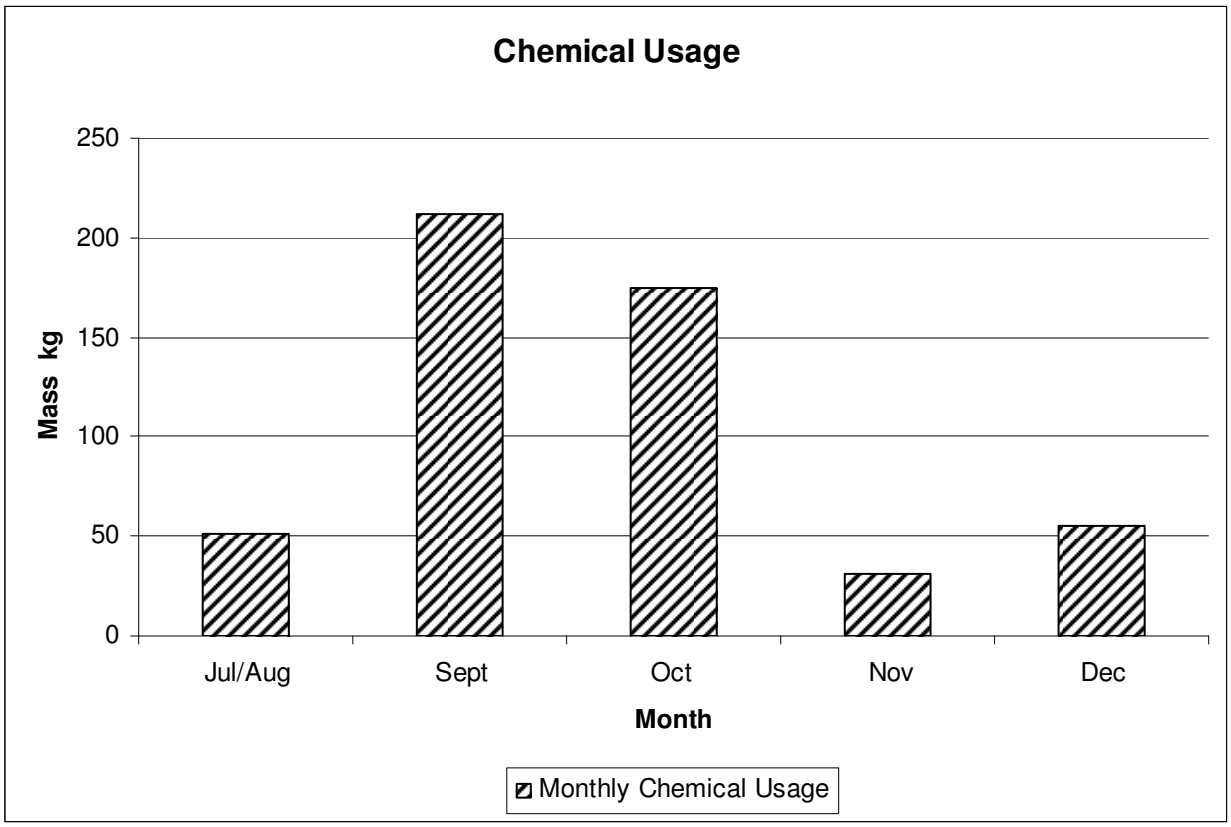
Biogas generated within the anaerobic digesters is stored and used as required to power the boilers (which provide hot water for the pasteurization process). There is currently no measurement of biogas production onsite.

Diesel fuel is stored on site for the generator and the boilers for situations where there is a shortfall in the primary fuel source, i.e. electricity and biogas. The capacity of boiler fuel tank is 10,000 litres diesel and the generator fuel tank also holds 10,000 litres diesel. Records for diesel usage onsite were not available.

Polyelectrolytes are used in the thickening and dewatering process of the sewage treatment. These are the only chemicals that are used on site. Two types are used for the WWTP: PLF 1700Q (for sludge thickening) and PLF 2800Q (for sludge dewatering). The polyelectrolyte is in powder form and approximately 2.4 tonnes is be held on site, i.e. one week supply.

The chemical usage for the plant are shown in Figure 4.2.

Figure 4.2: Chemical Usage



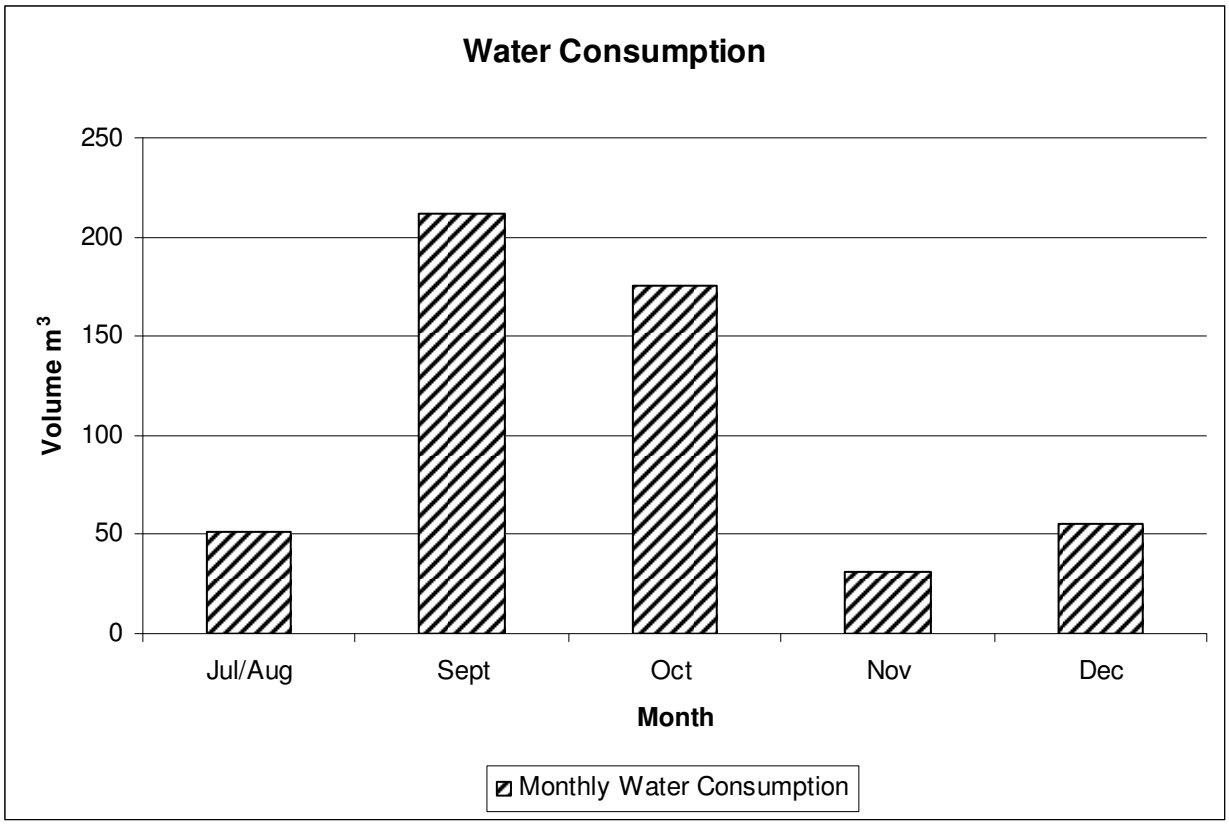
The quantities of raw materials utilised in the process will continue to be monitored to ensure efficiency of use.

4.8 Report on Progress Made and Proposals being developed to minimise water demand and the volume of trade effluent discharges

The water consumption onsite is monitored; the monthly water consumption is shown in Figure 4.3. The consumption of water onsite will continue to be monitored.

Water Consumption is minimised by the reuse of the treated effluent as a washwater supply for sludge thickening, sludge dewatering and general washdown activities.

Figure 4.3: Water Consumption



4.9 Development/Infrastructural works summary

The following development/ infrastructural works are proposed at the facility

- Biogas meter
- CO monitors and SCADA connection
- Biogas Monitor for Flare Stack
- Storm water sampling chamber

4.10 Decommissioning Management Plan

The Residual Management Plan for the Waterford City WWTP is contained in Appendix A. The estimate of "known" decommissioning costs identified in the Residual Management Plan Report for this site is €335,500.00.

4.11 Environmental Liabilities Risk Assessment

The Environmental Liabilities Risk Assessment is contained in Appendix B. The Estimate of Potential "Unknown" Environmental Liabilities identified in this ELRA report is €205,263 for the Waterford City WWTP.

Appendices

Appendix A. Residual Management Plan

Waterford City WWTP (Sludge Treatment)
Springfield House, Gorteens, Co. Kilkenny
W0244-01

Residuals Management Plan

May 2011

Waterford City Council

Mott MacDonald

Waterford City WWTP (Sludge Treatment)
Springfield House, Gorteens, Co. Kilkenny
W0244-01

Residuals Management Plan

May 2011

Waterford City Council

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Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	Feb. 2011	A. Lambe	FMcG	FMcG	Draft Report
B	May 2011	A. Lambe	FMcG	FMcG	Issue following incorporation of WCC comments

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Content

1. Introduction

Condition 10 (Decommissioning and Residuals) of the Waste Licence states that:

Condition 10 Decommissioning & Residuals Management

10.1 Following termination, or planned cessation for a period greater than six months, of use or involvement of all or part of the site in the licensed activity, the licensee shall, to the satisfaction of the Agency, decommission, render safe or remove for disposal/recovery any soil, subsoil, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.

