RESTORATION AND AFTERCARE MANAGEMENT PLAN

Churchtown Landfill Site

IBR1363 RAMP
Final
18 May 2022

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Document status

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1	Preliminary/Draft	Angela McGinley	John Durey	Donal Doyle	17/05/2022
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Approval for issue

Donal Doyle  18 May 2022

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1 INTRODUCTION

This restoration and aftercare management plan (RAMP) has been prepared for Churchtown Landfill Site in order for Donegal County Council (DCC) to comply with Condition 10.2 and 10.3 of their Waste Licence, W0062-02. This RAMP also takes due regard of the EPA Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision Document (2014).

In accordance with Condition 10.3 The Closure, Restoration and Aftercare Management Plan (CRAMP) shall include, as a minimum, the following:

i. a scope statement for the plan;
ii. the criteria that define the successful closure and restoration and aftercare 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 of the plan;
v. details of the long term supervision, monitoring, control, maintenance and reporting requirements for the restored facility; and
vi. details of the costings for the plan and the financial provisions to underwrite those costs.

In accordance with the guidance there are two types of closure;

- Clean Closure - upon cessation of operations and subsequent decommissioning at the facility, there are no remaining environmental liabilities.
- Non-Clean Closure – upon cessation of operations and subsequent decommissioning - there are remaining liabilities, which require a restoration and aftercare management plan.

1.1 FACILITY AND LICENCE DETAILS

The facility comprises a closed capped landfill with an integrated constructed wetlands system and willow bed installed on top of the landfill. The willow bed and integrated constructed wetlands treat leachate generated by the landfill. The landfill was restored 2014. Revised Waste licence W0062-02 was issued on 26th of August 2021. This licence authorises DCC to operate the integrated constructed wetlands systems and the willow bed, and to discharge the treated leachate to the adjacent waterbody, the River Finn.

1.2 FACILITY CLOSURE SCENARIOS COVERED IN THE PLAN

Due to the nature of the operation (landfill – Category 3 facility) a process of restoration and aftercare is required including on-going restoration/remediation works, management and long term monitoring.

The scope of the RAMP is to describe the facility and to outline the restoration and aftercare proposals in relation to the criteria required, management issues and costs. For Churchtown Landfill Site this RAMP will be for the aftercare only as the site closed in August 2000 and restoration works were completed by 14th December 2014.

1.3 SITE EVALUATION

For the purpose of this RAMP Churchtown landfill is as one distinct area as shown on Drawing No IBR1292-002 (Appendix A).

1.4 FACILITY COMPLIANCE STATUS

Other than the reporting of on-going emissions exceedances detected in the monitoring programme (3 in total in 2021), no other incidents occurred and no complaints were received. The 3 breaches of trigger level incidents were as follows;

- 1 incident in relation to exceedances of EPA agreed trigger level of 0.68 mg/l for ammoniacal nitrogen at surface water monitoring location SW2 in October (4.21 mg/l).
- 2 incidents in relation to exceedances of the methane (1.0%v/v/) or carbon dioxide (1.5% v/v) trigger levels in perimeter gas wells LG8 and LG9 in April and September.

1.5 FACILITY PROCESSES AND ACTIVITIES

Churchtown Landfill Site operated from 1987 to 31st August 2000. Licenced waste disposal activities in accordance with the Third Schedule of the Waste Management Act, 1996 as amended are as follows:

- Class D1 – Deposit on, in or under land (including landfill etc),
- Class D4 – Surface impoundment (e.g. placement of liquid or sludge discards into pits, ponds or lagoons etc) Principal Activity,
- Class D15 –Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage (being preliminary storage according to the definition of "collection" in section 5(1), pending collection on the site where the waste is produced.

1.6 INVENTORY OF SITE BUILDINGS, PLANT, RAW MATERIALS AND WASTES

There are no site buildings, plant , raw materials or waste remaining on site.

1.7 POLLUTION CONTROL SYSTEMS

1.7.1 Leachate Management

The site is an unlined site historically operated on a dilute and disperses principal, whereby solid waste was tipped directly onto the underlying excavated surface with leachate allowed to percolate directly through the soils with no engineered liner installed. Landfilling began in 1987 and the site ceased operations on the 31st August 2000. The existing landfill was capped with a permanent low permeability clay liner in conjunction with a willow and reed plantation and constructed wetland installed in 2014-2015. A 0.15 to 0.45 metre thick topsoil and 0.5 m clay cap with a permeability of $1x10^{-8}$ m/s was installed at the facility. The willow plantation in situated in the centre and above the capped waste (Zones 1 to 4) with a series of constructed wetlands along western and eastern side of willow plantation (Drawing No IBR1292-002).

