
S.I. Ltd Contract No: 6301

Client: Kildare County Council
Engineer: Hayes Higgins Partnership
Contractor: Site Investigations Ltd

Craddockstown,
Naas, Co. Kildare
Site Investigation Report

Prepared by:

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Stephen Letch

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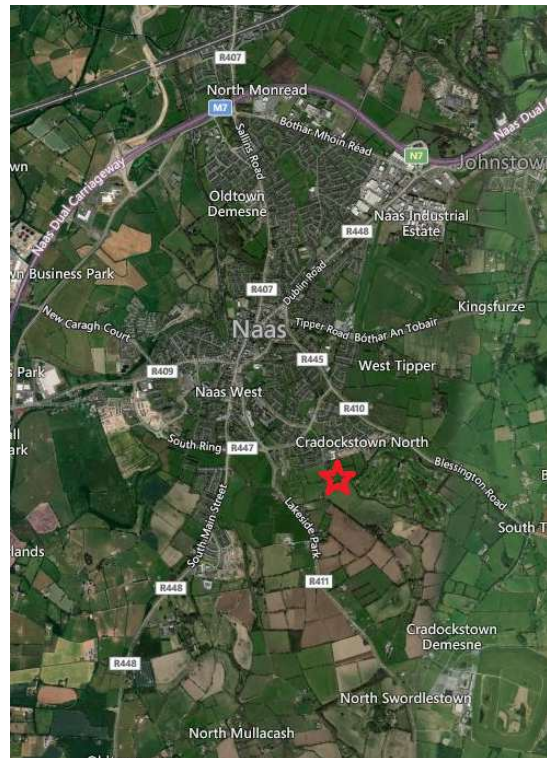
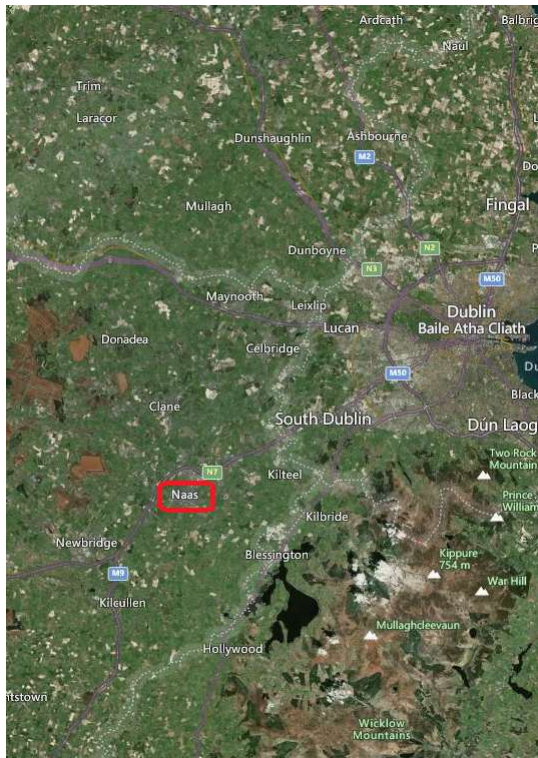
1. Introduction

On the instructions of Hayes Higgins Partnership, Site Investigations Ltd (SIL) was appointed to complete a ground investigation at Craddockstown, Naas, Co. Kildare. The investigation was for a residential development and was completed on behalf of the Client, Kildare County Council. The fieldworks were completed in June 2024.

This report presents the factual geotechnical data obtained from the field and laboratory testing with interpretation of the ground conditions discussed.

2. Site Location

Craddockstown is to the south of Naas town centre, to the south west of Dublin. The map on the left below shows the location of Naas in Co. Kildare and the second map shows the location of the site in the town.



3. Fieldwork

All fieldwork was carried out in accordance with BS 5930:2015, Engineers Ireland GI Specification and Related Document 2nd Edition 2016 and Eurocode 7: Geotechnical Design. The fieldworks comprised of the following:

- 3 No. cable percussive boreholes
- 5 No. trial pits
- 1 No. soakaway test

3.1. Cable Percussive Boreholes

Cable percussion boring was undertaken at 3 No. locations using a Dando 2000 rig and constructed 200mm diameter boreholes. The boreholes terminated at depths ranging from 3.80mbgl (BH03) to 7.70mbgl (BH01) after an hour and a half chiselling was completed and no further progress was made. It was not possible to collect undisturbed samples due to the granular soils encountered so bulk disturbed samples were recovered at regular intervals.

To test the strength of the stratum, Standard Penetration Tests (SPT's) were performed at 1.00m intervals in accordance with BS 1377 (1990). In soils with high gravel and cobble content it is appropriate to use a solid cone (60°) (CPT) instead of the split spoon and this was used throughout the testing. The test is completed over 450mm and the cone is driven 150mm into the stratum to ensure that the test is conducted over an undisturbed zone. The cone is then driven the remaining 300mm and the blows recorded to report the N-Value. The report shows the N-Value with the 75mm incremental blows listed in brackets (e.g., BH01 at 1.00mbgl where N=9-(1,2/2,3,2,2)). Where refusal of 50 blows across the test zone was encountered was achieved during testing, the penetration depth is also reported (e.g., BH01 at 5.00mbgl where N=50-(5,12/50 for 275mm)).

At BH01, a groundwater standpipe was installed to allow for the equalisation of the water table and long-term monitoring. These included a gravel response zone around the slotted standpipe with bentonite seals at the top of the holes to stop migration of water from the surface.

The cable percussive borehole logs are presented in Appendix 1.

3.2. Trial Pits

5 No. trial pits were excavated using a wheeled excavator and they were logged and photographed by SIL geotechnical engineer. Representative disturbed bulk samples were recovered as the pits were excavated, which were returned to the laboratory for geotechnical testing. Any groundwater ingresses and pit wall stability were also logged as the pits were excavated with the pits backfilled with the arisings immediately upon completion.

The trial pit logs and photographs are presented in Appendix 2.

3.3. Soakaway Tests

At TP04, a soakaway test was completed and logged by SIL geotechnical engineer. BRE Special Digest 365 stipulates that the pit should be filled three times and that the final cycle is

used to provide the infiltration rate. The time taken for the water level to fall from 75% volume to 25% volume is required to calculate the rate of infiltration. However, if the water level does not fall at a steady rate, then the test is deemed to have failed and the area is unsuitable for storm water drainage.

The soakaway test result is presented in Appendix 3.

3.4. Surveying

Following completion of all the fieldworks, a survey of the exploratory hole locations was completed using a GeoMax GPS Rover. The data is supplied on each individual log and along with a site plan in Appendix 6.

4. Laboratory Testing

Environmental testing was completed by ALS Environmental Ltd. and consists of the following:

- 3 No. Suite I analysis

The environmental tests are reported in Appendix 4 and a Waste Classification Report in Appendix 5.

5. Ground Conditions

5.1. MADE GROUND

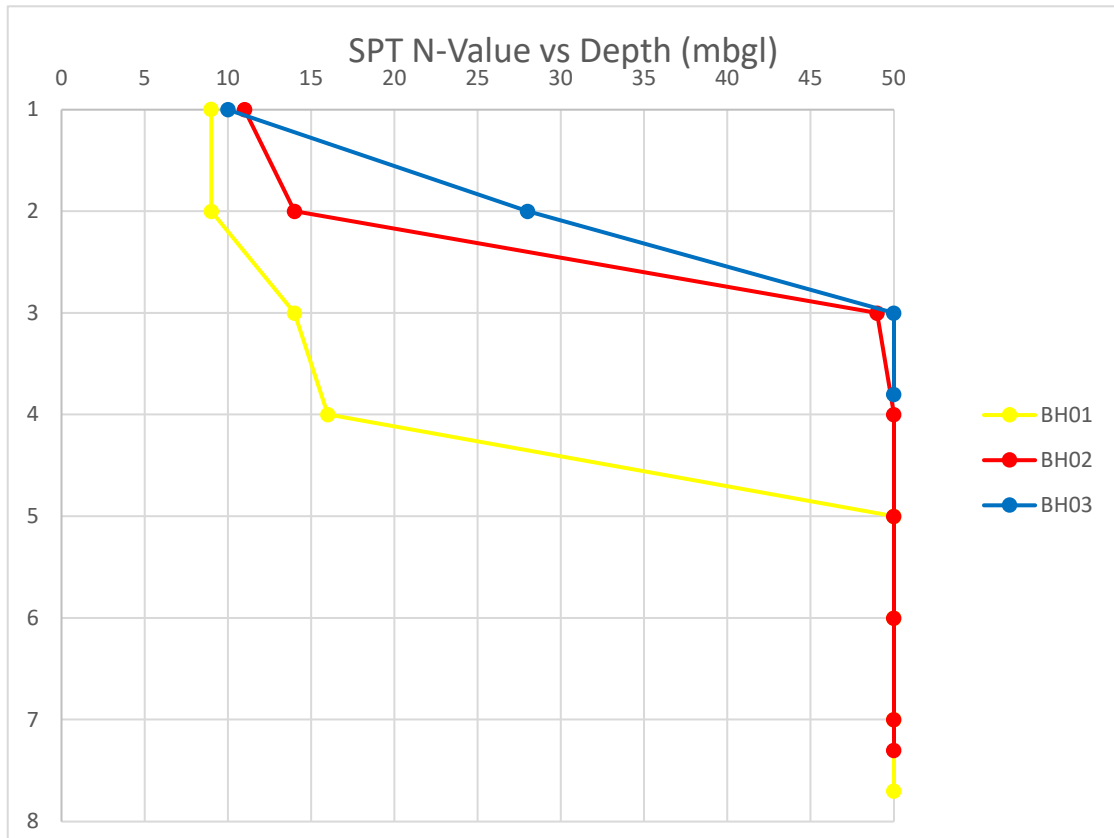
MADE GROUND was recorded at TP05 to the north of the site to a depth of 1.50mbgl and was logged as grey brown sandy gravelly cobbles with some red brick and bone fragments recorded.