10.2 Decommissioning Management Plan (DMP)

10.2.1 The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for the decommissioning or closure of the site or part thereof. This plan shall be submitted to the Agency for agreement within six months of the date of grant of the licence.

10.2.2 The plan shall be reviewed annually and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the agreement of the Agency.

10.2.3 The licensee shall have regard to the Environmental Protection Agency Guidance on Environmental Liability Risk Assessment, Decommissioning Management Plans and Financial Provision when implementing Condition 10.2.1 above.

10.3 The Decommissioning Management Plan shall include, as a minimum, the following:

(i) a scope statement for the plan;

(ii) the criteria that define the successful decommissioning of the activity or part thereof, which ensures minimum impact on the environment;

(iii) a programme to achieve the stated criteria;

(iv) where relevant, a test programme to demonstrate the successful implementation of the decommissioning plan; and

(v) details of the costings for the plan and the financial provisions to underwrite those costs.

10.4 A final validation report to include a certificate of completion for the Decommissioning Management Plan, for all or part of the site as necessary, shall be submitted to the Agency within three months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment.

This report is prepared in accordance with the EPA's Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision.

2. Site Evaluation

2.1 Description of Site

The facility is a wastewater treatment plant for Waterford City and its Environs to cater for domestic and industrial wastewater. It is located approximately 3km east of Waterford City in the townland of Gorteens, County Kilkenny. The facility is operated by Celtic Anglian Water on behalf of Waterford City Council and operates 24 hours/day and 365 days/year.

The wastewater treatment process consists of inlet screening, grit and grease removal, primary settlement, activated sludge process and final settlement. The facility includes infrastructure for the treatment of excess sludge generated by the wastewater treatment process. The maximum tonnage of sewage sludge to be treated is 95,100 tonnes per annum. No sludges or other wastes are permitted to be imported for treatment.

The sludge arising from wastewater treatment is thickened, pasteurised, treated in two anaerobic digesters and dewatered. Biogas from the digestion process is used for the on-site boilers, with any excess gas being flared. The wastewater preliminary treatment works and sludge dewatering works are located indoors, in the inlet works building and sludge building respectively. These areas are to be operated under negative air pressure with odours extracted to two odour control units for treatment.

2.2 Inventory of Site Plant and Raw Materials

The key infrastructural and process plant are as follows:

- Works Inlet Building
- Inlet Screens (Duty/Duty/Standby) and associated valves, isolation penstocks, and associated controls.
- Aerated grit channel and blowers and associated valves and control, surface scrapers, penstock
  Grit classifier and associated valves
- Grit screening washer and compactor, washwater sump and submersible pump, associated valves and control
- Odour Control System (OCU1)
  Biofilter, carbon filter, centrifugal fan, ducting exhaust stack, water supply
- Storm Tanks, submersible pumps and associated valves and control, jet mixer
- Flow measurement, flow splitter chamber
- Primary Settlement Tanks covered and clarifier scrapers, scum sump and submersible pump, sludge progressive cavity pumps and associated controls
- Selector Tank
- Inclined Bubble Aeration (IBA) Tanks, mixers, air blowers and associated valves and control equipment
- Final Settlement Tanks, scrapers, valves and associated control equipment
  RAS centrifugal pumps, valves, flow meter and associated controls (each tank has dedicated pump plus two common standby pumps)
  SAS centrifugal pumps, valves and associated controls
- Final Effluent Sampling and Washwater Pumping Station
- Sludge Building
- Sludge Thickening Belt Presses, Sludge Dewatering Belt Presses, Boilers, Generator, MCC, Electrical Switchgear
  OCU2- Biofilter, carbon filter, centrifugal fan, ducting exhaust stack, water supply

- Picket Fence Thickener, valves and associated controls
  Progressive cavity pumps (periodically waste sludge to sludge blending tank)
- Primary and Secondary Sludge Storage Tanks
- Thickened Sludge Blending Tank, mixer, valves and associated controls
- Pasteurisation System
  Pasteurisation Tanks, Progressive Cavity pumps, Macerator, valves, associated control, flow meters, heat exchangers
  Pasteurised Sludge Pumps
- Anaerobic Digestion
  Digester vessel, digester instruments, pressure / vacuum relief valves, digester mixer, sludge offtake
- Digested Sludge Tank, sludge dewater feed pumps, valves and associated controls
- Biogas holder (flexible membrane), condensate trap/chamber, pressure relief valves
- Flare Stack, control Valves and Burner
- Sludge Waste Storage Containers
- Liquor Sump, sludge liquors return pumps, valves and associated controls
- Liquid polymer bulk storage,
  polymer preparation plant and dosing plant
- diesel storage
- Administration Building

Biogas

Biogas produced onsite is stored in flexible membrane holder.

Diesel

Fuel, which is diesel, is stored on site for the generator and the boilers. The fuel storage tanks are located beside the Sludge Thickening, Dewatering and Digestion Control Building. The tanks are double skinned, which provide a second layer of protection.

Chemicals

Approximately 2.4 tonnes/week of polyelectrolytes are used in sludge thickening and dewatering. These are the only chemicals in the process.

Administration Building

The building contains standard office equipment.

2.3 Details of Site Wastes and Decontamination Requirements

The wastes generated are sludge bio-cake (41.1 t/day), screenings, grit, grease, mixed municipal waste, paper/card and plastic. No hazardous waste is generated.

2.4 Initial Screening and Operational Risk Assessment

2.4.1 Environmental Sensitivity

2.4.1.1 Human Occupation

There are residential areas to the west, northwest and northeast of the site. Residential areas are within 200 to 750m from the site boundary.

2.4.1.2 Groundwater Protection

The underlying geology of the site is comprised of shales and siltstones, which can be highly weathered in the upper layers and quite weak. The depth to bedrock ranges significantly in the area, ranging from 3.8 m BGL (Below Ground Level) to 16.6 m BGL in the vicinity of the site. Direction of groundwater flow appears to be from north to south, i.e. towards the River Suir.

The bedrock aquifer has been given a Groundwater Protection Zone classification by the GSI (as part of the Groundwater Protection Scheme for Co. Kilkenny) of Rf/M – Regionally Important of Moderate Vulnerability.

Well card data from the GSI Well Card Database (a record of wells drilled in Ireland) shows a number of wells within a 3 km radius of the WWTP site. From these records, the underlying bedrock in the area has been shown to be capable of yields ranging from moderate (40 – 100 m3/day) to excellent (>400 m3/day).

The IDA Park, located directly to north of the site, contains a borehole within the IDA Park for the purposes of water supply for the area until a public water supply is put in place by the Local Authority. It is understood that the IDA has permission to abstract approximately 10,100 gallons per hour. A public water supply has been constructed to the entrance to the IDA Park.

There are no direct emissions to groundwater. The only emissions to ground waters will be from the surface water runoff from the roads. Swales along the northern access road through the site, will allow some percolation into the ground. The balance of the road runoff is drained via a stormwater drainage system, discharging to a stream at the south east corner of the site. The swales are a SUDS (Sustainable Urban Drainage Systems) component and are grassed depressions for surface water drainage. The underlying soil is sandy clay with sandy gravelly clay in places. The underlying geology of the site is comprised of shales and siltstones.

2.4.1.3 Sensitivity of the Receiving Waters

The site is bounded by the Lower Suir Estuary to the south, and a small unnamed stream to the east. The Lower Suir Estuary was designated as Good Status (SERBD Transitional and Coastal Waters Action Programme 2009-2015). There is no information on the unnamed stream which runs alongside the site.

The Lower Suir Estuary is not designated as sensitive under the Urban Waste Water Treatment Regulations, 2001 (S.I. No. 254 of 2001) and subsequent amendments. The Middle Suir Estuary located upstream of the site is designated as sensitive under the Urban Waste Water Treatment Regulations, 2001 (S.I. No. 254 of 2001) and subsequent amendments. The Middle Suir Estuary was designated as Moderate Status (SERBD Transitional and Coastal Waters Action Programme 2009-2015).

Waterford Harbour is a designated shellfish water (2008) located >1km downstream of site.

Duncannon Beach is a designated bathing waters situated >5km downstream of the site. In 2009, the bathing waters were compliant with EU Mandatory Values.

2.4.1.4 Protected Ecological Sites and Species

The WWTP site overlaps with the Lower River Suir SAC boundary as the boundary of the SAC extends into the salt marsh and runs parallel to the shoreline. The infrastructure does not impinge on the designated site and there will be no impact during operation of the facility.

The Lower River Suir SAC (Site Code 002137) extends from freshwater stretches of the River Suir immediately south of Thurles, to the tidal stretches as far as the confluence with the Barrow/Nore immediately east of Cheekpoint in Co. Waterford. The site is a SAC selected for the presence of the priority habitats on Annex I of the E.U. Habitats Directive - alluvial wet woodlands and Yew Wood. The site is also selected as a SAC for floating river vegetation, Atlantic salt meadows, Mediterranean salt meadows, old oak woodlands and eutrophic tall herbs, all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive - Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon and Otter.