1.7.1.1 Leachate Extraction

Leachate is extracted from 3 No. Pumping stations (Sump 1, 2 and 3) on site. A common 90mm HDPE leachate pumping main has been laid through the full length of the site within an existing site access road as shown on Drawing No IBR1292-002. Sump 1, 2 and 3 are connected to the 90mm pumping main adjacent to each extraction point.

1.7.1.2 Treatment System

The Willow Plantation (area is approximately drawing 400m long with widths varying from 50m – 70m) is divided into four zones with two main irrigation feed points each located centrally between Zone 1 and 2 and Zone 3 and 4. The connection to willow plantations is via 80mm leachate pumping main via an isolating valve, a strainer and a Flowmeter. The Willows are planted in double rows. Each ICW pond is above a 0.5m clay cap and is bunded using imported subsoil material that provides containment and processing of the influent contaminated waters. Each pond is planted with native species such as *Carex riparia*, *Typha*

latifolia, *Typha angustafolia*, *Glyceria maxima* and *Iris pseudacorus* and a shallow water depth of 100-200mm is maintained. The base area of each pond is level, with a level difference occurring from one pond to the next. Gravity flow is provided through the system from Pond 1 to the outlet of Pond 5. Each pond is connected by means of 150mm diameter inter-connecting pipes. Water levels can be managed within each pond by adjusting bends on the outlet pipe of each pond. The irrigation distribution system, flowmeters, flow analyser and motorised valves are housed within concrete chambers.

1.7.1.3 Leachate Treatment

The primary treatment option for the extracted leachate is to the willow plantation. Leachate is pumped to the willow plantation before discharge to surface water. If treated leachate levels are unacceptably elevated, the leachate is pumped into the nearest pumping station chamber (No 1 or 2) to be treated further by circulating via the willow/ICW's before discharging to surface water. The SCADA system monitors all site equipment and runs the entire plant automatically. The leachate pumping main is controlled at different pressures depending on what it is supplying, either ICW's or Willow Plantation irrigation system.

1.7.2 Surface Water Management

Collected runoff effluent meeting the required parameters from the willow bed and two separate ICWs is discharged to adjacent surface water drains as shown on the Drawing No IBR1292-002.

1.7.3 Landfill Gas Management

Passive landfill gas vents (18) have installed at the facility as shown on Drawing IBR01015/105.

2 CLOSURE CONSIDERATIONS

This section details the plant, buildings, equipment and other materials which require consideration as part of the closure process. Non Clean Closure with active aftercare leading eventually to Clean Closure is envisaged for the site. Closure considerations are outlined under two main headings:

- Underground Decommissioning
- Surface Decommissioning

2.1 CLEAN OR NO CLEAN CLOSURE DECLARATION

Successful 'clean closure' requires that there are no remaining environmental liabilities existing at the site. In practice, for a facility such as a landfill, monitoring will be required for at least a 30-year period. Therefore all landfilling areas will be subject to non-clean closure and an aftercare management plan will have to be maintained as part of this report and its revisions.

2.2 PLANT OR EQUIPMENT DECONTAMINATION REQUIREMENT

Equipment associated with the leachate treatment system will be maintained onsite in the aftercare period until the EPA approves of their decommissioning.

2.2.1 Building Demolition

There are no buildings on site.

2.2.2 Removal of Infrastructure & Services

Equipment associated with the leachate treatment system will be maintained onsite in the aftercare period until the EPA approves of their decommissioning. There is no other infrastructure or services on site that requires removal. All drainage and associated services no longer required which are located outside of the filled waste areas will be removed.

3 CRITERIA FOR SUCESSFUL CLOSURE

3.1 ADDRESSING OF SITE ENVIRONMENTAL LIABILITIES AT CLOSURE

3.1.1 Criteria for Successful Closure

As per the guidance document it should be outlined what type of closure is expected.

- Clean Closure - upon cessation of operations and subsequent decommissioning at the facility, there are no remaining environmental liabilities.
- Non-Clean Closure – upon cessation of operations and subsequent decommissioning - there are remaining liabilities, which require a restoration and aftercare management plan.