5.2. Overburden

The natural ground conditions vary slightly with BH01 recorded cohesive CLAY over granular SAND soil at 1.60mbgl. The soils remain as granular soils with GRAVEL dominant soils also recorded in the borehole. BH02 recorded cohesive soils to 4.80mbgl before granular GRAVEL soils were encountered and finally BH03 terminated at 3.80mbgl still within the cohesive CLAY soils.

The trial pits recorded slightly different conditions with TP02 only recording cohesive CLAY soils whereas TP01 to the west recorded CLAY over SAND with the boundary at 1.90mbgl with TP03 and TP04, to the east recording SAND at 0.90mbgl and 0.60mbgl respectively below thin layers of CLAY soil. Finally, TP05 recorded SAND beneath the fill material at 1.50mbgl.

The SPT tests recorded different profiles with similar values of 9 to 11 at 1.00mbgl then the values range from 9 in BH01, 14 in BH02 and 28 in BH03 at 2.00mbgl. BH01 values remain lower with values of 14 and 16 at 3.00mbgl and 4.00mbgl and then refusals from 5.00mbgl onwards. BH02 recorded a value of 48 at 3.00mbgl before recording refusals whereas BH03 recorded refusal at 3.00mbgl. The graph below shows SPT N-values vs depth.



5.3. Groundwater

No groundwater was recorded in the boreholes or the trial pits during the fieldworks.

6. Recommendations and Conclusions

Please note the following caveats:

The recommendations given, and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between the exploratory hole locations or below the final level of excavation, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for adjacent unexpected conditions that have not been revealed by the exploratory holes. It is further recommended that all bearing surfaces when excavated should be inspected by a suitably qualified Engineer to verify the information given in this report.

Excavated surfaces in clay strata should be kept dry to avoid softening prior to foundation placement. Foundations should always be taken to a minimum depth of 0.50mBGL to avoid the effects of frost action and possible seasonal shrinkage/swelling.

If it is intended that on-site materials are to be used as fill, then the necessary laboratory testing should be specified by the Client to confirm the suitability. Also, relevant lab testing should be specified where stability of side slopes to excavations is a concern, or where contamination may be an issue.

6.1. Shallow Foundations

Due to the unknown depth of foundation and no longer-term groundwater information, this analysis assumes the groundwater will not influence the construction or performance of these foundations.

MADE GROUND was encountered at TP05 to 1.50mbgl. SIL do not recommend that narrow shallow foundations are placed on fill material due to the unknown compaction methods used during laying of man-made material. This unknown could result in softer spots and differential settlement once construction is completed. If shallow foundations are to be used and man-made soils are encountered below foundation level, then the soil should be removed and replaced with engineered fill which is compacted to the required standard.

For cohesive soils, a correlation proposed by Stroud and Butler between SPT N-values and plasticity indices can be used to calculate the undrained shear strength. Dependent on the plasticity index at each site, the Stroud and Butler correlation is $C_u=4$ to $6N$. With the low plasticity indexes recorded in the laboratory for the soils on this site, the correlation chosen is $C_u=6N$. The C_u value can then be used to calculate the ultimate bearing capacity, which is the total loading that the soil could withstand but then a factor of safety is used to ensure that failure of the soils does not occur. A factor of safety of 3 has been chosen for this site.

In granular soils, the SPT N-value can then be used to calculate the allowable bearing capacity, as per Terzaghi and Peck, using the correlation of $SPT\ N\text{-value} \times 10 = ABC$.

The table overleaf shows the SPT N-value, C_u , the ultimate bearing capacity and finally, the allowable bearing capacities at 1.00mbgl, 2.00mbgl and 3.00mbgl. For the refusals, no bearing capacity is calculated. The C_u , ultimate bearing capacity and allowable bearing capacities are in kN/m^2 .

Depth	BH01				BH02			
	N-Value	Cu	UBC	ABC	N-Value	Cu	UBC	ABC
1.00	9	54	294	100	11	66	356	120
2.00	9	-	-	90	14	84	464	155
3.00	14	-	-	140	49	294	1553	515
Depth	BH03							
	N-Value	Cu	UBC	ABC				
1.00	10	60	325	110				
2.00	28	168	893	300				
3.00	-1	-1	-1	-1				

It would be recommended that all founding strata be inspected by a suitably qualified Engineer prior to pouring the foundations and additional insitu testing completed if required to confirm the soils are suitable for the final foundation design.

The following assumptions were made as part of these analyses. If any of these assumptions are not in accordance with detailed design or observations made during construction these recommendations should be re-evaluated.

- Foundations are to be constructed on a level formation of uniform material type.
- All man-made or filled material is to be removed prior to construction.
- The bulk unit weight of the material in this stratum has a minimum density of 19kN/m³.
- Based on groundwater observations this analysis assumes the groundwater will not influence the construction or performance of these foundations.
- All bearing capacity calculations allow for 25mm settlement.

The trial pit walls generally remained stable during excavation but it would be recommended due to the high sand and gravel content in the soils, that all excavations should be checked immediately and battered back accordingly. Regular inspection of temporary excavations should be completed during construction to ensure that all slopes are stable. Temporary support should be used on any excavation that will be left open for an extended period.

6.2. Groundwater

The caveats below relating to interpretation of groundwater levels should be noted:

There is always considerable uncertainty as to the likely rates of water ingress into excavations in clayey soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water.

Furthermore, water levels noted on the borehole and trial pit logs do not generally give an accurate indication of the actual groundwater conditions as the borehole or trial pit is rarely left open for sufficient time for the water level to reach equilibrium.

Also, during boring procedures, a permeable stratum may have been sealed off by the borehole casing, or water may have been added to aid drilling. Therefore, an extended period of groundwater monitoring using any constructed standpipes is required to provide more accurate information regarding groundwater conditions. Finally, groundwater levels vary with time of year, rainfall or any nearby construction sites.

Pumping tests would be required to determine likely seepage rates and persistence into excavations taken below the groundwater level. Deep trial pits also aid estimation of seepage rates.

As discussed previously, no groundwater was recorded in the boreholes or trial pits during the fieldworks.

There is always considerable uncertainty as to the likely rates of water ingress into excavations in cohesive soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water. Based on this information at the exploratory hole locations to date, it is considered likely that any shallow ingress (less than 2.00mbgl) into excavations of the CLAY will be slow to medium.

If groundwater is encountered during excavations then mechanical pumps will be required to remove the groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches.

6.3. Soakaway Tests

The soakaway tests at TP04 passed the specification with f-value calculated as **1.44 x 10⁻⁴m/s**.

It would be recommended that the soakaways are placed in the higher permeability granular soils rather than the cohesive clay and silt soils.

6.4. Contamination

Environmental testing was carried out on three samples from the investigation and the results are shown in Appendix 4. For material to be removed from site, Suite I testing was carried out to determine if the material is hazardous or non-hazardous and then the leachate results were compared with the published waste acceptance limits of BS EN 12457-2 to determine whether the material on the site could be accepted as 'inert material' by an Irish landfill.

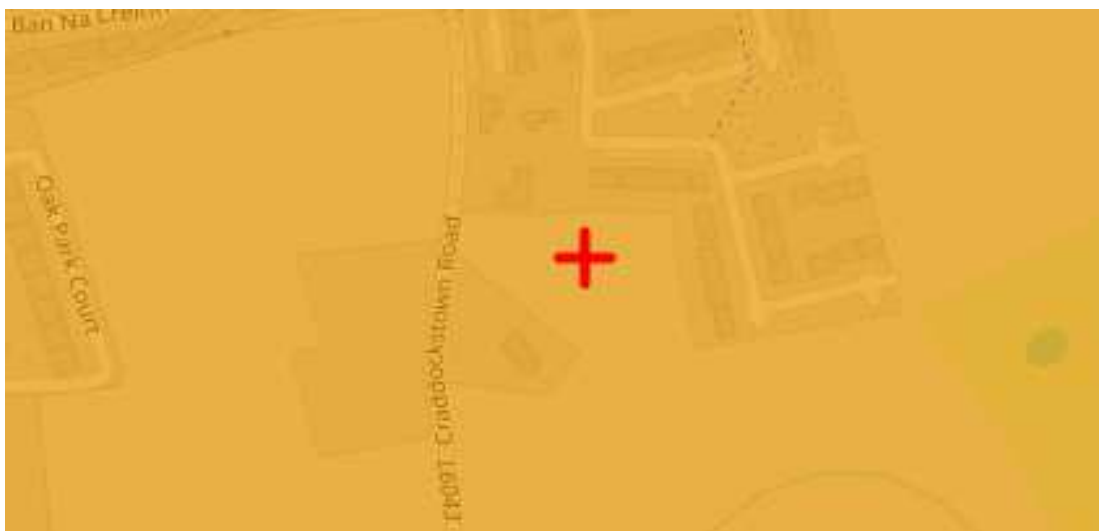
The Waste Classification report created using HazWasteOnline™ software shows that the material tested can be classified as non-hazardous material.

