Waterman Moylan
Engineering Consultants

Preliminary Construction, Demolition and Waste Management Plan

Residential Development at Broomfield SHD Lands, Malahide.

April 2022

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Comments

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1. Introduction

Waterman Moylan in conjunction with the Developer have prepared the following Preliminary Construction, Demolition & Waste Management Plan which is to accompany the SHD planning application for the implementation of the construction of a residential development at Broomfield, Back Road, Malahide, Co. Dublin.

The plan sets out typical arrangements and measures which may be undertaken during the construction phase of the project in order to mitigate and minimise disruption / disturbance to the area around the site. The purpose of this report is to summarise the possible impacts and measures to be implemented and to guide the Contractor who will be required to develop and implement the Preliminary Construction, Demolition & Waste Management Plan on site during the works.

This management plan is indicative only and should not be construed as representing the exact method or sequence in which the construction works shall be carried out.

As is normal practice, the Main Contractor for the project is responsible for the method in which the construction works are carried out and to ensure that best practices and all legal obligations including Local Authority requirements and Health and Safety legislation are complied with. The main contractor is also responsible for the design and installation of all temporary works required to complete the permanent works. The plan can be used by the Main Contractor to develop their final construction management plan. The Applicant reserves the right to deviate from the contents of this Report as the construction of the development progresses on-site. Any such deviation from this report however shall still comply with all relevant Local Authority requirements and legislation.

2. Surrounding Environs and the Proposed Site

The area of the Broomfield development lands is approximately 12.5 hectares, over 2 sites, north and south. The lands are generally greenfield in nature and are located 1.2km to the south of Malahide town centre, within the catchment of the Sluice River, via a ditch system that drains to the Hazelbrook Stream, a tributary of the Sluice.

It should be noted that there exists a small area of hardstanding paving and 2 structures on a small portion of the northern site. These were associated with the former use of part of the site as a rugby club. The clubhouse and outhouse have been vandalised in the form of fire damage and their demolition is included as part of the subject application. Furthermore, the area to the south of the former the playing pitch, has been historically infilled with inert demolition rubble. It is also intended to excavate and appropriately dispose of this historic infill material as part of the development. Further details on the location and composition of this waste is located in Appendix A: Site Investigation Report.

Please note that the aforementioned Site Investigation report included as Appendix A extends to the area of the known historic infill and the lands immediately adjacent to it, located on the north site, and includes extensive analysis of the made ground material properties for off-site disposal. Appendices B & C contain the Site Investigation reports for the remained of the north site and the south site respectively. No evidence of made ground was found in either of these reports.

The development entrance is from Back Road, 0.5km east of the junction between Back Road and Kinsealy Lane, Malahide Road (R107) is 1.1km to the west, and the Malahide-Donaghmede Road (R124) is 0.5km to the east of the subject site. An additional site access to the south site has been provided from Kinsealy Lane via the Hazelbrook residential development, as requested by Fingal County Council.

The overall proposed development is divided into 2 sites as indicated in *Figure 1* overleaf. The north site is located between the existing Ashwood Hall residential development to the west and the Dublin-Belfast rail line to the east. To the south is agricultural land, the north is bounded by existing properties on the Back Road. The southern site is bounded by the Hazelbrook development to the west, Brookfield residential development to the north and agricultural lands to the south and east.

Figure 1 | *Site Location (Image: Google Earth)*

The proposed development consists of a total of 415 residential units, comprising of 252 houses, 28 duplex units and 135 apartments, as set out in the Schedule of Accommodation in *Table 1*, below. The proposed development will also include construction of a 476m² creche, projected to cater for 15 staff and 85 children.

Description	1-bed	2-bed	3-bed	4-bed	5-bed	Total
House	-	-	192	48	12	252
Duplex	8	14	6	-	-	28
Apartment	37	93	5	-	-	135
Total	45	107	203	48	12	415

Table 1 | *Schedule of Accommodation*

The proposed development is likely to be constructed in two phases and includes, in broad terms, the following:-

- Site clearance, demolition, and removal of historic infill material which comprises inert building rubble (refer to appended Site Investigation report for details).
- Construction and subsequent fitting out of the residential units.

There may be a practical requirement for the development to be divided into sub-phases as part of the construction programme. These will be detailed at the appropriate stage prior to construction.

Working hours for the site will be set out in the conditions of planning approval and would typically be 08.00 to 19.00 from Monday to Friday and 08.00 to 14.00 on Saturday. No Sunday or Bank Holiday work will generally be permitted. The above working hours are typical; however, special construction operations may need to be carried out outside these hours in order to minimise disruption to the surrounding area.

A detailed construction programme has not been developed at this stage. However, it is anticipated that the total construction period for the development will be approximately 36 months. Commencement is estimated to begin before the end of 2023 and will achieve completion by 2026.

On the basis that the construction period is estimated to be 36 months, typically 160 units a year could be under construction at the same time.

3. Demolition of Existing Structures

The structures to be demolished will require an assessment by a structural engineer to ensure they are safe to enter due to the fire damage.

When they structures have been determined as safe to enter, only then may a refurbishment/demolition asbestos survey (RDAS) be undertaken. This is legally required as the building were constructed prior to 2000. The results of this asbestos survey will determine the course of action for progression of the demolition works, and disposal of the demolition material.

4. Construction Waste Management

The main sources of construction waste arising from this project will be:

- Historic rubble infill material to be removed
- Demolition waste
- Topsoil and subsoil
- Packaging and general waste from construction activities
- General site clearance waste including tree stumps, etc.

The site is predominantly greenfield in nature, with some buildings on site.

The buildings to be demolished will require a refurbishment/demolition asbestos survey (RDAS), as the structures were constructed prior to 2000.

It is practical that all topsoil and subsoil generated remains on site and is used for landscaping and engineering purposes as appropriate. Please refer to sections 5.6 & 5.7 for further details.

4.1 Policy and Legislation

The principles and objectives to deliver sustainable waste management for this project have been incorporated in the preparation of this report and are based on the following strategic objectives:-

- National Policy: The Waste Management Acts 1996 to 2005.
- Local Policy: Waste Management Plan for the Dublin Region 2005 – 2010, November 2005.

This Waste Management Plan is also in accordance with the following guidance note published by the Department of the Environment, Heritage and Local Government in July 2006:-

- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition (C&D) Projects.