Successful 'clean closure' requires that there are no remaining environmental liabilities existing at the site. In the case of Category 3 facilities, due to the nature of the operation (i.e. landfill) a process of extensive restoration and aftercare may be required. It is expected that during this period there would be once-off restoration/remediation works and long term monitoring and management.

In practice, for a facility such as a landfill, monitoring will be required for at least a 30-year period. Therefore all landfilling areas will be subject to non-clean closure and an aftercare management plan will have to be maintained as part of this report and its revisions. For non clean closure, a Restoration and Aftercare Management Plan (RAMP) will be required in order to address this aspect. The content of this RAMP is outlined in Section 3.4 of the EPA Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision Document (2006).

Table 3.1 Criteria for Successful Non Clean Closure for Churchtown Landfill Site

Criteria	Action
Leachate concentrations no longer cause a hazard to the aquatic environment for a continuous period of 2 years	Proposals should be looked at to discharge untreated 'leachate' directly to surface water. The leachate treatment infrastructure could be decommissioned.
Leachate treatment infrastructure decommissioned	The leachate treatment infrastructure will be decommissioned, decontaminated and taken off site. The ICW/Willow treatment area can then be returned to the natural environment.

3.1.2 Monitoring Programme

Monitoring will continue for the parameters identified in Schedule C of the Waste Licence W0024-04. If monitoring identifies possible environmental pollution, action will be taken to rectify this. Surface water, groundwater, leachate and landfill gas monitoring will be reduced in frequency during the aftercare period as agreed with the EPA.

3.1.3 Identification of Elements Costed Following Restoration

The following elements have been included in the aftercare costings per year provided in Section 5.2 and detailed in Appendix B.

Table 3.2 Elements Costed for Churchtown Landfill Site

Elements	Assumptions
Monitoring costs	Annual compliance monitoring costs as per Waste Licence. Based on May 2022 Tender rates plus consumables for operational monitoring (2021). Indexed thereafter at 1.05
Licence Fee	Charge applied for 2022 (indexed at 1.05 thereafter)
Staff pay and expenses	Indexed after 2022 at 1.05

Elements	Assumptions
Materials/Plant for Area Support	Based on 2021 spend, indexed thereafter at 1.05
Routine Maintenance support	Based on March 2022 competition rates, indexed after 3 years
Consultancy Support	Based on tendered rates for reporting and ad hoc support in 2021
Annual meter calibration	Based on rate paid in 2021 and indexed thereafter
Water charges	No connection
Willow harvesting	Cost neutral when last undertaken. Due again in 2023/4
Contingency / Provision for Small Works	Based on outlays necessary in 2021 and indexed (1.05) thereafter (GII Drilling Contract)
Contingency for Equipment Repairs/ Replacement	
EPS Annual Licence Fee & Comms	€510.75 +€44.89
Energy costs	Based on 2021. Indexed 1.3 during 2022, 1.05 thereafter
Hydrogeological Risk Assessment (HRA) Project costs	Once-off HRA Follow-Up Works Costs (based on consultancy tender plus estimate for drilling works) €12,500 + €50,000

3.1.4 Non Clean Closure Declaration

The total area of the landfill site will be subject to 'non-clean' closure and a restoration and aftercare plan will have to be maintained.

4 RESTORATION AND AFTERCARE MANAGEMENT PLAN

As previously stated for Churchtown Landfill Site this RAMP will be for the aftercare only as the site closed in August 2000 and restoration works were completed by 14th December 2014.

4.1 Aftercare Monitoring

All post closure monitoring will be in accordance with the requirements of the Environmental Protection Agency's Manual on Landfill Monitoring and Waste Licence W0062-02. The current requirements for aftercare monitoring are shown in Table 4.1, which has been agreed with the EPA. The location of the aftercare monitoring points are shown in Drawing No IBR1292-002.

