REPORT

Specified Engineering Works (SEW) Proposal for Site Investigation within Capped Landfill Cells

Hollywood Landfill

Submitted to:

Environmental Protection Agency
Johnstown Castle
Wexford

Submitted by:

Golder Associates Ireland Limited
Town Centre House Dublin Road Naas
Co. Kildare Ireland

+353 45 81 0200

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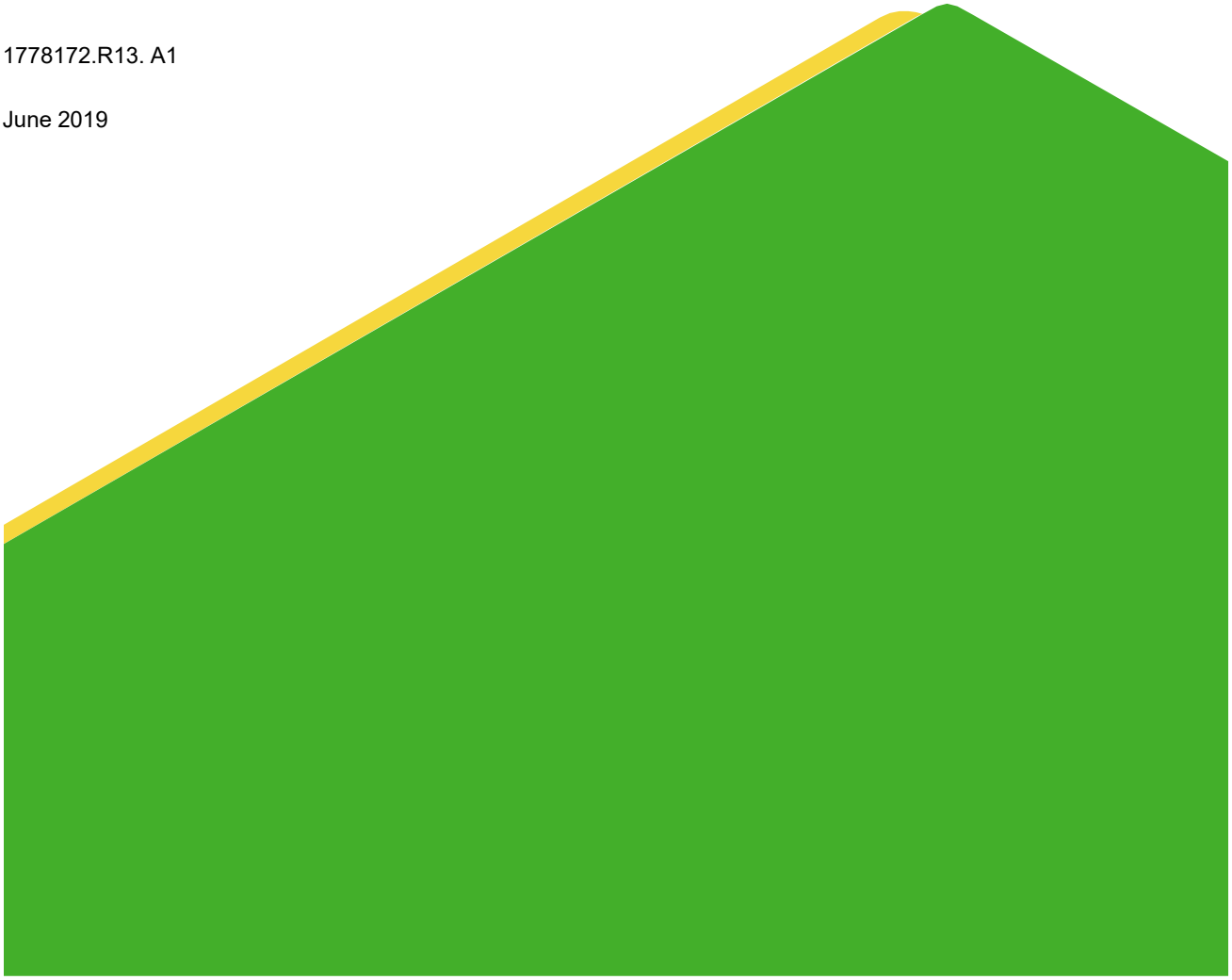

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1.0 INTRODUCTION

This document presents the Specified Engineering Works (SEW) Proposal for an Inspection and Sampling Programme within the Waste Mass at the Hollywood Landfill Facility, including inspection, drilling and waste sampling, as well as groundwater, surface water, leachate and gas monitoring and sampling.

This document has been prepared by Golder Associates Ireland Limited (Golder) on behalf of the licensee, Integrated Materials Solution Ltd GP. This SEW is being submitted by the Licensee as required under Condition 3.3.1 of Waste Licence W0129-02 and is solely based on works proposed in the "Method Statement for Inspection and Testing at the IMS Landfill Facility" prepared by Marron Environmental, as enclosed in Appendix A.

The Licensee is not submitting this SEW for engineering works considered essential for the improvement of the operation and maintenance of the facility in terms of environmental protection rather that the licensee has been directed by the Courts to submit this SEW in relation to litigation in respect of Murphy Environmental Hollywood Ltd & Anor v Spencer Place Development Company Ltd & Ors (High Court Record No. 2017/3203P). This SEW proposal relates to third party investigation works at Hollywood Landfill that were ordered by the High Court.

The Scott Schedule appended at Appendix B records the technical disagreement among the parties' respective experts regarding the works proposed in the document titled "Method Statement for Inspection and Testing at the IMS Facility" prepared by Marron Environmental, as appended at Appendix A. The letter from Fieldfisher dated 31 May 2019 appended at Appendix C sets out the EPA's preliminary views on the Scott Schedule.

1.1 Objectives of the SEW

The objectives of this document are to present the proposed SEW for the approval of the Agency as instructed by the Court whilst presenting all supporting information required for the approval of such an SEW proposal where possible. To achieve this, the following sections will be discussed within this document:

- Site location and layout - to provide background information on the current status of the site to inform a decision by the Agency;
- Background - to provide background information on the current status of the licence and facility ownership as well as background to the incident to inform a decision by the Agency;
- Relevant Licence Conditions, Guidance and Standards – list of conditions and standards relevant to the proposed works;
- Details of the proposed investigation works; this will include the objectives, the scope of works, method statements and risk assessments; and
- CQA and Responsibilities for the Works.

2.0 SITE LOCATION AND LAYOUT

IMS operates a Waste Management Facility, known as Hollywood Landfill, at Hollywood Great, Naul, Co. Dublin. The site encompasses approximately 41 ha. and is situated approximately 3 km to the southeast of the town of Naul and approximately 23 km north of Dublin city centre.

The Site is located on a hill with elevations on the western boundary of around 150 mOD and falling to around 90 m AOD on the eastern boundary. The land use in the surrounding area is predominantly agricultural with some small clusters of domestic dwellings. At the northern end of the Site, the surrounding land surface is at an elevation of approximately 125 mOD. The land surface is slightly higher at the southern end of the Site where it is approximately 136 mOD. The maximum height of the restoration contours is 148 mOD, rising from 109 mOD at the northern end of the Site to 148 mOD around the Site entrance area, and then dropping again to 137 mOD at the southern end. The restoration elevations are intended to be in line with the natural

topography of the area. To date, Cells 1, 2, 3 and 5 are complete, except for completion of restoration activities which have been ongoing at the Site. These cells have largely been closed for greater than 10 years. Cell 4 is currently available for landfilling activities. The proposed locations for the Site Investigation works are shown in Drawing 01 which is attached to the document titled "Method Statement for Inspection and Testing at the IMS Landfill Facility" contained in Appendix A.

3.0 BACKGROUND

Historically, the Site was a limestone and shale quarry that operated between the late 1940s and 2007. Planning permission for restoration of the quarry was first granted in July 1988 and the first permit for landfilling was issued in 1993 under the European Communities (Waste) Regulations. Since then, Waste Licence W0129 (issued by the Environment Protection Agency (EPA) has been held by Murphy Concrete Manufacturing Ltd, and subsequently by Murphy Environmental Hollywood Ltd.

IMS purchased the Site from Murphy Environmental Hollywood Ltd in June 2017 and currently operates the Site under Waste Licence Register No. W0129-02.

Between 03 February and 16 February 2017, approximately 6,000 tonnes of soil material was imported to the Hollywood site for disposal as inert waste. Incident reference number INC011815 was opened as required by the Site's Licence. Subsequent sampling of this material in the site's quarantine area and within the active landfill cell (Cell 4) confirmed that this material was not inert waste as had been stated and was in fact, a combination of hazardous and non-hazardous waste. In the intervening months, this waste was removed from the Site, the area remediated, and a validation report issued to the EPA and the Incident file was subsequently closed. As a result of the waste deposition, legal actions have ensued which are still ongoing. An initial request for inspection of the entire Hollywood Landfill was made by the Defendants to the courts and this was subsequently ordered by the Court in May 2017. An inspection of one part of the landfill, Cell 4, was completed on the 29 & 30 August 2017 and waste samples were collected throughout the cell. This SEW proposal relates to the inspection and testing of the remaining areas of the landfill, as ordered by the High Court.

4.0 RELEVANT STANDARDS, GUIDANCE & LICENCE CONDITIONS

4.1 Standards and Guidance

The standards and guidance detailed below should be considered for any proposed works:

1) BS 10175: 2011 + A2:2017 – Investigation of Potentially contaminated Sites. Code of Practice;

2) Guidance on the Management of contaminated Land and groundwater at EPA licenced Sites (EPA, 2013);

3) Code of Practice: Environmental Risk Assessment for Unregulated Waste Disposal Sites (EPA, 2007); and

4) CLR 11: Model Procedures for the management of land contamination.

5) Waste Licence W0129-02

4.2 Licence Conditions

The Licensee does not agree on a technical basis with the nature of the proposed inspection i.e. invasive drilling in capped areas as the drilling through a waste body creates a potential pathway for entry of water even if it is subsequently filled and also poses a risk to the landfill liner. Therefore, it is imperative that the Agency are satisfied that the proposed works would not cause a breach of any conditions of the Licensee's Waste Licence.

Licence Conditions of particular relevance to the proposed works are reproduced below.

Condition 3.3.1 which states:

'The licensee shall submit proposals for all Specified Engineering Works, to the Agency for its agreement at least two months prior to the intended date of commencement of any such works. No such works shall be carried out without the prior agreement of the Agency'

Condition 3.3.2 which states:

"All specified engineering works shall be supervised by an appropriately qualified person, and that person, or persons, shall be present at all times during which relevant works are being undertaken'.

Condition 3.3.3 which states:

"Following the completion of any specified engineering works, the licensee shall complete a construction quality assurance validation. The validation report shall be made available to the Agency on request. The report shall, as appropriate, include the following information:

(i) A description of the works;
(ii) As-built drawings of the works;
(iii) Records and results of all tests carried out (including failures);
(iv) Drawings and sections showing the location of all samples and tests carried out;
(v) Name(s) of contractor(s)/individual(s) responsible for undertaking the specified engineering works;
(vi) Records of any problems and the remedial works carried out to resolve those problems; and
(vii) Any other information requested in writing by the Agency."

Conditions 1.2, 3.1, 5.6.1, 5.6.2, 7.4, 7.6, 10.1 and 10.2 are also relevant to the carrying out of the works.

5.0 OBJECTIVES & SCOPE OF THE PROPOSED WORKS

The objectives of the site inspection and sampling investigation are detailed in Section 1.2 of the document titled "Method Statement for Inspection and Testing at the IMS Landfill Facility V.6" attached in Appendix A.

The stated objectives of the site inspection programme are as follows:

- To assess the nature and quality of waste soils already present at the site compared with the site WAC;
- To assess the potential for any non-compliant wastes, if present, to impact on the environment; and
- To generate information necessary to refine the Conceptual Site Model and inform any future risk assessment for the site.

6.0 PROPOSED WORKS

Hollywood Landfill is an engineered landfill that has been developed over the past 16 years to yield five lined cells to date, namely Cells 1, 2, 3, 4 and 5. Cells 1, 2, 3 and 5 are complete, except for grass seeding activities to complete the restoration works in this area. Cell 4 is currently available for landfilling activities and is currently being filled. The proposed works cover the majority of these closed and active landfill cells.

The proposed works are listed under Section 1.3 of the document titled "Method Statement for Inspection and Testing at the IMS Landfill Facility" contained in Appendix A. In summary, the scope of work can be summarised as follows:

- An inspection of potential surface sources of contamination and pathways to include the leachate management system, surface water management system and the local drainage network;
- Drilling and Waste Sampling Programme; and
- Groundwater, surface water, leachate and gas monitoring.

The three aspects of the scope of work are described in greater detail in Section 2.0 (Site Inspection), Section 3.0 (Drilling & Waste Sampling Plan) and Section 4.0 (Surface Water, Groundwater and Leachate Sampling) of the document titled "Method Statement for Inspection and Testing at the IMS Landfill Facility" (Version 6) contained in Appendix A.

The proposed locations of the boreholes are indicated on Figure 01 attached to the Marron Protocol V6 contained in Attachment A. Borehole locations have been proposed in Cells 1, 2, 3 and 5.

The Scott Schedule presents Golders' comments that the site inspection as proposed, i.e. the non-targeted drilling of soil boreholes and sampling across Cells 1, 2, 3 and 5, was not agreed among the parties' respective experts at the meeting that took place on 2 May 2019.

7.0 METHOD STATEMENT

As the Licensee has been directed by the High Court to submit this SEW proposal for the works proposed by the Defendants, it is considered appropriate to refer to the document titled "Method Statement for Inspection and Testing at the IMS Landfill Facility" contained in Appendix A for details of how the proposed works would be carried out and the relevant risk assessment and mitigation measures to ensure licence compliance.