Following this analysis of the solid test results, the leachate disposal suite results indicate that the soils tested would generally be able to be treated as Inert Waste.

Three samples were tested for analysis but it cannot be discounted that any localised contamination may have been missed. Any MADE GROUND excavated on site should be stockpiled separately to natural soils to avoid any potential cross contamination of the soils. Additional testing of these soils may be requested by the individual landfill before acceptance and a testing regime designed by an environmental engineer would be recommended to satisfy the landfill.

6.6. Radon Gas

The Environmental Protection Agency (EPA) has recently updated the Radon gas exposure map and this is available to view on the EPA website. This shows the possible exposure to radon gas with the bedrock geology, subsoil geology, soil permeability and aquifer type analysed to produce the map. The map below shows that the site falls within the medium level of radon exposure. Measures should be taken in the form of radon protection barriers from radon exposure in the new structure.



EPA map identifying possible Radon exposure.


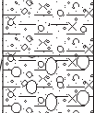
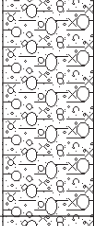
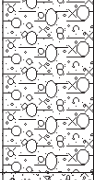
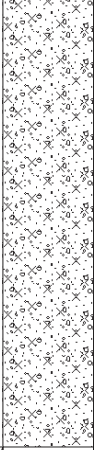

<https://gis.epa.ie/EPAMaps/Radon?&lid=EPA:RadonRiskMapofIreland>


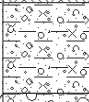
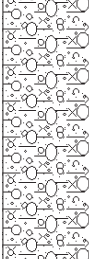
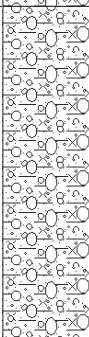



Appendix 1
Cable Percussive Borehole Logs


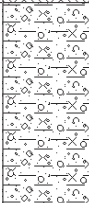

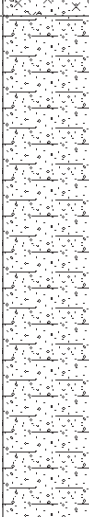


Contract No: 6301		Cable Percussion Borehole Log							Borehole No: BH03			
Contract:		Craddockstown			Easting:		690222.573		Date Started:		14/06/2024	
Location:		Naas, Co. Kildare			Northing:		718062.963		Date Completed:		14/06/2024	
Client:		Kildare County Council			Elevation:		116.57		Drilled By:		D. McEoin	
Engineer:		Hayes Higgins Partnership			Borehole Diameter:		200mm		Status:		FINAL	
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill
Scale	Depth					Scale	Depth	Depth	Type	Result		
	0.30	TOPSOIL.				116.5						
	0.5	Firm brown slightly sandy slightly gravelly silty CLAY with low cobble content.				116.27						
	1.0					116.0						
	1.5	Stiff becoming very stiff grey brown slightly sandy gravelly silty CLAY with high cobble content.				115.5	1.00	B	DMc15			
	2.0					115.0	1.00	C	N=10 (1,1/2,2,3,3)			
	2.5					114.5	2.00	B	DMc16			
	3.0					114.0	2.00	C	N=28 (2,3/4,6,9,9)			
	3.5					113.5	3.00	B	DMc17			
	3.60	Obstruction - boulders.				113.0	3.00	C	50 (8,12/50 for 225mm)			
	3.80	End of Borehole at 3.80m				112.97	3.80	C	50 (25 for 5mm/50 for 5mm)			
	4.0					112.77						
	4.5					112.5						
	5.0					112.0						
	5.5					111.5						
	6.0					111.0						
	6.5					110.5						
	7.0					110.0						
	7.5					109.5						
						109.0						


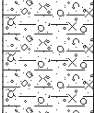
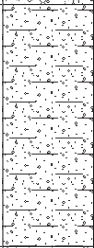
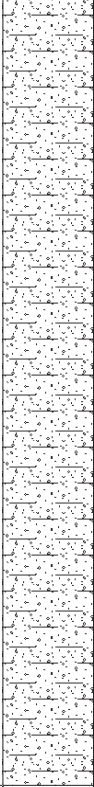

	Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:	Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
	From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Borehole terminated due to obstruction.	
	3.60	3.80	02:00				14/06	3.80	Dry				0.00	3.80	Arisings		



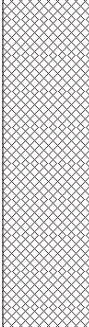
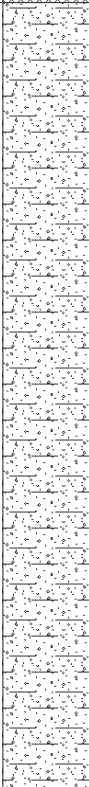

Appendix 2
Trial Pit Logs and Photographs

Contract No: 6301		Trial Pit Log				Trial Pit No: TP01			
Contract:		Craddockstown	Easting:	690133.629	Date:	07/06/2024			
Location:		Naas, Co. Kildare	Northing:	718036.341	Excavator:	JCB 3CX			
Client:		Kildare County Council	Elevation:	118.64	Logged By:	M. Kaliski			
Engineer:		Hayes Higgins Partnership	Dimensions (LxWxD) (m):	4.30 x 0.70 x 3.40	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.20	TOPSOIL.		118.5	118.44				
	0.40	Soft brown slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles are angular to subrounded of limestone.			118.24	0.50	ES	MK01	
	0.5	Soft becoming firm grey brown slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 300mm diameter).		118.0					
	1.0			117.5		1.00	B	MK02	
	1.30	Firm grey brown slightly sandy gravelly silty CLAY with high cobble, medium boulder content and bands of silty sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 300mm diameter).			117.34				
	1.5			117.0		1.50	B	MK03	
	1.90	Grey brown silty gravelly fine to coarse SAND with low cobble and boulder content. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 400mm diameter).			116.74				
	2.0			116.5					
	2.5			116.0		2.50	B	MK04	
	3.0			115.5					
	3.40	Obstruction - boulders.			115.24				
	3.5	Pit terminated at 3.40m							
	4.0			115.0					
	4.5			114.5					
				114.0					
	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:		
	Obstruction - boulders.	Pit walls stable.	Dry	-			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 6301		Trial Pit Log				Trial Pit No: TP02			
Contract:		Craddockstown	Easting:	690173.432	Date:	07/06/2024			
Location:		Naas, Co. Kildare	Northing:	718003.616	Excavator:	JCB 3CX			
Client:		Kildare County Council	Elevation:	119.27	Logged By:	M. Kaliski			
Engineer:		Hayes Higgins Partnership	Dimensions (LxWxD) (m):	4.40 x 0.70 x 2.80	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.20	TOPSOIL.		119.0	119.07				
	0.50	Soft brown slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles are angular to subrounded of limestone.		118.5	118.77				
	1.00	Soft becoming firm grey brown slightly sandy gravelly silty CLAY with high cobble, low boulder content interbedded with silty sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 300mm diameter).		118.0	117.87	1.00	B	MK05	
	1.40	Firm becoming stiff grey brown slightly sandy gravelly silty CLAY with high cobble, medium boulder content interbedded with silty sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 300mm diameter).		117.5	117.0	2.00	B	MK06	
	2.50	Very stiff grey brown slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 300mm diameter).		116.5	116.77	2.70	B	MK07	
	2.80	Pit terminated due to strength of soils. Pit terminated at 2.80m		116.0	116.47				
	3.00			115.5					
	3.50			115.0					
	4.00			114.5					
	4.50								
	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:		
	Strength of soil.	Pit walls stable.	Dry	-			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 6301		Trial Pit Log				Trial Pit No: TP03			
Contract:		Craddockstown	Easting:	690224.296	Date:	07/06/2024			
Location:		Naas, Co. Kildare	Northing:	718002.027	Excavator:	JCB 3CX			
Client:		Kildare County Council	Elevation:	118.76	Logged By:	M. Kaliski			
Engineer:		Hayes Higgins Partnership	Dimensions (LxWxD) (m):	5.20 x 0.70 x 4.10	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.20	TOPSOIL.			118.56				
	0.5	Soft brown slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles are angular to subrounded of limestone.			118.5	0.50	ES	MK08	
	0.90	Grey silty gravelly fine to coarse SAND with medium cobble content. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles are angular to subrounded of limestone.			117.86	1.00	B	MK09	
	2.10	Grey brown silty gravelly fine to coarse SAND with occasional clay bands. Gravel is fine to coarse, angular to subrounded of limestone.			116.66	2.50	B	MK10	
	3.80	Grey brown silty very sandy fine to coarse, angular to subrounded GRAVEL of limestone with low cobble content. Sand is fine to coarse. Cobbles are angular to subrounded of limestone.			114.96	4.00	B	MK11	
	4.10	Pit terminated due to strength of soils. Pit terminated at 4.10m			114.66				
	4.5				114.5				
					114.0				
	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:		
	Strength of soil.	Pit walls stable.	Dry	-			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 6301		Trial Pit Log				Trial Pit No: TP04			
Contract:		Craddockstown	Easting:	690228.449	Date:	07/06/2024			
Location:		Naas, Co. Kildare	Northing:	718025.127	Excavator:	JCB 3CX			
Client:		Kildare County Council	Elevation:	118.11	Logged By:	M. Kaliski			
Engineer:		Hayes Higgins Partnership	Dimensions (LxWxD) (m):	4.90 x 0.70 x 4.00	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.20	TOPSOIL.		118.0	117.91				
	0.5	Soft brown slightly sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles are angular to subrounded of limestone.							
	0.60	Grey brown silty gravelly fine to coarse SAND with low cobble content and occasional clay bands. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles are angular to subrounded of limestone.		117.5	117.51				
	1.0			117.0		1.00	B	MK12	
	1.40	Grey brown silty gravelly fine to coarse SAND with low cobble content. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles are angular to subrounded of limestone.		116.71					
	1.5			116.5					
	2.0			116.0					
	2.5			115.5		2.50	B	MK13	
	3.0			115.0					
	3.5			114.5					
	4.0	Pit terminated due to strength of soils. Pit terminated at 4.00m		114.11		4.00	B	MK14	
	4.5			114.0					
				113.5					
	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:		
	Strength of soil.	Pit walls stable.	Dry	-			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 6301		Trial Pit Log				Trial Pit No: TP05			
Contract:		Craddockstown	Easting:	690207.844	Date:	07/06/2024			
Location:		Naas, Co. Kildare	Northing:	718050.177	Excavator:	JCB 3CX			
Client:		Kildare County Council	Elevation:	115.49	Logged By:	M. Kaliski			
Engineer:		Hayes Higgins Partnership	Dimensions (LxWxD) (m):	4.90 x 0.70 x 4.10	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.10	TOPSOIL.			115.39				
		MADE GROUND: grey brown sandy gravelly silty clay.							
	0.40	MADE GROUND: grey brown sandy gravelly cobbles with some red brick and bone fragments.			115.09	0.50	ES	MK15	
	0.5				115.0				
	1.0				114.5	1.00	B	MK16	
	1.5	Grey silty gravelly fine to coarse SAND with occasional clay bands. Gravel is fine to coarse, angular to subrounded of limestone.			114.0				
	1.50				113.99				
	2.0				113.5				
	2.5				113.0	2.50	B	MK17	
	3.0				112.5				
	3.5				112.0				
	4.0				111.5	4.00	B	MK18	
	4.10	Pit terminated due to strength of soils. Pit terminated at 4.10m			111.39				
	4.5				111.0				
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Strength of soil.	Pit walls stable.	Dry	-		B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