Other sites designated under the Habitats and Birds Directives within 5km of the site include the River Barrow and Nore SAC (Site Code 002162) that joins the Suir less than 5km downstream.

2.4.1.5 Air Quality and Topography

The site is situated on the banks of the River Suir at an elevation of approximately 10m OD. Sensitive receptors are located at elevations greater than 20m OD. Therefore the terrain is classified as intermediate terrain, i.e. where the elevations lie between the stack tip elevation and the plume rise elevation.

An assessment of the baseline air quality in the region of the facility was carried out by reference to suitable EPA long-term monitoring data (Updated EIS, April 2008). Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality entitled “Air Quality Monitoring Annual Report 2006” (EPA, 2007), details the range and scope of monitoring undertaken throughout Ireland. The EIS (2008) for the facility concluded that existing baseline levels of NO2, SO2, CO, benzene, PM10 and PM2.5 were below ambient air quality limit values in the vicinity of the site.

The predominant wind direction is south-westerly with an average wind speed of approximately 4-6 m/s.

2.4.1.6 Sensitive Agricultural Receptors

The agricultural land surrounding the site is identified as pasture by the EPA Corine landcover dataset. There were no fruit, vegetable or dairy farming identified within 150m of the site.

2.4.2 Compliance Record

The Waterford City WWTP is a newly licensed facility and has been operating since July 2010. Therefore the facility is classified as Compliant/New Facility with a score of 1.

2.4.3 Operation Risk Assessment

Table 2.5.1 Operation Risk Assessment

Complexity	Complexity Band	Score	
Activity Class:			
Class 6 - Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in this Schedule	G3	-	
Schedule 4 No. 2 "Recycling or reclamation of organic substances which are not used as solvents (including compositing and other biological processes)."	G4	4	Where more than one scheduled activity is located at a facility, then the highest Complexity Band is applied.
Environmental Sensitivity	**Sub Matrix Score**	**Score**	
Human Occupation			
- Located 50-250m from Site	3		
Groundwater Protection			
- Regionally Important Aquifer	2		
- Moderate Vulnerability	1		
Sensitivity of Receiving Waters			
- Good Status Waters	2		
Protected Ecological Sites and Species			
- Lower River Suir SAC overlaps site boundary	2		
Air Quality and Topography			
- Intermediate terrain	1		
Sensitive Agricultural Receptors			
- Fruit, vegetable or dairy farming >150m from activity footprint	0		
Total Environmental Sensitivity	11	2	
Compliance Record		**Score**	
Compliance/New Facility		1	
OVERALL RISK SCORE / RISK CATEGORY			
OVERALL RISK SCORE Complexity x Environmental Sensitivity x Compliance Record	4x2x1 =	8	
RISK CATEGORY		Category 2	

3. Residual Management Plan Scope and Criteria

3.1 Introduction and Scope of Plan

"10.1 Following termination, or planned cessation for a period greater than six months, of use or involvement of all or part of the site in the licensed activity, the licensee shall, to the satisfaction of the Agency, decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution."

The scope of this plan addresses the key issues, which would occur in an orderly shutdown of the activity or part thereof over the closure period of 4 months (for a full closure). Refer to Table 3.1.1 for closure programme. The closure programme details the cessation of activities and makes an allowance for the shutting downing of processing activities and for the removal of the sludges/ wastewater from site. This time period may be reduced depending on production.

The scope of the plan includes the following major activities:

- Setting up a management structure to oversee the Residuals Management Plan.
- Cessation of all treatment activities
- Removal of all remaining raw materials and final products from the site
- Cleaning and decontamination of all equipment and buildings
- Demolition of Buildings
- Groundwater monitoring.

A residual includes any potentially contaminating material and includes chemicals, wastes, buildings and equipment. In general, specialist equipment will be sold or distributed to other plants in the event of a shut down.

It is envisaged that suitably qualified employees at Waterford City Council will manage and oversee the Residuals Management Plan. Outside contractors required for demolition, cleaning, recycling activities or waste disposal would be licensed and approved.

This section details the plant, buildings, equipment and other materials, which require consideration as part of the closure process. The closure is detailed with regard to the closure of process areas/ activities, with further details regarding the overall residuals present onsite. Details of residuals which require decontamination and the proposed method of decontamination are provided.

It is expected that clean closure will be achieved; a benchmark set of criteria for clean closure for Waterford City WWTP is set out in Section 3.2.

Process Equipment

Upon implementation of the Residuals Management Plan, the transfer of wastewater to the site will cease. Once the final wastewater has been processed, and sludge removed from the site, decommissioning of the process equipment commence.

The processing plant will be isolated from the power source. The plant will then be drained of any oils/chemicals and taken offsite for reuse or sale. If this is not viable, the plant will be dismantled and sold as scrap metal.

The process tanks will be decontaminated and the washings will be tankered from site for treatment. Once the process tanks have been cleaned, the reinforced concrete tanks will be demolished and disposed of by a suitable contractor. The storage tanks onsite will be decommissioned and removed from the site. Reuse of the storage tanks should be considered where appropriate. Any process tanks not suitable for reuse will be dismantled and sold as scrap metals or sent for recycling.

Buildings and Infrastructure

The decommissioning of activities in the respective buildings (Inlet Works Building, Sludge Building, and Administration Building) is discussed above. Once the plant, chemicals, process residuals are removed and the buildings are washed, a final walkthrough inspection of the buildings will be undertaken.

The buildings will be demolished by an approved contractor followed by appropriate disposal.

Ancillary Services

Ancillary services areas such as the Administration Building will be decommissioned in a timely manner.

Office equipment will be isolated from electricity supply. Suitable office equipment will be redistributed to another site, sold for reuse or recycled as scrap materials and disposed of by a licensed contractor.

Canteen equipment and furniture will be sold for reuse or recycled as scrap materials and disposed of by a licensed contractor as appropriate.

Chemicals and Fuel

The quantities of bulk chemicals onsite will be monitored in accordance with the scheduled shut down of the site. Bulk chemicals will be returned to the vendor. Any raw materials which cannot be returned to the supplier whether due to minimal volume constraints or failure to find a suitable user for the material will be treated as a waste product and treated accordingly as outlined in the section of this plan detailing waste handling and disposal.

The bulk chemical storage tanks will be decommissioned and will either be distributed to another site or sold as scrap metal, once they have been decontaminated.

The ordering and supply of diesel to the site will be inline with the planned cessation of activities onsite. Diesel residuals remaining onsite in the bunded storage area will be returned to the vendor or reused in other sites. The bunded diesel storage area will be jetted and cleaned by a specialist contract. The washings will be removed from site and treated by a licensed contractor.

Waste

Existing environmental policies regarding recycling and waste disposal will continue to apply during plant decommissioning. Existing Environmental practises regarding the disposal of waste will be implemented during plant shutdown.

Any plant which cannot be redistributed to another plant or sold for reuse or sold as scrap metals (or materials) will be treated as waste. A contingency is allowed in the costing of the plan to allow for this occurrence where reuse or recycling is not appropriate.

Any chemicals or fuels which cannot be returned to the supplier whether due to minimal volume constraints or failure to find a suitable user will be treated as a waste product and treated accordingly. These chemicals will be disposed of utilising a hazardous waste contractor.

Chemical and fuel wastes outlined above include:

- Polyelectrolyte
- Diesel
- Biogas (it is envisaged that the biogas will be utilised completely, or flared in the process prior to plant shutdown)

Groundwater Monitoring

Groundwater monitoring, will be undertaken in accordance with the licence requirements at the onset of the plant shut down, and again at the completion of the plant shutdown. No further monitoring is anticipated, unless requested by EPA.

Table 3.1.1 Programme

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16
Cessation of receipt of wastewater	x															
Cessation of wastewater/sludge processing	x	x														
Removal of Sludge		x	x													
Process tanks cleaning			x													
Chemicals and fuel removal				x												
Plant inventory					x											
Plant decontamination, decommissioning and removal						x	x	x	x							
Removal of Tanks										x	x	x				
Removal of General Wastes													x			
Building decontamination, inspection													x			
Demolition and Removal Building materials														x	x	
Groundwater Monitoring	x															x

3.2 Criteria for successful decommissioning

Clean Closure is envisaged for this site and the criteria for successful decommissioning are as follows:

1. All plant and buildings safely decontaminated using standard procedures and authorised contractors.

2. All Wastes handled, packaged, temporarily stored and disposed or recovered in a manner which complies the regulatory requirements:

    a. All hazardous materials should be classified in accordance with European Communities (Classification, Packaging, Labelling and Notification of Dangerous Substances) Regulations, 1994.

    b. Handling and transport of waste should be undertaken in accordance with the Waste Management Act 1996.

3. All relevant records relating to waste and materials movement and transfer or disposal were managed and retained throughout the closure process.

4. Remove all potential sources of effluent generation from the site and minimise water use and release quantities during decommissioning

5. There was no soil or groundwater contamination at the site. This was verified using monitoring data and a soil/groundwater assessment at the time of closure.