8.0 CQA AND RESPONSIBILITIES FOR WORKS

The licensee operates the Hollywood Landfill site under Waste Licence W0129-02 and adopts a stringent approach to environmental risk management. The Licensee is currently very concerned that the proposed work will not be under its control and have the capacity to impact its compliance record and its approach to environmental management at the site.

The Licensee is not responsible for any works to be carried out by third parties. The lead consultant supervising the proposed works on behalf of the defendants is stated to be Donal Marron of Marron Environmental. Golder would act in a supervisory capacity on behalf of the Licensee.

The Licensee has concerns that they are particularly vulnerable in relation to Condition 3.3.3 of the licence which requires the licensee to prepare a CQA Validation Report confirming that the works carried out by a third party whose interests are not aligned with those of the licensee, have been completed to a satisfactory level which will not impact the integrity of the lining or capping systems. Should the Agency be minded to approve this SEW proposal, the licensee hereby requests that the Agency notes in its response that the licensee is absolved of its obligations under Condition 3.3.3 for these particular SEW.

Further, the licensee notes that whilst the attached method statement does address issues such as dust and unauthorised spills and discharges, these works are outside the control of the Licensee and therefore the Licensee's compliance record is dependent on those in control of the proposed works adhering to this method statement and good operating practices in general. Whilst the Licensee can seek indemnities from the third parties who will be undertaking the works, the Licensee feels that its compliance record cannot be indemnified through any request to the third party. Therefore, the Licensee duly requests the Agency to note within its response should the EPA be minded to approve this SEW proposal, that the Licensee is absolved of its obligations under conditions relating to environmental discharges and noise.

9.0 REFERENCES

1) Waste Licence Register Number W0129-02

Signature Page

Golder Associates Ireland Limited

APPENDIX A

Method Statement for Inspection and Testing at the IMS Landfill Facility

MEHL & IMS –v- SPDCL, PJ Hegarty & Ors

Method Statement for Inspection and Testing at the IMS Landfill Facility, Hollywood Great, The Naul, Co. Dublin

May 2019

Prepared by:

Marron Environmental

Suite 16, The Mall,

Beacon Court,

Sandyford Business Park,

Dublin 18

Prepared for:

Barnmore Demolition & Civil Engineering Ltd.

MEHL & IMS –v- SPDCL, PJ Hegarty & Ors

Method Statement for Inspection and Testing at the IMS Landfill Facility

Document Control Sheet

Client:	Barnmore Demolition and Civil Engineering Ltd.
Project Title:	MEHL & IMS –v- SPDCL, PJ Hegarty & Ors
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1.0 INTRODUCTION

The purpose of this document is to provide a detailed scope of works and method statement for a site inspection and soil, water and leachate sampling programme to be carried out at Hollywood landfill, the Naul, Co. Dublin.

This document will outline;

1. The background to the issue,
2. Conceptual Site Model (CSM) and reasons and objectives for the work programme.
3. An inspection and sampling plan for the site.
4. A detailed methodology plan for carrying out the works.
5. An environmental risk assessment and health and safety plan for the specified works.
6. Laboratory analyses to be undertaken.

1.1 Background

The issue relates to waste (impugned material) brought to the MEHL landfill in February 2017 and stored in an isolated mound in a section of the active Cell No. 4. The volume of the impugned material was stated by MEHL and their advisors to be approximately 9,000 tonnes. The waste was sampled for compliance with the MEHL Waste Acceptance Criteria (WAC[1]) and non-compliance of the waste was highlighted by MEHL. MEHL informed the Environmental Protection Agency (EPA) of the non-compliance in the context of MEHL's WAC. The EPA requested a remediation plan for the impugned material to be drafted and submitted. Golder Associates were commissioned by MEHL to draft a sampling and remediation plan for the impugned material. Golder Associates sampled and provided split soil samples to the interested parties on 18th and 19th of April 2017.

On or around this time, Integrated Management Solutions Partnership Ltd. (IMS), who bought the site from MEHL, has along with MEHL initiated legal proceedings to assert liability for contamination of the site including groundwater beneath the site due to the placement of the impugned material. Their environmental consultants, Golder Assoc., have stated in previous affidavits and documents that, while the risk of residual contamination arising from the impugned material (or leachate from the impugned material) is low it could impact existing leachate quality within Cell 4, move through the inter-cell bund walls to impact leachate quality in other cells, or percolate through the basal clay liner to contaminate underlying groundwater beneath the site. They therefore established a Conceptual Site Model based on the Source – Pathway – Receptor (SPR) linkage system where the source was defined as the impugned stockpile (and leachate associated with the stockpile), the pathway was by migration through the inter-cell bund walls and/or the basal clay liner, and the receptors were defined as groundwater beneath the site and local surface water.

The defendants sought to ensure that any such risk or liability would be confined to the impugned stockpile and not result from the presence of any other non-compliant wastes at the site. There is a bank of environmental monitoring data for the site (mainly contained in Annual Environmental Reports (AERs))

[1] Note: the WAC were revised in January 2019 via a technical amendment to the licence

held in the EPA files and much of this is publicly available on the EPA website. Marron Environmental conducted a detailed review of the waste licence and EPA files. From this review and from site investigations, they found that there were other non-compliant wastes present in the existing waste cells as follows:

(i) The defendants' consultants including the author were allowed by the plaintiffs to conduct a soil sampling exercise of the impugned stockpile and the active Cell 4 in accordance with a previous version of this document and as directed by the court. The exercise consisted of a trial pitting programme and was conducted in August 2017. The results of that trial pitting exercise in Cell 4 in areas removed from the impugned stockpile recorded non-compliant wastes present at the landfill including asbestos shards and fibres (hazardous waste) and some elevated levels of sulphate, TDS and antimony above the landfill's WAC, and very strong hydrocarbon odours in one trial pit. This confirmed the presence of non-compliant waste in Cell 4 itself and the possibility that non-compliant wastes are present in our opinion in other waste cells at the landfill. In addition, while conducting the sampling exercise a load of waste was tipped out on the active cell tipping face and an inspection of this load prior to its burial found that it contained asbestos-containing material (ACM) and a level of mineral oil exceeding the landfill's WAC for mineral oil . This likely was one of the 99 loads that were not WAC tested and highlighted the concern that quantities of non-compliant waste may have been deposited at the site.

(ii) A detailed review of the leachate quality monitoring data in the EPA files revealed that there have been a number of exceedances of the landfill's WAC for soil leachate over time particularly in relation to sulphate and chloride. The overall assessment of the results indicated that the leachate quality exceeded certain WAC threshold limits for inert waste (particularly sulphate and chloride) on many occasions and reported high levels of other parameters in leachate at the landfill that were not dissimilar to the lower range of that found in non-hazardous (municipal waste type) landfills. This indicated there are wastes that are non-compliant with regard to the landfill's WAC, and which are impacting on leachate quality at the landfill. It should be noted that the leachate quality is only monitored at single distinct points on the landfill and if leachate monitoring boreholes were located in other parts of the landfill the quality recorded could be different.

(iii) A review of the waste licence indicates that MEHL only conduct analytical sampling on 1 in one hundred loads coming to the site. This implies that there is/was potential for non-compliant loads to enter the site in the other 99 non-tested loads.

(iv) A site audit carried out by the EPA in 22/03/2018 (report Ref. No. SV14688) found that the MEHL and subsequently the IMS procedure for dealing with loads (the 1 in 100) that failed the analytical test (i.e. were non-compliant) was to cease further acceptance of waste from the source site and remove the load that was tested. However, all previously deposited loads from such non-compliant source sites were left in-situ in the landfill and not removed and therefore are still in place in the landfill.

The EPA report also recorded that IMS failed to notify the Agency of a WAC breach in accordance with condition 11.1 of the waste licence and the facility's Rejected Load procedure 'P4.6.F/Reject Load'. Apart from the failure to notify the Agency of the breach it suggests that there is non-compliant waste in Cell 4. Clearly, any other failures to notify the Agency of failed WAC tests over the years would be of concern.

There were two other occasions reported in the AERs where waste loads were rejected based on the results from WAC testing of samples from 1 in 100 loads. This would indicate that while the actual loads tested were removed from the site other loads from the same source sites have remained in the landfill

where they were deposited.

Having established the potential for non-compliant wastes to be present at the site as a whole, excluding the impugned stockpile, we used a similar Conceptual Site Model as that put forward by Golder Assoc. and report the same Source-Pathway-Receptor linkages as follows:

- The source is 'potential non-compliant wastes' present in the c. 2 million tonnes of waste already deposited in Cells 1, 2, 3, Cell 3 extension, Cell 5, Cell 5 extension and the presently active Cell 4;
- The pathway is by leachate migration through the inter-cell bund walls and basal clay liner; and
- The receptors are groundwater beneath the site and surface water downgradient of the site.

Based on this Conceptual Site Model, the defendants sought to carry out an assessment of the landfill as a whole, to establish the nature and extent of non-compliant wastes therein and their potential to impact the identified receptors. While Golder Assoc. have acknowledged (Ref: Waste Characterisation and Draft remediation Plan Section 9, dated May 2017) that once the impugned stockpile was removed from the site, the potential for residual impact from the stockpile on leachate and groundwater would be 'unlikely or limited in a worst case scenario" it is important to the defendants to ascertain that any such impact, should it arise, and liability for same would be solely attributable to the stockpile and not to any other waste activities at the site.

In light of this the defendants sought and were granted a court order to carry out a site inspection on 15th May 2017. For clarity, the court ordered that;

> **THE COURT DOTH DIRECT** that an inspection of the First Named Plaintiff's property at Hollywood Great, Nags Head, the Naul, County Dublin by the Defendants' experts do take place on or before Friday the 26th day of May 2017 and that the reports following the inspection be completed and exchanged within one week thereafter (on or before Friday the 2nd day of June 2017)
>
> **AND THE COURT DOTH DIRECT** that the relevant experts do meet by Thursday of this week (the 18th day of May 2017) to agree a protocol for inspection and the taking of samples for testing and if there is any difficulty in agreeing a protocol then the Court doth grant the parties liberty to apply

The site inspection is to include a detailed inspection of the site as a whole including but not limited to the waste cells, drainage and leachate management, borehole drilling, soil sampling, groundwater, surface water, leachate and gas monitoring. Drilling and trial pitting works on the landfill constitute specified engineering works (SEW) and in accordance with the Waste licence W0129-02 have to be notified to the

EPA with a detailed methodology plan for the work programme. In order to complete the methodology plan for the proposed site inspection, it was necessary to carry out a site walkover survey to select suitable locations for boreholes, assess the condition of the site in order to define a suitable drilling method, ascertain the topographic heights of the borehole locations and therefore the depths of each of the boreholes, carry out an environmental risk assessment for the proposed work programme, assess the access and security for the drilling rig and crew, and assess health and safety aspects of the site inspection work programme among others. Permission was eventually granted from the plaintiffs to carry out the walkover survey via direction from the Court and the survey of the closed cells was completed on 10/12/2018.

This document details the methodology plan for the proposed site inspection work programme. It should be noted that a trial pitting and soil sampling exercise were already carried out at Cell 4 and the impugned stockpile by the defendants in August 2017. This methodology plan relates to all other aspects of the proposed site inspection.

1.2 Objectives

The objectives of the site inspection programme are as follows:

- To assess the nature and quality of waste soils already present at the site compared with the site WAC.
- To assess the potential for any non-compliant wastes, if present, to impact on the environment.
- To generate information necessary to refine the Conceptual Site Model and inform any future risk assessment for the site.

1.3 Outline Scope of Works

(i) An inspection of potential surface sources of contamination and pathways to include the leachate management system, surface water management system and the local drainage network.

(ii) Drilling and Waste Sampling Programme – The potential for non-compliant wastes to be present in the closed landfill cells has been established. The drilling and waste sampling programme will go some way in determining the nature and extent of non-compliant wastes and therefore aid in defining and evaluating the 'Source' in the SPR linkage.

(iii) Groundwater, surface water, leachate and gas monitoring - To establish the elevations of groundwater and leachate and verify their quality. This will aid in determining the nature of wastes in the landfill, the quality of leachate and the potential for impacts on the surrounding water environment.

2.0 SITE INSPECTION

It is proposed to carry out a detailed site inspection of the entire property to include walkover survey of surface water drainage and management systems, surface water run-off mechanisms in the area surrounding the location of the impugned stockpile, the local drainage network in and around the site and leachate management systems at the site. This will entail the Lead Consultant walking around the entire site, note taking, annotating maps and taking photographs. The Lead Consultant will be accompanied by their assistant and/or the licensee's representative. This will be carried out in accordance with all health

and safety protocols pertaining at the site and appropriate PPE will be used to include hard hat, high viz, jacket, steel toe capped boots and gloves. Eye and ear protection may also be necessary and will be used where required.

3.0 DRILLING & WASTE SAMPLING PLAN

It is proposed to drill 15 No. boreholes in the closed Cells 1, 2, 3 and 5. The number and locations of the boreholes were selected to enable a representative assessment of the waste quality in the closed cells in terms of spatial and vertical distribution. The density of boreholes approximates to 3 / ha and while this is a relatively low number we believe it will be sufficient to provide us with the information required to meet the objectives. Borehole locations and depths were also influenced by the location and depths of the basal clay liner, the cell side walls and inter-cell bund walls.

. The drilling and sampling programme will be conducted in accordance with BS10175:2011+A2:2017. The locations of the boreholes are shown on Figure 1 and were selected following a detailed review of the existing leachate quality information for the cells, the recent closed cell walkover survey and information from the CQA reports produced for each of the cells when they were constructed. The borehole locations will include Cell 5 (map points 1, 2 & 3A); Cell 1 (map points 4, 5, 6A & 7B), Cell 2 (map points 8, 9 & 10) and Cell 3 (map points 11C, 12, 13C, 14A and 15).

The boreholes will be drilled using a light cable percussion drilling rig by a reputable drilling contractor with experience of drilling at landfill sites. Boreholes will be logged in accordance with the Code of Practice for Ground Investigations, BS 5930: 2015. Borehole logs will be recorded at the time of drilling and produced in hard copy format.

