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Proposed Development at Ballyowen / Ramsfortpark, Gorey Co. Wexford

Excavation Plan

Client: Strutec Ltd,
Garryhill, Bagenalstown
Co. Carlow, R21 KP44, Ireland.

December 2018

IE CONSULTING
WATER-ENVIRONMENTAL-CIVIL

STRUTEC
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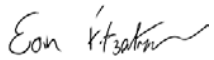
Prepared by (consultant)	*Eoin Fitzpatrick BSc MSc PGeo (Contaminated Land)*		*07/12/2018*	*Contaminated Land & Remediation Scientist*	*97.5%*
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Organisation	Contact	Format	Copies
JSA	Rory Kunz	PDF copy	1

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1. INTRODUCTION

1.1 Project Contractual Basis & Parties Involved

IE Consulting Ltd. was requested by *Strutec Ltd* to commission an *Excavation Plan* with respect to the proposed development at Ballyowen / Ramsfortpark, Gorey Co. Wexford (please see Plate 2 and Plate 3 below). This Excavation Plan will accompany a planning application for the site.

1.2 General Introduction

It is proposed to develop the former Walsh Mushrooms Facility and adjoining greenfield land site of 9.57 hectares at Ballyowen / Ramsfortpark, Gorey Co. Wexford for the construction of 297 dwellings and an associated childcare facility.

1.3 Current Description of the Site

The former mushroom production facility was demolished to just above ground level. The facility consisted of tunnels with a floor area of 10,500 m^2 and other site buildings with an approximate gross floor area of 4,300 m^2. A steel portal frame building had a floor area of 1,024 m^2. The steel portal frame of the portal frame building and the floor remains in-situ.

1.3.1. Topography

The proposed development site is located in the northern outskirts of Gorey Town and approximately 6 km from the coast which lies to the east. The surrounding land slopes from the hilly area at Creagh Lower (at 120 mOD approximately 1 km to the northwest) towards the valley of the Banogue River located at 40 mOD approximately 750 m to the southeast. The proposed development site itself slopes from c. 75 mOD in the northwest to 55 mOD in the southeast.

1.3.2. Potentially Contaminated Land & EPA Licensed Sites

The proposed development site was previously used as a mushroom growing facility. Mushroom growing commenced on the site in the 1970's. It was subsequently closed and most of associated buildings and infrastructure were demolished in 2007. The mushroom growing facility may have included an on-site ESB electrical substation and on-site septic tank (located close to the north-eastern area of the proposed development site). Polychlorinated Biphenyls (PCBs) are substances that may

occur in older electrical equipment such as transformers, capacitors and fluorescent lighting ballasts. PCBs are persistent organic pollutants and are extremely harmful to the environment and at higher levels, human health. No reports on the presence, or not, of any PCB containing equipment/contamination, or of the decommissioning/remediation of same was available. A former bund was noted in the north-eastern corner of the former factory area. This bund may or may not have housed on-site ESB electrical substation.

There are no EPA licensed sites within the immediate vicinity of the site. The nearest licensed site is for a waste transfer station (IED licence no. W0220-01) operated by Starrus Ecco Holdings Ltd. at Ramstown c. 1.8 km to the south/southwest of the proposed development site.

1.3.3. Conceptual Model

The hydrological and hydrogeological conceptual model for the site is described below;

- Made ground is located in the south-eastern area of the proposed development site where the former mushroom facility was located. The depth of Made Ground ranges from 0.15-1.0 m;
- The subsoils underlying the Made Ground comprises of stiff brown sandy gravelly CLAY with some cobbles. Subsoils are at least 10 m thick in the south-eastern area of the site;
- The subsoils in the remaining undeveloped area are mapped as Till derived from Lower Palaeozoic Shales' (TLPS) and are assumed to be similar in composition to those investigated in the south-eastern area of the site;
- Some perched groundwater/seepages was recorded in the clay subsoils in the south-eastern are of the site at depths ranging from 2.9 m to 4.70 m;
- The bedrock immediately beneath the site is green, red or purple, buff and occasionally grey slates, usually interbedded with siltstones (Oaklands Formation (OA)). Volcanic rocks comprising are located c. 100 m to the south of the proposed development site;
- The slates/siltstone bedrock immediately beneath site is classified as a Locally Important bedrock (Ll) aquifer. Groundwater flow in this type of aquifer is expected to be confined to the fractured/weathered zone in the top 15-30 m of the bedrock. Groundwater flow paths will be short and groundwater is expected to discharge to the nearest stream or river;
- The volcanic rock to the south is classified as a Regionally Important bedrock (Rf) aquifer;
- Groundwater flow direction will be to the southeast towards the Ballyowen Stream (which is a tributary of the Banogue River). Therefore, a small area of the Rf aquifer will be hydraulically

downgradient of the site;

- A spring occurs to the south of the site along the mapped location of the fault. It is considered likely that the spring is related to this fault, with groundwater being forced upwards where it encounters the fault which acts as an impermeable hydraulic barrier;
- The groundwater vulnerability in the south-eastern area of the site (where the former mushroom facility was) proposed extension area of the site is mapped by the GSI as High (H), although site investigation indicates that it is in fact Low (L);
- Diffuse recharge occurs over most of the land surface through the permeable till. Estimates are in the order of 315 mm yr^{-1};
- There is the potential for PCB contaminated soils/subsoils in the area of the former ESB substation on the proposed development site. Given the thick, low permeability subsoils there is unlikely to be a pathway for PCB contamination to percolate downwards into the bedrock aquifer. PCBs could be transmitted via overland run-off to nearby surface water bodies (the drain on the site and the nearby Ballyowen Stream).

As outlined, the south and southwestern part of the site was once part of the Walsh Mushrooms factory area. Please see *Plate 1* and *Plate 2* below for Google Maps satellite aerial photography from June 2010 and April 2018. The April 2018 aerial photography demonstrates that the majority of the above ground structures of the former factory have been demolished. Much of the former factory area can be delineated by the apparent absence of topsoil and the brown colouration of bare subsoils.