Table 4.1 Aftercare monitoring for Churchtown Landfill Site

Sample type	Sampling Locations	Parameter	Frequency
LFG Perimeter Wells Schedule C.1.1	LG8 & LG9	Methane Carbon dioxide Oxygen Atmospheric pressure Temperature	Monthly
Emissions to Surface Water Schedule .2.2	D1, D2, D3 & D4	Vis Inspn / Odour	Weekly
		Flow Temp Electrical conductivity pH TOC Ammonia (as N)	Quarterly
		COD BOD SS TDS DO Orthophosphate (as P) Total Phosphorus Nitrates (as N) Nitrites	Quarterly
		Metals	Annual
		Ammoniacal Nitrogen Chloride Sulphate Phenols Total Alkalinity	Quarterly
		Organic compounds	Annual
		Toxicity	To be agreed
Pond Sediment monitoring Schedule C.2.1	Ponds 1, 1A, 2A, 3A, 4A, 5A, 1B, 2B, 3B, 4B, 5B	Heavy metals	Annually for 2 years, three yearly thereafter
Leachate Monitoring Schedule C.2.3	Leachate sumps (1,2,& 3)	Vis Inspn / Odour Leachate level EC pH TOC	Weekly Quarterly

Sample type	Sampling Locations	Parameter	Frequency
		Ammonia (as N) COD BOD SS TDS DO Orthophosphate (as P) Total phosphorus Nitrates (as N) Nitrites Ammoniacal Nitrogen Chloride Sulphate Phenols Total Alkalinity Nitrate (as N) Nitrite Metals Organic compounds	Annual
Receiving Water Monitoring Schedule C.6	SW1, SW2, SW3, SW4, SW5, SW6, SW7	Biological Quality (Q Rating/Q Link Vis inspn / Odour EC pH TOC Ammonia (as N) COD BOD SS TDS DO Orthophosphate (as P) Total phosphorus Nitrates (as N) Nitrites Ammoniacal Nitrogen Chloride Sulphate Phenols Total Alkalinity Toxicity Metals Organic compounds	Technique to be agreed with OEE Quarterly To be agreed Annual Annual
Groundwater Monitoring Schedule C.5*	BH1, BH2 & BH3* Plus 2 proposed wells	GW Level Vis Inspn / odour pH COD Nitrate Total Ammonia Total Nitrogen EC Chloride Fluoride	Quarterly

Sample type	Sampling Locations	Parameter	Frequency
		Ammoniacal Nitrogen Tot P/Orthophosphate Phenols Faecal coliforms Total coliforms	
		Hazardous compounds	Annual
		Metals / Non-metals	Annual

4.2 Aftercare of Infrastructure

During the aftercare period the maintenance of the leachate treatment system shall include:

- Regular checks of the leachate monitoring points and pumping system. Any remedial works or modifications to the leachate treatment system, including collection, treatment and monitoring systems, shall be carried out with minimal impact on the afteruse.
- Current SCADA System installed at the site for leachate treatment system will be maintained with a call out system via text message should problems arise. The SCADA system will be accessible from a Donegal County Council Office.

The effectiveness of the leachate treatment system will be monitored and any remedial works required will be carried out where required. All drainage ditches and outfalls carrying run-off from the site will be regularly checked to ensure effective water flows through the system are being maintained. Any depressions created through settlement will be re-profiled to ensure water flow.

4.3 Vegetation

The long-term aftercare of the site will require vegetation management. Personnel with appropriate experience will undertake such maintenance work. Cutback (coppicing) after the first year of growth is the standard practice in willow biomass production systems has been undertaken. The willow will be coppiced in a cycle of between two and four years depending on yield.

4.4 Decommissioning

The leachate treatment system shall be maintained on-site until the EPA approves of its decommissioning. Once leachate abstraction and treatment is no longer required, decommissioning and removing of redundant structures shall take place. All work in relation to leachate management shall be carried out in an environmentally safe manner and shall not adversely impact the afteruse or users of the restored site.

5 CLOSURE PLAN COSTING

5.1 FINANCIAL PROVISIONS

DCC is a Local Authority and is committed to provide for the proper management and aftercare costs of the Churchtown Landfill Site.

5.2 AFTERCARE/MANAGEMENT COSTS

The long-term "known" environmental liabilities are those that will occur between 4 and 30 years from now. Whilst it is known that environmental liabilities at the landfill are likely to extend beyond 30 years, the assessment of the environmental liabilities has been limited to a 30-year period in accordance with Article 10 of the Council Directive 1999/31/EC of 26 April 1999 on the Landfill of Waste. Long-term liabilities which apply include the maintenance of the leachate treatment system, the SCADA pumping system as well as general maintenance and management of the landfill in the aftercare phase. Cost for aftercare/management for Churchtown Landfill Site to 30 years post closure are provided in Table 5.1. As the site closed in closed in 2000 this will be until 2030. A breakdown of the costs are provide in Appendix A.