4. Residual Management Plan Costs

The Residual Management Plan Costs are set out in Table 4.1.1., expenditure includes man-hours, transport costs, disposal costs, specialist contractors and groundwater testing.

Table 4.1.1 Cost of Plan

Residual	Action/Disposal	Costs incurred	Cost
			Total
-	Management of RMP	man-hours	30,000
Waste	Implement existing operational practice. Reuse or recycle where possible. Utilise best practice and comply with regulatory requirements.	man-hours disposal costs	5,000
Chemicals and Fuel	Return to vendor where possible. Dispose of remainder as waste, utilising best practice and complying with Regulatory Requirements.	man-hours disposal costs	3,000
	Decontaminate bunds by specialist contractor. Dispose and treat washings at a licensed facility.	specialist contractor disposal costs	10,000
Process Plant and Equipment	Follow decommissioning programme as set out in Section 3. Decontaminate tanks, demolish tanks, disposal of waste by a licensed contractor Remove pipes and disposal by licensed contractor Utilise specialist contractors for removal of gas/chemicals. Decontaminate plant and sell to another site or sell remainder as scrap.	man-hours specialist contractor disposal costs	206,000
	Office Equipment	man-hours disposal costs	2,000
Buildings and Infrastructure	Follow decommissioning programme as set out in Section 3. Decontaminate buildings. Demolish Buildings.	man-hours disposal costs	27,000
Groundwater	groundwater monitoring and groundwater report	At start of closure period and following completion of RMP	12,000
Environmental Reports			10,000
Contingency			30500
TOTAL			335,500

Appendix B. Environmental Liabilities Risk Assessment

Waterford City WWTP (Sludge Treatment)
Springfield House, Gorteens, Co. Kilkenny
W0244-01

Environmental Liabilities Risk Assessment

May 2011

Waterford City Council

Mott MacDonald

Waterford City WWTP (Sludge Treatment)
Springfield House, Gorteens, Co. Kilkenny
W0244-01

Environmental Liabilities Risk Assessment

May 2011

Waterford City Council

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Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	Feb 2011	A. Lambe	FMcG	FMcG	Draft Report
B	May 2011	A. Lambe	FMcG	FMcG	Issue following incorporation of WCC comments

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Content

1. Introduction

The facility's requirement for Environmental Liability Risk Assessment is contained within Condition 12.2.2 as follows:

"The licensee shall arrange for the completion, by an independent and appropriately qualified consultant, of a comprehensive and fully costed Environmental Liabilities Risk Assessment ***(ELRA),*** *which addresses the liabilities from past and present activities. The assessment shall include those liabilities and costs identified in Condition 10 for execution of the DMP. A report on this assessment shall be submitted to the Agency for agreement within twelve months of date of grant of this licence. The ELRA shall be reviewed as necessary to reflect any significant change on site, and in any case every three years following initial agreement. The results of the review shall be notified as part of the AER."*

This report is intended to comply with the requirements outlined in Environmental Liability Risk Assessment guidance.

2. Risk Identification

2.1 Introduction

The facility is a wastewater treatment plant for Waterford City and its Environs to cater for domestic and industrial wastewater. It is located approximately 3km east of Waterford City in the townland of Gorteens, County Kilkenny. The facility is operated by Celtic Anglian Water on behalf of Waterford City Council and operates 24 hours/day and 365 days/year.

The wastewater treatment process consists of inlet screening, grit and grease removal, primary settlement, activated sludge process and final settlement. The facility includes infrastructure for the treatment of excess sludge generated by the wastewater treatment process. The maximum tonnage of sewage sludge to be treated is 95,100 tonnes per annum. No sludges or other wastes are permitted to be imported for treatment.

The sludge arising from wastewater treatment is thickened, pasteurised, treated in two anaerobic digesters and dewatered. Biogas from the digestion process is used for the on-site boilers, with any excess gas being flared. The wastewater preliminary treatment works and sludge dewatering works are located indoors, in the inlet works building and sludge building respectively. These areas are operated under negative air pressure with odours extracted to two odour control units for treatment.

The Sludge Treatment Processes at the Waterford City WWTP are as follows:
- Primary sludge is thickened to 6% dry solids in a picket fence thickener
- Secondary activated sludge is thickened to 5% dry solids in a gravity belt thickener
- The sludges are blended and then pumped to a pasteurisation stage. In the pasteurisation stage the sludge is heated to at least 55^{o}C with and a residence time of at least 2 hours.
- Following pasteurisation the sludge is further treated in an anaerobic digester with a sludge retention period of at least 14 days and an operating temperature of approximately 35^{o}C.
- Following digestion the sludge is dewatered to produce a cake with a minimum target dry solids content of 23%.

2.2 Complexity

Under the Waste Management Acts 1996 to 2008 the treatment of sewage sludge from municipal wastewater treatment plants, where the residual sludge is sent for disposal, is a licensable activity. The maximum tonnage of sludge to be treated is 95,100 tonnes per annum.

The principal activity under this act is "*Class 6 - Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in this Schedule".* The Secondary Activity, under Schedule 4 No. 2 of the Waste Management Acts, is recovery: "*Recycling or reclamation of organic substances which are not used as solvents (including compositing and other biological processes)."*

The complexity band for the primary activity is G3, whilst the complexity band for the secondary activity is G4 (>25 tonnes per annum). In accordance with EPA Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision, where more than one scheduled activity is located at a facility, then the highest Complexity Band is applied. Therefore the complexity band for the licensed site activity used in the Operational Risk Assessment is G4, which has a Score of 4.

2.3 Environmental Sensitivity

The Environmental Sensitivity of the Site is set out in Table 2.5.1 Operational Risk Assessment.

2.3.1 Human Occupation

There are residential areas to the west, northwest and northeast of the site. Residential areas are within 200 to 750m from the site boundary.

2.3.2 Groundwater Protection

The underlying geology of the site is comprised of shales and siltstones, which can be highly weathered in the upper layers and quite weak. The depth to bedrock ranges significantly in the area, ranging from 3.8 m BGL (Below Ground Level) to 16.6 m BGL in the vicinity of the site. Direction of groundwater flow appears to be from north to south, i.e. towards the River Suir.

The bedrock aquifer has been given a Groundwater Protection Zone classification by the GSI (as part of the Groundwater Protection Scheme for Co. Kilkenny) of Rf/M – Regionally Important of Moderate Vulnerability.

Well card data from the GSI Well Card Database (a record of wells drilled in Ireland) shows a number of wells within a 3 km radius of the WWTP site. From these records, the underlying bedrock in the area has been shown to be capable of yields ranging from moderate (40 – 100 m3/day) to excellent (>400 m3/day).

The IDA Park, located directly to north of the site, contains a borehole within the IDA Park for the purposes of water supply for the area until a public water supply is put in place by the Local Authority. It is understood that the IDA has permission to abstract approximately 10,100 gallons per hour.

There are no direct emissions to groundwater. The only emissions to ground waters will be from the surface water runoff from the roads. Swales along the northern access road through the site, will allow some percolation into the ground. The balance of the road runoff is drained via a stormwater drainage system, discharging to a stream at the south east corner of the site. The swales are a SUDS (Sustainable Urban Drainage Systems) component and are grassed depressions for surface water drainage. The underlying soil is sandy clay with sandy gravelly clay in places. The underlying geology of the site is comprised of shales and siltstones.

2.3.3 Sensitivity of the Receiving Waters

The site is bounded by the Lower Suir Estuary to the south, and a small unnamed stream to the east. The Lower Suir Estuary was designated as Good Status (SERBD Transitional and Coastal Waters Action Programme 2009-2015). There is no information on the unnamed stream which runs alongside the site.

The Lower Suir Estuary is not designated as sensitive under the Urban Waste Water Treatment Regulations, 2001 (S.I. No. 254 of 2001) and subsequent amendments. The Middle Suir Estuary located upstream of the site is designated as sensitive under the Urban Waste Water Treatment Regulations, 2001 (S.I. No. 254 of 2001) and subsequent amendments. The Middle Suir Estuary was designated as Moderate Status (SERBD Transitional and Coastal Waters Action Programme 2009-2015).

Waterford Harbour is a designated shellfish water (2008) located >1km downstream of site.

Duncannon Beach is a designated bathing waters situated >5km downstream of the site. In 2009, the bathing waters were compliant with EU Mandatory Values.

2.3.4 Protected Ecological Sites and Species

The WWTP site overlaps with the Lower River Suir SAC boundary as the boundary of the SAC extends into the salt marsh and runs parallel to the shoreline. The infrastructure does not impinge on the designated site and there will be no impact during operation of the facility.

The Lower River Suir SAC (Site Code 002137) extends from freshwater stretches of the River Suir immediately south of Thurles, to the tidal stretches as far as the confluence with the Barrow/Nore immediately east of Cheekpoint in Co. Waterford. The site is a SAC selected for the presence of the priority habitats on Annex I of the E.U. Habitats Directive - alluvial wet woodlands and Yew Wood. The site is also selected as a SAC for floating river vegetation, Atlantic salt meadows, Mediterranean salt meadows, old oak woodlands and eutrophic tall herbs, all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive - Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon and Otter.