The hierarchy of waste management sets out the guiding principles in order of importance as follows:-

1. Reduction of the amount of waste generated by the construction process.
2. Segregation of waste is a key concept that will be implemented during the course of the construction phase of the development to enable ease of re-use and recycling, wherever appropriate.
3. Recycle waste material where feasible, including the use of excess excavations as fill material, recycling of various waste fractions such as; metals, packaging etc.

4.2 On site Waste Management

An estimate of the quantities of surplus construction and demolition (C&D) waste and materials which will arise during the course of the construction phase shall be created by the main contractor.

The Purchasing Manager shall ensure that materials are ordered so that the quantity delivered, the timing of the delivery and the storage is not conducive to the creation of unnecessary waste.

4.3 Off Site Waste Management Licensing/Permitting

All waste materials (where necessary, after in-situ reuse and recycling options have been fully considered) shall be disposed of off-site, under the appropriate Duty of Care and subject to approvals/consents from the relevant statutory bodies. It is the responsibility of the Main Contractor to ensure that any company to whom waste is transferred is legally permitted to do so and that the facility they bring the waste to is licensed to handle that type of waste as outlined in the Waste Management Acts 1996-2005. The Waste Collection Permit Register, in accordance with the Waste Management (Collection Permit) Regulations 2001 will be consulted to ensure that waste carriers hold the appropriate permit.

It is anticipated that there is the possibility that waste materials will have to be moved off-site. It is the intention to engage specialist waste service contractors, who will possess the requisite authorisations, for the collection and movement of waste off-site, and to transport the material to a facility which currently holds a Waste Licence, Waste Permit, or Certificate of Registration. Details of waste service contractors and demolitions are not confirmed at the time of writing. The following waste authorisations will be arranged specifically for the project:

Authorisation Type	**Specific Need for Project** (Yes / No?)
Waste Licence	Yes
Waste Permit	Yes
Waste Collection Permit	Yes
Transfrontier Shipment Notification	Not expected
Movement of Hazardous Waste Form	Not expected

Table 2 | *Specific Waste Authorisation Necessary for the Scheme*

Any wastes that have to be disposed/recycled off site will be transported to the nearest appropriate facility in order to comply with the proximity principle and reduce the associated emissions from the transportation of waste. The Environmental Protection Agency holds details of waste facilities; which will be consulted where necessary.

An inspection of the site shall be made by the Main Contractor for hazardous substances, gas cylinders and the like. If such substances are encountered during the course of construction, then works must be halted. The project supervisor for construction stage (PSCS) and the responsible Statutory Authority shall be informed immediately.

The Contractor shall prepare a detailed inventory of construction based hazardous waste generated, such as tars, adhesives, sealants, and other dangerous substances, and these will be kept segregated from other non-hazardous waste to prevent possible contamination. Arrangements shall be made for such substances for disposal in a safe manner to an authorized disposal site or by means acceptable to the relevant Authority.

Certificates and licenses of waste hauliers and recycling/ disposal facilities shall be held by the main contractor for inspection as part of the contractor's own construction waste management plan

The Contractor shall ensure that the excavation works are carried out in accordance with best standard practice and excavation materials are well segregated to minimize any potential cross-contamination.

It is preliminarily estimated that there will not be a requirement for engineering backfill material. Should a surplus (or shortfall) in subsoil or topsoil arise, an article 27 notification to the EPA will be required for soil transfers providing that the volumes either generated or received are unavoidable “by-products” created by another process, i.e., construction.

Similar preliminary estimations for topsoil indicate there will not be an excess or additional requirement of Topsoil for landscaping purposes. Topsoil generated will be used for landscaping purposes and should be handled as discussed in Section 5.6.

In the unlikely case of a soil/topsoil surplus the Contractor shall carry out appropriate environmental chemistry testing in order to determine the waste classification of the soils that are to be excavated and that shall include Waste Acceptance Criteria testing. The test regime shall be agreed with the receiving landfill operator, if not suitable for an Article 27 transfer, and the testing shall be carried out by an accredited laboratory.

Should excavation materials be assessed to be hazardous, the Contractor shall carry out pre-treatment of the waste soils to a methodology that is agreed with the receiving landfill operator and in accordance with Environmental Protection Agency guidance.

The Main Contractor is encouraged to reuse and recycle any waste materials as far as is reasonably practicable.

The Main Contractor shall manage and carry out the works in accordance with best environmental practice and in accordance with the requirements of Local Authority, EPA and all requirements as specified in this document.

4.4 Appointment of C&D Waste Manager

A C&D Waste Manager shall be appointed from the Contractor’s Staff and have overall responsibility for the implementation of the project Waste Management Plan (WMP) during the construction phase. The C&D Waste Manager will be appropriately trained and assigned the authority to instruct all site personnel to comply with the specific provisions of the WMP. At the operational level, a designated person from the main contractor and from each sub-contractor on the site shall be assigned the direct responsibility to ensure that the operations stated in the WMP are performed on an on-going basis.

Copies of the WMP will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the WMP and informed of the responsibilities which fall upon them as a consequence of its provisions. Where source segregation, selective demolition and material reuse techniques apply, each member of staff will be given instructions on how to comply with the WMP. Posters will be designed to reinforce the key messages within the WMP and will be displayed prominently for the benefit of site staff.

4.5 C&D Record Keeping

Details of all arisings, movement and treatment of C&D waste shall be recorded as part of the Waste Auditing regime.

It is the duty of the C&D Waste Manager to ensure that necessary licenses have been obtained as needed. Each consignment of C&D waste taken from the site will be subject to documentation which will conform with *Table 3* along with Transportation Dockets to ensure full traceability of the material to its final destination.

Detail	Particulars
Project of Origin	Broomfield, Malahide, Co. Dublin
Material being Transported	Soil, Construction waste
Quantity of Material	TBC by Contractor prior to starting works
Date of Material Movement	TBC by Contractor prior to starting works
Name of Carrier	TBC by Contractor prior to starting works
Destination of Material	TBC by Contractor prior to starting works
Proposed Use	TBC by Contractor prior to starting works

***Table 3** | Details of Materials Taken from Site*

Fingal County Council have requested in their opinion report, that details of permits and licences for waste transportation and disposal facilities, and expected waste streams and tonnages be provided, however, at this stage of the planning process a Main Contractor for the project has not been appointed and this request is considered premature. It may be considered more practical that the Main Contractors Construction Waste Management Plan be conditioned for agreement by Fingal County Council (with the requisite permits and licences and waste stream and tonnages included) as part of a grant of planning permission.