Plate 1: The Proposed Site Area with Respect to the Walsh Mushrooms Factory April 2010 (Ref. 1 Google Earth Pro).

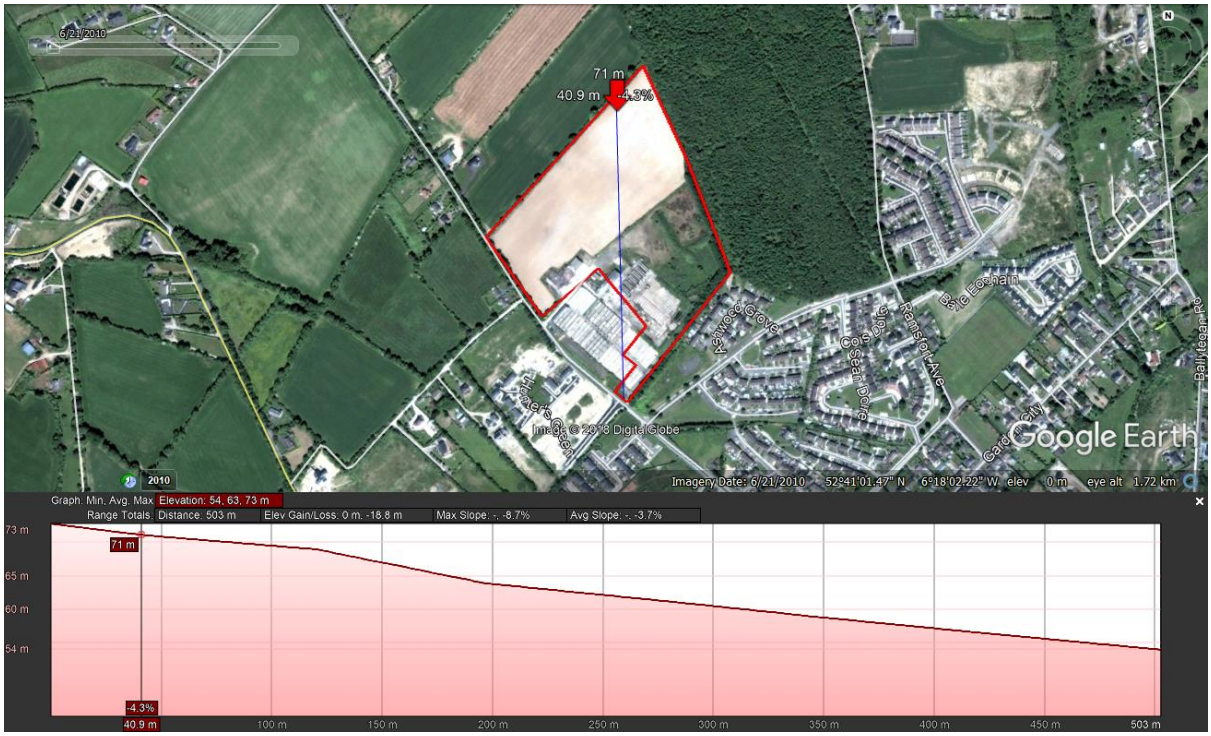

Plate 2: The Proposed Site Area with Respect to the Walsh Mushrooms Factory April 2014 (Ref. 1 Google Earth Pro).

1.4 Rationale for the Excavation Plan and Proposed objectives

An Bord Planála have outlined in a briefing note a requirement for an Excavation Plan which will

address the full extent of the proposed 'cut and fill' activities, excavation methods, calculations on the volumes of soil to be excavated/extracted, re-used and/or removed off site, calculations on the proposed traffic movements into and out of the site, and potential mitigation measures that may be required to separate, handle, and dispose of any contaminated or hazardous materials that may be associated with the brownfield area of the site.

The objectives of this report are as follows;

1. Propose soil site investigations and laboratory soil analyses to determine the suitability for soil re-use and waste disposal;
2. Set out a soil analyses schedule of soil samples;
3. Set out an outline plan and positioning of proposed site investigations point;
4. Set out the proposed schedule of assessment and interpretation of the soil analyses;

The briefing note Point No. 5 as set out by An Bord Planála is outlined below;

> 5. Details of the full extent of 'cut and fill' activities proposed. Such details should also provide for inter alia, excavation methods to be used on site particular having regard to the brownfield nature of part of the lands, volumes of soil to be excavated/extracted, re-used and/or removed off site, associated traffic movements to and from the site. Such details should be included in the Environmental Impact Assessment Report.

2. EXCAVATION METHODOLOGY

2.1 Cut and Fill Volumes

The proposed development of the site will require the cut and fill of certain area of the site to develop the site at the proposed topographic levels. An outline cut and fill plan has been drawn up to estimate a cut and fill materials mass balance. The proposed cut and fill plan is attached in ***Appendix C*** to this report. The plan outlines that there is a net requirement for the Article 27 by-product designation or potential disposal of 4,470 m^3 of soil and subsoil to be exported from the site.

The cut and fill report attached in ***Appendix C*** has outlined that there is a balance of 4,288 m^3 of soil/fill required for the levelling of the site to suitable topographic levels. An excess of 8,758 m^3 of soil will be generated from the construction of off-site drainage infrastructure which shall generate a balance of 4,470 m^3 of soil.

2.2 Article 27 Declaration of By-Product

In recognition of the waste hierarchy and the prevention of waste, there is at this time no significant barriers that would prevent the excess 4,470 m^3 of soil and subsoil from being classified as a by-product under the under the Article 27 of the Waste Directive Regulations 2011. If a local use for the material could be identified, if use was certain, and if the proposed end use site met the requirements of the Article 27 Regulations, there would be no need to send this material to a waste facility.

The recent EPA Consultation Document G*uidance on Soils and Stone By-Products* (October 2018) on the Article 27 process has outlined four conditions which must be met for the declaration of a by-product.