Other sites designated under the Habitats and Birds Directives within 5km of the site include the River Barrow and Nore SAC (Site Code 002162) that joins the Suir less than 5km downstream.

2.3.5 Air Quality and Topography

The site is situated on the banks of the River Suir at an elevation of approximately 10m OD. Sensitive receptors are located at elevations greater than 20m OD. Therefore the terrain is classified as intermediate terrain, i.e. where the elevations lie between the stack tip elevation and the plume rise elevation.

An assessment of the baseline air quality in the region of the facility was carried out by reference to suitable EPA long-term monitoring data (Updated EIS, April 2008). Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality entitled “Air Quality Monitoring Annual Report 2006” (EPA, 2007), details the range and scope of monitoring undertaken throughout Ireland. The EIS (2008) for the facility concluded that existing baseline levels of NO2, SO2, CO, benzene, PM10 and PM2.5 were below ambient air quality limit values in the vicinity of the site.

The predominant wind direction is south-westerly with an average wind speed of approximately 4-6 m/s.

2.3.6 Sensitive Agricultural Receptors

The agricultural land surrounding the site is identified as pasture by the EPA Corine landcover dataset. There were no fruit, vegetable or dairy farming identified within 150m of the site.

2.4 Compliance Record

The Waterford City WWTP is a newly licensed facility and has been operating since July 2010. Therefore the facility is classified as Compliant/New Facility with a score of 1.

2.5 Operation Risk Assessment

Table 2.5.1 Step 1 Operation Risk Assessment

Complexity	Complexity Band	Score	
Activity Class:			
Class 6 - Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in this Schedule	G3	-	
Schedule 4 No. 2 "Recycling or reclamation of organic substances which are not used as solvents (including compositing and other biological processes)."	G4	4	Where more than one scheduled activity is located at a facility, then the highest Complexity Band is applied.
Environmental Sensitivity	**Sub Matrix Score**	**Score**	
Human Occupation			
- Located 50-250m from Site	3		
Groundwater Protection			
- Regionally Important Aquifer	2		
- Moderate Vulnerability	1		
Sensitivity of Receiving Waters			
- Good Status Waters	2		
Protected Ecological Sites and Species			
- Lower River Suir SAC overlaps site boundary	2		
Air Quality and Topography			
- Intermediate terrain	1		
Sensitive Agricultural Receptors			
- Fruit, vegetable or dairy farming >150m from activity footprint	0		
Total Environmental Sensitivity	11	2	
Compliance Record		**Score**	
Compliance/New Facility		1	
OVERALL RISK SCORE / RISK CATEGORY			
OVERALL RISK SCORE Complexity x Environmental Sensitivity x Compliance Record	4x2x1 =	8	
RISK CATEGORY		Category 2	

3. Risk Assessment

The Risk Classification Tables 3.1 and 3.2 have been designed to reflect the critical levels of risk appropriate to the site. The cost of remediation reflects cost of remediation associated with the sensitive nature of the receiving waters and the proximity of designated areas.

Table 3.1 Risk Classification Table - Occurrence

Rating	Category	Description	Likelihood of Occurrence (%)
1	Negligible	Very low chance (0-5%) of hazard occurring during operating period	0 - 5
2	Low	Low chance (5-10%) of hazard occurring during operating period	5 -10
3	Medium	Medium chance (10-20%) of hazard occurring during operating period	10 – 20
4	High	High chance (20-50%) of hazard occurring during operating period	20 - 50
5	Very High	Greater than 50% chance of hazard occurring during operating period	>50

Table 3.2 Risk Classification Table - Severity

Rating	Category	Description	Cost of Remediation
1	Trivial	No damage or negligible change to the environment	<1,000
2	Minor	Minor impact/ localised or nuisance	1,000 - 20,000
3	Moderate	Moderate damage to environment	20,000 -75,000
4	Major	Severe damage to local environment	100,000 - 175,000
5	Massive	Massive damage to a large area, irreversible in medium term	175,000 - 1,000,000

Table 3.3 sets out the Risk Assessment and the overall Risk Score for each risk identified and the basis for the severity and occurrence rating for each risk is set out.

Table 3.3 Risk Assessment Form

Risk ID	Process	Potential Hazards	Environmental Effect	Severity Rating	Basis of Severity	Occurrence Rating	Basis of Occurrence	Risk Score (Severity x Occurrence)
1	Inlet works	Blockage	Untreated wastewater discharge to groundwater/ surface water	2	Duration would be short, blockage would be noticed. Bypass screens in place.	3	2 automatic screens and bypass screen. Screens are regularly inspected. Pumped flow to inlet.	**6**
2	Operation of plant under storm events	Storm water (continuous pumping of wastewater to plant) resulting in washout of bacteria.	Untreated dilute wastewater discharge to surface water	2	Wastewater feed to plant by a combination of gravity and pumped mains, storm water tanks.	2	No reports of storm events causing problems at site.	**4**
3	Biological Tank	Failure of aeration/ insufficient aeration capacity to treat incoming load	Receiving waters - Depletion of D.O., nutrient enrichment.	3	Remediation of river, and protected habitats.	4	Plant designed for carbonaceous oxidation, aeration system does not have capacity to achieve nitrogen limits set under licence for design load, D.O. monitors, monitoring of D.O. Standby blowers. Trained operatives onsite, monitoring of process.	**12**
4	Biological Tank	Washout of MLSS, failure/ insufficient biological treatment, discharge of untreated/ partially treated wastewater	Receiving waters - Depletion of D.O., nutrient enrichment, potential fish kill	3	Remediation of river, and protected habitats.	4	Plant designed for carbonaceous oxidation, plant does not have capacity to achieve nitrogen limits set under licence for design load, MLSS	**12**

Risk ID	Process	Potential Hazards	Environmental Effect	Severity Rating	Basis of Severity	Occurrence Rating	Basis of Occurrence	Risk Score (Severity x Occurrence)
							monitors, monitoring of D.O. Trained operatives onsite, monitoring of process.	
5	Clarifier	Failure of critical equipment leading to solids carryover in effluent	Suspended solids concentration in the receiving water	3	Impact on receiving waters would be short	2	MLSS monitoring and monitoring of process, failure would be noticed.	**6**
6	Sludge Exports	Spill onsite	Groundwater pollution - subsequent impact on watercourses	2	High volumes of sludge for transport offsite	3	High volume of sludge for transport on/off site. Experienced site personnel.	**6**
7	Sludge Treatment	Spill onsite	Groundwater pollution - subsequent impact on watercourses	4	High volumes of sludge onsite,	3	Constructed and last integrity tested in 2009/10. Regular inspection and maintenance. Experienced site personnel. Sludge Treatment area to be bunded with drainage directed to the return liquors system.	**12**
8	Biogas Production	Escape of biogas due to malfunction of flare or gas control system	Release of biogas to atmosphere,	4	release of biogas to atmosphere	3	SCADA control system, failure would be noticed. Experienced operatives onsite.	**12**
9	Biogas Production - Gas Holder	Explosion/ fire	Potential release of explosive gas, fire and firewater.	4	Fire at WWTP and potential release of firewater	3	Biogas produced onsite	**12**
10	Supernatant return	Failure of pumps	Groundwater pollution - subsequent impact on watercourses	3	Moderate quantities of high strength wastewater.	2	Pumps linked to plant SCADA, failure would be noticed.	**6**

Risk ID	Process	Potential Hazards	Environmental Effect	Severity Rating	Basis of Severity	Occurrence Rating	Basis of Occurrence	Risk Score (Severity x Occurrence)
11	General - chemical spill	Spill onsite	Groundwater pollution - subsequent impact on watercourses	2	2.4 tonnes powdered polyelectrolyte stored onsite (one weeks supply) for sludge thickening and dewatering.	3	Bunded polymer dosing area. Polymer stored with Sludge Building and any spillages will be washed and drained to the Liquors return pumping station.	**6**
12	General - diesel spill	Spill onsite	Groundwater pollution - subsequent impact on watercourses	3	The capacity of boiler fuel tank is 10,000 litres diesel and the generator fuel tank also holds 10,000 litres diesel.	2	Double skin tanks, high level alarm experienced personnel onsite.	**6**
13	General - power failure	Power Failure - Washout of MLSS, failure of biological treatment, discharge of untreated wastewater	Receiving waters - Depletion of D.O., nutrient enrichment, potential fish kill	3	Backup generator onsite, no history of power failure onsite. Duration would be short.	1	No reported problem with ESB supply. Backup generator onsite.	**3**
14	General - tank failure	Tank failure	Groundwater pollution - subsequent impact on watercourses	4	Contamination could be ongoing for a long period of time if leak not detected. Possible need to pump and treat groundwater and soil.	2	Constructed and last integrity tested in 2006. Regular inspection and maintenance. Sludge Farm area is bunded.	**8**
15	General - pipe failure	Pipe Failure	Groundwater pollution - subsequent impact on watercourses	3	Contamination could be ongoing for a long period of time if leak not detected. Possible need to pump and treat groundwater and soil.	2	Constructed and last integrity tested in 2009/10. Regular inspection and maintenance.	**6**
16	WWTP operation	Fire at WWTP (firewater)	Groundwater pollution - subsequent impact on watercourses	4	Possible need to pump and treat groundwater.	3	Moderate quantities of hydrocarbons stored onsite.	**12**
17	WWTP site	Flooding	Receiving waters - Depletion of D.O., nutrient enrichment, potential fish	4	Remediation of soil, groundwater and estuarine habitats.	1	No history of flooding onsite.	**4**