It is proposed that the boreholes will be drilled at 200mm nominal diameter with the potential to reduce to a smaller diameter with depth should it be necessary. It is imperative that the boreholes do not intersect the clay liner at the base of the cells, the clay liner making up the sidewalls of the landfill or the inter-cell bund walls. The borehole positions have been selected at locations removed from the landfill side walls and the inter-cell bund walls i.e. generally in central parts of the cells. Information from the CQA reports and from Golder Assoc. who designed and oversaw construction of most of the cells provided data on the height of the top of the basal clay liner and in some cases the geometry and slope of the cell walls. These confirm that the level of the top of the basal clay liner ranges from 105.5 mOD across many of the cells to 111 mOD in Cell 5 extension.

During the recent walkover survey of the closed cells each of the proposed drilling locations was surveyed to establish their locations relative to the National Grid Reference system, and the ground elevations relative to Ordnance Datum (Malin Head). Table 1 shows the surveyed elevations of the proposed drilling locations, the estimated depth to the top of the basal clay liner or potential side walls and the proposed depth of drilling at each location. In order to ensure that there is no possibility of intersecting the basal layer or cell walls a significant margin of safety has been allowed for in designing the depth of the boreholes. In addition, the Lead Consultant supervising the drilling works will closely monitor the depth of each borehole on a continuous basis during drilling and examine in detail every retrieved drill core to confirm that clay liners or side walls have not been intersected.

The Lead Consultant will collect composite and targeted samples from each of the boreholes as follows.

A composite sample will be collected from every two meters depth of drilling. Targeted samples may be collected from horizons that exhibit a significant difference from the norm (e.g. unusual staining or

odours). For composite samples each of the retrieved cores will be laid out on a flat impermeable surface composed of tarpaulin sheets by the driller in an intact state as far as practically possible and logged. The Lead Consultant will then thoroughly mix the retrieved core with a spade or trowel. This composite material will then be used to fill the sample containers. Sufficient amounts of soil sample will be available for duplicate samples to be collected if required. Targeted samples will be derived using a similar method though these will be collected across discrete horizons. The Lead Consultant will decide which of the collected samples will be sent to the laboratory for analysis. Duplicate samples will be collected for quality control purposes at a rate of c. 5% and given coded references.

Leachate samples will be collected from the boreholes where encountered and the depth noted in each case.

Sample containers will be provided by the laboratory and labelled at the time of sampling. All samples will be stored in cool boxes and dispatched by courier to the laboratory within 24 hours of sampling. Samples will be stored in a fridge if required to be kept overnight. The Lead Consultant will be responsible for the samples and for filling in Chain of Custody forms. All sampling equipment will be decontaminated between sampling events by washing with Decon 90 and rinsing with potable water. Sample containers will be suitable sized and made of appropriate materials for the suite of analyses. Sample containers will be labelled using a systematic nomenclature. Samples will be stored within suitably sized cool boxes in accordance with laboratory requirements. The chain of custody form concerning all samples will be generated by the Lead Consultant, maintained and will accompany the samples to the laboratory. The samples Chain of Custody forms will specify the samples to be included for analysis and the parameters for laboratory testing. The cool boxes will be sealed for transportation to the laboratory. Samples will be protected during transportation by using the bubble-wrap packing provided with the sample jars.

Samples will be sent to the UKAS accredited Exova Jones Environmental Laboratories Ltd. in the UK for analysis. The suite of parameters for analysis is provided in Appendix 1. This is designed to provide a broad-based characterisation of the waste and to include those parameters found to be elevated in the site leachate and the impugned stockpile.

During drilling, water level measurements will be taken and gas monitoring will be carried out on the borehole with a calibrated field gas monitor. Gases monitored will include methane (% v/v), methane LEL (%), carbon dioxide (% v/v), oxygen (% v/v), hydrogen sulphide (ppm), carbon monoxide (ppm), atmospheric pressure (mBar) and flow (l/hr).

Following completion, each borehole will be backfilled as follows: The drill tools will be withdrawn from the borehole and the casing withdrawn in stages. A 2m plug of bentonite will be placed in the lower 2m depth of the borehole. The borehole will then be backfilled with the drilled material, in reverse order to how it was taken out and from the top of the bentonite plug to within 3m of the surface. A bentonite seal will be placed in the upper 3m of the borehole. It is understood that all of the boreholes are located on areas of the site where a 850mm capping layer of subsoil has been placed. The bentonite plug placed at the top of each borehole will provide a seal that has permeability lower than that of the surrounding capping layer, ensuring that the reinstated boreholes do not provide a preferential pathway for infiltration of surface water runoff. It is proposed that an inspection of the finished boreholes be carried out one month and three months after completion to check for any settlement issues at the surface of the boreholes and these be reinstated if necessary.

It is proposed that the remaining drilled material be transported to storage in the waste quarantine area pending receipt of the laboratory results and then disposed to the active Cell 4 if it complies with the landfill's WAC or removed off-site to an appropriately licensed landfill if found to be non-compliant with the landfill's WAC.

Once a borehole is complete the drill tools will be withdrawn from the bore, cleaned with high-pressure potable water and transported to the next drill site.

In the event of a drilling refusal such as intersecting an immovable blockage in the borehole the drill tools will be removed and a fresh start made at an alternative location within c.5m meters of the original location if the obstruction is encountered at a depth less than 10m. The abandoned borehole will be backfilled as above with bentonite plugs and the drilling equipment will be cleaned as above prior to setting up at the alternative location. If the obstruction is encountered at a depth greater than 10m then drilling will cease at that location and the borehole will be reinstated. A maximum of two boreholes will be drilled at each of the 15 locations - i.e. the primary borehole and up to one additional borehole if an obstruction is encountered at a depth of less than 10m in the primary borehole.

The selected drilling contractor (Contractor) shall take all adequate care to ensure that all of his materials and equipment are in a good state of repair and are managed correctly, that there is minimal damage to the surface or any other parts of the landfill from drilling and movement and that all Health and Safety requirements are complied with. In this regard, drilling method statements will be sought from drillers prior to awarding the contract and checked against the specific requirements of the project. Reputable drilling contractors have developed detailed robust method statements appropriate for most environmental site investigations. Nevertheless, their method statements will be reviewed and the Contractor will be asked to amend them if necessary to ensure they meet the requirements of this particular project.

The cable percussion drilling system utilises a relatively lightweight drilling rig normally supported by a 4X4 pickup truck and therefore traversing the site should not cause any issues for the landfill surface. It is expected that the Contractor will deliver site accommodation for the drilling crew and storage of materials and this can be positioned at a location suitable to the drilling crew and to be agreed with the licensee.

3.1 Environmental Risk Assessment

The potential environmental risks associated with the drilling operation have been identified and assessed as follows:

3.1.1 Access

There is adequate access to the borehole locations through the landfill entrance, along site haul routes and across the surface of the closed cells. The borehole locations have been selected in flat areas and there are no steep inclines that need to be traversed. Access and movement around the site will comply with the current site traffic management plan.

3.1.2 Site Infrastructure (utilities, services, solid structures etc.)

All site structures and infrastructure including those underground, over-ground or on poles/pylons can be

easily avoided using the access routes as above. IMS confirmed that there are no underground services or structures in any of the closed cells.

3.1.3 Landfill Surface & Clay Cap

The cable percussion drilling system utilises a relatively lightweight drilling rig normally supported by a 4X4 pickup truck and therefore traversing the site should not cause any issues for the landfill surface. If there are unusually wet conditions at the site prior to or during drilling that would indicate that movement of the plant could damage the surface then drilling can be suspended until drier conditions pertain. The decision whether or not to suspend works will be made by the Lead Consultant in consultation with the Contractor. IMS have confirmed that all of the closed cells have been covered with an 850mm layer of subsoil and that c. 10% of this layer has been covered with a 150mm layer of topsoil. All drill sites will be inspected and photographed prior to set up. If any damage is caused to the capped areas either by drilling or movement of the rig this will be made good by the Contractor upon completion of the work programme and in accordance with the cap specification for the site.

The drill holes will be completed by installing a bentonite seal in the upper 3m. This will ensure that there is no possibility of any failure of the clay cap after the drilling operation is complete.

3.1.4 Basal Clay Liner, Cell walls and Inter-Cell bund walls

As stated above the boreholes have been located in the central areas of the cells removed from the cell walls and inter-cell bund walls. The design depths of each of the boreholes have been designed with a significant margin for error incorporated to ensure that the basal clay liner will not be intersected. The Lead Consultant supervising the drilling will inspect every retrieved core for evidence of the liner material understood to be a distinctive 'blue' clay and if encountered will halt drilling immediately and install a bentonite plug over the entire depth of the borehole.

3.1.5 Storage and Management of Surplus Soils/Wastes removed from the Drill holes

All retrieved soil/waste cores from drilling will be stored on tarpaulin sheets laid out beside the drill rig. The bulk of the soils/wastes removed from the drill holes will be backfilled into the drill holes in reverse order after drilling apart from the lower 2m and upper 3m which will be filled with a bentonite seal. After backfilling in the boreholes the surplus soils will be removed from the drill site by the Contractor and taken to the quarantine area of the landfill.

3.1.6 Water/Leachate Management

If the driller is required to add water to aid with drilling this will be provided by potable water from the Contractor's water bowser. It is expected that if this is required it will entail very minor quantities of water and will not impact on leachate volumes in the landfill in any measurable way. In the case where leachate is removed from the borehole during drilling it is expected to consist of very minor quantities and can be allowed to percolate back into the landfill adjacent to the drill rig. Similarly, any wash-water or rinse water produced by cleaning equipment or tools will be a very minor quantity. Where practicable leachate and washwater will be collected and redirected back into the borehole

3.1.7 Refuelling

The Contractor shall ensure that the rig and support vehicles are in good working order prior to arrival on site and that there are no leaks or drips from the plant. When the drill rig requires fuel the refuelling process shall be completed by the Contractor in a safe manner. Refuelling will take place within a

designated compound to be agreed between the licensee, drilling contractor and Lead Consultant. Diesel shall be pumped or poured directly into the rig using a funnel and in the presence of spill mats and a spill kit. Any spillages shall be reported to the Site Supervisor and cleaned up without delay.

3.1.8 Surface Water & Groundwater

The boreholes are located centrally in the closed cells, at significant distance from any natural water courses and will generate little or no run-off during drilling (apart from the minor quantities of water as above in 3.1.6). If run-off is generated during rainfall events this should not be impacted detrimentally by the drilling operation and will naturally percolate into the cells or flow down the landfill surface to the site drainage systems as is the present situation. As the drill sites are located within the engineered cells incorporating a basal clay liner there should be no impact on groundwater from the drilling operation.

3.1.9 Ecology

All sites are located in closed waste cells and most if not all are in uncapped (topsoil is yet to be placed) areas. Therefore there will be no impact on the local ecology.

3.1.10 Dust

The drilling system is such that there are only very minor emissions of dust during drilling and in most conditions no dust emissions at all.

3.1.11 Gas

It is not expected that significant gas emissions will be encountered. A gas monitor will on site at all times and used to monitor the boreholes at regular intervals. In the event that gases (e.g. methane, carbon dioxide) are released in the borehole then depending on the concentration and flow of the gas a decision will be made by the Lead Consultant as to the continuance of the drilling or the need for additional PPE (e.g. respirators) for site personnel. This is an unlikely scenario and in most cases drilling can proceed as normal. The installation of a bentonite seal in the upper 3m of the borehole will ensure no continuing emissions at the borehole after drilling is complete.

3.1.12 Noise

The cable percussion drill system entails use of a relatively low output engine and therefore produces low noise. Elevated noises can occur when pushing down the casing though these events are usually for short durations. The drilling sites are located in central parts of the closed cells and remote in excess of 320m distant from local houses or receptors. It is not expected that there will be an impact from noise due to the drilling operation at any sensitive receptors. However, it is proposed that a noise assessment be carried out prior to drilling to determine the potential impacts of noise from the work programme. Noise mitigation measures will be implemented if considered necessary.

3.1.13 Conclusion

Having considered the potential environmental risks posed by the drilling operation and assessed each aspect in turn it is concluded that the work programme can be completed without any impact on the local environment.

4.0 SURFACE WATER, GROUNDWATER AND LEACHATE SAMPLING

It is proposed to collect surface water, groundwater and leachate samples at the site. The locations of these samples will be determined after the initial site walkover and from discussions with IMS representatives. It is expected that c. 4 No. surface water samples will be collected from the local drainage network including one sample upstream and up to three samples downstream of the site.

Depending on the location of existing monitoring wells it is proposed that two or three groundwater samples be collected to include one sample up-gradient of the landfill and one or two samples downgradient (if available).

Existing maps provided by MEHL/Golder indicate seven leachate monitoring points (LC2 may be inaccessible) and it is proposed to sample all of these.

Groundwater, surface water and leachate samples will be analysed for the EPA's baseline suite of parameters for landfills (Landfill Monitoring Manual 2003, 2nd edition) and will include List I and List II substances, VOCs, Semi-VOCs, TPH, PAH, BTEX, cyanide, arsenic, antimony, chromium III and VI and Phenols. Split samples will be provided for interested parties as required.

Sampling will be carried out in accordance with best industry practices and will reference BS ISO 10175:2011+A2:2017 and BS ISO 5667. Monitoring wells will be purged of three times their volume prior to sampling and following stabilisation of the field parameters of pH and conductivity. Water and leachate samples will be collected either using dedicated sampling equipment (pumps, bailers, hoses etc.) at each of the wells or by decontaminating the sampling equipment between wells. The field parameters of water level, pH, temperature, conductivity and dissolved oxygen will be measured in the field at the time of sampling using calibrated field monitors. The samples will be collected into suitable containers supplied by the laboratory and labelled at the time of sampling. The samples will be stored in cool boxes and dispatched to the laboratory on the same day as sampling. The Lead Consultant will be responsible for management of the samples and filling in the Chain of Custody forms.