TP01 Sidewall



TP01 Spoil



TP02 Sidewall



TP02 Spoil



TP03 Sidewall



TP03 Spoil



TP04 Sidewall



TP04 Spoil



TP05 Sidewall



TP05 Spoil



Appendix 3
Soakaway Test Result

SOAKAWAY TEST



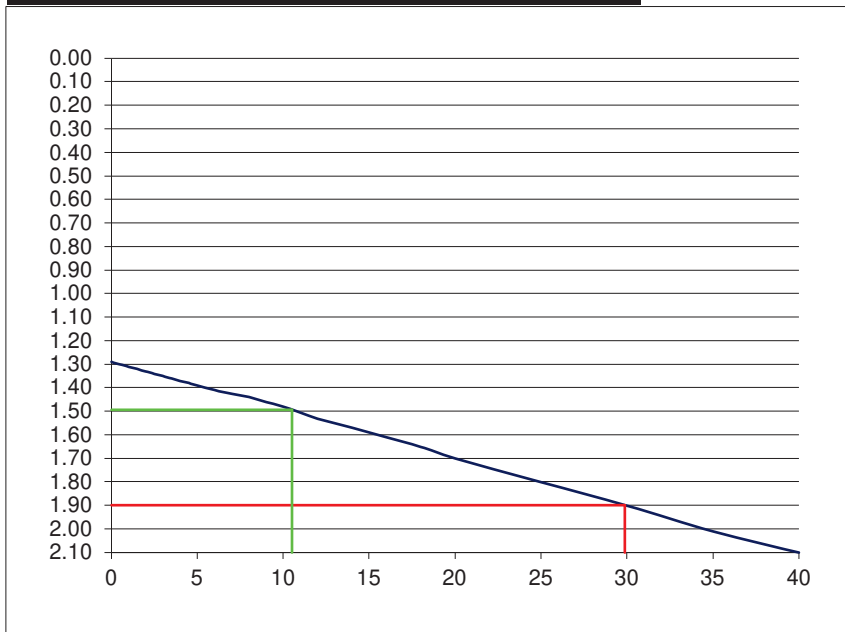
Project Reference:	6301
Contract name:	Craddockstown
Location:	Naas, Co. Kildare
Test No:	TP04
Date:	07/06/2024

Ground Conditions

From	To	
0.00	0.20	TOPSOIL.
0.20	0.60	Soft brown slightly sandy gravelly silty CLAY with low cobble content.
0.60	1.40	Grey brown silty gravelly SAND with low cobble content and occasional clay bands.
1.40	2.10	Grey brown silty gravelly SAND with low cobble content.

Elapsed Time (mins)	Fall of Water (m)
0	1.29
0.5	1.30
1	1.31
1.5	1.32
2	1.33
2.5	1.34
3	1.35
3.5	1.36
4	1.37
4.5	1.38
5	1.39
6	1.41
7	1.43
8	1.44
9	1.46
10	1.48
12	1.53
14	1.57
16	1.61
18	1.65
20	1.70
25	1.80
30	1.90
35	2.01
40	2.10

Pit Dimensions (m)	
Length (m)	3.10 m
Width (m)	0.70 m
Depth	2.10 m
Water	
Start Depth of Water	1.29 m
Depth of Water	0.81 m
75% Full	1.49 m
25% Full	1.90 m
75%-25%	0.41 m
Volume of water (75%-25%)	0.88 m ³
Area of Drainage	15.96 m ²
Area of Drainage (75%-25%)	5.25 m ²
Time	
75% Full	10.5 min
25% Full	29.875 min
Time 75% to 25%	19.375 min
Time 75% to 25% (sec)	1162.5 sec



f = 0.00864 or
m/min

1.44E-04
m/s

Appendix 4
Environmental Laboratory Test Results



Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US

Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Site Investigations Ltd
The Grange
Carhugar
12th Lock Road
Lucan
Co. Dublin

Attention: Stephen Letch

CERTIFICATE OF ANALYSIS

Date of report Generation: 24 June 2024
Customer: Site Investigations Ltd
Sample Delivery Group (SDG): 240617-36
Your Reference: 6301
Location: Craddockstown, Naas
Report No: 732635
Order Number: 24/B/24

We received 3 samples on Monday June 17, 2024 and 3 of these samples were scheduled for analysis which was completed on Monday June 24, 2024. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 240617-36
Client Ref.: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
29942239	TP 01		0.50 - 0.50	
29942240	TP 03		0.50 - 0.50	
29942241	TP 05		0.50 - 0.50	

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 240617-36
Client Ref.: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

Results Legend

- X Test
- N No Determination Possible

Sample Types -

- S - Soil/Solid
- UNS - Unspecified Solid
- GW - Ground Water
- SW - Surface Water
- LE - Land Leachate
- PL - Prepared Leachate
- PR - Process Water
- SA - Saline Water
- TE - Trade Effluent
- TS - Treated Sewage
- US - Untreated Sewage
- RE - Recreational Water
- DW - Drinking Water
- Non-regulatory
- UNL - Unspecified Liquid
- SL - Sludge
- G - Gas
- OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
29942239	TP 01		0.50 - 0.50	1 kg TUB with Handle (ALE260)	S
29942240	TP 03		0.50 - 0.50	250g Amber Jar (ALE210)	S
29942241	TP 05		0.50 - 0.50	60g VOC (ALE215)	S

Parameter	All	NDPs: 0 Tests: 3	29942239	29942240	29942241
Anions by Kone (w)	All	NDPs: 0 Tests: 3	X	X	X
CEN Readings	All	NDPs: 0 Tests: 3	X	X	X
Chromium III	All	NDPs: 0 Tests: 3	X	X	X
Coronene	All	NDPs: 0 Tests: 3	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3	X	X	X
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 3	X	X	X
EPH by GCxGC-FID	All	NDPs: 0 Tests: 3	X	X	X
EPH CWG GC (S)	All	NDPs: 0 Tests: 3	X	X	X
Fluoride	All	NDPs: 0 Tests: 3	X	X	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3		X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3	X	X	X
Loss on Ignition in soils	All	NDPs: 0 Tests: 3	X	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 3	X	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 3	X	X	X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 3	X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 240617-36
Client Ref.: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

Results Legend <div style="display: flex; flex-direction: column; gap: 5px;"> <div style="display: flex; align-items: center;">X Test</div> <div style="display: flex; align-items: center;">N No Determination Possible</div> </div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	
		29942239	TP 01		0.50 - 0.50	60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)	S
		29942240	TP 03		0.50 - 0.50	60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)	S
		29942241	TP 05		0.50 - 0.50	60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)	S
	PAH by GCMS	All	NDPs: 0 Tests: 3				
	PCBs by GCMS	All	NDPs: 0 Tests: 3				
pH	All	NDPs: 0 Tests: 3					
pH Value of Filtered Water	All	NDPs: 0 Tests: 3					
Phenols by HPLC (W)	All	NDPs: 0 Tests: 3					
Sample description	All	NDPs: 0 Tests: 3					
Total Organic Carbon	All	NDPs: 0 Tests: 3					
TPH CWG GC (S)	All	NDPs: 0 Tests: 3					
VOC MS (S)	All	NDPs: 0 Tests: 3					