Risk ID	Process	Potential Hazards	Environmental Effect	Severity Rating	Basis of Severity	Occurrence Rating	Basis of Occurrence	Risk Score (Severity x Occurrence)
			kill. Risk to Groundwater					
18	WWTP Influent	Variations in influent, which may impact on process performance e.g. increased salinity in the influent during high tide conditions	Failure of process, resulting in non-complicant discharges. Receiving waters - Depletion of D.O., nutrient enrichment.	3	Remediation of river, and protected habitats.	4	conditions have resulted in non-compliant discharges and mitigation measures are been taken.	**12**
19	WWTP Influent	Underloading of plant, or variations in influent temperature resulting in the growth of filamentous bacteria	Failure of process, resulting in non-complicant discharges.Receiving waters -Depletion of D.O., nutrient enrichment.	3	Remediation of river, and protected habitats.	4	conditions have resulted in non-compliant discharges and mitigation measures are been taken.	**12**

Table 3.4 Risk Matrix – Current Risk Status

Occurrence						
V. High	5					
High	4			3, 4, 18, 19		
Medium	3		1, 6, 11		7, 8, 9, 16	
Low	2		2	5, 10, 12, 15	14	
V. Low	1			13	4, 17	
		Trivial	Minor	Moderate	Major	Massive
		1	2	3	4	5
		Severity				

These are considered to be high-level risks requiring priority attention. These risks have the potential to be catastrophic and as such should be addressed quickly.

These are medium-level risks requiring action, but are not as critical as a red coded risk.

Green (light and dark green) – These are lowest-level risks and indicate a need for continuing awareness and monitoring on a regular basis.
Whilst they are currently low or minor risks, some have the potential to increase to medium or even high-level risks and must therefore be regularly monitored

The risk matrix indicates that there are no risks in the yellow or red zones requiring priority attention. All are located in the green zone indicating a need for continuing awareness and monitoring on a regular basis. However, assessment of the green zone risks during the process has indicated that some of these risks can be reduced through the implementation of mitigation measures. These measures should be adopted where considered cost-effective to further reduce the risks. As these risks may have the potential to increase to yellow or red zone risks, risk management measures should be put in place to manage them at their current levels, or preferably to reduce them further.

Risks 3 and 4 deal with the WWTPs ability to achieve the nitrogen emission limit values set out in was water discharge licence D0022-01. At present the plant is complying with the nitrogen emission limit values, however as the plant is not designed for nitrogen removal it is considered the occurrence of insufficient aeration (Risk 3) or overloading of the biological treatment system (Risk 4) is high. Should the load to the plant increase above current levels the occurrence of Risks 3 and 4 may increase to very high resulting in medium-level risks.

Risks 18 and 19 deal with variations in influent (salininty levels during high tide) and under loading of plant resulting in the growth of filamentous bacteria. Both risks have resulted in non-compliant discharges and mitigation measures are being taken to address these issues.

Measures to mitigate these risks are included in the Statement of Measures contained in Section 5.

4. Statement of Measures

Table 4.1 Risk Assessment Mitigation Form

Risk I.D.	Risk Score	Mitigation measure to be taken	Outcome	Action	Date for completion	Owner/Contact Person
1	6	Continue regular maintenance and inspection.	Reduced risk of blockage and over spill.	Continue regular maintenance and inspection.	ongoing	Waterford City Council
2	4	Continue regular maintenance and inspection.	Reduced risk from storm events.	Continue regular maintenance and inspection.	ongoing	Waterford City Council
3	6	Continue regular maintenance and inspection, access aeration plant capacity to achieve nitrogen limits.	Reduced risk of aeration failure.	Continue regular maintenance and inspection. Access aeration system capacity to achieve nitrogen limits and improve infrastructure if required.	ongoing	Waterford City Council
4	6	Continue regular maintenance and inspection, access plant capacity to achieve nitrogen limits.	Reduced risk of failure of biological treatment.	Continue regular maintenance and inspection. Access plant capacity to achieve nitrogen limits and improve infrastructure if required.	ongoing	Waterford City Council
5	6	Continue regular maintenance and inspection.	Reduced risk of failure of clarifier.	Continue regular maintenance and inspection.	ongoing	Waterford City Council
6	6	Continue regular maintenance and inspection. Ensure staff training is up to date and SOPs are followed.	Reduced risk of sludge spill onsite	Continue regular maintenance and inspection. Ensure staff training is up to date and SOPs are followed.	ongoing	Waterford City Council
7	12	Continue regular maintenance and inspection. Ensure staff training is up to date and SOPs are followed.	Reduced risk of sludge spill onsite	Continue regular maintenance and inspection. Ensure staff training is up to date and SOPs are followed.	ongoing	Waterford City Council
8	12	Continue regular maintenance and inspection. Ensure staff training is up to date and SOPs are followed.	Reduced risk of emission of biogas.	Continue regular maintenance and inspection. Ensure staff training is up to date and SOPs are followed.	ongoing	Waterford City Council
9	12	Continue regular maintenance and inspection. Ensure staff training is up to date and SOPs are followed.	Reduced risk of fire/ explosion due to storage of biogas onsite.	Continue regular maintenance and inspection. Ensure staff training is up to date and SOPs are followed.	ongoing	Waterford City Council
10	6	Continue regular maintenance and inspection.	Reduced risk of failure of clarifier.	Continue regular maintenance and inspection.	ongoing	Waterford City Council

Risk I.D.	Risk Score	Mitigation measure to be taken	Outcome	Action	Date for completion	Owner/Contact Person
11	6	Continue regular maintenance and inspection. Ensure staff training is up to date and SOPs are followed.	Reduced risk of spill/leak onsite	Continue regular maintenance and inspection. Ensure staff training is up to date and SOPs are followed.	ongoing	Waterford City Council
12	6	Continue regular maintenance and inspection. Ensure staff training is up to date and SOPs are followed.	Reduced risk of spill/leak onsite	Continue regular maintenance and inspection. Ensure staff training is up to date and SOPs are followed. Ferric chloride bunding to be provided.	ongoing	Waterford City Council
13	3	Put in place emergency procedures for prolonged power outage. Ensure staff training is up to date.	Reduced risk from power outage onsite.	Put in place emergency procedures for prolonged power outage. Ensure staff training is up to date.	ongoing	Waterford City Council
14	8	Continue regular maintenance and inspection.	Reduced risk from tank failure.	Continue regular maintenance and inspection.	ongoing	Waterford City Council
15	6	Continue regular maintenance and inspection.	Reduced risk from pipe failure.	Continue regular maintenance and inspection.	ongoing	Waterford City Council
16	12	Put in place emergency procedures for dealing with fire/firewater. Ensure staff training is up to date.	Reduced risk firewater.	Put in place emergency procedures for dealing with fire/firewater. Ensure staff training is up to date.	ongoing	Waterford City Council
17	4	None required	n/a	None required	n/a	n/a
18	12	Continue regular maintenance and inspection. Investigate source of saline infiltration, survey of sewers to identify sewers requiring rehabilitation.	Reduced risk of failure of biological treatment.	Survey of sewers for saline infiltration complete, report submitted to DEHLG for funding of proposed rehabilitation works to sewers.	ongoing	Waterford City Council
19	12	Continue regular maintenance and inspection, monitor loading to plant and biomass growth.	Reduced risk of failure of biological treatment.	To date the rate of return activated sludge draw-off from the Final Settlement Tanks has been adjusted and floating booms on the Aeration Tanks have been installed to control filamentous growth during underloading.	ongoing	Waterford City Council

Statement

I confirm the above are the measures which will be taken by the Local Authority

Signed:

Name Date

5. Assessment of Environmental Liabilities

The “unknown” environmental liabilities are associated with environmental risks and may or may not occur. The best case scenario is that none of the environmental risks occur and hence at the end of the assessment period of 30 years, the additional costs incurred by Waterford City Council are zero. Alternatively, should a significant number of risks materialise, significant additional costs could be incurred.

The “unknown” environmental liabilities are estimated through the use of a financial model. Each risk has two characteristics that are derived from the Risk Classification Tables (Tables 3.1 and 3.2) that are used in the financial model:

- The range in cost implications (€A-B) if the risk occurs (Table 3.1)
- The range in probability (X-Y%) of the risk occurring (Table 3.2)

In order to identify an indicative level of environmental liability associated with the environmental risks for the purposes of the ELRA, a cost model has been used to generate the expected cumulative cost of the risks as outlined in Section 3 of this report. The modelling has been undertaken using the median probability and severity of occurrence of each risk (Table 5.1).