- Further use of the soil and stone is certain;
- The soil and stone can be used directly without any further processing other than normal industrial practice;
- The soil and stone is produced as an integral part of a production process;
- Further use is lawful in that the soil and stone fulfils all relevant requirements for the specific use and shall not lead to overall adverse environmental or human health impacts.

It is the intention of the development (as required by the EPA Regulatory Position on Article 27 By-Product Designations) to classify this material as a by-product and to re-use this material.

The EPA Regulatory Position on natural Soil and Stone By-products encourages the prevention of waste including the lawful and beneficial use of excess ***uncontaminated*** soil and stone. Due to the

intention to re-use soils on-site and to declare the excess soils as a by-product, some relevant site investigations and soil analytical data must be gathered to demonstrate that the soils of both the greenfield and the former factory area of the development are situatable for re-use and that these soils are uncontaminated with respect to naturally occurring concentrations.

2.3 Proposed Site Investigations

2.3.1. Health and Safety

A Health and Safety Plan shall be developed by the sampler to illustrate that sampling shall 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).

Personal Protective Equipment appropriate to the potential risk of exposure from any waste or contaminated materials shall be required and shall include: Hard hats, safety glasses, reflective high visibility jackets/vests, steel toe boots, half face masks, nitrile disposable gloves shall be worn at all times when sampling on-site.

The site investigations crew shall at all times comply with the Health & Safety rules for the Site. All personnel shall be aware of any working machinery and be aware of the trial pit stability during the sampling on-site.

All personnel visiting the site shall have current Safe Pass cards and shall undergo any site induction training as required by the site.

2.3.2. Sampling Methodology

The site investigations and sampling methodology employed by the site investigations crew should be carried out in general accordance with the guidance documents provided below to enable representative samples to be obtained from the site investigation. Best practice should be followed when planning the site investigation and detection of sampling locations.

It is best practice to obtain representative samples from the proposed cut and fill excavation within both the brownfield and the greenfield areas of the proposed development as well as the proposed trenches for site drainage.

- *BS5930:1999 Code of practice for site investigations, as modified by BS14688 for soil and rock descriptions* (Ref. 4)*;*
- *BS10175:2011 Code of Practice for the Investigation of Potentially Contaminated Sites* (Ref. 5)*;*

- *Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination, 2001 (Environment Agency)* (Ref. 6).
- Environment Agency (2015). Technical guidance WM3 – Guidance on the Classification and assessment of waste. Last updated 21 July 2015 (Ref .2)
- The UK Environment Agency (2004), Model Procedures for the Management of Land Contamination, Contaminated Land Report 11 and BS10175:2011 Code of Practice for the Investigation of Potentially Contaminated Sites.
- The Model Procedures for the Management of Land Contamination (CLR 11), have been developed to provide the technical framework for applying a risk management process when dealing with land affected by contamination. These procedures are intended to assist all those involved in dealing with land contamination, including landowners, developers, professional advisors, regulatory bodies and financial providers.
- Synopsis of Data and the Assessment of Soil with Reference to EU Council Decision 2003/33EC (for proposed waste soil only) and the EPA Assessment of Hazardous Properties (using Hazardous Waste Online).

2.3.3. Quality Control Procedures

Representative soil samples should be obtained based on the proposed cut and fill plan. All sampling equipment, hand tools, and handling gloves should be decontaminated or disposed of prior to re-use or further sampling.

Field duplicate samples can be obtained for Quality Control.

2.3.4. Note Taking and Field Records

All soil samples obtained should be noted on the field trial pit/drilling logs, field site maps, field notes, or any similar field record at the time of sampling. Field notes should be supported by photographic records and GPS positioning.

Field notes and trial pit records shall contain descriptions if the presence of any debris, staining, odours and the percentage estimation of potential wastes por materials that may be present with the trial pits.

2.3.5. Marking, Packaging, Preservation & Transport

Sample containers should be suitable sized and designed for the proposed suite of analyses. Sample containers shall be made of appropriate materials for the suite of analyses.

All sample containers shall be marked with an agreed nomenclature. All samples shall be stored within suitably sized cooler boxes in accordance with laboratory requirements.

The chain of custody form concerning all samples shall be generated, maintained and shall accompany the samples to the laboratory. The samples chain of custody form shall outline the samples to be included for analyses and identify the parameters for laboratory testing.

All cooler boxes shall be sealed for transportation to the laboratory. All samples shall be protected during transportation by using the accompanying bubble-wrap packing provided with the sample jars.

2.3.6. Trial Pitting

The site investigations and sampling methodology employed by the third party should be carried out in general accordance with the guidance documents provided below to enable representative samples to be obtained from the site investigation. Best practice should be followed when planning the site investigation and detection of sampling locations.

It is proposed that each trial pit is marked with a temporary marker and the locations fixed using a GPS unit. The locations of each trial pit shall also be surveyed to ordnance datum also. The base of all trial pits shall be a minimum of 1 meter below the existing ground level.

2.3.7. Sample Collection

Sampling of all soils shall employ best practice environmental sampling techniques. These techniques minimize the risk of cross contamination between any different sampling locations. Single-use disposable nitrile gloves, shall be used and changed following the collection of each sample. Composite samples from intervals can be created onsite by cone and quartering relevant sub-samples.

Appropriate sampling tools and equipment shall be used for the sampling of the soils to provide confidence that the materials sampled area representative of the in-situ soils to be cut and filled or declared as a by-product. All samples selected for analyses shall be placed into correct laboratory supplied sample containers. Each trial pit shall be sampled at least once vertically at representative depths to correspond the proposed cut depth. Additional soil samples shall be obtained from representative depths which correlate to the proposed depth of the site drainage excavation (greater than one-meter depth).