5.0 METHOD STATEMENT

5.1 Introduction

This Method Statement (MS) provides a description of the procedures to be followed for borehole drilling in the closed waste cells at Hollywood Landfill, Naul, Co. Dublin. The MS closely follows the template provided by Golder Assoc. Ireland Ltd. to ensure a consistency of approach in this submission to the EPA for Specified Engineering Works (SEW).

5.2 General Instructions

General instructions relating to all procedures conducted during the investigation program include:

- All personnel involved in the work must have completed a site-specific briefing (i.e. induction) with the Licensee prior to commencing work;
- Work shall be undertaken using the tools and personal protection equipment (PPE) specified in this MS, as well as the site specific Health, Safety & Environment Plan HSEP.

- In the event that a procedure specified in this MS cannot be completed safely, all work is to stop, the equipment and/or system made safe, and the Lead Consultant informed.

5.3 Related Documentation

The following documentation will be required to be prepared prior to drilling:

- Task based risk assessments contained within the HSEP (Lead Consultant).
- Job Hazard Assessment (JHA) forms (Lead Consultant).
- Contractor's method statement and HSEP (Main Contractor, Review by Lead Consultant).
- Borehole location drawing (Lead Consultant)
- Chain of custody forms for transporting samples from the site to the sample testing facility Lead Consultant).

5.4 Personnel Requirements

The following personnel will be required to carry out the drilling:

- Lead Consultant – Marron Environmental
- Contractor with at least a two-man crew

The licensee nominated site supervisor may be present at the drill rig.

5.5 Health and Safety

5.5.1 Site Induction

All personnel will receive a site-specific project briefing (i.e. induction) from the licensee in accordance with the project HaSEP.

5.5.2 Personal Protective Equipment

The following minimum personal protective equipment is required:

- Gloves
- Hard hat
- Hearing protection
- High visibility clothing
- Safety footwear
- Eye protection

The project specific HaSEP outlines additional PPE requirements for certain working conditions, activities, or hazards that may be encountered.

5.5.3 Before Drilling

Before drilling begins the following details related to health and safety will be conducted:

- Inform staff of the emergency shut-off switch on the rig and have the driller test it daily.
- The proposed borehole locations shall be photographed before moving the drill rig in place to document the condition of the site prior to work. The site should be photographed from similar locations following demobilization to demonstrate the degree of rehabilitation undertaken.
- Obtain site-specific information related to ground conditions and surface obstructions.
- Available maps and reports have been consulted and the subsurface conditions are known including the presence of waste and the depth to the basal clay liner.
- Each drilling location should be inspected by the Lead Consultant and Contractor to be approved as safe for drilling. Consider access requirements and locate the boreholes accordingly.
- A survey of the closed cells was completed on 10/12/18 and the drill site will be inspected again within 48 hours of drilling commencing.
- No surface or overhead features that may cause a hazard to drilling were identified during the survey and this will be confirmed during the re-inspection survey.
- The drill rig and associated equipment shall be inspected by the Contractor on a daily basis to identify any potential safety hazards. The inspection will be dependent on specific use, field conditions, and manufacturer's recommendations.
- The drill rig will not be moved between locations with the mast raised.

5.5.4 During Drilling

During drilling the following points related to health and safety will be noted:

- Where a safety guard is available to protect operators and field staff from the risk of entanglement it shall be used at all times during the drilling operations. Where a guard is not available, other mitigation measures will be discussed with the drilling crew, and documented in the lead Consultant's notebook and implemented before commencing work.
- Identify a safe viewing area where any non-drilling crew can observe the drilling operations, but not so close that they are either in danger of being struck by the equipment swinging from wirelines or winch cables.
- Always identify and ensure a route of escape is available for personnel working around the drill rig, should they need to move quickly away from the area. Be aware of wind direction and consider escaping upwind if subsurface contaminants are involved.
- Make sure the drill crew knows who is on site each day and where all personnel are at all times.
- Only approach the drill rig during times when it is safest to do so. Always signal the operator first and make sure the equipment is appropriately guarded or stopped before you approach.
- Technical personnel shall never act as the driller's helper. Technical personnel are not to handle drill

rods or equipment.

- The Contractor is responsible for providing the necessary drilling equipment and personnel who are trained in its safe use.
- Never use petrol or any other combustible solvent as a cleaning agent. It is a fire and explosion hazard.
- The Contractor is to use a personal fall arrest system while working at any height above five feet on the mast or on top of the rig.
- Maintenance shall not be carried out while the rig is running.
- Do not remove any blocking or jacks from under the rig while the rig is drilling.
- Stand clear of cables while lifting drill rods or while the rig is under a heavy strain.
- Do not wear loose clothing or jewellery around moving machinery.
- Be on guard for pinch and shear hazards for fingers and toes, especially around the drill winches and casing.
- Practice good housekeeping. Do not allow excess spoil material to accumulate and put away unused equipment.
- Communicate effectively; if using hand signals, make sure everyone knows what they are.
- Know the location of fire extinguishers, and how to use them. Check the charge condition before the start of project activities and periodically thereafter.
- All hoses carrying high pressure air or fluids should have safety chains or cables at connectors.
- Lighting on the site or rig shall be properly installed and sufficient in quantity to provide adequate illumination for night work. All receptacles shall be protected with a ground fault circuit interrupter (GFCI).
- All hooks will have safety latches and be checked between borings.
- Do not ride on hook ropes or other traveling lines connected to the drill rig.
- Keep walkways clear.
- In the event of an electrical storm, drill rig masts will be lowered as soon as possible, equipment will be stored and personnel will retreat from the drill site as soon as possible.

5.5.5 Critical Health & Safety Hazards

The following critical; hazards should be assessed:

- Impact by moving equipment.
- Rig toppling if incorrectly set up.
- High pressure air or hydraulic lines rupturing.
- Impact from high velocity fragments from drilling/casing.

- Traversing uneven ground to drill sites.
- Clothing, fingers or other body parts that could be caught in lifting or rotating equipment.
- Noise generated by the equipment or surroundings.
- Dust generated by equipment.

5.6 Special Tools, Materials and Equipment

The following special tools, materials and equipment are required from the Contractor:

- Drilling equipment, associated plant and accessories
- PPE (as described in Section 5.5.2)
- Available underground service plans. In the case of the IMS landfill it has been confirmed by site management that there are no underground services or infrastructure within the closed cells.
- Drill rig support vehicle(s)
- Installation material (e.g. steel casing, steel headworks, cement, bentonite and ballast)
- Water bowser or pump
- Intermediate bulk containers (if required)
- Appropriate decontamination equipment (e.g., pressure washer or steam cleaner)
- Scrub brushes, and container or tank for wash water
- Ancillary equipment (shovels, hand tools)
- Plastic sheeting and sandbags
- Diesel and lubricant cans in secondary containment with spill kits
- Fire extinguisher(s) (Powder)
- Other miscellaneous drilling equipment and tools

The following special tools, materials and equipment are required from the Lead Consultant:

- Borehole/site layout plans
- Tape measure
- Maps and drawings, notebook and writing materials
- Black permanent markers for writing on sample containers
- Camera
- GPS
- Mobile phone
- First aid kit

5.7 Pre-Commencement

Prior to commencing the work the Lead Consultant will complete the Point of Work Safety Assessment including a Take 5 Assessment of the site to identify site specific risks that may not have been included in the project HaSEP. The MS will be reviewed during initial site work in order to incorporate site-specific information identified during initial works associated with the drilling programme and will be updated accordingly.

A toolbox meeting is to be completed onsite with all staff involved with the drilling to discuss risks and mitigation measures prior to commencing work. The Lead Consultant will review the relevant MS, JHA risk assessment forms, and PPE for the task. The Lead Consultant will also ensure staff are aware of the potential hazards that may be present in the drilling location.

5.8 Drilling Procedure

5.8.1 Site Mobilization

- The Lead Consultant will locate the pre-selected borehole locations with a surveyor.
- A drill pad at the proposed borehole locations will be levelled using a tracked excavator or wheeled loader if required. The Lead Consultant will approve the location prior to commencing drilling.
- The finalized borehole locations will be marked out in accordance with the drilling specification and borehole layout plan using spray paint as per instructions from IMS.
- The working area will be set up with sample preparation and sample collection equipment.
- All equipment and associated materials will be delivered to site in a safe and operational condition.
- Maintenance records for all equipment will be made available by the Contractor.
- Any equipment requiring calibration must have a current calibration certificate, prior to use on site.
- Lifting equipment on the drill rig must be accompanied by appropriate inspection records and check sheets.
- Materials and equipment will only be unloaded by the Contractor at locations agreed with the nominated Site Supervisor.

5.8.2 Equipment Storage and Handling

- All materials and equipment will be stored in a tidy manner during work and at the end of each shift.
- Spill kits shall be supplied by the Contractor and shall be stored in a location where they are readily accessible while work is in progress. .
- Handling of any materials should be undertaken only by people properly trained and equipped to do so.
- Visual manual handling assessments shall be made prior to lifting and movement of any heavy or awkward equipment; and
- Equipment storage containers will be locked when not in use.

5.8.3 Set Up of Safe Working Areas

- Appropriate barriers (e.g. hazard tape) will be erected to prevent unauthorized access to the working area;

5.8.4 Drilling

- The rig will be moved into position over the borehole location identified by the Surveyor and approved by the Lead Consultant.
- The rig will be situated so that it remains level and well supported during drilling operations.
- A tarpaulin sheet or equipment rack shall be placed on the ground adjacent to the borehole and drill rig for placement of kit.

The method shall be as follows:

- The drilling will be carried out using a cable percussion drill rig (Technical specification to be provided by Contractor)
- The borehole will be commenced and advanced by appropriate tools and casing as determined by the drilling conditions, which are lifted and placed by the rig's hydraulic or winch system.
- Soil samples will be recovered by the Contractor using the sampling tool.
- The recovered soil will be placed on clean plastic tarpaulin for examination. The depth interval of the sample will be written on the sample containers with a permanent marker.
- Samples will be locked in the Lead Consultant's vehicle until they are transported back to the testing facility, according to MS.
- A record of the borehole completion details will be kept in the Consultants daily site log and drilling logs.
- Where the borehole cannot be advanced due to the presence of underground obstructions within the ground encountered, the Lead Consultant will be informed and an alternate drilling site may be selected within a short distance in order to complete the drill hole.

5.8.5 Refuelling of the Drill Rig

- When the drill rig requires fuel the refuelling process shall be completed by the Contractor in a safe manner within the designated compound.
- Diesel shall be pumped or poured directly into the rig using a funnel and in the presence of spill mats and a spill kit.
- Any spillages shall be reported to the Site Supervisor and cleaned without delay.

5.8.6 Sample Preparation and Logging

- The Contractor shall remove arisings from the drilling tool and place the arisings on a clean tarpaulin sheet adjacent to the rig.

- The Lead Consultant will supervise all sample handling and will collect the samples
- Each sample will be photographed at the drill rig immediately after it has been taken.
- Borehole logs will be prepared on the day of sampling. Logs will include the borehole location, drilling method, coordinates, samples collected, waste descriptions and depth of borehole.
- Samples will be transferred to an analytical laboratory in accordance with the MS.

5.8.7 Equipment Cleaning and Decontamination

- All drilling equipment will be cleaned with high pressure potable water before moving to the next drill location.
- Following cleaning of the equipment the drill rig will be repositioned at the next borehole location under supervision.

5.8.8 Completion or Cessation of Work

- Upon completion of work, the borehole installation will be certified as complete and in accordance with design by all parties.
- The drillers log will be submitted to the Lead Consultant and Site Supervisor.
- The daily log of events will be finalized by the Lead Consultant.
- Any incidents that occurred during drilling will be reported to the Lead Consultant and Site Supervisor.

5.9 Hours of Operation and Programme Schedule

- Drilling will be undertaken during the normal opening hours for the landfill i.e. between 08.00 hrs and 18.00 hrs. If weather conditions are extremely windy or wet drilling will be suspended until weather improves. The rig will be taken down during electric storms. In the event that darkness falls before 6 pm and there isn't sufficient lighting on the rig to operate safely, drilling will be suspended until the following day.
- It is estimated that each borehole could be completed in two days indicating a 30 day programme to complete the drilling operation.

6.0 PERSONNEL

The following roles have been identified in order to implement the design, management, supervision and completion of the project.

Role	Party Representing	Company (or representative)	Lead Person
Lead Consultant	Defendants	Marron Environmental	Donal Marron
Contractor	Defendants	TBC -once appointed	TBC –once appointed
PSCS	Defendants	Contractor	TBC –once appointed
PSDP	Licensee	Golder Associates	Peter Corrigan/Ruth Treacy
Preparation of Specified Engineering Works (SEW) Report	Licensee	Golder Associates	Peter Corrigan/Ruth Treacy
Licensee Representative	Licensee/IMS	Golder Associates	Peter Corrigan/Ruth Treacy

Donal Marron of Marron Environmental is to fulfil the role of Lead Consultant. He has 34 years experience as an environmental consultant with the last 25 years specialising in waste management consultancy and is a professional member of the Institute of Geologists of Ireland (PGeo) and the European Federation of Geologists (EurGeol). Over the years he has been involved in the design, Waste licence management and environmental management and monitoring of numerous landfills including the subject landfill (Waste Licence Ref. No. W0129-03) then owned by Murphy Concrete Manufacturing (MCM) Ltd. He has also designed and supervised the completion of drilling and sampling programmes on many landfills including County Council and privately owned municipal waste landfills at Balleally (W0009-04), Dunsink (W0127-01), Basketstown (W0010-02), Ballydonagh (W0028-03), Ballyguyroe (W0002-02), Arthurstown (W0004-04), Kinsale Road (W0012-03), Rafeen (W0023-01), Ardla (Waste Permitted site), Marlinstown (W0071-02), Killegar (W0043-01) and Whitestown (W0204-01) and on unregulated landfills at Ballymorris, Whitestown, Esker, Fancourt, Longwood, Cleanbuild, Kyle among others and the works at Dunsink, Fancourt and Esker were completed within the last 5 years. All the required insurances are in place including professional indemnity, public liability and employers liability.