Table 5.1: Summary of Potential “Unknown” Environmental Liabilities

Risk ID	Severity Rating	Cost Range (€)	Occurrence Rating	Likelihood of Occurrence Rating (%)	Median Probability (%)	Median Severity (€)	Most Likely Cost Scenario (€)
1	2	1,000 - 20,000	3	10 - 20	15	10,500	1,575
2	2	1,000 - 20,000	2	5 - 10	7.5	10,500	788
3	3	20,000 -75,000	4	20 - 50	35	60,000	21,000
4	3	20,000 -75,000	4	20 - 50	35	60,000	21,000
5	3	20,000 -75,000	2	5 - 10	7.5	60,000	4,500
6	2	1,000 - 20,000	3	10 - 20	15	10,500	1,575
7	4	100,000 - 175,000	3	10 - 20	15	137,500	20,625
8	4	100,000 - 175,000	3	10 - 20	15	137,500	20,625
9	4	100,000 - 175,000	3	10 - 20	15	137,500	20,625
10	3	20,000 -75,000	2	5 - 10	7.5	60,000	4,500
11	2	1,000 - 20,000	3	10 - 20	15	10,500	1,575
12	3	20,000 -75,000	2	5 - 10	7.5	60,000	4,500
13	3	20,000 -75,000	1	0 – 5	2.5	60,000	1,500
14	4	100,000 - 175,000	2	5 - 10	7.5	137,500	10,313
15	3	20,000 -75,000	2	5 - 10	7.5	60,000	4,500
16	4	100,000 - 175,000	3	10 - 20	15	137,500	20,625
17	4	100,000 - 175,000	1	0 – 5	2.5	137,500	3,438
18	3	20,000 -75,000	4	20 - 50	35	60,000	21,000
19	3	20,000 -75,000	4	20 - 50	35	60,000	21,000
Total							**205,263**

The Estimate of Potential “Unknown” Environmental Liabilities identified in this ELRA report is €205,263 for the Waterford City WWTP. The estimate of “known” environmental identified in the Residual Management Plan Report for this site is €335,500.00.

Appendix C. Summary of Sludge Disposal Records

Batch No.	Date	Destination of Product	Type of Product	Quantity of Product (kg)	Contact at Destination	Certificate of Origin/ Delivery	Receipt Received After Delivery	Name of Farmer	Address of Farmer	Land Parcel Spread	Surface Area Spread (HA)	Quantity of Sludge Spread (t)
1	23-Jul	Ormonde Organics	Class A	15,320	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	Field no.: 10,11A,12A,13,14,16,17A,18A, 19A&B, 22, 23A&C, 25A, 25B, 26, 27	79.79	15,320
2	24-Jul	Ormonde Organics	Class A	11,980	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	11980
3	24-Jul	Ormonde Organics	Class A	10,100	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	10100
4	26-Jul	Ormonde Organics	Class A	16,900	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	16900
5	27-Jul	Ormonde Organics	Class A	14,140	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	14140
6	27-Jul	Ormonde Organics	Class A	13,220	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	13220
7	28-Jul	Ormonde Organics	Class A	13,400	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	13400
8	29-Jul	Ormonde Organics	Class A	7,680	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	7680
9	30-Jul	Ormonde Organics	Class A	19,740	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	19740
10	31-Jul	Ormonde Organics	Class A	16,980	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	16980
11	03-Aug	Ormonde Organics	Class A	16,620	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	16620
12	03-Aug	Ormonde Organics	Class A	13,840	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	13840
13	04-Aug	Ormonde Organics	Class A	13,160	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	13160
14	05-Aug	Ormonde Organics	Class A	16,460	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	16460
15	06-Aug	Ormonde Organics	Class A	16,940	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	16940

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Batch No.	Date	Destination of Product	Type of Product	Quantity of Product (kg)	Contact at Destination	Certificate of Origin/ Delivery	Receipt Received After Delivery	Name of Farmer	Address of Farmer	Land Parcel Spread	Surface Area Spread (HA)	Quantity of Sludge Spread (t)
16	09-Aug	Ormonde Organics	Class A	15,720	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	15720
17	10-Aug	Ormonde Organics	Class A	12,680	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	12680
18	11-Aug	Ormonde Organics	Class A	11,200	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	11200
19	12-Aug	Ormonde Organics	Class A	14,200	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	14200
20	13-Aug	Ormonde Organics	Class A	10,980	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	10980
21	16-Aug	Ormonde Organics	Class A	15,660	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	15660
22	17-Aug	Ormonde Organics	Class A	13,980	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	13980
23	19-Aug	Ormonde Organics	Class A	15,240	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	15240
24	20-Aug	Ormonde Organics	Class A	14,460	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	14460
25	23-Aug	Ormonde Organics	Class A	12,740	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	12740
26	24-Aug	Ormonde Organics	Class A	12,320	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	12320
27	25-Aug	Ormonde Organics	Class A	13,320	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	13320
28	26-Aug	Ormonde Organics	Class A	12,960	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	12960
29	26-Aug	Ormonde Organics	Class A	12,340	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	12340
30	27-Aug	Ormonde Organics	Class A	16,540	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	16540
31	28-Aug	Ormonde Organics	Class A	15,840	Nicholas Downey	yes	yes	Oliver Carroll	Ballydurn, Portlaw	as above	as above	15840
1	01-Sep	Ormonde Organics	Class A	13,340	Nicholas Downey	yes	yes	all sludge still in storage				

Batch No.	Date	Destination of Product	Type of Product	Quantity of Product (kg)	Contact at Destination	Certificate of Origin/ Delivery	Receipt Received After Delivery	Name of Farmer	Address of Farmer	Land Parcel Spread	Surface Area Spread (HA)	Quantity of Sludge Spread (t)
2	02-Sep	David Reck, Courtnacuddy, Clonroche	Class A	14,400	Gareth Clegg	yes	yes					
3	07-Sep	David Reck, Courtnacuddy, Clonroche	Class A	13,400	Gareth Clegg	yes	yes					
4	07-Sep	David Reck, Courtnacuddy, Clonroche	Class A	13,400	Gareth Clegg	yes	yes					
5	08-Sep	David Reck, Courtnacuddy, Clonroche	Class A	12,280	Gareth Clegg	yes	yes					
6	09-Sep	David Reck, Courtnacuddy, Clonroche	Class A	11,200	Gareth Clegg	yes	yes					
7	10-Sep	David Reck, Courtnacuddy, Clonroche	Class A	12,200	Gareth Clegg	yes	yes					
8	14-Sep	David Reck, Courtnacuddy, Clonroche	Class A	13,520	Gareth Clegg	yes	yes					
9	15-Sep	David Reck, Courtnacuddy, Clonroche	Class A	15,420	Gareth Clegg	yes	yes					
10	15-Sep	David Reck, Courtnacuddy, Clonroche	Class A	15,440	Gareth Clegg	yes	yes					
11	16-Sep	David Reck, Courtnacuddy, Clonroche	Class A	10,480	Gareth Clegg	yes	yes					
12	17-Sep	David Reck, Courtnacuddy, Clonroche	Class A	11,600	Gareth Clegg	yes	yes					
13	17-Sep	David Reck, Courtnacuddy, Clonroche	Class A	13,160	Gareth Clegg	yes	yes					

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Batch No.	Date	Destination of Product	Type of Product	Quantity of Product (kg)	Contact at Destination	Certificate of Origin/ Delivery	Receipt Received After Delivery	Name of Farmer	Address of Farmer	Land Parcel Spread	Surface Area Spread (HA)	Quantity of Sludge Spread (t)
14	20-Sep	David Reck, Courtnacuddy, Clonroche	Class A	12,160	Gareth Clegg	yes	yes					
15	20-Sep	David Reck, Courtnacuddy, Clonroche	Class A	10,220	Gareth Clegg	yes	yes					
16	21-Sep	David Reck, Courtnacuddy, Clonroche	Class A	12,980	Gareth Clegg	yes	yes					
17	22-Sep	David Reck, Courtnacuddy, Clonroche	Class A	14,760	Gareth Clegg	yes	yes					
18	23-Sep	David Reck, Courtnacuddy, Clonroche	Class A	13,320	Gareth Clegg	yes	yes					
19	27-Sep	David Reck, Courtnacuddy, Clonroche	Class A	8,920	Gareth Clegg	yes	yes					
20	28-Sep	David Reck, Courtnacuddy, Clonroche	Class A	15,060	Gareth Clegg	yes	yes					
21	28-Sep	David Reck, Courtnacuddy, Clonroche	Class A	14,040	Gareth Clegg	yes	yes					
22	29-Sep	David Reck, Courtnacuddy, Clonroche	Class A	12,560	Gareth Clegg	yes	yes					
23	29-Sep	David Reck, Courtnacuddy, Clonroche	Class A	12,460	Gareth Clegg	yes	yes					
24	30-Sep	David Reck, Courtnacuddy, Clonroche	Class A	13,580	Gareth Clegg	yes	yes					
1	01-Oct	David Reck, Courtnacuddy, Clonroche	Class A	12,540	Gareth Clegg	yes	yes					