2.3.8. Laboratory Analyses of Soils

The following suites of analyses listed in ***Table 1*** will be used for waste characterisation and assessment of suitability of all soil samples obtained:

Table 1: Chemical Analysis of Soils & Laboratory Leachate

Analysis Suite		
Parameter	***Soil***	***Soil Leachability***
Metals and non-metals suite: - Arsenic, antimony, barium, cadmium, chromium, hexavalent chromium, copper, molybdenum, nickel, lead, mercury, nickel, selenium, zinc, boron, mercury	Yes	Yes
Cyanide	Yes	
Asbestos screen, Asbestos quantification	Yes	
Speciated polyaromatic hydrocarbons (PAH 17)	Yes	
Total Petroleum Hydrocarbons Criteria Working Group (TPHCWG)	Yes	
Benzene, toluene, ethylbenzene, xylene (BTEX)	Yes	
MTBE, Polychlorinated biphenyls (PCB)	Yes	
Soil Organic Matter (SOM), Total Sulphate, Sulphide, Elemental Sulphur	Yes	
Phenols, PAH 17	Yes	Yes
Moisture content as % wet weight, pH using Matron	Yes	
Total Dissolved Solids, Dissolved Organic Carbon, Ammoniacal Nitrogen as N, Chloride Fluoride Sulphate		Yes
VOCs	Yes	
SVOCs	Yes	

2.3.9. Brownfield Lands

Prior to the development of the site, it is proposed to undertake shallow site investigations in the area of the former Walsh Mushrooms Factory area of the site. These lands were previously developed upon and may contain some residual impacted or contaminated soils due to the former site usage. The potential risk of soil contamination associated with Mushroom farming is considered to be low. None the less, it is proposed to carry out sufficient on-site investigations and environmental sampling to scientifically assess the potential environmental risk associated with the future use of the in-situ soil.

Sampling of in-situ soils on-site shall be completed by trial pitting. It is proposed that approximately ten (10 No.) trial pits shall be excavated and sampled to a maximum depth of one metre from the ground surface across the proposed “brownfield” cut and fill area. Approximately five of these investigation points could be sampled at sufficient depths greater than one metre to obtain representative soil samples from the proposed site drainage excavations. Please see the proposed trial pits TP101-TP110 in ***Figure 1 of Appendix A***.

2.3.10. Greenfield Lands

Prior to the development of the site, it is proposed to undertake shallow site investigations in the "Greenfield" previously un-developed area of the site. These lands are unlikely to contain residual impacted or contaminated soils due to the former usage as agricultural lands. It is proposed to carry out sufficient on-site investigations and environmental sampling to scientifically assess the potential environmental risk associated with the future use of the in-situ soil.

Sampling of in-situ soils on-site shall be completed by trial pitting. It is proposed that approximately four (4 No.) trial pits shall be excavated and sampled to a maximum depth of one metre from the ground surface across the proposed "greenfield" cut and fill area. Approximately three of these investigation points could be sampled at sufficient depths greater than one metre to obtain representative soil samples from the proposed site drainage excavations. Please see the proposed trial pits TP111-TP114 in ***Figure 1 of Appendix A***.

2.3.11. Existing Stockpiles

There are existing stockpiles of crushed stone, crushed concrete and topsoil/subsoil on the site, that will be assessed for their suitability for re-use during construction. Their use will depend on the specification required, and how this material meets the required specification. The methodology for the assessment of this material shall mitigate the potential for contamination of these stockpiles and assess the suitability for re-use on-site.

Prior to the development of the site, it is proposed to undertake site investigations in the "Existing Stockpiles" identified during the IE Consulting Walkover Survey. These stockpiles are unlikely to contain residual impacted or contaminated soils due to the former usage as a Mushroom Factory. Nonetheless, It is proposed to carry out sufficient on-site investigations and environmental sampling to scientifically assess the potential environmental risk associated with the future use of these materials.

Sampling of stockpiles on-site shall be completed by trial pitting and composite sampling. It is proposed that approximately six (6 No.) trial pits shall be excavated and sampled to a depth of one each stockpile to ground level. Six no samples shall be obtained in total. Two samples shall be gathered from the three soil and fill stockpiles each. Please see the map of the existing stockpiles in ***Figure 2 of Appendix A***.

2.4 Cut/Fill Associated Traffic Movements

The proposed excavation plan cut and fill of soil and subsoil on-site along with the excess soil by-product transfer off-site will generate traffic movement.

For the proposed housing development and the associated surface water and foul water pipeline connection to the site, it is estimated that 1,332 truck movements will be required to transport the net soil and fill required to the site. This estimate includes the fill required to be moved to the proposed pipelines to form the pipeline beds as well as the excess soil/subsoil that shall be hauled through the gates of the development site to be placed as filled soil.

It is estimated that 1,858 truck movements will be required to transport the cut and filled soil within the site boundary (does not leave the site).

It is estimated that 447 truck movements will be required to transport the soils and stones by-product away from site.

All assumptions assume a soil density of 1.8 and average truck tonnage load of 18 tonnes.

3. MITIGATION

3.1 Soil Analyses

The proposed soil sampling and laboratory analyses will facilitate the assessment of the suitability of the on-site soils to be re-used as fill. Both the greenfield and the brownfield areas of the development area shall be assessed by soil sampling.

Soil which may be contaminated above natural levels shall be risk assessed or disposed off-site at a suitable waste disposal facility. Un-suitable soils shall not be re-used onsite within the cut and fill plan.

The outline cut and fill plan shall be revised following the site investigations and assessment of the soil suitability. The site investigations in this way shall mitigate the potential for elevated or contaminated ground and the potential risks that such material may pose to human health and to controlled waters.

3.2 Hazardous or Contaminated Soils

In the unlikely event of evidence of soil contamination being found during the site investigations and assessment, appropriate remediation measures should be employed.

Contaminated or soils that contain hazardous properties shall be delineated laterally and vertically to facilitate the excavation and disposal of these soils at a suitable waste disposal facility.

All hazardous soils that require the frontier shipment of waste from the Republic of Ireland shall ensure that that the appropriate documentation and notification(s) are in place prior to the movement of the waste from the site. A record of any hazardous wastes removed from the site shall be maintained as the development excavations proceed.

The removal of any hazardous or contaminated soils shall mitigate he potential risk of exposure to human health and to controlled waters. Off-site disposal of hazardous wastes is typically the most appropriate mitigation method for handling and dealing with hazardous waste in Ireland. Any work of this nature would be carried out in consultation with, and with the approval of the Environmental Protection Agency and the Environmental Department of Wexford City Council.