The Contractor has not as yet been appointed and will be subject to a tendering process to ensure they have the requisite qualifications, skill and experience to complete the task. The Contractor will be required to submit an H&S Plan, method statement, and evidence of insurances held to the Lead Consultant no later than 5 working days in advance of the works commencing.

7.0 HEALTH AND SAFETY

The work programme will be completed in accordance with the Safety Health and Welfare at Work (Construction) Regulations 2013 (SI No. 291 of 2013) and the Safety Health and Welfare at Work (Exposure to Asbestos) (amendment) 2010 (S.I No. 589 of 2010). A Health and Safety Risk Assessment is provided in Appendix 2. All personnel will hold current Safe pass cards and will undergo the IMS site induction training and all works will meet with the requirements of the current H & S plans for the landfill.

Personal Protective Equipment appropriate to the potential risk of exposure from the waste materials will be required and will include: Hard hats, safety glasses, reflective high visibility jackets/vests, steel toe capped boots and nitrile disposable gloves will be worn at all times when sampling on-site. The need for additional safety PPE such as ear protection, half face masks etc. will be assessed on an on-going basis and will be used where required.

All parties shall at all times comply with the Health & Safety rules for the Site. All personnel will be aware of working machinery associated with the drilling operation and the normal workings of the landfill site.

Prior to works beginning on site the H&S risk assessment will be reviewed and amended if necessary. Any amendments will be communicated to site personnel via a tool box talk and in hard copy format.

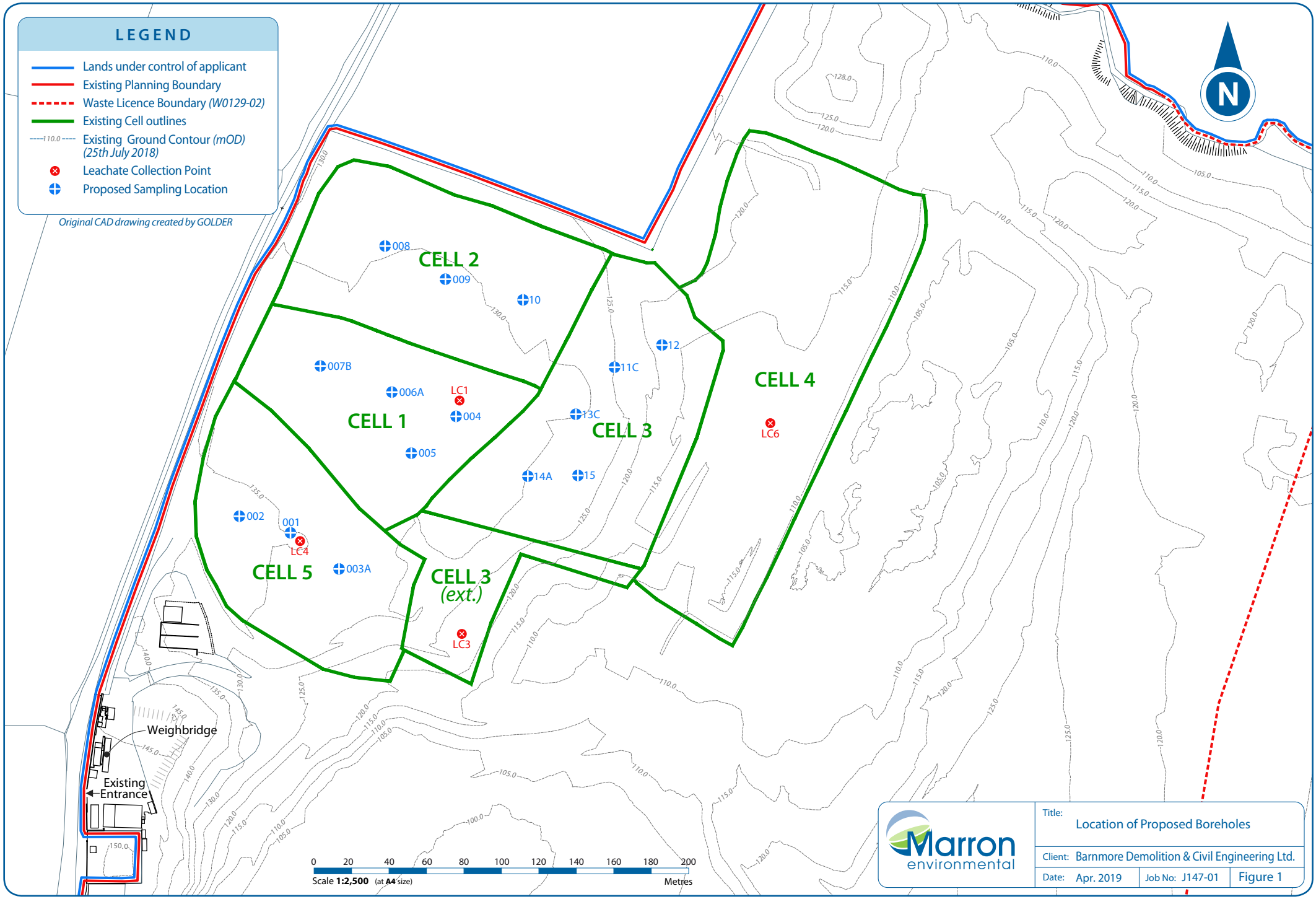
LEGEND
Lands under control of applicant
Existing Planning Boundary
Waste Licence Boundary (W0129-02)
Existing Cell outlines
110.0 Existing Ground Contour (mOD) (25th July 2018)
Leachate Collection Point
Proposed Sampling Location
Original CAD drawing created by GOLDER
N
CELL 1
CELL 2
CELL 3
CELL 3 (ext.)
CELL 4
CELL 5
008
009
10
12
007B
11C
006A
LC1
004
13C
005
14A
15
LC6
002
001
LC4
003A
LC3
Weighbridge
Existing Entrance
0 20 40 60 80 100 120 140 160 180 200
Scale 1:2,500 (at A4 size)
Metres
Marron environmental
Title: Location of Proposed Boreholes
Client: Barnmore Demolition & Civil Engineering Ltd.
Date: Apr. 2019
Job No: J147-01
Figure 1

TABLE 1

Drill Point	Cell No.	East	North	Topo level (mOD)	Est. max. level of top of basal liner/walls(mOD)	Borehole Base elevation (mOD)	Proposed Borehole finish depth (m)
1	Cell 5	715473	758095	134.944	107	111.00	23.94
2	Cell 5	715445	758104	135.97	118	123.00	12.97
3A	Cell 5	715499	758076	133.928	107	111.00	22.93
4	Cell 1	715562	758157	131.104	106	110.00	21.10
5	Cell 1	715537	758138	131.062	106	110.00	21.06
6A	Cell 1	715527	758170	131.407	106	110.00	21.41
7B*	Cell 1	715489	758184	130.9	118	123	7.90
8	Cell 2	715523	758249	129.663	109.5	114	15.66
9	Cell 2	715556	758231	130.371	106	110	20.37
10	Cell 2	715597	758220	129.695	106	110	19.70
11C	Cell 3	715646	758184	127.539	106	110	17.54
12	Cell 3	715672	758196	120.615	106	110	10.62
13C	Cell 3	715626	758159	129.195	106	110	19.20
14A	Cell 3	715600	758125	129.94	106	110	19.94
15	Cell 3	715627	758126	128.9	106	110	18.90

APPENDIX 1

Laboratory Analysis for Soil Samples

The following suites of analyses will be used for waste characterisation of soil samples obtained:

- Soil pH
- Moisture content
- Total Organic Carbon (TOC)
- Dissolved organic carbon (DOC)
- Fraction of Organic Carbon (FOC)
- Loss on ignition
- BTEX
- Total Petroleum Hydrocarbons (CWG)
- Mineral Oil
- Polychlorinated Biphenyls (7 congeners)
- Speciated Polyaromatic Hydrocarbons (PAHs)
- Volatile organic compounds and semi-volatile organic compounds;
- Chromium III
- Chromium VI
- Metals — Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium Total, Copper, Manganese, Mercury, Molybdenum, Nickel, Lead, Selenium, Zinc.
- Cyanides
- Sulphate
- CEN 10:1 leachate analysis of Metals - Arsenic, Barium, Cadmium, Chromium Total, Copper, Mercury, Molybdenum, Nickel, Lead, Antimony, Selenium, Zinc.
- Chloride
- Total Dissolved Solids
- Phenol index and total monohydric phenol
- Asbestos screen

APPENDIX 2

PRELIMINARY HEALTH AND SAFETY ENVIRONMENT PLAN (HASEP)

For

INSPECTION AND TESTING AT THE IMS LANDFILL

Site Address:
Hollywood Landfill, Naul, Co. Dublin

Submitted By:
Marron Environmental

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1.1 CONTACTS LIST SUMMARY

1.2 Emergency Contacts

Contact Donal Marron	**Number** 0872228641
Ambulance	999
Fire	999
Police	999

Hospital name	Address	Phone	Level of Care Available
Beaumont General Hospital	Beaumont Road, Dublin 9	(01) 8093000	A & E; General

1.3 Client and Site Contacts

Role	Name	Number
Contact person on site	Donal Marron	0872228641
Client safety contact	Cian O'Hora	0858073721

You have the right to refuse any work you feel is unsafe, or that you are not trained to do. Choose to work safely and in compliance with all HSE requirements.

2.1 CLIENT/SITE LOCATION DETAILS

2.2 Client/Site Location Details

Project location map (See Figure 1)	

2.1.1 *Site Description*

Site Name	Hollywood Landfill			
Address	Nags Head, Naul. Co. Dublin			
Coordinates				
Description	Existing Inert Waste Landfill			
Access info	Sallowood Road			
Previous land uses	Quarry			
Site Receptors that maybe impacted by the proposed work	Groundwater, surface water			
Additional Info				
HSE Induction / orientation provider	IMS			
Site Contact Numbers	**Field cell phone**	0872228641	**Satellite phone**	n/a
	Other			

3.1 SUBCONTRACTOR DETAILS

Principal Contractor

TBC

Name	Subcontractor key staff	Phone	Subcontractor activities	Risk Assessment Supplied	Method Statement Supplied	Approved subcontractor
TBC	TBC		Borehole Drilling			

4.1 UNDERGROUND SERVICES

Investigation involves ground penetration or intrusive works (e.g. drilling, augering and excavation).
The following controls will be implemented prior to commencing work:

Underground Services	Yes	No	If yes, provide details:
Service locator engaged?		√	Closed waste cells-IMS confirmed no underground services
Plans detailing location of services obtained?		√	See above
Client provided service locator?		√	See above
Other controls?		√	See above

4.2 Welfare / Hygiene Facilities

The following issues should be considered when planning welfare provision including: the work to be carried out; the associated health risks; duration and number of different locations; number of people working at different locations and distances from welfare facilities.
Describe the project's welfare facilities below:

Facility	Yes	No	Describe alternate arrangements:
Toilets available?	√		Site toilets/washrooms available
Rest areas available?	√		Arrangements to be made prior to mobilizing to site (e.g. contractors vehicle, contractors hut)
Washing facilities available?	√		Site toilets/washrooms available
Drinking water available?	√		Contractor provided
Area for changing and storing clothes available?	√		Contractor provided
Smoking permitted on site?		√	Only in site designated areas

5.1 PERMITS AND APPROVALS

Are permits and approvals required for this project? (e.g Client supplied Permit, Hot Works Permit, Mobile Treatment Permit etc.)

Permit or Approval:	Approval Arranged by:
EPA Approval	IMS

6.1 CHECK-IN SYSTEM

6.2 Check-in contacts

	Primary	Secondary
Name	Site Manager	Lead Consultant
Phone/Email	TBC	
Check-in frequency*	Morning, Midday, Evening	

By phone		
By email		
By SMS		
On site	√	

6.3 Missed Check-in Procedure

Within 2 hours of missed check-in time:

1. Attempt to contact employee
2. Contact accommodation or other project personnel to determine last contact with employee
3. Notify Lead Consultant.
4. Lead Consultant to determine timing of further action, based on project details.

7.1 CHEMICALS AND CONTAMINANTS

Hazardous substances likely to be used during this project and/or present at the site.