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Batch No.	Date	Destination of Product	Type of Product	Quantity of Product (kg)	Contact at Destination	Certificate of Origin/ Delivery	Receipt Received After Delivery	Name of Farmer	Address of Farmer	Land Parcel Spread	Surface Area Spread (HA)	Quantity of Sludge Spread (t)
2	04-Oct	David Reck, Courtnacuddy, Clonroche	Class A	15,200	Gareth Clegg	yes	yes					
3	05-Oct	David Reck, Courtnacuddy, Clonroche	Class A	14,700	Gareth Clegg	yes	yes					
4	06-Oct	David Reck, Courtnacuddy, Clonroche	Class A	13,280	Gareth Clegg	yes	yes					
5	07-Oct	David Reck, Courtnacuddy, Clonroche	Class A	14,980	Gareth Clegg	yes	yes					
6	08-Oct	David Reck, Courtnacuddy, Clonroche	Class A	16,080	Gareth Clegg	yes	yes					
7	11-Oct	David Reck, Courtnacuddy, Clonroche	Class A	15,800	Gareth Clegg	yes	yes					
8	12-Oct	David Reck, Courtnacuddy, Clonroche	Class A	10,840	Gareth Clegg	yes	yes					
9	13-Oct	David Reck, Courtnacuddy, Clonroche	Class A	13,420	Gareth Clegg	yes	yes					
10	13-Oct	David Reck, Courtnacuddy, Clonroche	Class A	14,020	Gareth Clegg	yes	yes					
11	14-Oct	David Reck, Courtnacuddy, Clonroche	Class A	12,620	Gareth Clegg	yes	yes					
12	14-Oct	David Reck, Courtnacuddy, Clonroche	Class A	11,160	Gareth Clegg	yes	yes					
13	15-Oct	David Reck, Courtnacuddy, Clonroche	Class A	14,900	Gareth Clegg	yes	yes					

Batch No.	Date	Destination of Product	Type of Product	Quantity of Product (kg)	Contact at Destination	Certificate of Origin/ Delivery	Receipt Received After Delivery	Name of Farmer	Address of Farmer	Land Parcel Spread	Surface Area Spread (HA)	Quantity of Sludge Spread (t)
14	18-Oct	David Reck, Courtnacuddy, Clonroche	Class A	11,140	Gareth Clegg	yes	yes					
15	19-Oct	David Reck, Courtnacuddy, Clonroche	Class A	13,220	Gareth Clegg	yes	yes					
16	19-Oct	David Reck, Courtnacuddy, Clonroche	Class A	12,440	Gareth Clegg	yes	yes					
17	21-Oct	David Reck, Courtnacuddy, Clonroche	Class A	15,460	Gareth Clegg	yes	yes					
18	21-Oct	David Reck, Courtnacuddy, Clonroche	Class A	14,260	Gareth Clegg	yes	yes					
19	22-Oct	David Reck, Courtnacuddy, Clonroche	Class A	10,820	Gareth Clegg	yes	yes					
20	22-Oct	David Reck, Courtnacuddy, Clonroche	Class A	10,840	Gareth Clegg	yes	yes					
21	26-Oct	David Reck, Courtnacuddy, Clonroche	Class A	13,200	Gareth Clegg	yes	yes					
22	26-Oct	David Reck, Courtnacuddy, Clonroche	Class A	9,380	Gareth Clegg	yes	yes					
23	27-Oct	David Reck, Courtnacuddy, Clonroche	Class A	11,340	Gareth Clegg	yes	yes					
24	28-Oct	David Reck, Courtnacuddy, Clonroche	Class A	12,940	Gareth Clegg	yes	yes					
25	29-Oct	David Reck, Courtnacuddy, Clonroche	Class A	9,720	Gareth Clegg	yes	yes					

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Batch No.	Date	Destination of Product	Type of Product	Quantity of Product (kg)	Contact at Destination	Certificate of Origin/ Delivery	Receipt Received After Delivery	Name of Farmer	Address of Farmer	Land Parcel Spread	Surface Area Spread (HA)	Quantity of Sludge Spread (t)
26	29-Oct	David Reck, Courtnacuddy, Clonroche	Class A	7,560	Gareth Clegg	yes	yes					
1	02-Nov	David Reck, Courtnacuddy, Clonroche	Class A	10,700	Gareth Clegg	yes	yes					
2	03-Nov	David Reck, Courtnacuddy, Clonroche	Class A	11,880	Gareth Clegg	yes	yes					
3	04-Nov	David Reck, Courtnacuddy, Clonroche	Class A	14,560	Gareth Clegg	yes	yes					
4	05-Nov	David Reck, Courtnacuddy, Clonroche	Class A	14,520	Gareth Clegg	yes	yes					
5	12-Nov	David Reck, Courtnacuddy, Clonroche	Class A	19,180	Gareth Clegg	yes	yes					
6	15-Nov	David Reck, Courtnacuddy, Clonroche	Class A	13,440	Gareth Clegg	yes	yes					
7	17-Nov	David Reck, Courtnacuddy, Clonroche	Class A	15,700	Gareth Clegg	yes	yes					
8	18-Nov	David Reck, Courtnacuddy, Clonroche	Class A	13,320	Gareth Clegg	yes	yes					
9	19-Nov	David Reck, Courtnacuddy, Clonroche	Class A	12,960	Gareth Clegg	yes	yes					
10	22-Nov	David Reck, Courtnacuddy, Clonroche	Class A	13,400	Gareth Clegg	yes	yes					
11	23-Nov	David Reck, Courtnacuddy, Clonroche	Class A	8,680	Gareth Clegg	yes	yes					

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Batch No.	Date	Destination of Product	Type of Product	Quantity of Product (kg)	Contact at Destination	Certificate of Origin/ Delivery	Receipt Received After Delivery	Name of Farmer	Address of Farmer	Land Parcel Spread	Surface Area Spread (HA)	Quantity of Sludge Spread (t)
12	24-Nov	David Reck, Courtnacuddy, Clonroche	Class A	12,900	Gareth Clegg	yes	yes					
13	24-Nov	David Reck, Courtnacuddy, Clonroche	Class A	13,000	Gareth Clegg	yes	yes					
14	25-Nov	David Reck, Courtnacuddy, Clonroche	Class A	16,380	Gareth Clegg	yes	yes					
15	26-Nov	David Reck, Courtnacuddy, Clonroche	Class A	12,380	Gareth Clegg	yes	yes					
1	02-Dec	David Reck, Courtnacuddy, Clonroche	Class A	15,120	Gareth Clegg	yes	yes					
2	02-Dec	David Reck, Courtnacuddy, Clonroche	Class A	9,440	Gareth Clegg	yes	yes					
3	03-Dec	David Reck, Courtnacuddy, Clonroche	Class A	11,860	Gareth Clegg	yes	yes					
4	06-Dec	David Reck, Courtnacuddy, Clonroche	Class A	16,760	Gareth Clegg	yes	yes					
5	07-Dec	David Reck, Courtnacuddy, Clonroche	Class A	10,500	Gareth Clegg	yes	yes					
6	08-Dec	David Reck, Courtnacuddy, Clonroche	Class A	17,020	Gareth Clegg	yes	yes					
7	09-Dec	David Reck, Courtnacuddy, Clonroche	Class A	7,260	Gareth Clegg	yes	yes					
8	10-Dec	David Reck, Courtnacuddy, Clonroche	Class A	15,180	Gareth Clegg	yes	yes					

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9	11-Dec	David Reck, Courtnacuddy, Clonroche	Class A	13,500	Gareth Clegg	yes	yes					
10	12-Dec	David Reck, Courtnacuddy, Clonroche	Class A	13,360	Gareth Clegg	yes	yes					
11	13-Dec	David Reck, Courtnacuddy, Clonroche	Class A	16,040	Gareth Clegg	yes	yes					
12	15-Dec	David Reck, Courtnacuddy, Clonroche	Class A	13,980	Gareth Clegg	yes	yes					
13	16-Dec	David Reck, Courtnacuddy, Clonroche	Class A	14,760	Gareth Clegg	yes	yes					
14	16-Dec	David Reck, Courtnacuddy, Clonroche	Class A	10,620	Gareth Clegg	yes	yes					
15	17-Dec	David Reck, Courtnacuddy, Clonroche	Class A	13,100	Gareth Clegg	yes	yes					
16	17-Dec	David Reck, Courtnacuddy, Clonroche	Class A	11,340	Gareth Clegg	yes	yes					
17	21-Dec	David Reck, Courtnacuddy, Clonroche	Class A	15,740	Gareth Clegg	yes	yes					
18	21-Dec	David Reck, Courtnacuddy, Clonroche	Class A	13,220	Gareth Clegg	yes	yes					
19	22-Dec	David Reck, Courtnacuddy, Clonroche	Class A	14,660	Gareth Clegg	yes	yes					
20	23-Dec	David Reck, Courtnacuddy, Clonroche	Class A	14,360	Gareth Clegg	yes	yes					

Batch No.	Date	Destination of Product	Type of Product	Quantity of Product (kg)	Contact at Destination	Certificate of Origin/ Delivery	Receipt Received After Delivery	Name of Farmer	Address of Farmer	Land Parcel Spread	Surface Area Spread (HA)	Quantity of Sludge Spread (t)
21	24-Dec	David Reck, Courtnacuddy, Clonroche	Class A	8,300	Gareth Clegg	yes	yes					
22	30-Dec	David Reck, Courtnacuddy, Clonroche	Class A	11,060	Gareth Clegg	yes	yes					
23	31-Dec	David Reck, Courtnacuddy, Clonroche	Class A	13,480	Gareth Clegg	yes	yes					