4.6 Topsoil

In the case of topsoil careful planning and on-site storage can ensure that this resource is reused on-site as much as possible. Any surplus of soil not reused on site can be sold. However, topsoil is quite sensitive and can be rendered useless if not stored and cared for properly.

- It is important that topsoil is kept completely separate from all other construction waste as any cross-contamination of the topsoil can render it useless for reuse.
- It is important to ensure that topsoil is protected from all kinds of vehicle damage and kept away from site-track, delivery vehicle turning areas and site plant and vehicle storage areas.

If topsoil is stored in piles of greater than two metres in height the soil matrix (internal structure) can be damaged beyond repair. It should also be kept as dry as possible and used as soon as possible to reduce any deterioration through lengthy storage and excess moving around the site.

Records of topsoil storage, movements and transfer from site should be kept by the C&D Waste Manager. It is projected that all the topsoil will be reused on-site for landscaping purposes in both private residential gardens and public green areas.

4.7 Earthworks (Subsoil) – Cut and Fill Policy

Practical measures have been implemented during the design process to ensure that cut and fill volumes generated have been kept to a minimum by ensure proposed road and building levels match existing ground levels.

The Site Investigation Reports (S.I. Report) has shown that the soil type is a brown boulder clay which is suitable for reuse as a fill material. The Site Investigation Reports are included as Appendix A, B & C of this document.

Based on the details of the Site Investigation reports, and experience of construction on adjacent sites, there will be no requirement for rock-blasting as part of any excavation works.

The SI report (Appendix A) for part of the north site has confirmed an area of fill material located in the south-east corner of the northern site. It is intended that this fill material be removed and disposed of in accordance with applicable legislation as per its waste classification analysis.

The site investigation report has determined that the infill material is non-hazardous and comprises a volume of approx. 17,280m³. A full discussion on the analysis results is included in the EIAR, Chapter 6.

The volume of material to be excavated to facilitate the installation of the attenuation tanks has been calculated to be 2,130.48m³. This volume is projected to be retained on-site for localised regrading and landscaping works.

With the implementation of practical design measures, preliminarily, there is no requirement for fill material during the course of construction of the development. In order to optimise the impact of the generation of excavated material the following principles have been considered during the detail design and construction phase:-

- The quantity of excavated materials to be removed from or imported to the site has been greatly reduced, by establishing levels of the proposed buildings and roads which optimise the volume of cut and fill.
- Surplus subsoil excavated from the site will be reviewed for possible reuse as engineering fill.
- Surplus unsuitable sub-soils generated by excavations on site will be reviewed for reuse as landscaping or non-engineering fills on site.
- Careful separation of builder's rubble packaging and contaminated waste from re-usable material will result in the minimisation of the disposal of material to landfill.

4.8 Site Access Route for Waste Haulage Vehicles

It is intended that waste haulage vehicles to and from the construction site will typically be made to one main access which is expected to be the main entrance via the access road off Back Road. It is likely that the main arrival route will be from the Malahide Road (R107) as indicated in the figure overleaf. This route offers excellent connectivity for vehicles arriving from Feltrim Road, the M50, the Port Tunnel & Dublin Airport (disposal location to consider proximity principle for the location of waste disposal facilities).

There will no construction access permitted via the Hazelbrook estate.

Figure 2 | *Site Access Route*

5. Dust and Dirt Control

Nuisance dust emissions from construction activities are a common and well recognised problem. Fine particles from these sources are recognised as a potential significant cause of pollution.

The main contractor will be required to demonstrate that both nuisance dust and fine particle emissions from the site is adequately controlled and are within acceptable limits.

Dust and fine particle generation from construction and demolition activities on the site can be substantially reduced through carefully selected mitigation techniques and effective management. Once particles are airborne it is very difficult to prevent them from dispersing into the surrounding area. The most effective technique is to control dust at source and prevent it from becoming airborne, since suppression is virtually impossible once it has become airborne.

The following are techniques and methods which are widely used currently throughout the construction industry and which may be used in the development.

1. The roads around the site are all surfaced, and no dust is anticipated arising from unsealed surfaces.
2. A regime of ‘wet’ road sweeping can be set up to ensure the roads around the immediate site are as clean and free from dirt / dust arising from the site, as is reasonably practicable. This cleaning will be carried out by approved mechanical sweepers.
3. Footpaths immediately around the site can be cleaned by hand regularly, with damping as necessary.
4. High level walkways and surfaces such as scaffolding can be cleaned regularly using safe ‘wet’ methods, as opposed to dry methods.
5. Vehicle waiting areas or hard standings can be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary.
6. Vehicle and wheel washing facilities can be provided at site exit(s) where practicable. If necessary, vehicles can be washed down before exiting the site.
7. Netting can be provided to enclose scaffolding in order to mitigate escape of airborne dust from the existing and new buildings.
8. Vehicles and equipment shall not emit black smoke from exhaust system, except during ignition at start up.
9. Engines and exhaust systems should be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation.
10. Servicing of vehicles and plant should be carried out regularly, rather than just following breakdowns.
11. Internal combustion plant should not be left running unnecessarily.
12. Exhaust direction and heights should be such as not to disturb dust on the ground and to ensure adequate local dispersal of emissions.
13. Where possible fixed plant such as generators should be located away from residential areas.

14. The number of handling operations for materials will be kept to a minimum in order to ensure that dusty material is not moved or handled unnecessarily.
15. The transport of dusty materials and aggregates should be carried out using covered / sheeted lorries.
16. Material handling areas should be clean, tidy, and free from dust.
17. Vehicle loading should be dampened down and drop heights for material to be kept to a minimum.
18. Drop heights for chutes / skips should be kept to a minimum.
19. Dust dispersal over the site boundary should be minimised using static sprinklers or other watering methods as necessary.
20. Stockpiles of materials should be kept to a minimum and if necessary, they should be kept away from sensitive receptors such as residential areas etc.
21. Stockpiles where necessary, should be sheeted or watered down.
22. Methods and equipment should be in place for immediate clean-up of spillages of dusty material.
23. No burning of materials will be permitted on site.
24. Earthworks excavations should be kept damp where necessary and where reasonably practicable.
25. Cutting on site should be avoided where possible by using pre-fabrication methods.
26. Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc, which minimise dust emissions and which have the best available dust suppression measures, should be employed.
27. Where scabbling is to be employed, tools should be fitted with dust bags, residual dust should be vacuumed up rather than swept away, and areas to be scabbled should be screened off.
28. Wet processes should be used to clean building facades if possible. If dry grit blasting is unavoidable then ensure areas of work are sealed off and dust extraction systems used.
29. Where possible pre-mixed plasters and masonry compounds should be used to minimise dust arising from on-site mixing.
30. Prior to commencement, the main contractor should identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions. Furthermore, the main contractor should prepare environmental risk assessments for all dust generating processes, which are envisaged.
31. The main contractor should allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.