3.2.1. European Waste Catalogue Codes

Table 2 outlines the potential waste categories that may be encountered if contaminated or hazardous soils are identified during the site investigations.

Table 2: Potential Waste Classifications of Soil Subject WAC (Ref.3) and Hazardous Waste Assessment

Classification	*EWC Code*	*No. of Samples*	*Sample Ref.*
Non-Hazardous Waste containing Asbestos Fibres	17 05 04	1	SPA-1
Hazardous Waste	17 05 03	0	
Inert Waste	17 05 04	0	

3.3 Article 27 Risk Assessment

The proposed development of the site will require the by-product declaration of 4,470 m^3 of soil/subsoil for offs-site re-use.

In accordance with Article 27 of the Waste Directive Regulations 2011, and the recent EPA Consultation regarding the Article, soil and stone may be suitable for use if the soil meets generally accepted standards for the management of soil contamination such as the LQM/CIEH Generic Assessment Criteria (2nd Edition) and the EPA's Management of Contaminated Land & Groundwater at EPA Licenced Sites. The Article 27 application can be supported where necessary by a site-specific use risk assessment that will assess the risk of the proposed soils re-use at the proposed end point. The risk assessment process allows mitigating factors concerning the re-use of the material to be highlighted or addressed prior to the movement and placement of the soils at the end user site. The Article 27 Risk Assessment would be site specific to the receptor site.

3.4 Construction Stage Mitigation Measures

The following construction stage mitigation measures listed in ***Table 3*** shall also be utilised to limit the generation of hazardous wastes:

Table 3: Construction Stage Mitigation Measures

Mitigation Measures
On-site segregation of all waste materials into appropriate categories including:
Made ground, soil, subsoil, bedrock
Concrete, bricks, tiles, ceramics, and plasterboard
Metals
Dry recyclables e.g. cardboard, plastic, timber
All waste materials will be stored in skips or other suitable receptacles in a designated area of the

Mitigation Measures
site.
An asbestos survey will be completed in the buildings. Asbestos will be removed by qualified and registered asbestos removal contractors, in accordance with the requirements of the *HSA (Health and Safety Authority).*
Wherever possible, left over materials (e.g. timber off cuts) and any suitable demolition materials shall be re-used on-site.
All waste leaving the site will be transported by suitable permitted contractors and taken to suitably licensed or permitted facilities.

These mitigation measures will ensure the waste arising from the demolition and construction of the development is dealt with in compliance with the provisions of the *Waste Management Act 1996 (as amended 2001*), and associated Regulations, the *Litter Act of 1997* and the *Southern Region Waste Management Plan (2015 - 2021),* and achieve optimum levels of waste reduction, re-use and recycling.

References

No.	Reference
1.	Google Earth Pro
2.	Environment Agency (2015). Technical guidance WM3 – Guidance on the Classification and assessment of waste. Last updated 21 July 2015.
3.	2003/33/EEC. Establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:011:0027:0049:EN:PDF
4.	BS5930:1999 Code of practice for site investigations, as modified by BS14688 for soil and rock descriptions;
5.	BS10175:2011 Code of Practice for the Investigation of Potentially Contaminated Sites;
6.	Environment Agency (2000), Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination.

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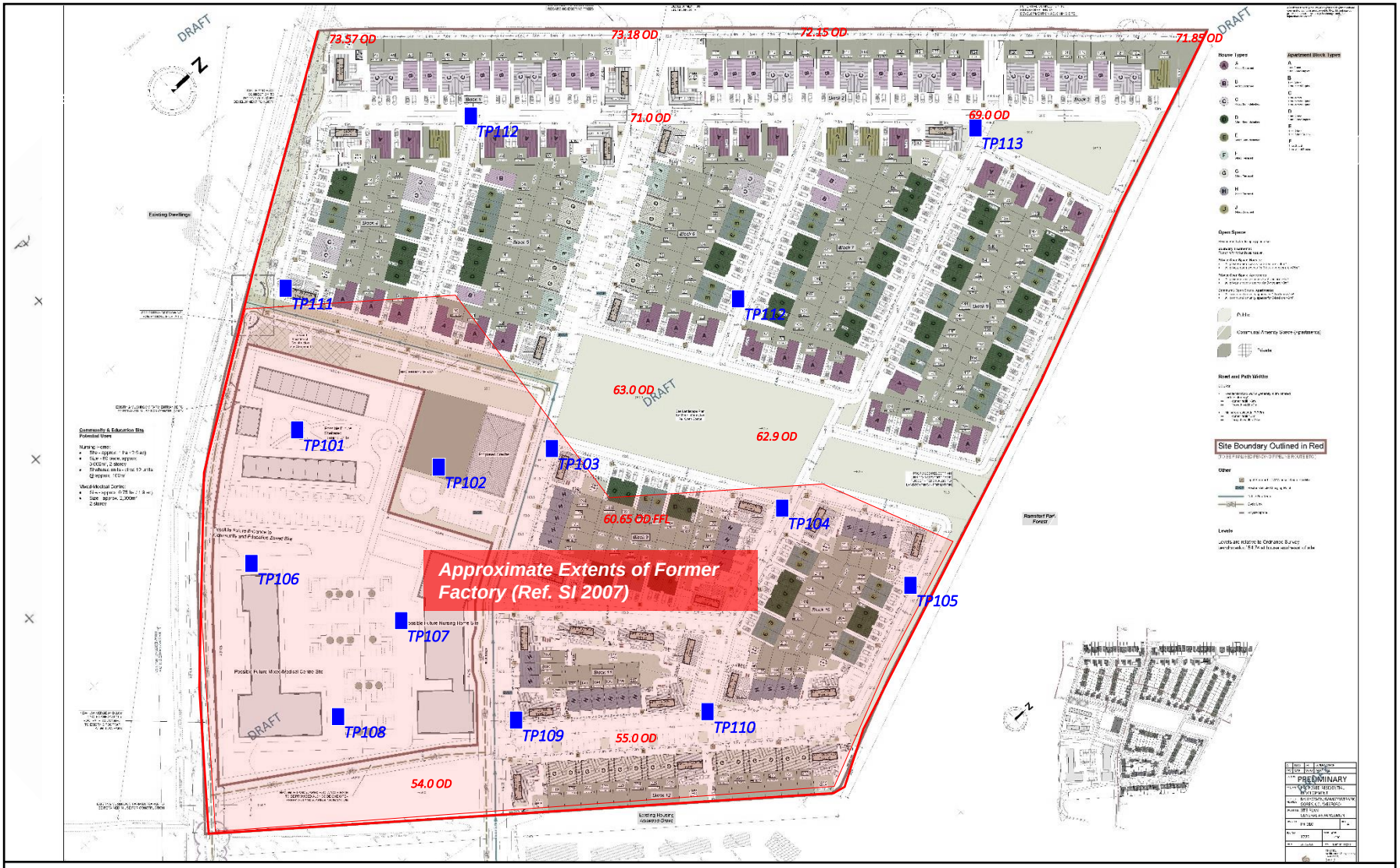
APPENDIX A