CERTIFICATE OF ANALYSIS

Validated

SDG: 240617-36
Client Ref.: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
------------------	----------	-------------	-----------------	---------------	-------------	---------------	------------	--------------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
29942239	TP 01	0.50 - 0.50	Dark Brown	Sandy Loam	Stones	None
29942240	TP 03	0.50 - 0.50	Dark Brown	Loamy Sand	Vegetation	Stones
29942241	TP 05	0.50 - 0.50	Dark Brown	Loamy Sand	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 240617-36
Client Ref.: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

Results Legend			Customer Sample Ref.	TP 01	TP 03	TP 05		
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50		
M	mCERTS accredited.			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
aq	Aqueous / settled sample.			-	-	-		
diss.filt	Dissolved / filtered sample.			-	-	-		
tot.unfilt	Total / unfiltered sample.			-	-	-		
*	Subcontracted - refer to subcontractor report for accreditation status.			17/06/2024	17/06/2024	17/06/2024		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			240617-36	240617-36	240617-36		
(F)	Trigger breach confirmed			29942239	29942240	29942241		
1-4*	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	11 §	15 §	13 §			
Loss on ignition	<0.7 %	TM018	1.41 § M	3.81 § M	4.13 § M			
Organic Carbon, Total	<0.2 %	TM132	0.232 § M	0.988 § M	1.35 § M			
pH	1 pH Units	TM133	8.72 § M	8.63 § M	8.7 § M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 § M	<0.6 § M	<0.6 § M			
PCB congener 28	<3 µg/kg	TM168	<3 § M	<3 § M	<3 § M			
PCB congener 52	<3 µg/kg	TM168	<3 § M	<3 § M	<3 § M			
PCB congener 101	<3 µg/kg	TM168	<3 § M	<3 § M	<3 § M			
PCB congener 118	<3 µg/kg	TM168	<3 § M	<3 § M	<3 § M			
PCB congener 138	<3 µg/kg	TM168	<3 § M	<3 § M	<3 § M			
PCB congener 153	<3 µg/kg	TM168	<3 § M	<3 § M	<3 § M			
PCB congener 180	<3 µg/kg	TM168	<3 § M	<3 § M	<3 § M			
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21 §	<21 §	<21 §			
Chromium, Trivalent	<0.9 mg/kg	TM181	7.27 §	15.2 §	10.9 §			
Antimony	<0.6 mg/kg	TM181	<0.6 § #	<0.6 § #	<0.6 § #			
Arsenic	<0.6 mg/kg	TM181	8.11 § M	14.7 § M	13.3 § M			
Barium	<0.6 mg/kg	TM181	39.9 § #	67.2 § #	65.4 § #			
Cadmium	<0.02 mg/kg	TM181	1.47 § M	2.36 § M	1.9 § M			
Chromium	<0.9 mg/kg	TM181	7.27 § M	15.2 § M	10.9 § M			
Copper	<1.4 mg/kg	TM181	14.5 § M	21.6 § M	18.5 § M			
Lead	<0.7 mg/kg	TM181	16.7 § M	31.4 § M	31.5 § M			
Mercury	<0.1 mg/kg	TM181	<0.1 § M	<0.1 § M	<0.1 § M			
Molybdenum	<0.1 mg/kg	TM181	0.826 § #	1.17 § #	1.52 § #			
Nickel	<0.2 mg/kg	TM181	26 § M	42.4 § M	31.8 § M			
Selenium	<1 mg/kg	TM181	1.96 § #	2.5 § #	2.15 § #			
Zinc	<1.9 mg/kg	TM181	92.1 § M	144 § M	118 § M			
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410	<10 §	<10 §	<10 §			
Coronene	<200 µg/kg	TM410	<200 §	<200 §	<200 §			
Mineral Oil >C10-C40 (EH_2D_AL)	<5 mg/kg	TM415	<5 §	<5 §	<5 §			



CERTIFICATE OF ANALYSIS

Validated

SDG: 240617-36
Client Ref.: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

TPH CWG (S)

Results Legend		Customer Sample Ref.	TP 01	TP 03	TP 05			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50			
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
aq	Aqueous / settled sample.		-	-	-			
diss.filt	Dissolved / filtered sample.		-	-	-			
tot.unfilt	Total / unfiltered sample.		-	-	-			
*	Subcontracted - refer to subcontractor report for accreditation status.		17/06/2024	17/06/2024	17/06/2024			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		240617-36	240617-36	240617-36			
(F)	Trigger breach confirmed		29942239	29942240	29942241			
1-4*	@Sample deviation (see appendix)							
Component	LOD/Units		Method					
GRO Surrogate % recovery**	%	TM089	105	103	102			
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/kg	TM089	<10	<10	<10			
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/kg	TM089	<10	<10	<10			
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/kg	TM089	<10	<10	<10			
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1000 µg/kg	TM414	<1000	<1000	<1000			
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1000 µg/kg	TM414	<1000	<1000	<1000			
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1000 µg/kg	TM414	<1000	<1000	<1000			
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1000 µg/kg	TM414	<1000	<1000	3510			
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1000 µg/kg	TM414	<1000	<1000	<1000			
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5000 µg/kg	TM414	<5000	<5000	<5000			
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10000 µg/kg	TM414	<10000	<10000	<10000			
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/kg	TM089	<10	<10	<10			
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/kg	TM089	<10	<10	<10			
Aromatics >EC8-EC10 (HS_1D_AR)	<10 µg/kg	TM089	<10	<10	<10			
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000	<1000	<1000			
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000	<1000	<1000			
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000	<1000	1030			
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000	<1000	4130			
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000	<1000	<1000			
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000	<1000	<1000			
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5000 µg/kg	TM414	<5000	<5000	6250			
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10000 µg/kg	TM414	<10000	<10000	<10000			
GRO >C5-C6 (HS_1D)	<20 µg/kg	TM089	<20	<20	<20			
GRO >C6-C7 (HS_1D)	<20 µg/kg	TM089	<20	<20	<20			
GRO >C7-C8 (HS_1D)	<20 µg/kg	TM089	<20	<20	<20			
GRO >C8-C10 (HS_1D)	<20 µg/kg	TM089	<20	<20	<20			
GRO >C10-C12 (HS_1D)	<20 µg/kg	TM089	<20	<20	<20			
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<50 µg/kg	TM089	<50	<50	<50			
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<50 µg/kg	TM089	<50	<50	<50			
GRO >C5-C10 (HS_1D_TOTAL)	<20 µg/kg	TM089	<20	<20	<20			



CERTIFICATE OF ANALYSIS

Validated

SDG: 240617-36
Client Ref.: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

VOC MS (S)

Results Legend			Customer Sample Ref.	TP 01	TP 03	TP 05			
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50			
M	mCERTS accredited.			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
aq	Aqueous / settled sample.			-	-	-			
diss.filt	Dissolved / filtered sample.			-	-	-			
tot.unfilt	Total / unfiltered sample.			17/06/2024	17/06/2024	17/06/2024			
*	Subcontracted - refer to subcontractor report for accreditation status.			240617-36	240617-36	240617-36			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			29942239	29942240	29942241			
(F)	Trigger breach confirmed								
1-4*	@Sample deviation (see appendix)								
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	149	107	111				
			§	§	§				
Toluene-d8**	%	TM116	99.8	86.3	96.4				
			§	§	§				
4-Bromofluorobenzene**	%	TM116	97.5	86.8	78.2				
			§	§	§				
Methyl Tertiary Butyl Ether	<0.5 µg/kg	TM116	<0.5	<0.5	<0.5				
			§ M	§ M	§ M				
Benzene	<1 µg/kg	TM116	<1	<1	<1				
			§ M	§ M	§ M				
Toluene	<1 µg/kg	TM116	<2	<1	<2.1				
			§ M	§ M	§ M				
Ethylbenzene	<1 µg/kg	TM116	<1	<1	<1				
			§ M	§ M	§ M				
p/m-Xylene	<2 µg/kg	TM116	<2	<2	<2				
			§ #	§ #	§ #				
o-Xylene	<2 µg/kg	TM116	<2	<2	<2				
			§ M	§ M	§ M				



CERTIFICATE OF ANALYSIS

Validated

SDG: 240617-36
Client Ref.: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.100
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Craddockstown, Naas
Natural Moisture Content (%)	11.1
Dry Matter Content (%)	90

Case	
SDG	240617-36
Lab Sample Number(s)	29942239
Sampled Date	
Customer Sample Ref.	TP 01
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.232
Loss on Ignition (%)	1.41
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.72
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	<0.0002	<0.0002	<0.002	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00115	<0.0003	0.0115	<0.003	2	50	100
Mercury Dissolved (CVAf)	0.0000155	<0.00001	0.000155	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000629	<0.0004	0.00629	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00156	<0.001	0.0156	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	49.2	<10	492	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.16	<3	31.6	<30	500	800	1000

Leach Test Information

Date Prepared	18-Jun-2024
pH (pH Units)	8.88
Conductivity (µS/cm)	64
Volume Leachant (Litres)	0.890

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
 Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation



CERTIFICATE OF ANALYSIS

Validated

SDG: 240617-36
Client Ref.: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.101
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Craddockstown, Naas
Natural Moisture Content (%)	12.6
Dry Matter Content (%)	88.8