6. Ground Water

The excavations for the drainage pipes, water supply, utilities, and foundations have been designed to be as shallow as possible in order to reduce excavation depths. Careful attention will be required to maintain the excavations clear of ground water.

A discharge licence will be required for all water pumped from the excavations to any public water course or sewer.

All water pumped from the excavations will require to be treated for silt and deleterious matter. During any discharge of surface water from the excavations, the quality of the water will be regularly monitored visually for hydrocarbon sheen and suspended solids. Periodic laboratory testing of discharge water samples will be carried out in accordance with the requirements of the discharge licence obtained from the Local Authority.

7. Noise Assessment and Control Measures

The contractor is to meet the requirements of the Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition.

This Guide has been produced with reference to the London Good Practice Guide: Noise and Vibration Control for Demolition and Construction produced by the London Authorities Noise Action Forum, July 2016.

7.1 Environmental Noise Mitigation Measures:

General Considerations:

1. All site staff shall be briefed on noise mitigation measures and the application of best practicable means to be employed to control noise.
2. Site hoarding should be erected to maximise the reduction in noise levels.
3. The contact details of the contractor and site manager shall be displayed to the public, together with the permitted operating hours, including any special permissions given for out of hours work.
4. In the event that The Contractor gets a complaint about noise from a neighbour he will act immediately to remedy the situation.
5. The site entrance shall be located to minimise disturbance to noise sensitive receptors.
6. Internal haul routes shall be maintained, and steep gradients shall be avoided.
7. Material and plant loading and unloading shall only take place during normal working hours, unless the requirement for extended hours is for traffic management (i.e. road closure) or health and safety reasons.
8. Use rubber linings in chutes, dumpers, and hoppers to reduce impact noise.
9. Minimise opening and shutting of gates through good coordination of deliveries and vehicle movements.

Plant

1. Ensure that each item of plant and equipment complies with the noise limits quoted in the relevant European Commission Directive 2000/14/EC.
2. Fit all plant and equipment with appropriate mufflers or silencers of the type recommended by the manufacturer.
3. Use all plant and equipment only for the tasks for which it has been designed.
4. Shut down all plant and equipment in intermittent use, in the intervening periods between work or throttle down to a minimum.
5. Power all plant by mains electricity where possible rather than generators.

6. Maximise screening from existing features or structures and employ the use of partial or full enclosures for fixed plant.
7. Locate movable plant away from noise sensitive receptors where possible
8. All plant operators to be qualified in their specific piece of plant.
9. Compressors and generators will be sited in areas least likely to give rise to nuisance where practicable.

Vehicle activity

1. Ensure all vehicle movement (on-site) occur within normal working hours. (Other than where extension of work requiring such movements has been granted in cases of required road closures or for health and safety reasons).
2. Plan deliveries and vehicle movements so that vehicles are not waiting or queuing on the public highway, if unavoidable engines should be turned off.
3. Plan the site layout to ensure that reversing is kept to a minimum.
4. Where reversing is required use broadband reverse sirens or where it is safe to do so disengage all sirens and use banksmen.
5. Rubber/neoprene or similar non-metal lining material matting to line the inside of material transportation vehicles to avoid first drop high noise levels.
6. Wheel washing of vehicles prior to exiting the site shall take place to ensure that adjoining roads are kept clean of dirt and debris. Regular washing of adjoining streets should also take place as required by road sweepers.

Demolition Phase

1. Employ the use of acoustic screening; this can include planning the demolition sequence to utilise screening afforded by buildings to be demolished.
2. If working out of hours for Health and Safety reasons, limit demolition activities to low level noise activity (unless absolutely unavoidable).
3. Use low impact demolition methods such as non-percussive plant where practicable.
4. Use rotary drills and ‘bursters’ activated by hydraulic or electrical power or chemically based expansion compounds to facilitate fragmentation and excavation of hard material.
5. Avoid the transfer of noise and vibration from demolition activities to adjoining occupied buildings through cutting any vibration transmission path or by structural separation of buildings.
6. Consider the removal of larger sections by lifting them out and breaking them down either in an area away from sensitive receptors or off site.

Ground Works and Piling Phase (No piling works expected)

1. The following hierarchy of groundwork/piling methods should be used if ground conditions, design and safety allows;
    - pressed in methods, e.g., hydraulic jacking
    - Auger/bored piling
    - Diaphragm walling
    - Vibratory piling or vibro-replacement
    - Driven Piling or dynamic consolidation
2. The location and layout of the piling plant should be designed to minimise potential noise impact of generators and motors.
3. Where impact piling is the only option utilise a non-metallic dolly between the hammer and driving helmet or enclose the hammer and helmet with an acoustic shroud.
4. Consider concrete pour sizes and pump locations. Plan the start of concrete pours as early as possible to avoid overruns.
5. Where obstructions are encountered, work should be stopped, and a review undertaken to ensure that work methods that minimise noise are used.
6. When using an auger piling rig do not dislodge material from the auger by rotating it back and forth. Use alternate methods where safe to do so.
7. Prepare pile caps using methods which minimise the use of breakers, e.g., use hydraulic splitters to crack the top of the pile.

Monitoring

1. Carry out regular on-site observation monitoring and checks/audits to ensure that BPM is being used at all times. Such checks shall include;
    - Hours of work
    - Presence of mitigation measures
    - Number and type of plant
    - Construction methods
2. In the event that The Contractor receives a complaint about noise from a neighbour he will act immediately to remedy the situation.
3. A sound level digital meter will be employed as necessary to monitor noise, with results recorded to inform the contractor of noise level.
4. Site reviews must be recorded and made available for inspection.

5. Appraise and review working methods, processes, and procedures on a regular basis to ensure continuous development of BPM.

Communication and Liaison

1. A Community Liaison Plan should be developed by the developer in consultation with local residents/businesses and a single point of contact nominated to engage with Fingal County Council and the residents/businesses and to handle complaints and communication of site information.
2. All site staff should be briefed on the complaints procedure and mitigation requirements and their responsibilities to register and escalate complaints received.

7.2 Risk Assessment & Mitigation

The main contractor will deal with the immediate dangers to hearing etc. associated with high noise levels and the impact of same on construction operatives, by means of risk assessment and mitigation / precautionary measures and equipment, all pursuant to the current health and safety legislation.