Figure 1: Drawing IE1539-4-201 Proposed SI – Brownfield & Drainage

Figure 2: Drawing IE1539-4-202 Existing Stockpiles



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Project Address:	Site at Ballyowen / RamsfortPark, Gorey Co. Wexford
Client:	Structec
Drg. Title:	Figure 1: Proposed SI – Brownfield & Drainage

Drg. Scale:	Date:	Dwg No:	Job No:	Revision:	Dwg. By :
NTS	04/12/2018	IE1539-201	IE1539	A	EF

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Drg. Title:	Figure 2: Proposed SI – Existing Stockpiles

Drg. Scale:	Date:	Dwg No:	Job No:	Revision:	Dwg. By :
NTS	07/12/2018	IE1539-202	IE1539	A	EF

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APPENDIX B

Photo Log

Walkover Survey

Description of Photo	Photograph
Greenfield area of the proposed development.	1
Concrete for potential re-use on-site.	2
Potential former bunded area of the former Mushroom Factory.	3
Soil stockpile for potential re-use.	4
Mass concrete for potential re-use.	5
Crushed fill stockpile for potential re-use.	6
Former mushroom growing shed.	7
Soil stockpile for potential re-use.	8

Photographic Records

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

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APPENDIX C

Cut and Fill Plan

AMIL Properties Ltd.
Creagh Housing SHD

Cut/Fill Report

27-Nov-18

STRUTEC
Architects - Engineers - Project Managers

Buildings			
Cut	m3	18579	
Fill		30292	
Fill Provided by Subbase etc.		7425	
Balance		4288	of fill required

Foul Drainage			
Initial Excavation / Trench Volume	m3	7784	
Pipe and Bed Volume		2378	
Backfill		5406	from excavated material
Balance		2378	excess created

Storm Drainage			
Initial Excavation / Trench Volume	m3	18076	
Pipe and Bed Volume		2180	
Attenuation System		4200	
Backfill		11696	from excavated material
Balance		6380	excess created

Total Fill Remaining	m3	4288	
Total Excess Created		8758	goes to fill required
Balance	**m3**	**4470**	**excess for disposal**

Cut/Fill Report

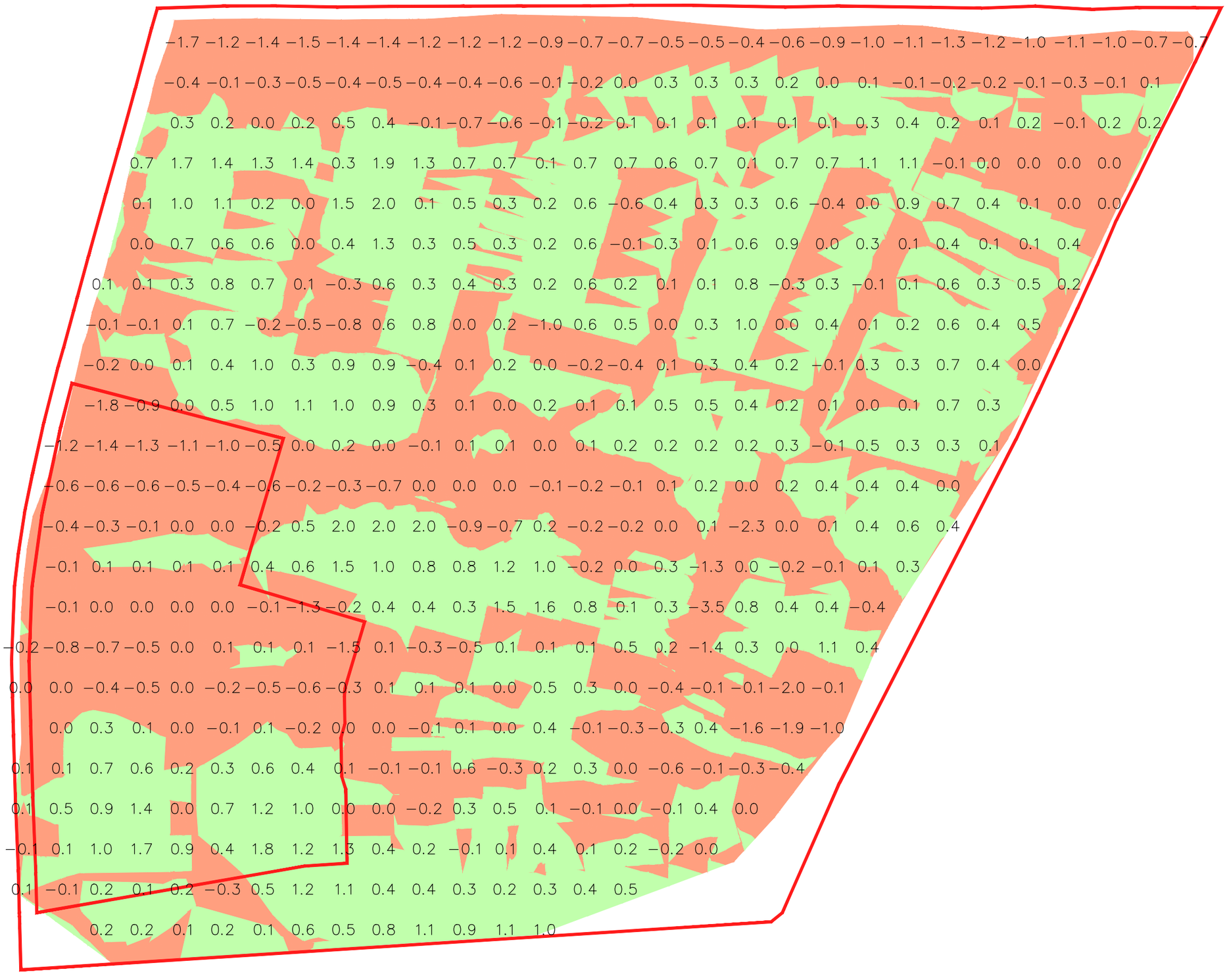
Buildings Cut and Fill	m3
Cut of Material Required	18,579
Fill of Material Needed	30,292
Fill To Be Provided by Subbase etc	7,425
Balance of Fill Needed for Buildings	4,288