Table 5.1 Cost of Aftercare/Management (Revenue costs for Churchtown Landfill Site to 30 years post closure))

Year	Total
2022	€ 95,606
2023	€ 162,599
2024	€ 104,556
2025	€ 109,692
2026	€ 114,772
2027	€ 120,107
2028	€ 125,707
2029	€ 131,586
2030	€ 137,761
Total	**€ 1,102,385**

6 CLOSURE PLAN UPDATE, REVIEW, IMPLEMENTATION AND VALIDATION

6.1 PROPOSED FREQUENCY OF MONITORING

The plan shall be reviewed annually and proposed amendments thereto notified to the Agency for agreement as part of the AER in accordance with Condition 10.2 of the licence. No amendments will be implemented without the prior agreement of the Agency.

6.2 PROPOSED SCOPE OF REVIEW

Due to the nature of the operation (landfill – Category 3 facility) a process of aftercare will be required including on-going management and long term monitoring. The scope of this report is to describe the facility and to outline the aftercare proposals in relation to the criteria required, management issues and costs. All revisions to this report will update any new proposals in relation to aftercare management and associated costs and logistics.

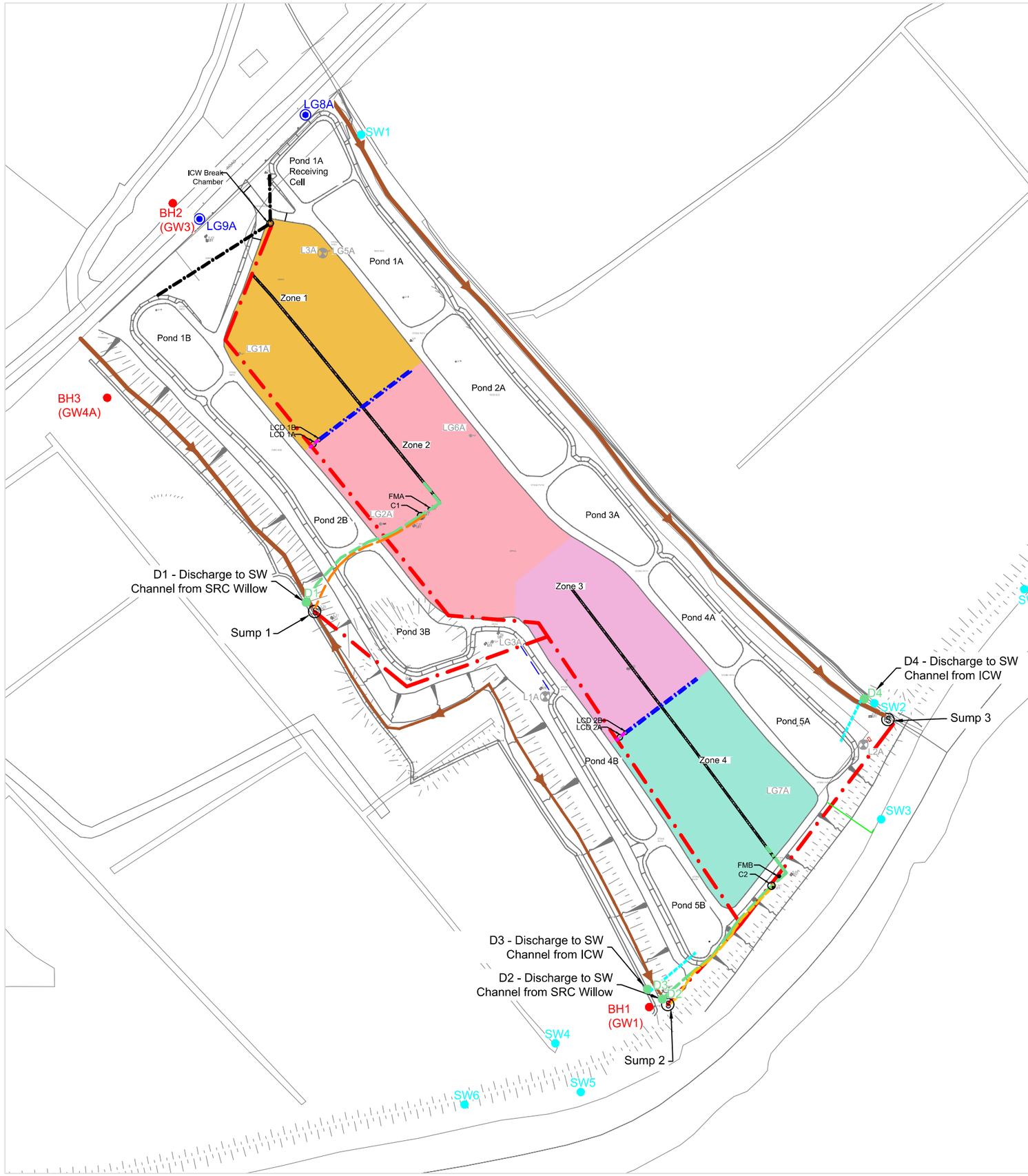
6.3 VALIDATION

Upon Closure of the facility a closure validation audit will be carried out by an independent consultant.

6.4 CONCLUSION

This Restoration and Aftercare Management Plan for Churchtown Landfill, Co. Donegal has been prepared in compliance with Condition 10.2 of Waste Licence W0062-02, takes guidance from EPA Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision Document (2014). This CRAMP meets the requirements of the EU Council Directive (1999/31/EC) on the Landfill of Waste. This Plan is a working document that will be held at DCC Office, Lifford Co Donegal.

Appendix A
Drawings



NOTES

1. Verifying Dimensions.
   The contractor shall verify dimensions against such other drawings or site conditions as pertain to this part of the work.
2. Existing Services.
   Any information concerning the location of existing services indicated on this drawing is intended for general guidance only. It shall be the responsibility of the contractor to determine and verify the exact horizontal and vertical alignment of all cables, pipes, etc. (both underground and overhead) before work commences.