Spill kit available to manage potential spills? ☒Yes ☐No (To be provided by contractor)

7.2 Chemicals (Hazardous Substances)

Chemical Name	SDS Available	Additional Info
Diesel Oil	√	To be provided by contractor

7.3 Possible Contaminants or Chemical Exposures

☒Additional contaminants likely to be encountered during this project (consider previous land uses)

Contaminant Name	Possible non-inert waste materials			
Exposure routes	Skin, spillage, ingestion/inhalation			
Flash point			**Odour threshold**	
Explosive limits	**LEL**		**UEL**	
Occupational Exposure Limits	**TWA**		**STEL**	
			Ceiling	
Air Monitoring Required - No				
Monitoring equipment				
Monitoring location				
Monitoring frequency				
Action levels and appropriate response	To be determined by lead Consultant			
Exposure Controls				
Medical Surveillance, if required	To be determined by Lead Consultant			
Additional Info				

8.1 RISK REGISTER

8.2 Risk Definition

Health & Safety Consequence or Impact Description:

Catastrophic	5	Death, toxic release off-site with detrimental effect, very high financial loss
Major	4	Extensive injuries, loss of production capability, off-site release with no detrimental effects, major financial loss
Moderate	3	Medical treatment required, on-site release contained with outside assistance, high financial loss
Minor	2	First aid treatment, on-site release immediately contained, limited financial loss
Insignificant	1	No injuries, low financial loss

Environmental Consequence or Impact Description:

Catastrophic	5	Release to air, water or land with life threatening impacts on or off site. e.g.: human death(s); destruction of endangered species; habitat destruction; human water supply or food destruction; localized extinction of a species; Protracted or extensive clean up requiring external resources.
Major	4	Release to air, water or land with destructive impacts on or off site. e.g.: destruction of animal / fish life; habitat damage; making air, water or land unfit for use by living things; destruction of known or unknown indigenous people's / heritage sites ; irreversible alteration of the natural environment or its aesthetics; dust or noise affecting a region; large volumes of contaminated or hazardous waste. Requires clean up using external resources.
Significant	3	Release to air, water or land with impacts requiring long term recovery. e.g.: habitat disturbance; damage to indigenous people's/heritage sites; alteration of the natural environment or its aesthetics; generation of contaminated or hazardous waste, or large volumes of solid waste; dust or noise affecting the immediate area. Clean-up can be managed by internal resources.
Minor	2	Release to air, water or land with resulting in localised damage to worksite requiring short term recovery. e.g.: readily repairable impacts (physical or aesthetic) to the natural environment, indigenous people's/heritage items, property, or business operations; public nuisance (noise, dust, odours); generation of small quantities of waste. Clean up can be completed by internal resources.
Insignificant	1	Release to or disturbance of air, water or land resulting in no impact or localised (i.e. isolated to worksite) impacts within authorized limits. Short term impact with complete recovery. Clean up can be completed by person(s) involved.

Likelihood Description:

Almost certain	5	Incident will occur in every circumstance (e.g. every time).
Likely	4	Incident will probably occur (e.g. 1 in 10 times).
Possible	3	Incident may occur at sometime (e.g. 1 in 100 times).
Unlikely	2	Incident not expected to occur, but conceivable (e.g. 1 in 1, 000 times).
Rare	1	Incident would only occur in exceptional circumstances (e.g. 1 in 10,000 times).

Risk Analysis Matrix:

Likelihood:		**Consequence:**				
		Catastrophic	Major	Moderate	Minor	Insignificant
		5	4	3	2	1
Almost certain	5	25 (VH)	20	15	10	5
Likely	4	20	16 (H)	12	8	4
Possible	3	15	12	9 (M)	6	3
Unlikely	2	10	8	6	4 (L)	2
Rare	1	5	4	3	2	1 (VL)

0-3 (VL) Very Low Risk	No additional controls necessary. Continue to monitor risk.
4-6 (L) Low Risk	Consider additional controls to further reduce risk.
8-12 (M) Moderate Risk	Controls must be implemented to reduce risk.
15-16 (H) High Risk	Risk Unacceptable, do not proceed without controls, minimum of 'engineering controls'.
20-25 (VH) Very High Risk	Risk Unacceptable, do not proceed without controls, elimination or substitution controls required.

8.3 Risk Register

Header key:

- PA: Persons Affected
- IC: Initial Consequence
- IL: Initial Likelihood
- IR: Initial Risk
- RC: Residual Consequence
- RL: Residual Likelihood
- RR: Residual Risk
- AC: Additional controls

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
General	Under the influence of drugs or alcohol	Undertaking work while under the influence of drugs or alcohol	Contractor	5	4	20	• Do not begin or continue work if they are knowingly impaired in any way due to alcohol, legal or illegal drugs. • Comply with drug and alcohol testing in conformance with local legislation. • Please specify other appropriate controls for the site/project.	5	1	5	
General	Undertaking work without adequate rest	Undertaking work without adequate rest	Contractor	5	2	10	• Where possible allow a person to have at least 8 hours rest before commencing work and between shifts • Reschedule work • Modify the task so the person is not undertaking high risk work, or working alone. • Please specify other appropriate controls for the site/project.	5	1	5	Maximum 10 hour working days with minimum 3 rest breaks.
General	Working in excess of 14 consecutive days	Working in excess of 144 hours over 14 consecutive days	Contractor	5	2	10	• Where possible plan work so no person has a working hours in excess of 144 hours over 14 consecutive days • Rotate employees through the project • Schedule a break in the project • Modify the task so the person is not undertaking high risk work, or working alone • Implement Fatigue leave in accordance with local legislation • Please specify other appropriate controls for the site/project.	5	1	5	Maximum 10 hr. days and 6 day weeks

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
General	Working longer than 12 hrs (inc. travel)	Working in excess of twelve (12) hours including travel time	Contractor	5	2	10	• Where possible plan work so no person has a working day in excess of 12 hours • Plan work to be conducted over multiple days • Arrange accommodation close to the work to minimise travel time • Modify the task so the person is not undertaking high-risk work, or working alone after 12 hours. • Please specify other appropriate controls for the site/project.	5	1	5	As above
General	Working longer than 14 hrs (inc. travel)	Working day longer than 14 hours work including travel time	Contractor	5	2	10	• Where possible plan work so no person has a working day in excess of 12 hours • Plan work to be conducted over multiple days • Arrange accommodation close to the work to minimise travel time • Modify the task so the person is not undertaking high-risk work, or working alone after 12 hours. • No person shall operate a vehicle after 14 hours • Arrange for taxi or other transport • Arrange accommodation close to the work to minimise travel time • Please specify other appropriate controls for the site/project.	5	1	5	As above
General	First Aid Risk Assessment	Historical Incidents and Injuries	Contractor	4	3	12	• Ensure your first-aid provision will cater for the type of injuries and illness that have occurred in your workplace. • Monitor accidents and ill health and review your first-aid provision as appropriate.	4	1	4	First aid kit provided.

HEALTH AND SAFETY ENVIRONMENT PLAN (HASEP)

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
General	First Aid Risk Assessment	Special Hazards Present (e.g. Workshop or Chemicals)	Contractor	4	4	16	• First aid at Work trained employee present.• Additional training for first-aiders to deal with injuries resulting from special hazards present.• Additional first-aid equipment required as per specific hazard (e.g. eye wash or safety shower etc.).• Providing a first-aid room if appropriate.• Inform the emergency services of specific hazards in advance.• Contractors to provide suitable safe system of work for approval prior to work and then to complete work in accordance with the safe system.	4	1	4	Drillers experienced in drilling at waste landfill sites. Suitable PPE will be used.
General	First Aid Risk Assessment	Vulnerable People and Existing Health Problems	Contractor	4	3	12	• Additional training for first-aiders.• Additional first-aid equipment.• Local siting of first-aid equipment.	4	1	4	As above.
General	First Aid Risk Assessment	Working on Others Sites	Contractor	4	3	12	• Make arrangements with site occupiers to ensure access adequate provision of first aid.	4	1	4	
General	General Premises Risk Assessment	Bio Hazards (e.g. Typhoid, Tetanus, Hepatitis B, Weils disease, HIV)	Contractor	5	3	15	• Assess premises for areas of potential bio hazard build up (e.g. water systems for Legionella).• Implement appropriate control measures for any biohazards identified (e.g. flushing of water systems).• Inform workers of the hazards present and ensure they are clearly identified.• Contractors to provide suitable safe system of work for approval prior to work and then to complete work in accordance with the safe system.	5	1	5	

HEALTH AND SAFETY ENVIRONMENT PLAN (HASEP)

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
General	General Premises Risk Assessment	Lone Working	Contractor	4	3	12	• Where possible lone working should be avoided.• Lone working completing high risk tasks (e.g. operating hazardous machinery) is not permitted.• Lone workers should adopt and use a robust call in process so the alarm can be raised.Lone workers should have access to communication equipment at all times.• Consider the use of automated lone worker alarms if lone working is likely to be a regular activity.	4	1	4	No Lone working will be allowed.
General	General Premises Risk Assessment	Manual Handling	Contractor	3	5	15	• Where possible manual handling should be avoided.• Excessive manual handling requires a specific manual handling risk assessment.• If manual handling is required then mechanical aids should be used where possible and the amount of handling minimised.• Kinetic manual handling techniques should be used at all times.• Contractors to provide suitable safe system of work for approval prior to work and then to complete work in accordance with the safe system.	3	2	6	
General	General Premises Risk Assessment	Vehicles	Contractor	5	4	20	• Avoid interaction between vehicles and pedestrians where possible.• Use a one way vehicle travel direction if layout allows.	5	1	5	
General	General Premises Risk Assessment	Violence at Work	Contractor	4	2	8	• Violence at work shall not be tolerated.• If violence at work is observed then the Lead Consultant will take immediate action. The violent person should be asked to leave the premises.• If the violent person will not leave the premises then call the police immediately.	4	1	4	

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
General	General Premises Risk Assessment	Welfare Facilities	Contractor	3	4	12	• Welfare facilities shall be provided in accordance with The Safety, Health and Welfare at Work (General Application)(Amendment) Regulations 2007 in Ireland.• Any defective or damaged equipment provided for welfare at the premises should be reported to the facilities management for repair or replacement.• Contractors to provide suitable safe system of work for approval prior to work and then to complete work in accordance with the safe system.	3	1	3	
General	General Premises Risk Assessment	Work Equipment	Contractor	4	3	12	• Only work equipment designed for use for the task shall be used.• All work equipment shall be provided to the relevant standards applicable to that equipment.• All work equipment shall be maintained, serviced and calibrated in accordance with legal requirements, industry standards or the manufacturers recommendations.• All work equipment shall be inspected prior to use and damaged equipment clearly marked and removed from use.• Damaged equipment shall be repaired in accordance with the manufacturers requirements or replaced.• Work equipment shall not be modified for alternative uses.• Only people trained to use work equipment shall be permitted to use the equipment where suitable training exists.• Contractors to provide suitable safe system of work for approval prior to work and then to complete work in accordance with the safe system.• If required for the safe use of the equipment PPE will be provided and shall be worn.	4	1	4	

HEALTH AND SAFETY ENVIRONMENT PLAN (HASEP)

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
General	General Premises Risk Assessment	Working Patterns, Working Hours and Fatigue	Contractor	4	4	16	• Contractors to provide suitable safe system of work prior to work and then to complete work in accordance with the safe system. Max. 10 hr. days and 6 day weeks allowed.	4	1	4	
General	Premises Fire Risk Assessment	Ignition - Naked Flames	Contractor	5	4	20	• Where possible naked flames should be avoided. • Contractors requiring to use a naked flame will provide a risk assessment and method statement for their work. • Work involving naked flames is classed as hot works and will be completed under a permit to work system.	5	1	5	
General	Premises Fire Risk Assessment	Ignition - Smoking	Contractor	5	3	15	• Smoking only allowed in designated smoking areas. • Waste bins provided for smokers to be emptied regularly.	5	1	5	
General	Working at Height	Falling Tools or Equipment	Contractor	3	2	6	• Minimise tools to be used at height. • Clear area around working of people. • Use tool box or tool belt to secure tools to person or on platform at top of ladder. • Cut resistance gloves and eye protection to be worn when handling light bulbs.	3	1	3	
General	Operator Hazards	Distractions from Communication Devices while driving	Contractor	5	3	15	• Do not use communication or electronic devices whilst driving, including hands-free kits. The exception to this is where fitted radios e.g. haul trucks and boats are required for the safe navigation of the mode of transport. • Please specify other appropriate controls for the site/project.	5	1	5	
General	Operator Hazards	Operating a vehicle after fourteen (14) hours work (including travel time).	Contractor	5	3	15	• No person shall operate a vehicle after 14 hours • Arrange for taxi or other transport • Arrange accommodation close to the work to minimise travel time • Please specify other appropriate controls for the site/project.	5	1	5	

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
General	Operator Hazards	Unsafe driving	Contractor	5	2	10	• All drivers must possess the appropriate operator's license for the area of operation and has had sufficient training, and experience to operate the mode of transport • Use, and ensure passengers use, a seat belt or restraining device at all times when operating or travelling in a mode of transport where they are fitted • Wear and ensure passengers wear any appropriate personal protection equipment as required by local legislation, the mode of transport manufacturer's instructions or through risk assessment; whichever specifies the more protective standard. • Do not allow unauthorized personnel (e.g. hitch-hikers) to ride in the mode of transport • Ensure no personnel travel in cargo areas. • Please specify other appropriate controls for the site/project.	5	1	5	

HEALTH AND SAFETY ENVIRONMENT PLAN (HASEP)

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
General	Route Hazards	Driving in adverse weather conditions	Contractor	5	2	10	• Eliminate by rescheduling times and routes • Ensure that modes of transport are properly equipped to operate in poor weather conditions, e.g. the correct tyres are fitted including winter tyres or snow chains etc. • Establish designated primary and back up contacts with call in schedules to ensure the person making the journey is safe. • Ensure operators understand the actions they should take to reduce risk, e.g. do operators of high-sided vehicles know that they should take extra care if driving in strong winds with a light load? Is the operator of a boat experienced in heavy weather operations? • Operators not to be pressurised to complete journeys when they consider weather conditions are poor • Consider if the mode of transport can become stuck/bogged-down/trapped and, if so, how employees will be recovered • Provide appropriate communication devices for adverse weather conditions. • Please specify other appropriate controls for the site/project.	5	1	5	

HEALTH AND SAFETY ENVIRONMENT PLAN (HASEP)

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
General	Route Hazards	Journey Timing	Contractor	5	2	10	• Allow sufficient time to complete the journey safely • Avoid periods when drivers are most likely to feel sleepy. Sleep-related accidents are most likely to occur between 2 am and 6 am and between 2 pm and 4 pm • Employees must not drive if they feel sleepy even if this might upset the project schedule • Allow operators to make an overnight stay, rather than having to complete a long journey at the end of the working day • Consider the fatigue effects of long haul flights and time zone changes • Establish designated primary and back up contacts with call in schedules to ensure the person making the journey is safe. • Establish criteria to ensure that employees are not being asked to work an exceptionally long day(s) • Allow new operators more time to complete a journey • check that the schedule takes into account expected route factors e.g. heavy congestion. • Avoiding periods of peak traffic flow • Avoid night driving where possible • Consider route specific factors that may increase the risks during particular hours of the day, e.g. encounters with deer at dawn and dusk, reduced visibility from the low sun at sunset and sunrise • Avoid local holidays where possible (particularly in countries where fasting is practiced). • Please specify other appropriate controls for the site/project.	5	1	5	