Current legislation limits, assessment period of 8 hours of one week (noisiest 8 hours likely to experience):

- Lower Action Value (LAV) – 80 dBA $L_{EX,8}$, 135 dB Peak – Hearing Protection shall be made available and information shall be provided.
- Upper Action Value (UAV) – 85 dBA $L_{EX,8}$, 137 dB Peak – Use of Hearing Protection is mandatory, measures to eliminate the noise as much as possible shall be applied.
- Exposure Limit Value (ELV) – 87 dBA $L_{EX,8}$, 140 dB Peak – Not to be exceeded.

Protection by ear plugs/muffs given by their Signal-to-Noise Ratio (SRN) or Noise Reduction Rating (NRR) is typically 20 – 30 dB.

$$\text{Exposure} = L_{EX,8} - (\text{SNR} - 10)$$

As a guide, if it is difficult to hear a normal conversation at a distance of 2m or a workplace is consistently noisier than a busy street, it is likely that the noise levels in the area are above 80 dBA.

It is not envisaged that any excessively noisy activities will be carried out over extended periods of time during the construction stage. However, due to the nature of the construction works, exposure to noise levels in excess of 80 dBA (Safe Working Limit) may occur occasionally. The Main Contractor will carry out a noise assessment in relation to the proposed works at construction stage. The noise assessment identified the following steps in its analysis;-

1. **Potentially Hazardous Activities**: Use of site machinery and power tools. For example, concrete saws, angle grinders, vibratory plate compactors etc.
2. **Potential Hazards**: Excessive noise
3. **Persons as Risk**: People in the vicinity of the work generating an excessive noise. These persons include employees, contractors, and members of the public.
4. **Risk of Exposure to the Potential Hazard**: Temporary or permanent hearing loss.

5. **Risk Assessment before the Implementation of Control Measures**: Medium.
6. **Risk Assessment after the Implementation of Control Measures**: Low.
7. **Control Measures Implemented by**: Site Manager / Works Supervisor.

The following control measure are to be implemented for persons at risk:-

1. Site Manager shall monitor a likelihood of prolonged exposure to excessive noise and commission noise surveying/monitoring programme where necessary.
2. Works Supervisor shall assess risk arising from noise prior to each particular activity taking place and determine appropriate action. The aim shall be to minimise the exposure to excessive noise levels.
3. If it is likely that the noise exposure exceeds Lower Action Value, then hearing protection must be made available.
4. If it is likely that the noise exposure exceeds Upper Action Value, then hearing protection is mandatory to be used. Work Supervisor shall decide on the most suitable hearing protection to be used based on Exposure (see formula above) and worker's personal preference (earmuffs or earplugs).
5. Works Supervisor shall ensure proposed measures are put in place and that their effectiveness and suitability is evaluated on a regular basis.
6. Site management shall minimise noise at work by looking for alternative processes and/or working methods, which would make the work quieter and/or exposure times shorter.
7. Site Manager shall liaise with all site contractors in order to effectively control noise exposure.
8. Number of people working near source of the noise shall be minimised.
9. Employees must use hearing protection where its use is made compulsory.
10. Hearing protection zones shall be identified where necessary.
11. Spot checks on appropriate use of hearing protection shall be carried out.
12. Operators of rock breaking machines and workers nearby must wear adequate ear protection.

7.3 Proper use of hearing protection

1. Earmuffs: Workers must make sure that they totally cover their ears, fit tightly and that there are no gaps around the seals. Hair, glasses, jewellery, hats etc. shall not interfere with the seal. Seals and insides of earmuffs shall be kept clean. Workers shall make sure that any headband keeps its tension.
2. Earplugs: Workers shall make sure that they are wearing them properly. They shall practice fitting them and get help if they are having trouble. Hands shall be clean before fitting earplugs. Earplugs must not be shared with other workers.
3. Semi-inserts/caps: Same applies as for earplugs. Worker shall make sure that any headband keeps its tension.

All workers are expected to:

1. Co-operate: Help the Company to do what is needed to protect their hearing. Make sure that they use properly any noise control device and follow any working methods that are put in place.

2. Wear any hearing protection they are given: Make sure that they are wearing it properly. They shall wear it all the time when they are exposed to a noisy environment (over UAV). Taking it off even for a short while means that the hearing could still be damaged.
3. Maintain their hearing protection so as to preserve its working condition.
4. Report any problems: Report any problems with the hearing protection or effectiveness of the measures to the work supervisor.

8. Proposed Construction Phasing and Programme

A detailed construction programme has not been developed at this stage. However, it is anticipated that the total construction period for the development will be approximately 36 months. Commencement is estimated to begin before the end of 2023 and will achieve completion by 2026.

9. Runoff Pollution and Sediment Control

The site has drainage ditches on some boundaries which are tributaries of Hazelbrook Stream which outfalls to the Sluice River which in turn ultimately outfalls to Baldoyle Bay. Baldoyle Bay has been designated as an SPA (Special Protection Area) by the NPWS (National Park and Wildlife Service) and Local authority, under the RAMSAR Convention. It was declared a Statutory Nature Reserve in 1988 and supports several habitats as listed in the EU Habitats Directive.

Waste, including waters contaminated with soil/silts and chemicals, should be prevented from entering the natural watercourse.

The Preliminary Construction Management Plan, submitted under a separate cover, identifies the most likely sources of potential contamination and mitigation measures to be implemented on-site to prevent this.

The Site Investigation report for the area of the historic infill material attached is as Appendix A, has included analysis of water samples obtained from the ditch serving the area of the historic infill. No sign of contamination has been identified, and given the material contained within the historic infill has been categorised as non-hazardous, no adverse effects are expected by any potential runoff that may occur during its removal. Further details on this are contained within the EIAR, Chapter 7.

APPENDICES

A. Site Investigation Report - North Site: Historic Infill Area

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Ground Investigations Ireland

Back Road Malahide

Cladwell Estates

Waste Classification Report

April 2020

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DOCUMENT CONTROL SHEET

Project Title	Back Road Malahide
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Document Title	Waste Classification Report

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A	Final	P Moloney	B Sexton	B Sexton	Dublin	09 April 2020

Ground Investigations Ireland Ltd. present the results of the fieldworks and laboratory testing in accordance with the specification and related documents provided by or on behalf of the client. The possibility of variation in the ground and/or groundwater conditions between or below exploratory locations or due to the investigation techniques employed must be taken into account when this report and the appendices inform designs or decisions where such variation may be considered relevant. Ground and/or groundwater conditions may vary due to seasonal, man-made or other activities not apparent during the fieldworks and no responsibility can be taken for such variation. The data presented and the recommendations included in this report and associated appendices are intended for the use of the client and the client's geotechnical representative only and any duty of care to others is excluded unless approved in writing.