3. Issue of Drawings.
   Hard copies, dwf and pdf will form a controlled issue of the drawing. All other formats (dwg, dxf etc.) are deemed to be an uncontrolled issue and any work carried out based on these files is at the recipients own risk. RPS will not accept any responsibility for any errors arising from the use of these files, either by human error by the recipient, listing of un-dimensioned measurements, compatibility issues with the recipient's software, and any errors arising when these files are used to aid the recipients drawing production, or setting out on site.
4. Datum.
5. Key:

GW4A	Ground Water Monitoring Boreholes
LG9A	Gas Monitoring Boreholes
SW11	Surface Water Monitoring Points
D1	Discharge Points from Willow/ICW
S	Leachate Sumps (Leachate Monitoring Points
	50mm Ø MDPE Header (Supply) Pipes
	80mm Ø MDPE Header (Supply) Pipes [between 90mm HDPE main and LDC1B/2B]
	150mm Ø nb uPVC pipe [between ICW Break chamber and connected to inlets to ICWs]
	90mm Ø HDPE PE100 Pumping Main
	50mm Ø MDPE Pumping Main from leachate tower to 90mm HDPE pumping main with 100mm bed and surround
	150mm Ø HDPE Outfall Pipe [To Drainage Ditch] with 100mm bedding and surround
	Existing 63mm Ø HDPE Outfall Pipe [To Collection Sump]
	Existing Lined French Drain (Runoff Drainage)
	Existing Leachate Toe Drain - Collecting Leachate from beneath landfill cap and discharging to Collection Sump
	Indicative location of 150mm Ø PVC Outfall Pipe from Ponds

Summary of Monitoring Points as per Waste Licence (W0062-02)

Emissions to Water
D1
D2
D3
D4

Monitoring of Landfill Gas Emissions
LG8A
LG9A

Leachate Monitoring
Sump 1
Sump 2
Sump 3

Groundwater Monitoring
BH1 (GW1)
BH2 (GW3)
BH3 (GW4A)

Receiving Water Monitoring
SW1
SW2
SW3
SW4
SW5
SW6
SW7

rev	amendments	drawn	date

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Client

Project
Churchtown AER

Title
Monitoring Locations 2022 (Waste Licence)

Drawing Status	Sheet Size	Drawing Scale
Preliminary	A3	1:2000

Drawing Number	Rev
IBR1291 /002	-

Project Leader	Drawn By	Date	Initial Review
DD	MC	Jan '22	AMcG

NOTES

1. Verifying Dimensions.
   The contractor shall verify dimensions against such other drawings or site conditions as pertain to this part of the work.