HEALTH AND SAFETY ENVIRONMENT PLAN (HASEP)

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
General	Route Hazards	Long-distance driving. (where a journey is considerably longer than driver is used to)	Contractor	5	2	10	• Ensure operators will not be put at risk from fatigue caused by driving without appropriate breaks • Reduce long road journeys by combining with other modes of transport, e.g. it may be possible to use an aircraft for part or all of the journey instead of a vehicle • Consider that sometimes people will be starting a journey from their home which could add extra distance to the journey. • Establish designated primary and back up contacts with call in schedules to ensure the person making the journey is safe. • Share driving between operators where possible. • Use tachographs / telematics to ensure operators are not exceeding the anticipated distances • Please specify other appropriate controls for the site/project.	5	1	5	
General	Route Hazards	Night Driving	Contractor	5	3	15	• Avoid travel at night if possible, especially in rural areas where there is greater risk of animals on the road • Ensure that the headlights are correctly aligned • Ensure adequate rest periods for long journeys throughout the night • Reduce speed where visibility of the road and oncoming traffic is not maintained, especially on inclines, declines and bends • Limit temporary night blindness by not looking directly into the headlights of oncoming traffic • Rotate driving responsibility if there is more than one licensed driver in the vehicle	5	1	5	

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
General	Route Hazards	Traveling on roads in poor condition or through rugged terrain	Contractor	5	3	15	• Eliminate by rescheduling routes • Ensure that modes of transport are properly equipped to operate on rugged terrain, e.g. select a 4x4 with off-road capability • Establish designated primary and back up contacts with call-in schedules to ensure the person making the journey is safe • Ensure operators understand the actions they should take to reduce risk • Consider if the mode of transport can become stuck/bogged-down/trapped and, if so, how employees will be recovered • Drivers to complete off road driving course if appropriate • Please specify other appropriate controls for the site/project.	5	1	5	
General	Unsafe Vehicle	Unsafe Vehicle	Contractor	5	2	10	• Only operate vehicles that have been registered or certified in accordance with local legislation • Assess rental and hired vehicles prior to each use to assess its condition and suitability for the intended operation including the planned route and transport of materials and equipment • Ensure the vehicle contains safety and emergency equipment suitable for its intended use in compliance with relevant local regulatory requirements. • Ensure vehicle has been inspected according to the schedule(s) required by the manufacturer and local regulations. • Where at all possible, materials and equipment should not be stored in the same compartment as people. • Please specify other appropriate controls for the site/project.	5	1	5	

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Tasks	General	Manual Handling of Equipment	Contractor	3	3	9	• Staff trained in safe lifting techniques • Avoid manual handling where possible, reduce the load, use two people when lifting, use equipment (sack barrow/trolley) or vehicles to move heavy items • Individuals should not attempt to lift weights which exceed their individual capacity and/or that they are uncomfortable lifting. As guide only, the weight to be lifted should not exceed 25kg (men) and 15 kg (women) • Manual handling of equipment over long distances will be minimized as far as practical	3	2	6	
Tasks	General	Slips, Trips and Falls	Contractor	2	3	6	• Communicate potential trip hazards to all Site personnel prior to commencement of and during works, as the hazards are identified • Maintain a tidy work area, conducting regular visual appraisals • Ensure adequate levels of lighting during work activities • Wear safety footwear	2	2	4	
Tasks	Drilling	Lifting Equipment	Contractor	5	2	10	• Check and ensure the statutory insurance maintenance certificates are in date - LOLER, lifting assessments, planning lifts, competent persons, equipment inspections etc. • Only use lifting equipment as stated in manufacturers instructions • Lifting equipment to be inspected for signs of damage or wear and tear • Lifting equipment to be used only within its safe working load • Safe lifting plan used when appropriate	5	1	5	

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Tasks	Drilling	Mechanical	Contractor	4	2	8	• Under no circumstances must an operator use any item of plant unless they have been trained or are competent to do so • Do not approach unattended or unguarded machinery • Communicate potential hazards to all Site personnel prior to commencement of, during works and as the hazards are identified i.e. rotating parts, hydraulics, location of emergency stop buttons etc. • Ensure all separation measures are used such as machine guards, safety barriers, warning signals/alarms, dead-man switch etc. • Loose clothing and long hair should be fastened and tucked inside PPE (overalls)	4	1	4	
Tasks	General	Access/Egress	Contractor	3	3	9	• Agree Site/work area access and egress arrangements with client prior to commencement of activities • Consider vehicular access arrangements which may prevent or restrict emergency vehicles attending Site/work area	3	1	3	
Tasks	General	Buried Objects/Services	Contractor	3	2	6	• Obtain Site plans and cross sections from Client (or land owner) showing the location of buried services, objects or structures • Suitable barriers should be erected to prevent unauthorized access to the work area with clearly designated entry and exit points for vehicles and people (as appropriate) • Have a Cable Avoidance Tool (CAT) available for on-site verification and to scan vicinity of the work area • Establish the location and orientation of underground structures/objects within the proposed work area and mark out as appropriate • Establish with the client a minimum suitable stand off distance from the objects to be maintained at all times	3	1	3	

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Tasks	General	Contaminated Arisings	Contractor	2	3	6	• Arisings to be stored on tarpaulin or similar • Arisings to be backfilled in approximately same order as they have been recovered	2	2	4	
Tasks	General	Cuts and Abrasions	Contractor	2	4	8	• Gloves suitable for the intended work activity will be used to protect individuals from cuts and abrasions • The use of other protective equipment such as kneepads, coveralls or other appropriate clothing will be used to provide abrasion protection • Suitable edge protection such as guarding or covers will be provided for all work equipment • First aid kit	2	2	4	
Tasks	General	Fire	Contractor	5	2	10	• If likely complete Fire Risk Assessment • Separate fuel, heat source and spark • Ensure equipment properly maintained, appropriate fire extinguishers available and assembly point designated • No smoking on site	5	1	5	
Tasks	General	Flammable Liquids	Contractor	5	2	10	• All refuelling operations to be undertaken at a Safe working distance from work area • Separate fuel, heat source and spark • Transfer diesel/petrol in suitable containers • Provide spillage kit • All refuelling to be done using a drip tray	5	1	5	
Tasks	General	Fumes	Contractor	2	3	6	• Activities should be visually monitored and work must be stopped if fumes from work activities are noted to be excessive within the work area i.e. migrating to adjacent workers/users/public, or extending beyond the site boundary • Wear appropriate safety glasses and goggles • Working area around equipment is to be well ventilated • Access restricted by use of barriers and signs	2	1	2	

HEALTH AND SAFETY ENVIRONMENT PLAN (HASEP)

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Tasks	General	Gases	Contractor	3	3	9	• Use suitable gas monitoring devices to continuously monitor lower explosive limits, oxygen and carbon dioxide during work activities • Remove and eliminate potential source of gases and sources of ignition (no smoking should be permitted) • Ensure items of electrical equipment are intrinsically safe • Where appropriate introduce artificial sources of ventilation or extraction	3	1	3	
Tasks	General	Hazardous Substances	Contractor	3	3	9	• Refer to Hazardous Substances Assessment and MSDS for details for appropriate details of safe handling and storage arrangements • Appropriate PPE - as stated in HASEP/Hazardous Substances Assessment • Minimise quantities of hazardous substances in storage at any time	3	1	3	
Tasks	General	Noise	Contractor	2	3	6	• Minimize noise from works as far as possible • Conduct a Noise Assessment of activities • Maintain safe working distance from equipment • If noise from activities are identified above the lower exposure action level of 80dBA consider the use of hearing protection and noise control equipment • If noise from activities are identified above the upper exposure action level of 85dBA put into place a planned programme of noise control including the mandatory use of hearing protection	2	1	2	

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Work Environment	Contaminant Handling	Contaminant Handling	Contractor	3	2	6	• The location of suitable washing facilities will be established with the Client prior to the commencement of work • Suitable hygiene precautions will be established such as wearing gloves/coveralls, washing hands before eating, smoking (if permitted on-Site) or driving etc. • Gas monitoring equipment may be used to continuously monitor the working environment for gases. Action/trigger levels will be established for work area evacuation and also the protection of the workforce and if necessary, Respiratory Protective Equipment (RPE) will be upgraded to provide the suitable protection factor • Double handling of contaminants such as soils and/or groundwater samples will be minimized as is practical • Suitable decontamination facilities in all work areas will be established • Barriers such as Heras fencing (or similar) may be used.	3	1	3	

HEALTH AND SAFETY ENVIRONMENT PLAN (HASEP)

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Work Environment	Dusts	Dusts	Contractor	2	4	8	• Establish the prevailing wind conditions, specifically the direction and strength that may contribute to potential dust transportation during the planned works • Activities should be visually monitored and work must be stopped if dust is noted to be excessive within the work area i.e. reducing visibility and/or migrating to adjacent workers/users/public, or extending beyond the site boundary • Eliminate dust generating activities at source by using dust control techniques i.e. water spray, shadow vacuuming etc. • Ensure site personnel use suitable Respiratory Protective Equipment (dust masks) with an appropriate Standard Assigned Protection Factor protection factor and filter for the hazard is used • Wear appropriate safety glasses/goggles	2	2	4	
Work Environment	Electricity	Electricity	Contractor	5	3	15	• Where possible electrical equipment shall be limited to 110 V rather than 240 V • Items of electrical equipment shall be Portable Appliance Tested (for earth leakage) • Maintain electrical equipment in good working order and conduct a regular checks for signs of obvious defect and check daily inspection before use • Installation and maintenance of electrical equipment should be conducted by suitably qualified and competent individuals only	5	1	5	
Work Environment	Fire Risks	Fire Risks	Contractor	5	3	15	• If likely complete Fire Risk Assessment • Separate fuel, heat source and sparks • Ensure equipment properly maintained, appropriate fire extinguishers available and assembly point designated • No smoking • Provide emergency evacuation procedures	5	1	5	

HEALTH AND SAFETY ENVIRONMENT PLAN (HASEP)

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Work Environment	Ground Conditions - Unstable	Ground Conditions - Unstable	Contractor	5	3	15	• Exclusion from work area for non-essential staff by use of appropriate barriers (Heras fencing or similar barrier) • Staff training • Use Approved Supplier when setting up equipment/plant e.g. drill rig • Maintain safe distance from area of instability	5	1	5	
Work Environment	Heavy Machinery - Toppling	Heavy Machinery - Toppling	Contractor	5	3	15	• Use Approved Supplier when setting up equipment/plant e.g. drill rig • Exclusion from work area for non-essential staff by use of appropriate barriers (Heras fencing or similar barrier) • Maintain safe distance from plant/equipment • Establish suitable exclusion zones from other site used, buildings etc.	5	1	5	
Work Environment	Landslide/Rock Falls	Landslides/Rock falls	Contractor	5	2	10	• Assess likelihood of rock/land slides, Check local contacts to assess likelihood and frequency of landslides in area. If likely refer to Lead Consultant for advice, as to whether to continue with location	5	1	5	
Work Environment	Overhead Utilities	Overhead Utilities	Contractor	5	3	15	• Minimize risk by inspecting Site and planning location of works away from overhead utilities • The Lead Consultant will inspect and appraise the work activities to ensure all operations are a safe distance from overhead structures • Maintain minimum clearance distance (between 5.2 and 7 m dependant on voltage) from overhead power lines, in line with local Legislation	5	1	5	
Work Environment	Uneven Working Area	Uneven Working Area	Contractor	3	5	15	• Clean and level area • Set up drill rig on an even level with block or other suitable supports.	3	2	6	

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Unique Issues	Ants	Ants	Contractor	2	3	6	• Watch your step. Ants are often found on walking paths and if the path is disturbed, they will bite • Prior to traveling, consult with local representative or check International SOS website to determine the potential exposure to biting ants • Wear covered shoes at all times • Tuck trousers in socks to prevent ants having access to skin around the lower legs and ankles	2	1	2	
Unique Issues	Bees, wasps	Bees, wasps	Contractor	3	3	9	• Check the area for nests and do not disturb nests • Discuss allergies with your colleagues in advance • Carry an epipen if required, train colleagues on how to use it and where you keep it	3	1	3	
Unique Issues	Bites and Stings (General)	Bites and Stings (General)	Contractor	2	3	6	• Communicate potential hazard to all Site personnel prior to commencement of, during works and as the hazards are identified • If employees are known to be sensitive/allergic to bites/stings advise co-workers and carry suitable medication e.g. epipen at all times • Ensure suitable insect replants and antihistamines are available • If hazards are identified, clear the work area (where possible) • First aid kit	2	2	4	

HEALTH AND SAFETY ENVIRONMENT PLAN (HASEP)

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Unique Issues	Mosquitoes	Mosquitoes	Contractor	3	3	9	• Wear full length clothing • Light coloured clothing makes it easier to see mosquitoes • Avoid working at dawn and dust when mosquitoes are most active • If directed by doctor take suitable treatment • An insect repellent containing diethyl-meta-toluamide (30% DEET) or picaridin should be applied to clothing and skin before going into known dengue or malaria areas • The repellent should be applied and re-applied according to the manufacturer's instructions • Stay in an air conditioned room where possible • Use an insecticide, if there are mosquitoes in your room (for example burning mosquito coil, vaporising spray) • Use a permethrin impregnated bed net at night	3	2	6	
Unique Issues	Rodents and other mammals	Rodents and other mammals	Contractor	3	2	6	• Never handle rodents and small mammals unless trained to do so • Wear protective clothing and safety glasses • Wear gloves that afford high needle puncture protection • Immediately cleanse the wound with soap and water • Let the wound bleed freely • Seek medical advice	2	2	4	