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APPENDICES

1.0 Preamble

Ground Investigations Ireland (GII) was appointed by Cladwell Estates to carry out a Waste Classification assessment for a proposed residential development in Malahide, Co. Dublin. All site investigation works were carried out under the supervision of a GII Geo-Environmental Engineer. The site investigation works were completed in March 2020.

2.0 Purpose & Scope

The site in question has been the subject of backfilling with waste material of unknown origin and composition. The extent of the waste deposition and waste type is not known. It is understood that as part of the proposed development there may be an excavation to accommodate services, foundations for structures as well as roadways and pavements and as such the material which may be excavated and removed from site needs to be assessed in terms of waste disposal outlets. The waste material which may be retained on site following development requires assessment in terms of human health exposure.

The purpose of the waste classification exercise was as follows.

- Classification, in terms of waste management and final disposal outlets, of material that may require disposal following excavation during the construction phase;
- Assess impact of waste body on local surface water; and
- Suitability for any material left on site for the proposed use following development.

The scope of the work undertaken to facilitate the waste classification exercise included the following:

- Excavation of fourteen (14 No.) trial pits;
- Excavation of three (3 No.) slit trenches;
- Collection of surface water samples for chemical analysis;
- Collection of waste/subsoil samples for chemical analysis;
- Environmental laboratory testing;
- Waste classification; and
- Assessment of subsoil quality against human health Generic Assessment Criteria (GAC).

3.0 Limitations

GII has prepared this report for the sole use of Cladwell Estates. No other warranty, express or implied, is made as to the professional advice included in this report or other services provided by GII.
The conclusions and recommendations contained in this report are based upon information provided by others and the assumption that all relevant information has been provided by those bodies from whom it

has been requested. Information obtained from third parties has not been independently verified by GII, unless otherwise stated in this report.

This report has been prepared in line with best industry standards and within the project's budgetary and time constraints. The methodology adopted and the sources of information used by GII in providing its services are outlined in this report.

The work described was undertaken in March 2020, this report is based on the conditions encountered and the information available during that period. The scope of this Report and the services are accordingly factually limited by these circumstances.

GII disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to GII's attention after the date of the Report.

The conclusions presented in this report represent GII's best professional judgement based on review of site conditions observed during any site visit and the relevant information available at the time of writing. The opinions and conclusions presented are valid only to the extent that the information provided was accurate and complete.

The investigation was focused on a broad assessment of the subsoil quality across the site. The assessment did not extend to the identification of asbestos containing materials associated with any on-site structures, ground gases or groundwater.

The waste classification exercise is reflective of and applicable to the ground conditions on site at the time of the site investigation and sampling. Alterations to the ground conditions or any further excavations carried out on site following the investigation are not reflected in this report.

4.0 Site Location and Layout

The site is located off Back Road, Malahide, County Dublin (Figure 1 Appendix 1). At the time of the assessment the site was comprised of an area of rough overgrown ground in the southern section and the former Malahide Rugby club playing pitch in the northern section. The site was bounded to the north by former Rugby Clubhouse. The site was bounded to the east by the Malahide Dublin railway line. The site was bounded to the south by a field drain with agricultural lands beyond. The site was bounded to the south west by agricultural lands and the north west by open rough ground which had formerly been occupied by a house.

There was an area on the western site boundary where Japanese Knotweed was present and an exclusion zone fenced off. The southern section of the site was more raised than the lands to the south and west.

5.0 Site History

GII reviewed the aerial photographs and historical maps maintained by the Ordnance Survey of Ireland (OSI) and the google imagery records. These included the 6-inch maps that were produced between 1829 and 1842, the 25-inch maps that were produced between 1888 and 1913 and the 6-inch Cassini Maps that were produced between the 1830's and 1930's. The site is undeveloped on all historical maps reviewed.

The southern section of the site appears to have been backfilled or in the process of backfilling on the 1995 OSI aerial image. The backfilling of the site appears to have ceased by the time of the 2000 and 2005 OSI aerial images.

6.0 Subsurface Exploration

6.1. General

During the ground investigation a programme of intrusive investigation specified by the Consulting Engineer was undertaken to determine the sub surface conditions at the proposed site. Regular sampling and in-situ testing was undertaken in the exploratory holes to facilitate the geotechnical descriptions and to enable laboratory testing to be carried out on the soil samples recovered during excavation and drilling.
The procedures used in this site investigation are in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007) and B.S. 5930:2015.

6.2. Trial Pits

The trial pits were excavated using a 12T tracked excavator at the locations shown in Figure 8. The locations were checked using a CAT scan to minimise the potential for encountering services during the excavation. The trial pits were sampled, logged and photographed by a Geotechnical Engineer/Engineering Geologist prior to backfilling with arisings. Notes were made of any services, inclusions, pit stability, groundwater encountered and the characteristics of the strata encountered and are presented on the trial pit logs which are provided in Appendix 2 of this Report.
The trial pits TP-01 to TP-09 were excavated within the southern section of the site where the waste material was expected to be encountered. The trial pits TP-10 to TP-14 were located within the northern section of the site (rugby pitch) where the waste material was not expected to be encountered.

6.3. Slit Trenches

The slit trenches were excavated using a 12T tracked excavator at the locations shown in Figure 8. The locations were checked using a CAT scan to minimise the potential for encountering services during the excavation. The slit trenches were sampled, logged and photographed by a Geotechnical Engineer/Engineering Geologist prior to backfilling with arisings. The slit trenches were excavated in order to identify the northern lateral extant of the waste materials encountered on site. The interphase between the waste materials and natural deposits in each slit trench are identified on Figure 8.

6.4. Surveying

The exploratory hole locations have been recorded using a Trimble R10 GNSS System which records the coordinates and elevation of the locations to ITM or Irish National Grid as required by the project specification. The coordinates are provided on the exploratory hole logs in the appendices of this Report.

7.0 Ground Conditions

7.1. General

The ground conditions encountered during the investigation are summarised below with reference to insitu and laboratory test results. The full details of the strata encountered during the ground investigation are provided in the exploratory hole logs included in the appendices of this report.