Case	
SDG	240617-36
Lab Sample Number(s)	29942240
Sampled Date	
Customer Sample Ref.	TP 03
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.988
Loss on Ignition (%)	3.81
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.63
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	<0.0002	<0.0002	<0.002	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.000991	<0.0003	0.00991	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000671	<0.0004	0.00671	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00107	<0.001	0.0107	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	63	<10	630	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.51	<3	35.1	<30	500	800	1000

Leach Test Information

Date Prepared	18-Jun-2024
pH (pH Units)	8.77
Conductivity (µS/cm)	82
Volume Leachant (Litres)	0.889

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
 Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

24/06/2024 15:01:04

15:00:55 24/06/2024



CERTIFICATE OF ANALYSIS

Validated

SDG: 240617-36
Client Ref.: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.105
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Craddockstown, Naas
Natural Moisture Content (%)	15.8
Dry Matter Content (%)	86.4

Case	
SDG	240617-36
Lab Sample Number(s)	29942241
Sampled Date	
Customer Sample Ref.	TP 05
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	1.35
Loss on Ignition (%)	4.13
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.7
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00061	<0.0005	0.0061	<0.005	0.5	2	25
Barium	<0.0002	<0.0002	<0.002	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00154	<0.0003	0.0154	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00066	<0.0004	0.0066	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00204	<0.001	0.0204	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	70.1	<10	701	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.37	<3	33.7	<30	500	800	1000

Leach Test Information

Date Prepared	18-Jun-2024
pH (pH Units)	8.67
Conductivity (µS/cm)	92
Volume Leachant (Litres)	0.885

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
 Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

24/06/2024 15:01:04

15:00:55 24/06/2024



CERTIFICATE OF ANALYSIS

Validated

SDG: 240617-36
Client Ref.: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

Table of Results - Appendix

Method No	Description
TM104	Determination of Fluoride using the Kone Analyser
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM414	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
PM024	Soil preparation including homogenisation, moisture, screens of soils for Asbestos Containing Material
PM115	Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	Determination of Loss on Ignition
TM090	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM116	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	ELTRA CS800 Operators Guide
TM133	Determination of pH in Soil and Water using the GLpH pH Meter
TM259	Determination of Phenols in Waters and Leachates by HPLC
TM410	Determination of Coronene in soils by GCMS
TM089	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM151	Determination of Hexavalent Chromium using Kone analyser
TM181	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM152	Analysis of Aqueous Samples by ICP-MS
TM168	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM218	The determination of PAH in soil samples by GC-MS
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM415	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 240617-36
Client Ref.: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

Test Completion Dates

Lab Sample No(s) Customer Sample Ref.	29942239	29942240	29942241
	TP 01	TP 03	TP 05
AGS Ref.			
Depth	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (w)	24-Jun-2024	24-Jun-2024	24-Jun-2024
CEN 10:1 Leachate (1 Stage)	19-Jun-2024	19-Jun-2024	19-Jun-2024
CEN Readings	21-Jun-2024	21-Jun-2024	21-Jun-2024
Chromium III	21-Jun-2024	20-Jun-2024	21-Jun-2024
Coronene	21-Jun-2024	21-Jun-2024	21-Jun-2024
Dissolved Metals by ICP-MS	21-Jun-2024	21-Jun-2024	21-Jun-2024
Dissolved Organic/Inorganic Carbon	21-Jun-2024	21-Jun-2024	21-Jun-2024
EPH by GCxGC-FID	20-Jun-2024	20-Jun-2024	20-Jun-2024
EPH CWG GC (S)	20-Jun-2024	20-Jun-2024	20-Jun-2024
Fluoride	20-Jun-2024	20-Jun-2024	20-Jun-2024
GRO by GC-FID (S)	20-Jun-2024	20-Jun-2024	20-Jun-2024
Hexavalent Chromium (s)	19-Jun-2024	19-Jun-2024	19-Jun-2024
Loss on Ignition in soils	20-Jun-2024	20-Jun-2024	20-Jun-2024
Mercury Dissolved	24-Jun-2024	24-Jun-2024	24-Jun-2024
Metals in solid samples by OES	21-Jun-2024	20-Jun-2024	20-Jun-2024
Moisture at 105C	18-Jun-2024	18-Jun-2024	18-Jun-2024
PAH 16 & 17 Calc	21-Jun-2024	21-Jun-2024	21-Jun-2024
PAH by GCMS	21-Jun-2024	21-Jun-2024	21-Jun-2024
PCBs by GCMS	21-Jun-2024	21-Jun-2024	21-Jun-2024
pH	20-Jun-2024	20-Jun-2024	20-Jun-2024
pH Value of Filtered Water	21-Jun-2024	21-Jun-2024	21-Jun-2024
Phenols by HPLC (W)	21-Jun-2024	21-Jun-2024	21-Jun-2024
Sample description	18-Jun-2024	18-Jun-2024	18-Jun-2024
Total Organic Carbon	21-Jun-2024	24-Jun-2024	24-Jun-2024
TPH CWG GC (S)	20-Jun-2024	20-Jun-2024	20-Jun-2024
VOC MS (S)	20-Jun-2024	21-Jun-2024	20-Jun-2024



CERTIFICATE OF ANALYSIS

SDG: 240617-36
Client Ref: 6301

Report Number: 732635
Location: Craddockstown, Naas

Superseded Report:

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anorthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

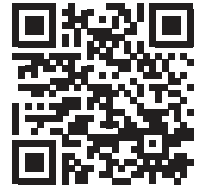
Appendix 5
Waste Classification Report



Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- a) understand the origin of the waste
- b) select the correct List of Waste code(s)
- c) confirm that the list of determinands, results and sampling plan are fit for purpose
- d) select and justify the chosen metal species (Appendix B)
- e) correctly apply moisture correction and other available corrections
- f) add the meta data for their user-defined substances (Appendix A)
- g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



9ZSIL-ZFKYX-G8GLA

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

6301

Description/Comments

Client: Kildare County Council
Engineer: Hayes Higgins Partnership

Project

Craddockstown

Site

Naas, Co. Kildare

Classified by

Name: **Stephen Letch**
Date: **30 Jul 2024 12:50 GMT**
Telephone: **00353 86817 9449**
Company: **Site Investigations Ltd**
The Grange
12th Lock Road
Lucan
K78 F598

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification
Most recent 3 year Refresher

Date

09 Oct 2019
04 Oct 2022

Next 3 year Refresher due by Oct 2025

Purpose of classification

2 - Material Characterisation

Address of the waste

Craddockstown, Naas, Co. Kildare

Post Code N/A

SIC for the process giving rise to the waste

43130 Test drilling and boring

Description of industry/producer giving rise to the waste

Site Investigation

Description of the specific process, sub-process and/or activity that created the waste

Soils recovered for environmental testing

Description of the waste

Natural soils



Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	WAC Results		Page
					Inert	Non Haz	
1	TP01-0.50	0.50	Non Hazardous		Pass	Pass	3
2	TP03-0.50	0.50	Non Hazardous		Pass	Pass	7
3	TP05-0.50	0.50	Non Hazardous		Pass	Pass	11

Related documents

#	Name	Description
1	240617-36.hwol	ALS Hawarden .hwol file used to populate the Job
2	Rilta Suite NEW	waste stream template used to create this Job

WAC results

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate the samples in this Job: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

Report

Created by: Stephen Letch

Created date: 30 Jul 2024 12:50 GMT

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Appendix B: Rationale for selection of metal species	16
Appendix C: Version	17



Classification of sample: TP01-0.50

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP01-0.50	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.50 m	
Moisture content:	
11%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

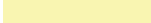
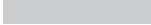


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
2	confirm TPH has NOT arisen from diesel or petrol				<input checked="" type="checkbox"/>					
3	antimony { antimony trioxide }				<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		<LOD
	051-005-00-X	215-175-0	1309-64-4							
4	arsenic { arsenic pentoxide }				8.11 mg/kg	1.534	11.071 mg/kg	0.00111 %	✓	
	033-004-00-6	215-116-9	1303-28-2							
5	barium { barium sulphide }				39.9 mg/kg	1.233	43.803 mg/kg	0.00438 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
6	cadmium { cadmium sulfate }				1.47 mg/kg	1.855	2.426 mg/kg	0.000243 %	✓	
	048-009-00-9	233-331-6	10124-36-4							
7	copper { dicopper oxide; copper (I) oxide }				14.5 mg/kg	1.126	14.53 mg/kg	0.00145 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	16.7 mg/kg		14.863 mg/kg	0.00149 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				0.826 mg/kg	1.5	1.103 mg/kg	0.00011 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel sulfate }				26 mg/kg	2.637	61.013 mg/kg	0.0061 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1.96 mg/kg	1.405	2.451 mg/kg	0.000245 %	✓	
	034-002-00-8									
13	zinc { zinc sulphate }				92.1 mg/kg	2.469	202.406 mg/kg	0.0202 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				7.27 mg/kg	1.462	9.457 mg/kg	0.000946 %	✓	
		215-160-9	1308-38-9							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
16	naphthalene				<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
17	acenaphthylene				<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
		205-917-1	208-96-8							
18	acenaphthene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
		201-469-6	83-32-9							
19	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		201-695-5	86-73-7							
20	phenanthrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
		201-581-5	85-01-8							
21	anthracene				<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
		204-371-1	120-12-7							
22	fluoranthene				<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %		<LOD
		205-912-4	206-44-0							
23	pyrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
		204-927-3	129-00-0							
24	benzo[a]anthracene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
25	chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	benzo[b]fluoranthene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
27	benzo[k]fluoranthene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
28	benzo[a]pyrene; benzo[def]chrysene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
29	indeno[123-cd]pyrene				<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %		<LOD
		205-893-2	193-39-5							
30	dibenz[a,h]anthracene				<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
31	benzo[ghi]perylene				<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
		205-883-8	191-24-2							
32	polychlorobiphenyls; PCB				<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.0005 mg/kg		<0.0005 mg/kg	<0.00000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
34	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
35	toluene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
36	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
37	coronene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		205-881-7	191-07-1							
38	pH				8.72 pH		8.72 pH	8.72 pH		
			PH							
39	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
Total:								0.0376 %		



Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



WAC results for sample: TP01-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis			Landfill Waste Acceptance Criteria Limits	
#	Determinand	User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	% 0.232	3	5
2	LOI (loss on ignition)	% 1.41	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg <0.008	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg <0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg <5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg <10	100	-
7	pH	pH 8.72	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	-	-
Eluate Analysis 10:1				
9	arsenic	mg/kg <0.005	0.5	2
10	barium	mg/kg <0.002	20	100
11	cadmium	mg/kg <0.0008	0.04	1
12	chromium	mg/kg <0.01	0.5	10
13	copper	mg/kg 0.0115	2	50
14	mercury	mg/kg 0.0001	0.01	0.2
15	molybdenum	mg/kg <0.03	0.5	10
16	nickel	mg/kg 0.0062	0.4	10
17	lead	mg/kg <0.002	0.5	10
18	antimony	mg/kg <0.01	0.06	0.7
19	selenium	mg/kg <0.01	0.1	0.5
20	zinc	mg/kg 0.0156	4	50
21	chloride	mg/kg <20	800	15,000
22	fluoride	mg/kg <5	10	150
23	sulphate	mg/kg <20	1,000	20,000
24	phenol index	mg/kg <0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg 31.6	500	800
26	TDS (total dissolved solids)	mg/kg 492	4,000	60,000

Key

User supplied data



Classification of sample: TP03-0.50

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP03-0.50	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.50 m	
Moisture content:	
15% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

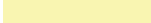
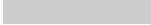


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2	confirm TPH has NOT arisen from diesel or petrol				<input checked="" type="checkbox"/>					
3	antimony { antimony trioxide }				<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		<LOD
	051-005-00-X	215-175-0	1309-64-4							
4	arsenic { arsenic pentoxide }				14.7 mg/kg	1.534	19.166 mg/kg	0.00192 %	✓	
	033-004-00-6	215-116-9	1303-28-2							
5	barium { barium sulphide }				67.2 mg/kg	1.233	70.457 mg/kg	0.00705 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
6	cadmium { cadmium sulfate }				2.36 mg/kg	1.855	3.72 mg/kg	0.000372 %	✓	
	048-009-00-9	233-331-6	10124-36-4							
7	copper { dicopper oxide; copper (I) oxide }				21.6 mg/kg	1.126	20.671 mg/kg	0.00207 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	31.4 mg/kg		26.69 mg/kg	0.00267 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				1.17 mg/kg	1.5	1.492 mg/kg	0.000149 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel sulfate }				42.4 mg/kg	2.637	95.026 mg/kg	0.0095 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				2.5 mg/kg	1.405	2.986 mg/kg	0.000299 %	✓	
	034-002-00-8									
13	zinc { zinc sulphate }				144 mg/kg	2.469	302.242 mg/kg	0.0302 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15.2 mg/kg	1.462	18.883 mg/kg	0.00189 %	✓	
		215-160-9	1308-38-9							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
16	naphthalene				<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
17	acenaphthylene				<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
		205-917-1	208-96-8							
18	acenaphthene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
		201-469-6	83-32-9							
19	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		201-695-5	86-73-7							
20	phenanthrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
		201-581-5	85-01-8							
21	anthracene				<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
		204-371-1	120-12-7							
22	fluoranthene				<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %		<LOD
		205-912-4	206-44-0							
23	pyrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
		204-927-3	129-00-0							
24	benzo[a]anthracene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
25	chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	benzo[b]fluoranthene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
27	benzo[k]fluoranthene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
28	benzo[a]pyrene; benzo[def]chrysene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
29	indeno[123-cd]pyrene				<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %		<LOD
		205-893-2	193-39-5							
30	dibenz[a,h]anthracene				<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
31	benzo[ghi]perylene				<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
		205-883-8	191-24-2							
32	polychlorobiphenyls; PCB				<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.0005 mg/kg		<0.0005 mg/kg	<0.00000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
34	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
35	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
36	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
37	coronene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		205-881-7	191-07-1							
38	pH				8.63 pH		8.63 pH	8.63 pH		
			PH							
39	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
Total:								0.0574 %		



Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



WAC results for sample: TP03-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis			Landfill Waste Acceptance Criteria Limits	
#	Determinand	User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	% 0.988	3	5
2	LOI (loss on ignition)	% 3.81	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg <0.007	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg <0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg <5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg <10	100	-
7	pH	pH 8.63	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	-	-
Eluate Analysis 10:1				
9	arsenic	mg/kg <0.005	0.5	2
10	barium	mg/kg <0.002	20	100
11	cadmium	mg/kg <0.0008	0.04	1
12	chromium	mg/kg <0.01	0.5	10
13	copper	mg/kg 0.0099	2	50
14	mercury	mg/kg <0.0001	0.01	0.2
15	molybdenum	mg/kg <0.03	0.5	10
16	nickel	mg/kg 0.0067	0.4	10
17	lead	mg/kg <0.002	0.5	10
18	antimony	mg/kg <0.01	0.06	0.7
19	selenium	mg/kg <0.01	0.1	0.5
20	zinc	mg/kg 0.0107	4	50
21	chloride	mg/kg <20	800	15,000
22	fluoride	mg/kg <5	10	150
23	sulphate	mg/kg <20	1,000	20,000
24	phenol index	mg/kg <0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg 35.1	500	800
26	TDS (total dissolved solids)	mg/kg 630	4,000	60,000

Key

User supplied data



Classification of sample: TP05-0.50

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP05-0.50	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.50 m	
Moisture content:	
13%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

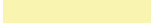
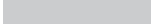


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2	confirm TPH has NOT arisen from diesel or petrol				<input checked="" type="checkbox"/>					
3	antimony { antimony trioxide }				<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		<LOD
	051-005-00-X	215-175-0	1309-64-4							
4	arsenic { arsenic pentoxide }				13.3 mg/kg	1.534	17.748 mg/kg	0.00177 %	✓	
	033-004-00-6	215-116-9	1303-28-2							
5	barium { barium sulphide }				65.4 mg/kg	1.233	70.183 mg/kg	0.00702 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
6	cadmium { cadmium sulfate }				1.9 mg/kg	1.855	3.066 mg/kg	0.000307 %	✓	
	048-009-00-9	233-331-6	10124-36-4							
7	copper { dicopper oxide; copper (I) oxide }				18.5 mg/kg	1.126	18.121 mg/kg	0.00181 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	31.5 mg/kg		27.405 mg/kg	0.00274 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				1.52 mg/kg	1.5	1.984 mg/kg	0.000198 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel sulfate }				31.8 mg/kg	2.637	72.947 mg/kg	0.00729 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				2.15 mg/kg	1.405	2.628 mg/kg	0.000263 %	✓	
	034-002-00-8									
13	zinc { zinc sulphate }				118 mg/kg	2.469	253.498 mg/kg	0.0253 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				10.9 mg/kg	1.462	13.86 mg/kg	0.00139 %	✓	
		215-160-9	1308-38-9							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
16	naphthalene				<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
17	acenaphthylene				<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
		205-917-1	208-96-8							
18	acenaphthene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
		201-469-6	83-32-9							
19	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		201-695-5	86-73-7							
20	phenanthrene				0.0343 mg/kg		0.0298 mg/kg	0.00000298 %	✓	
		201-581-5	85-01-8							
21	anthracene				<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
		204-371-1	120-12-7							
22	fluoranthene				0.127 mg/kg		0.11 mg/kg	0.000011 %	✓	
		205-912-4	206-44-0							
23	pyrene				0.112 mg/kg		0.0974 mg/kg	0.00000974 %	✓	
		204-927-3	129-00-0							
24	benzo[a]anthracene				0.0589 mg/kg		0.0512 mg/kg	0.00000512 %	✓	
	601-033-00-9	200-280-6	56-55-3							
25	chrysene				0.06 mg/kg		0.0522 mg/kg	0.00000522 %	✓	
	601-048-00-0	205-923-4	218-01-9							
26	benzo[b]fluoranthene				0.0737 mg/kg		0.0641 mg/kg	0.00000641 %	✓	
	601-034-00-4	205-911-9	205-99-2							
27	benzo[k]fluoranthene				0.0257 mg/kg		0.0224 mg/kg	0.00000224 %	✓	
	601-036-00-5	205-916-6	207-08-9							
28	benzo[a]pyrene; benzo[def]chrysene				0.0554 mg/kg		0.0482 mg/kg	0.00000482 %	✓	
	601-032-00-3	200-028-5	50-32-8							
29	indeno[123-cd]pyrene				0.0382 mg/kg		0.0332 mg/kg	0.00000332 %	✓	
		205-893-2	193-39-5							
30	dibenz[a,h]anthracene				<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
31	benzo[ghi]perylene				0.0356 mg/kg		0.031 mg/kg	0.0000031 %	✓	
		205-883-8	191-24-2							
32	polychlorobiphenyls; PCB				<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.0005 mg/kg		<0.0005 mg/kg	<0.00000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
34	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
35	toluene				<0.0021 mg/kg		<0.0021 mg/kg	<0.00000021 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
36	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
37	coronene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		205-881-7	191-07-1							
38	pH				8.7 pH		8.7 pH	8.7 pH		
			PH							
39	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
Total:								0.0494 %		



Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



WAC results for sample: TP05-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis			Landfill Waste Acceptance Criteria Limits	
#	Determinand	User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	% 1.35	3	5
2	LOI (loss on ignition)	% 4.13	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg <0.0081	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg <0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg <5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg <10	100	-
7	pH	pH 8.7	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	-	-
Eluate Analysis 10:1				
9	arsenic	mg/kg 0.0061	0.5	2
10	barium	mg/kg <0.002	20	100
11	cadmium	mg/kg <0.0008	0.04	1
12	chromium	mg/kg <0.01	0.5	10
13	copper	mg/kg 0.0154	2	50
14	mercury	mg/kg <0.0001	0.01	0.2
15	molybdenum	mg/kg <0.03	0.5	10
16	nickel	mg/kg 0.0066	0.4	10
17	lead	mg/kg <0.002	0.5	10
18	antimony	mg/kg <0.01	0.06	0.7
19	selenium	mg/kg <0.01	0.1	0.5
20	zinc	mg/kg 0.0204	4	50
21	chloride	mg/kg <20	800	15,000
22	fluoride	mg/kg <5	10	150
23	sulphate	mg/kg <20	1,000	20,000
24	phenol index	mg/kg <0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg 33.7	500	800
26	TDS (total dissolved solids)	mg/kg 701	4,000	60,000

Key

User supplied data



Appendix A: Classifier defined and non EU CLP determinands

• TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226, Asp. Tox. 1; H304, STOT RE 2; H373, Muta. 1B; H340, Carc. 1B; H350, Repr. 2; H361d, Aquatic Chronic 2; H411

• confirm TPH has NOT arisen from diesel or petrol

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

• barium sulphide (EC Number: 244-214-4, CAS Number: 21109-95-5)

EU CLP index number: 016-002-00-X

Description/Comments:

Additional Hazard Statement(s): EUH031 >= 0.8 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH031 >= 0.8 % hazard statement sourced from: WM3, Table C12.2

• lead compounds with the exception of those specified elsewhere in this Annex (worst case)

EU CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

• chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332, Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Resp. Sens. 1; H334, Skin Sens. 1; H317, Repr. 1B; H360FD, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

• acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302, Acute Tox. 1; H330, Acute Tox. 1; H310, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315

• acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 2; H411

• fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

• phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 2; H351, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Skin Irrit. 2; H315



• **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

• **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

EU CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans;
POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
29 Sep 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

• **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

EU CLP index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

• **coronene** (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source: <http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en>
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2; H371

• **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case scenario.

arsenic {arsenic pentoxide}

Arsenic pentoxide used as most hazardous species.



barium {barium sulphide}

Chromium VI at limits of detection. Barium sulphide used as the next most hazardous species. No chromate present.

cadmium {cadmium sulfate}

Cadmium sulphate used as the most hazardous species.

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Chromium VI at limits of detection. Lead compounds used as the next most hazardous species. No chromate present.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight.

nickel {nickel sulfate}

Chromium VI at limits of detection. Nickel sulphate used as the next most hazardous species. No chromate present.

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil.

zinc {zinc sulphate}

Chromium VI at limits of detection. Zinc sulphate used as the next most hazardous species. No chromate present.

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1.NI - Jan 2021

HazWasteOnline Classification Engine Version: 2024.158.6092.11254 (06 Jun 2024)

HazWasteOnline Database: 2024.158.6092.11254 (06 Jun 2024)



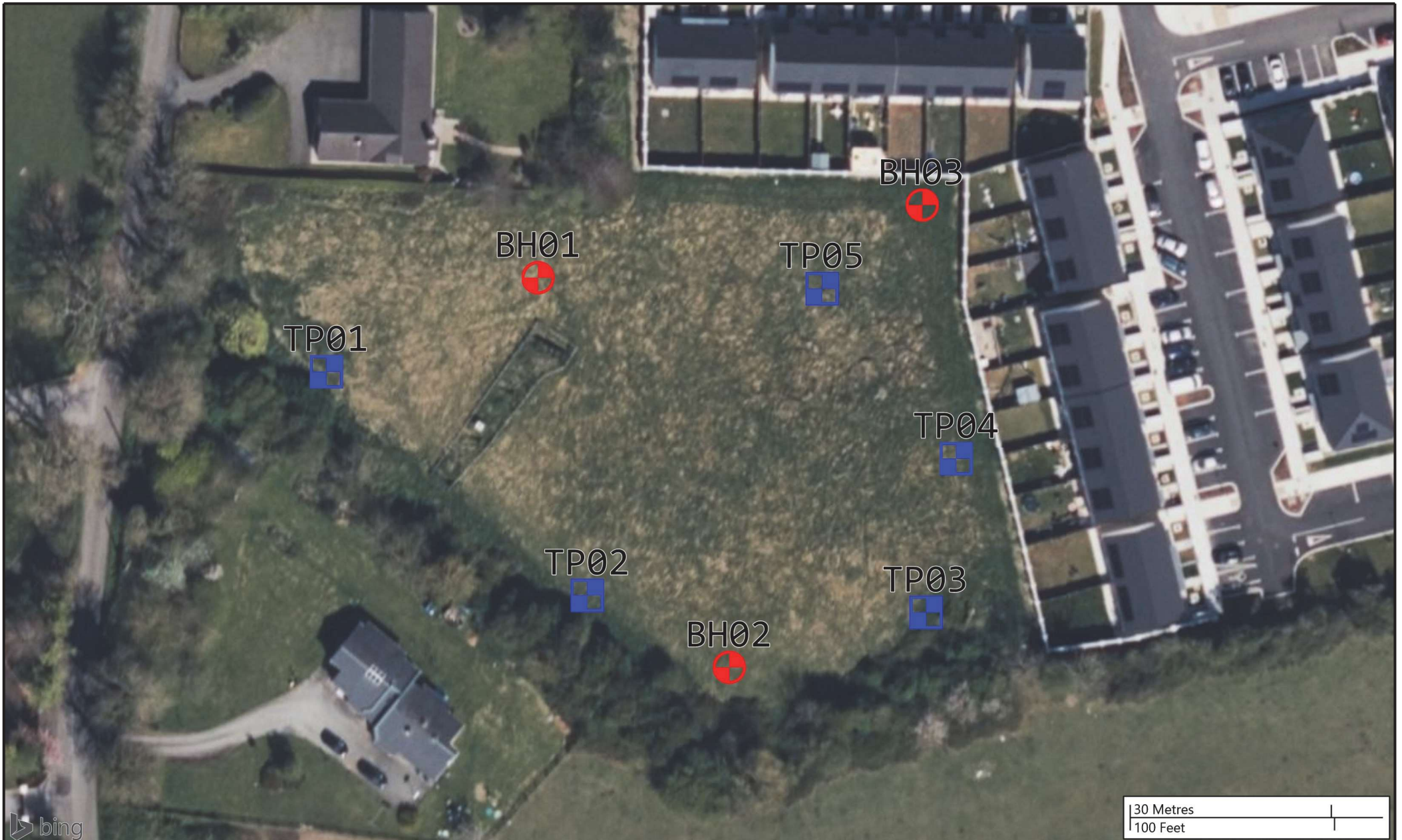
This classification utilises the following guidance and legislation:

WM3 v1.1.NI - Waste Classification - 1st Edition v1.1.NI - Jan 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
17th ATP - Regulation (EU) 2021/849 of 11 March 2021
18th ATP - Regulation (EU) 2022/692 of 16 February 2022
19th ATP - Regulation (EU) 2023/1434 of 25 April 2023
20th ATP - Regulation (EU) 2023/1435 of 2 May 2023
21st ATP - Regulation (EU) 2024/197 of 19 October 2023

Appendix 6
Survey Data

Survey Data

Location	Irish Transverse Mercator		Elevation	Irish National Grid	
	Easting	Northing		Easting	Northing
Cable Percussive Boreholes					
BH01	690165.209	718051.001	118.13	290234.181	218021.074
BH02	690194.962	717993.250	119.17	290263.941	217963.311
BH03	690222.573	718062.963	116.57	290291.558	218033.039
Trial Pits					
TP01	690133.629	718036.341	118.64	290202.594	218006.411
TP02	690173.432	718003.616	119.27	290242.406	217973.679
TP03	690224.296	718002.027	118.76	290293.281	217972.090
TP04	690228.449	718025.127	118.11	290297.435	217995.195
TP05	690207.844	718050.177	115.49	290276.825	218020.250



bing



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Contract No:	6301	Client:	Kildare County Council
Contract Name:	Craddockstown	Engineer:	Hayes Higgins Partnership
Location:	Naas, Co. Kildare	Scale:	1:750
Title:	Site Plan	Drawn By:	SL

Legend Key

-  Locations By Type - CP
-  Locations By Type - TP