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Unique Issues	Ticks	Ticks	Contractor	3	2	6	• Wear full length clothing (tucking trousers into socks prevents access for ticks) • Light coloured clothing makes it easier to see ticks and remove them before they can attach to the skin • An insect repellent containing diethyl-meta-toluamide (DEET) or picaridin should be applied to clothing and skin before going into infested areas • The repellent should be applied and re-applied according to the manufacturer's instructions • All clothing should be removed after visiting tick infested areas and the entire body checked for ticks • If a tick is found then seek medical attention for removal • If medical attention is not readily available use a tick removal kit to extract the tick from the bite area • If feeling unwell after a tick bite (nausea and fever) consult a medical practitioner immediately	3	1	3	
Unique Issues	Reaction (rash)	Reaction (rash)	Contractor	4	2	8	• Be aware of local vegetation and potential exposure issues • Be knowledgeable in their identification and signs and symptoms of exposure • Prevent exposure through recognition and avoidance, as well as wearing long trousers, long sleeved shirts and gloves hands can be exposed • Do not eat any wild vegetation	3	1	3	
Unique Issues	Physical threats and violence	Physical threats and violence	Contractor	5	2	10	• Plan the work so that staff do not work alone • Make contact with local authorities (e.g. police) and agree on a plan to deal with physical threats or violence • Establish a call in schedule and emergency response procedures • Secure the worksite where possible • If a threatening or violent situation occurs do not respond and stay calm • Initiate emergency response procedures	4	1	4	

HEALTH AND SAFETY ENVIRONMENT PLAN (HASEP)

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Unique Issues	Stress at Work	Stress at Work	Contractor	3	3	9	• Avoid excessive demands and working hours • Overnight stay, if required • Raise concerns with lead Consultant or colleague	3	1	3	
Unique Issues	Emergency Response	Emergency Response	Contractor	5	3	15	• Establish a means of communication (for example radio, satellite or cell phone) • Carry back-up communication equipment, such as batteries • Test the communication equipment before traveling to the remote location and conduct a daily check of communication devices • Develop a check-in plan which includes, contact names, phone numbers, planned routes of travel, frequency of check-in and daily activities • Develop an emergency response procedure outlining the nearest health care facility location and means of transport to that location • Carry a first aid kit and where appropriate, a survival kit • All employees must be first aid trained	3	1	3	
Unique Issues	Unknown site conditions	Unknown site conditions	Contractor	5	3	15	• Conduct pre-site visit hazard assessment • Client should be aware of visit and to provide information on hazards • Check-in with on-site personnel (if any) upon arrival • Talk to site supervisor about hazards present • Conduct a Take 5 and Point of Work Safety Plan to identify any uncontrolled hazards (i.e. hazards not included in the original hazard assessment)	3	2	6	

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Unique Issues	Unknown Sub-Contractors	Unknown Sub-Contractors	Contractor	3	2	6	• Project Manager to get Sub-contractor to submit Approved Suppliers form for application onto the Subcontractor Database • Subcontractors to supply appropriate method statements and risk assessments for assessment prior to attending Site • Ensure subcontractors wear appropriate PPE for their works • Undertake regular tool box talks communicating potential hazard(s) to all Site personnel prior to commencement of, during works and as the hazards are identified.	3	1	3	
Unique Issues	Inclement weather (storms)	Inclement weather (storms)	Contractor	4	2	8	• Secure loose equipment • Move vehicle under solid shelter and leave in gear and handbrake on • Seek shelter in secure buildings or vehicles • Listen to local radio for storm updates • If driving after the storm, stop clear of watercourses, fallen trees and power lines	3	2	6	
Unique Issues	Lightning	Lightning	Contractor	5	3	15	• Check daily forecast, monitor lightning activities • Carry a weather radio and extra battery as well as a personal lightning detector • Postpone outdoor activities if thunderstorms are imminent • Move to a sturdy building or car • Stay away from tall objects such as towers, fences, telephone poles and power lines • Avoid touching metal if you take shelter in your car • If you feel your skin tingle and hair stand on end, squat low to the ground, on the balls of your feet. Place hands over ears and your head between your knees. Make yourself the smallest target possible, with minimum contact with the ground • DO NOT lie down	3	1	3	

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Unique Issues	UV radiation (sun light)	UV radiation (sun light)	Contractor	4	3	12	• If the work does not involve significant movement, arrange for a portable shade structure to be erected to provide protection from the heat • Wear long sleeve clothing, long trousers and a wide brim hat (or hard hat brim) when working outdoors • Apply SPF 30+ sunscreen 20 minutes prior to commencing work and then at least every 2 hours • Wear sunglasses or tinted safety glasses • Ordinary sunglasses are suitable where there is no risk of impact or dust, otherwise UV rated safety eyewear must be worn	4	2	8	
Unique Issues	Weather - Cold	Weather - Cold	Contractor	2	4	8	• Check daily weather reports • Do not work in cold environments, if possible, reschedule work to a warmer day • Wherever possible, increase temperature through air heating and increased air movement • Assess physical demands of the work and provide equipment that will reduce the physical demands, to reduce sweating • Work in sheltered areas, or provide barriers to give shelter from the wind • Schedule work to allow workers to acclimatize • Wear layered appropriate winter clothing including for the feet and head • Ensure wet weather clothing is available on-Site during works • Increase the frequency and lengths of break periods in a warm, sheltered place • Cease work during abnormal or hazardous weather conditions • Check each other frequently for signs of frostbite and hypothermia (e.g. white or black spots on skin) • Drink plenty of fluids, not caffeine or alcohol • Eye protection is required against ice particles, snow and sun	2	2	4	

Risk Group	Initial Risk	Hazard	PA	IC	IL	IR	Controls	RC	RL	RR	AC
Unique Issues	Weather - Hot and Humid	Weather - Hot and Humid	Contractor	2	3	6	• Employees working in the area should be acclimatised to the conditions • Permanent shade shall be erected if another source of shade is not available • Wear lightweight coveralls, take regular breaks, provide drinking water and apply sun cream during periods of hot weather • If unwell stop work and seek medical attention • Stop work during abnormal or hazardous weather conditions • Rest breaks shall be taken every hour as a minimum • Additional water shall be provided	2	2	4	
Unique Issues	Weather - Visibility/Rain	Weather - Visibility/Rain	Contractor	4	2	8	• Stop work during abnormal or hazardous weather conditions, take shelter, if possible • Ensure wet weather clothing is available on-Site during works • Take regular breaks within a warm location during cold/wet weather	4	1	4	
Unique Issues	Wind	Windburn	Contractor	4	3	12	• Check daily weather reports • Seek shelter from the wind • Cover exposed skin	3	1	3	
Unique Issues	Environmental release	Groundwater contamination	Contractor				Contractor shall consider the location and depth of the engineered lining system and ensure that the installation of boreholes is a minimum 1m above the lining system.	4	1	3	

9.0 PERSONAL PROTECTIVE EQUIPMENT

Item	Required			Specific Requirement
Coveralls				
General	☒			When necessary
Gloves				
Disposable	☒			
Chemical resistant	☒			
Head Protection				
Hard Hat	☒			
Hearing Protection				
Ear protection	☒			When necessary
High Visibility Clothing				
Yellow	☒			
Safety Footwear				
Safety boots	☒			
Eye Protection				
Impact resistant safety goggles or glasses	☒			When necessary

10.1 TRAINING

Course Name	Employee Name or Role
Safe Pass	Donal Marron
Contractor	TBC

11.1 INCIDENT AND EMERGENCY MANAGEMENT

11.2 Additional Client / Site Reporting Procedures (if ticked provide applicable details in the text box and/or attach relevant documents to this HaSEP.)

11.3 First Aid Arrangements

Method of communication	**Phone**	0872228641
	Radio channel	
Location of first aid kit	Site Vehicle or hut	
First Aider(s)	Drilling Supervisor	

11.4 Environmental

☒Spill kit located adjacent rig.

12.1 HSE PLAN CONTROL

It is the responsibility of the lead Consultant to ensure that this HaSEP is prepared and the contents communicated at the pre-start / toolbox meeting to all project staff or subcontractor, with a copy held on site. The HaSEP has been reviewed or prepared by the Lead Consultant

.

Role	Name (printed)	Date	Signature
Prepared by	Donal Marron	04/01/2019	

12.2 Sign-off

Signing below indicates you have read and agree to comply with the information contained in this document.

Date	Name	Company	Signature

13.1 ONSITE CHANGES AND REVIEW

Date	Change or modification	How was it communicated?

APPENDIX B

Scott Schedule

Murphy Environmental Hollywood Limited & Anor v Spencer Place Development Company Limited & Ors (High Court Record No. 2017/3203P)

Scott Schedule from Meeting of Experts

2nd May 2019

Issues	**Plaintiffs' Position**	**First Named Defendant's Position**	**Second Named Defendant's Position**	**Third Named Defendant's Position**
The approach to the site inspection as proposed - i.e. soil boreholes and sampling across Cells 1, 2, 3 and 5, was not agreed during the meeting.	A targeted, scientific approach should be taken into account for the design of the site inspection as required by BS 10175. The Defendants have confirmed their approach as being a non-targeted site investigation. This approach is not considered by Golder to be aligned with best practice guidelines. Golder consider that the potential residual impacts from the impugned material in Cell 4 should be a starting point in order to refine the conceptual site model. This follows a risk-based approach to understanding the potential for residual impacts to remain in line with the process as originally identified by the defendants in the protocol dated 02 May 2017	Based on the outlined conceptual site model, non-compliant wastes if present outside of Cell 4 have the potential to present a risk to environmental receptors. The proposed site investigations as outlined will facilitate the investigation of potentially non-compliant wastes.	There is sufficient potential for non-compliant waste to be present in cells outside Cell 4 based on the available data to justify the approach to the proposed site inspection.	

APPENDIX C

Letter from Fieldfisher to Arthur Cox of 31 May 2019

fieldfisher

Arthur Cox
Solicitors
DX 27 Dublin

Your Ref: EM/IN313/005/ 31 May 2019

Our Ref: JT/ENV002/0360 (44'17)

Re: Murphy Environmental Hollywood Limited and Integrated Material Solutions Limited -v- Spencer Place Development Company Limited, PJ Hegarty & Sons, Barnmore Demolition & Civil Engineering Limited and Coras Iompair Eireann
High Court Record No. 2017/3203P
Our client : Environmental Protection Agency
The Licensee: Integrated Material Solutions Limited
Licence: Reg. No. W0129-02

Dear Sirs,

We refer to the above and in particular to yours of the 9th inst. enclosing Revised Protocol and Scott Schedule. We note that the Honourable Ms. Justice Costello has specifically requested our client's "…assessment as to the difficulties or otherwise that may be posed in a random use, selection of boreholes…." and whether "there should be some limitations on the placing of the boreholes…".

We are aware this matter has been in the Court's list for some time with the matter standing adjourned to the 6th prox.

Preliminary Views of the Agency

The Agency cannot advise on whether a targeted or non-targeted site investigation is appropriate in this case. As a general rule, a closed cell should be left closed. The rationale is that reopening a cell and digging through the waste body creates a potential pathway for entry of water (even if the hole is refilled subsequently) and also poses a risk to the landfill liner.

We understand the Court has determined that it is necessary to determine the nature and extent of the waste deposited in the closed cells and the proposed method to complete the determination is by constructing boreholes into the waste body, and the Agency respects

that it is the Court's function to make this determination. The Agency has reviewed the Method Statement for Inspection and Testing at the IMS Landfill Facility, Hollywood Great, The Naul, Co. Dublin (May 2019) and considers that it addresses the shortcomings previously identified by the Agency (Licensee Response Ref 034439). It now includes:

1. A detailed method statement and risk assessment for the proposed environmental inspection and testing works,

2. Submission of details of each of the proposed sampling locations, depths, installation and backfilling, having regard to existing site data, including as built drawings and existing monitoring results, and the environmental risks associated with the proposed works

3. Identifying clearly defined project roles and supervision of all works to ensure licence compliance.

The method statement contains proposals in relation to protecting the clay liner beneath the waste body, the clay liner making up the side walls and the inter-cell bund walls, and is sufficient to enable formal evaluation to take place.

The Agency would therefore ask that the licensee submit a Specified Engineering Works (SEW) proposal for installation of boreholes in locations to be determined by the Court, supported by the Method Statement in accordance with condition 3.3 of the licence. The proposal should be submitted through the EDEN portal, in the same manner as for all other licensee submissions.

The Agency would expect to be able to carry out an assessment of the proposed Specified Engineering Works within a month of them being correctly lodged.

Scott Schedule

The Agency notes that the Scott Schedule seems to continue argument as to whether the site should be opened up at all. The Agency does not regard it as its function to determine this controversy and understands that the Court has already done so.

It therefore cannot comment on the Scott Schedule.

Location of Boreholes

In relation to the Court's query about the location and number of boreholes, the Agency considers this is primarily a matter for the Court. The Agency requires that the boreholes, if

deemed necessary, must be constructed in such a way that the clay liner at the base of the cells, the clay liner making up the side walls and the inter-cell bund walls are not pierced or damaged, and the method statement appears to address this. Upon receipt of the formal SEW proposal, the Agency will consider whether what is proposed is adequate.

If the Court is seeking guidance in relation to the number of boreholes to direct, the Agency would recommend that the number should be the lowest number commensurate with achieving the desired objective.

Placing before the Court

You might please confirm that you will place this letter before the Court, and will report back on what the Court directs, or if it has any further questions.

Costs

Please also confirm that your clients will undertake jointly and severally to discharge the Agency's ongoing costs in this matter.

Yours faithfully,

Fieldfisher

Fieldfisher
SOLICITORS

5431931-1

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