Foul Drainage Cut and Fill	m3
Initial Excavation /	
Trench Volume	7,784
Pipe and Bed Volume	2,378
Backfill (Reinstatement of excavated material above pipe and bed)	5,406
Balance Excess Created Due to Placement of Pipe and Bed	2,378

Storm Drainage Cut and Fill	m3
Initial Excavation /	
Trench Volume	18,076
Pipe and Bed Volume	2,180
Attenuation System Excavation	4,200
Backfill (Reinstatement of excavated material above pipe and bed)	15,896
Balance Excess Created Due to Placement of Pipe and Bed	6,380

	m3
Total Fill Needed for Buildings	4,288
Total Excess Created From Foul and Storm Drainage	8,758

Balance of Material for Article 27 or Off-Site Disposal	4,470



Cut and Fill Diagram

A3

REV	DATE	REV BY	DESCRIPTION
-	-	-	-

STATUS **PLANNING**

PROJECT	PROPOSED RESIDENTIAL DEVELOPMENT
PROJECT ADDRESS	BALLYOWEN/RAMSFORTPARK, GOREY, CO. WEXFORD
DWG TITLE	CUT AND FILL DIAGRAM -
DWG NO	PL-050
REV	-
JOB NO	1725
SCALE @ A3	1:1500
DATE	17.9.2018
DRN	Liam Minogue

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APPENDIX D

Proposed Reference Database

Waste Acceptance Criteria Analyses

European Council Decision 2003/33/EC

Determing the acceptability of waste at landfill of various classifications.
Inert - Non-Hazardous - Hazardous Soil Limit Values

Soil Parameters	Units	Soil Samples: Trial Pit / Geology / Depth / Date	Trial Pit / Geology / Depth / Date	Trial Pit / Geology / Depth / Date	Trial Pit / Geology / Depth / Date	Inert: L/S = 10 l/Kg Leaching limit values	Inert: Total Pollutant Contents (TPC)	Non-Hazardous: L/S = 10 l/Kg Leaching limit values	Non-Hazardous: Total Pollutant Contents	Hazardous: L/S = 10 l/Kg Leaching limit values	Hazardous: Total Pollutant Contents
Antimony	mg/kg L/S 10					0.06		0.7		5	
Arsenic	mg/kg L/S 10					0.5		2		25	
Barium	mg/kg L/S 10					20		100		300	
Cadmium - Total	mg/kg L/S 10					0.04		1		5	
Chromium	mg/kg L/S 10					0.5		10		70	
Copper	mg/kg L/S 10					2		50		100	
Lead	mg/kg L/S 10					0.5		10		50	
Molybdenum (as Mo)	mg/kg L/S 10					0.5		10		30	
Nickel (as Ni)	mg/kg L/S 10					0.4		10		40	
Selenium	mg/kg L/S 10					0.1		0.5		7	
Zinc (as Zn)	mg/kg L/S 10					4		50		200	
Mercury (as Hg)	mg/kg L/S 10					0.01		0.2		2	
Phenol total	mg/kg L/S 10					1					
Fluoride	mg/kg L/S 10					10		150		500	
Sulphate total	mg/kg L/S 10					1,000		20,000		50,000	
Chloride	mg/kg L/S 10					800		15000		25000	
Dissolved Organic Carbon (DOC)	mg/kg L/S 10					500		800		1000	
TDS - (Solids - total dissolved)	mg/kg L/S 10					4,000		60,000		100,000	
pH	ph Units								>6		
BTEX/PRO by GC-FID (Benzene, Toluene, Ethylbenzene and Xylene)	mg/kg						6				
Mineral Oil (C10 to C40)	mg/kg										
Mineral Oil	mg/kg						500 (C10 - C40)				
PAHs (EPA 17 Total)	mg/kg						100 (MEHL W0129-02 Limit Value)				
Total Organic Carbon (TOC)	%						3		5		6

Note 1: Hazardous Waste Online (TM) classifies this waste as Potentially Hazardous Due to the pH value > 11.5.
As the buffer capacity is low, an in vitro test may be used to determine the classification as Irritant, Corrosive, or neither (Ref: UK WM3)
Note 2: PAH detected above the analytical limits of detection. Soil suitable for disposal at MEHL (<100 mg/kg PAH) and other waste facilities where PAHs above the analytical limits of detection are accepted.
Note 3: Hazardous Waste Online TM: Determines the waste as hazardous on a pass fail basis. The Hazardous Waste Online Hazardous Waste Assessment will state Non-Hazardous if the Waste is Not Hazardous. The waste may be Not Hazardous and classified as Inert. Hazardous Waste Online does not distinguish between Inert and Non-Hazardous Waste Classifications, for this we refer to the EU 2003/33/EC Council Decision.
Note 4: TDS has been substituted for Sulphate as per the 2003/33/EC Guideline Notes. "The values for total dissolved solids (TDS) can be used alternatively to the values for sulphate and chloride"
Note 5: PAH concentration >100 mg/kg. Disposal only at a suitable landfill capable of accepting PAH concetrations > 100 mg/kg.