The sequence of strata encountered were consistent across the site and are generally comprised;

- Topsoil
- Made Ground
- Cohesive Deposits

TOPSOIL: Topsoil was encountered in all the exploratory holes outside the backfilled area and at four of the locations within the backfilled area was present to a maximum depth of 0.3m BGL.

MADE GROUND: Made Ground deposits were encountered beneath the Topsoil or from the surface in the backfilled area of the site. The made ground was comprised of *brown silty sandy clayey fine to coarse subangular to subrounded GRAVEL with occasional subangular to subrounded cobbles and boulders and occasional fragments of plastic timber red and yellow brick slate foam concrete metal cloth wavin pipe and ceramics*. **There was no evidence of potentially hazardous waste such as hydrocarbon based materials, asbestos containing waste or clinical waste encountered during the trial pitting. There was no evidence of organic or household waste noted.**
Made ground deposits were not encountered beneath the former rugby pitch area.
The made ground deposits ranged in thickness from 0.7m in TP-09 to 2.1m in TP-06. The thickest sequence was in the central section of the backfilled area. Based on the survey completed following the excavation of the trial pits the footprint of the backfilled area is 11,520m^2, the average thickness of the waste material is 1.5m giving an estimated volume of waste material of 17,280m^3.

COHESIVE DEPOSITS: Cohesive deposits were encountered beneath the Made Ground or Topsoil and were described typically as *brown silty slightly sandy very gravelly CLAY with occasional subangular to subrounded cobbles and boulders*. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the glacial till matrix. These deposits had some, occasional or frequent cobble and boulder content where noted on the exploratory hole logs.

8.0 Surface Water Assessment

A surface water sample was collected from the drainage ditch located immediately to the south and downgradient of the site (Figure 8). The sample was collected on the 13th March 2020 by a GII Geo-Environmental Scientist.

8.1. Field Observations

There was no evidence of contamination noted during the collection of the surface water sample i.e. hydrocarbon odour or iridescence etc.

Table 1 Field Measurements

Sample ID	Date	pH (pH Units)	Electrical Conductivity (mS/cm)	ORP (mV)	Temperature (Celsius)
SW-01	13/03/2020	7.37	0.87	131	6.5
SW-02	13/03/2020	7.73	1.03	122	6.3

8.2. Laboratory Analysis

The laboratory analysis undertaken on the surface water sample included for dissolved arsenic, boron, cadmium, copper, chromium, cyanide, lead, mercury, nickel, manganese and zinc, aliphatic and aromatic petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAH), methyl tert butyl ether (MTBE), benzene toluene ethylbenzene and toluene (BTEX), total phenols, pH, electrical conductivity, nitrate, nitrite, chloride, sulphate, ammonia, BOD, COD, total suspended solids and potassium. The parameter range was based on the site history and the need to establish a comprehensive environmental baseline for the surface water quality for the site.

The laboratory testing was competed by Element Materials Technology in the UK; EMT is a UKAS accredited laboratory. The full laboratory reports are included in Appendix 3. The analytical methodologies are all ISO/CEN approved or equivalent.

8.3. Laboratory Results

The full laboratory test report is presented in Appendix 3 and the results are summarised in Tables 2 to 4. The tables include Environmental Quality Standards (EQS) specified in the Surface Water Environmental Objectives (Surface Water) Regulations 2009 (SI 272 of 2009).

The level of ammonia detected in both surface water samples is above the EQS.

The level of chromium increased between SW-01 and SW-02. The downstream level exceeded the AA-EQS but was within the MAC-EQS.

PAHs, petroleum hydrocarbons and the BTEX compounds were not detected in the surface water samples.

The results do not show any significant impact from the waste body on the surface water.

Table 2 Surface Water Metals and Inorganics

Parameter	SW-01	SW-02	LOD	Unit	AA-EQS[1]	MAC_EQS[2]
Dissolved Arsenic	4.0	3.6	<2.5	µg/l	25	20
Dissolved Boron	45	70	<12	µg/l	ne	ne
Dissolved Cadmium	<0.5	<0.5	<0.5	µg/l	0.08	0.45
Total Dissolved Chromium	<1.5	7.2	<1.5	µg/l	4.7	32
Dissolved Copper	<7	<7	<7	µg/l	5/30[3]	ne
Dissolved Lead	<5	<5	<5	µg/l	7.2	ne
Dissolved Manganese	103	63	<2	µg/l	ne	ne
Dissolved Mercury	<1	<1	<1	µg/l	0.05	0.07
Dissolved Nickel	<2	<2	<2	µg/l	20	ne
Dissolved Potassium	20	44	<0.1	mg/l	ne	ne
Dissolved Zinc	0.6	1.4	<3	µg/l	8/50/100[4]	ne
Hexavalent Chromium	<0.006	<0.006	<0.006	mg/l	3.7	ne
Sulphate	106.5	106.7	<0.5	mg/l	ne	ne
Chloride	37.1	37.4	<0.3	mg/l	ne	ne
Nitrate as NO_3	0.99	1.05	<0.2	mg/l	ne	ne
Nitrite	0.032	0.031	<0.02	mg/l	ne	ne
Total Cyanide	<0.01	<0.01	<0.01	mg/l	10	ne
Ammoniacal Nitrogen as NH_3	0.06	0.10	<0.03	mg/l	≤0.04[5]	≤0.09[6]
BOD (Settled)	<1	<1	<1	mg/l	ne	ne
COD (Settled)	18	20	<7	mg/l	ne	ne
Total Suspended Solids	<10	<10	<10	mg/l	ne	ne
Electrical Conductivity @25C	933	922	<2	µS/cm	ne	ne
pH	7.99	7.98	<0.01	pH units	6.0-9.0	ne

Table 3 Surface Water PAHs

Parameter	SW-01	SW-02	LOD	Unit	AA-EQS	MAC_EQ
PAH						
Naphthalene	<0.1	<0.1	<0.013	µg/l	2.4	ne
Acenaphthylene	<0.013	<0.013	<0.013	µg/l	ne	ne
Acenaphthene	<0.013	<0.013	<0.014	µg/l	ne	ne

[1] Annual Average.
[2] Maximum Allowable Concentration.
[3] For Copper, the value 5 applies where the water hardness measured in mg/l CaCO3 is less than or equal to 100; the value 30 applies where the water hardness exceeds 100 mg/l CaCO3.
[4] For Zinc, the standard shall be 8 µg/l for water hardness with annual average values less than or equal to 10 mg/l CaCO3, 50 µg/l for water hardness greater than 10 mg/l CaCO3 and less than or equal to 100 mg/l CaCO3 and 100 µg/l elsewhere.
[5] High status ≤0.040 (mean), Good status ≤0.065 (mean).
[6] High status ≤0.090 (95%ile), Good status or ≤0.140 (95%ile).