2. Existing Services.
   Any information concerning the location of existing services indicated on this drawing is intended for general guidance only. It shall be the responsibility of the contractor to determine and verify the exact horizontal and vertical alignment of all cables, pipes, etc. (both underground and overhead) before work commences.

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4. Date Surveyed 05 December 2014 by LSS Survey Services

5. Keys

   IRL PV01 Road Side Passive Wells (PV01 - PV07)

   IRL PV08 Passive Wells (PV08 - PV18)

rev	amendments	drawn	date

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Donegal County Council

Project

Churchtown License Review

Title

Passive Gas Vents Locations

Drawing Status	Sheet Size	Drawing Scale
Preliminary	A3	1:2000

Drawing Number	Rev
IBR1015 /105	-

Project Leader	Drawn By	Date	Initial Review
AMcG	AMB	May '17	AMcG

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Appendix B
Aftercare Costings

Revenue costs for Churchtown Landfill Site (to 30 years post closure)		(inflationary index applied = 1.05)								
Cost Element	**Details**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Monitoring costs	Annual compliance monitoring costs (€17,463.05 + €2,148.79) (May 2022 Tender) plus consumables for operational monitoring (2021) indexed thereafter at 1.05	€19,611.84	€20,592.43	€21,622.05	€22,703.16	€23,838.31	€25,030.23	26,281.74	€27,595.83	€28,975.62
Licence Fee	Charge applied for 2022 (indexed at 1.05 thereafter)	€10,502	€11,027	€11,579	€12,157	€12,765	€13,404	€14,074	€14,777	€15,516
Staff pay and expenses	Indexed after 2022 at 1.05	€29,359.31	€30,827.28	€32,368.64	€33,987.07	€35,686.42	€37,470.75	€39,344.28	€41,311.50	€43,377.07
Materials/Plant for Area Support	Based on 2021 spend, indexed thereafter at 1.05 (€2,347.52 + €510.75)	€2,858.27	€3,001.18	€3,308.80	€3,474.25	€3,647.96	€3,830.36	€4,021.87	€4,222.97	€4,434.11
Routine Maintenance support	Based on Mar 2022 competition rates, indexed after 3 years	€5,781	€6,071	€6,074	€6,692	€7,027	€7,378	€7,747	€8,134	€8,541
Consutlancy Support	Based on tendered rates for reporting and ad hoc support in 2021 €1260 + €3673	€4,933	€5,000	€5,000	€5,000	€5,000	€5,000	€5,000	€5,000	€5,000
Annual meter calibration	Based on rate paid in 2021 and indexed thereafter	€3,745.30	€3,932.57	€4,129.19	€4,335.65	€4,552.44	€4,780.06	€5,019.06	€5,270.01	€5,533.51
Water charges	No connection	€0	€0	€0	€0	€0	€0	€0	€0	€0
Willow harvest	Cost neutral when last done, Due again in 2023/4	€0	€0	€0	€0	€0	€0	€0	€0	€0
Contingency / Provision for Small Works	Based on outlays necessary in 2021 and indexed (1.05) thereafter (GII Drilling Contract)	€11,041.13	€11,593.19	€12,172.85	€12,781.49	€13,420.56	€14,091.59	€14,796.17	€15,535.98	€16,312.78
Contingency for Equipment Repairs/Replacement		€2,500	€2,500	€2,500	€2,500	€2,500	€2,500	€2,500	€2,500	€2,500
EPS Annual Licence Fee & Comms	€510.75 + €44.89	€555.64	€600	€600	€600	€600	€600	€600	€600	€600
Energy costs	Based on 2021. Indexed 1.3 during 2022, 1.05 thereafter	€4,718.01	€4,953.91	€5,201.61	€5,461.69	€5,734.77	€6,021.51	€6,322.59	€6,638.72	€6,970.65
HRA Project costs	Once-off HRA Follow-Up Works Costs (based on consultancy tender plus estimate for drilling works) €12,500 + €50,000	€0	€62,500	€0	€0	€0	€0	€0	€0	€0
TOTAL		**€95,606**	**€162,599**	**€104,556**	**€109,692.31**	**€114,772.46**	**€120,106.50**	**€125,706.71**	**€131,586.01**	**€137,760.74**