2003/33/EEC Waste Classification	Hazardous	Hazardous	Hazardous	Hazardous
Hazardous Waste Online Classification	Hazardous	Hazardous	Hazardous	Hazardous
IE Consulting Overall Waste Classification (Hazardous Waste Online & 2003/33/EEC Waste Classification)	Hazardous	Hazardous	Hazardous	Hazardous
European Waste Catalogue Code EWC Code	17 05 03	17 05 03	17 05 03	17 05 03

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WATER-ENVIRONMENTAL-CIVIL

PARAMETER	Units	LQM/CIEH S4ULs - Land Use: Residential with Home Grown Produce			LQM/CIEH S4ULs - Land Use: Commercial		
		Residential with Home Grown Produce (1% SOM)	Residential with Home Grown Produce (2.5% SOM)	Residential with Home Grown Produce (6.0% SOM)	Commercial (1% SOM)	Commercial (2.5% SOM)	Commercial (6.0% SOM)
Acenaphthene	mg/kg	210	510	1100	84000 (57.0 solubility)	97000 (141.0 solubility)	10,000
Acenaphythylene	mg/kg	170	420	920	83000 (86.1 solubility)	97000 (212 solubility)	10,000
Anthracene	mg/kg	2400	5400	11000	520,000	540,000	540,000
Benzo(a)anthracene	mg/kg	7.2	11.0	13.0	170	170	180
Benzo(a)pyrene	mg/kg	2.2	2.7	3.0	35	35	36
Benzo(b)fluoranthene	mg/kg	2.6	3.3	3.7	44	44	45
Benzo(bk)fluoranthene	mg/kg						
Benzo(k)fluoranthene	mg/kg	77	93	100	1,200	1,200	1,200
Chrysene	mg/kg	15	22	27	350	350	350
Dibenzo(a,h)anthracene	mg/kg	0.24	0	0	3.5	3.6	3.6
Fluoranthene	mg/kg	280	560	890	23,000	23,000	23,000
Fluorene	mg/kg	170	400	560	36000 (30.9 solubility)	68,000	71,000
Indeno (1,2,3-cd) pyrene	mg/kg	27	36	41	500	510	510
Naphthalene	mg/kg	2.3	5.6	13.0	190 (76.4 solubility)	460 (183 solubility)	1100 (432 solubility)
Phenanthrene	mg/kg	95.0	220	440	22,000	22,000	23,000
Pyrene	mg/kg	620	1200	2000	54,000	54,000	54,000
Pentachlorophenol	mg/kg	0.22	0.52	1.20	400	400	400
Phenol	mg/kg	280.0	550.0	1100.0	760 (direct skin	1500 (direct skin	3200 (direct skin
Benzene	mg/kg	0.09	0.17	0.37	27	47	90
Toluene	mg/kg	130.00	290.00	660.00	56000 vapour (869)	110000 vapour (1920)	180000 vapour (4360)
Ethylbenzene	mg/kg	47.00	110.00	260.00	5700 vapour (518)	13000 vapour (1220)	27000 vapour (2840)
Zylene - O	mg/kg	60	140	330	6600 solubility (478)	1500 solubility (1120)	33000 solubility
Zylene - M	mg/kg	59	140	320	6200 solubility (625)	14000 solubility	31000 solubility
Zylene - P	mg/kg	56	130	310	5900 solubility (576)	14000 solubility	30000 solubility
C5-C6 TPH Aliphatics	mg/kg	42	78	160	3200 (304 solubility)	5900 (558 solubility)	1200 (1150 solubility)
C6-C8 TPH Aliphatics	mg/kg	100	230	530	7800 (144 solubility)	17000 (322 solubility)	40000 (736 solubility)
C8-C10 TPH Aliphatics	mg/kg	27	65	150	2000 (78 solubility)	4800 (190 solubility)	11000 (451 solubility)
C10-C12 TPH Aliphatics	mg/kg	130 (48 vapour)	330 (118 vapour)	760 (283 vapour)	9700 (48 solubility)	23000 (118 solubility)	47000 (283 solubility)
C12-C16 TPH Aliphatics	mg/kg	1100 (24 solubility)	2400 (59 vapour)	4300 (142 vapour)	59000 (24 solubility)	82000 (59 solubility)	90000 (142 solubility)
C16-C35 TPH Aliphatics	mg/kg	65000 (8.48 solubility)	920000 (21 solubility)	110,000	1,600,000	1,700,000	1,800,000
C5-C7 TPH Aromatics (Benzene)	mg/kg	70	140	300	26000 (1220	46000 (2260	86000 (4710
C7-C8 TPH Aromatics (Toluene)	mg/kg	130	290	660	56000 (869 solubility)	110000 (1920	180000 (4360
C8-C10 TPH Aromatics	mg/kg	34	83	190	3500 (613 solubility)	8100 (1520 solubility)	170000 (3580
C10-C12 TPH Aromatics	mg/kg	74	180	380	16000 (364 solubility)	28000 (899 solubility)	34000 (2150
C12-C16 TPH Aromatics	mg/kg	140	330	660	36000 (169 solubility)	37,000	38,000
C16-C21 TPH Aromatics	mg/kg	260	540	930	28,000	28,000	28,000
C21-C35 TPH Aromatics	mg/kg	1,100	1,500	1,700	28,000	28,000	28,000
C5-C35 TPH Aliphatics & Aromatics	mg/kg						

Trial Pit Soil Samples

Trial Pit	*Trial Pit*	*Trial Pit*	*Trial Pit*
Depth	*Depth*	*Depth*	*Depth*
Geology	*Geology*	*Geology*	*Geology*
Date	***Date***	***Date***	***Date***