Parameter	SW-01	SW-02	LOD	Unit	AA-EQS	MAC_EQ
Fluorene	<0.014	<0.014	<0.011	µg/l	ne	ne
Phenanthrene	<0.011	<0.011	<0.013	µg/l	ne	ne
Anthracene	<0.013	<0.013	<0.012	µg/l	0.1	0.4
Fluoranthene	<0.012	<0.012	<0.013	µg/l	0.1	1
Pyrene	<0.013	<0.013	<0.015	µg/l	ne	ne
Benzo(a)anthracene	<0.015	<0.015	<0.011	µg/l	ne	ne
Chrysene	<0.011	<0.011	<0.018	µg/l	ne	ne
Benzo(bk)fluoranthene	<0.018	<0.018	<0.016	µg/l	0.03	ne
Benzo(a)pyrene	<0.016	<0.016	<0.011	µg/l	0.05	0.1
Indeno(123cd)pyrene	<0.011	<0.011	<0.01	µg/l	0.002	ne
Dibenzo(ah)anthracene	<0.01	<0.01	<0.011	µg/l	ne	ne
Benzo(ghi)perylene	<0.011	<0.011	<0.195	µg/l	0.002	ne
PAH 16 Total	<0.195	<0.195	<0.01	µg/l	ne	ne
Benzo(b)fluoranthene	<0.01	<0.01	<0.01	µg/l	ne	ne
Benzo(k)fluoranthene	<0.01	<0.01	<0.1	µg/l	ne	ne

Table 4 Surface Water Hydrocarbons

Parameter	SW-01	SW-02	LOD	Unit	EPA IGV	GTV
TPH CWG						
Aliphatics						
>C5-C6	<10	<10	<10	µg/l	ne	ne
>C6-C8	<10	<10	<10	µg/l	ne	ne
>C8-C10	<10	<10	<10	µg/l	ne	ne
>C10-C12	<5	<5	<5	µg/l	ne	ne
>C12-C16	<10	<10	<10	µg/l	ne	ne
>C16-C21	<10	<10	<10	µg/l	ne	ne
>C21-C35	<10	<10	<10	µg/l	ne	ne
Total aliphatics C5-35	<10	<10	<10	µg/l	ne	ne
Aromatics						
>C5-EC7	<10	<10	<10	µg/l	ne	ne
>EC7-EC8	<10	<10	<10	µg/l	ne	ne
>EC8-EC10	<10	<10	<10	µg/l	ne	ne
>EC10-EC12	<5	<5	<10	µg/l	ne	ne
>EC12-EC16	<10	<10	<10	µg/l	ne	ne
>EC16-EC21	<10	<10	<10	µg/l	ne	ne
>EC21-EC35	<10	<10	<10	µg/l	ne	ne
Total aromatics C5-35	<10	<10	<10	µg/l	ne	ne
Total aliphatics and aromatics(C5-35)	<10	<10	<10	µg/l	ne	ne

Parameter	SW-01	SW-02	LOD	Unit	EPA IGV	GTV
Total Phenols HPLC	<10	<10	<0.01	µg/l	8	46
MTBE	<0.1	<0.1	<5	µg/l	ne	ne
Benzene	<0.5	<0.5	<5	µg/l	10	50
Toluene	<5	<5	<5	µg/l	10	ne
Ethylbenzene	<1	<1	<5	µg/l	ne	ne
m/p-Xylene	<2	<2	<5	µg/l	10	ne
o-Xylene	<1	<1	<5	µg/l	10	ne

9.0 Subsoil Laboratory Analysis

9.1. Analysis Suite

In order to assess materials, which may be excavated and removed from site, in terms of waste classification, a selection of samples collected were analysed for a suite of parameters which allows for the assessment of the soils in terms of total pollutant content for classification of materials as *hazardous* or *non-hazardous* (RILTA Suite). The suite also allows for the assessment of the soils in terms of suitability for placement at various categories of landfill. The parameter list for the RILTA suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen.

The total pollutant content analysis also provides analytical data which can be used to assess the quality of the subsoils underlying the site and allow an assessment of their suitability for a range of proposed uses against generic assessment criteria.

The RILTA suite also includes those parameters specified in the EU Council Decision establishing criteria for the acceptance of waste at Landfills (Council Decision 2003/33/EC), which for the solid samples are pH, total organic carbon (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, polychlorinated biphenyls (PCB) and PAH.

In line with the requirement of Council Decision 2003/33/EC a leachate was generated from the solid samples which was in turn analysed for antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, chloride, fluoride, soluble sulphate, sulphide, phenols, dissolved organic carbon (DOC) and total dissolved solids (TDS). The suite was selected due to the unknown origin of the material underlying the site and no evidence of specific contaminants of concern highlighted in the site history. The laboratory testing was competed by Element Materials Technology (EMT) in the UK; EMT is a UKAS accredited laboratory. The full laboratory reports are included in Appendix 3.

9.2. Asbestos

Asbestos fibres were detected in the samples of waste material encountered in TP-01, 02, 03 and 06. The asbestos type encountered in all instances was Chrysotile, the levels detected were below the laboratory

detection limit of <0.001%. The laboratory did **not** identify asbestos containing materials (ACMs) in the sample. The level detected in all cases was below the hazardous level of 0.1%[7].

10.0 Waste Classification

GII understands that any materials which may be excavated from site would meet the definition of waste under the Waste Framework Directive. This may not be the case at the time of excavation when all or some of the materials may have been declared a by-product in line with Article 27 of the European Communities (Waste Directive) Regulations 2011[8].

Excess soil and stone resulting from excavation works (the primary purpose of which is not the production of soil and stone) may be declared a by-product if all four by-product conditions are met.[9]

a) further use of the soil and stone is certain;

b) the soil and stone can be used directly without any further processing other than normal industrial practice;

c) the soil and stone is produced as an integral part of a production process; and

d) further use is lawful in that the soil and stone fulfils all relevant requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

Due to the varying levels of anthropogenic materials encountered in the made ground there are potentially two sets of List of Waste (LoW)[10] codes with “mirror” entries which may be applied to excavated materials to be removed from site.

1. 17-05-03* (soil and stone containing dangerous substances, classified as hazardous) or 17-05-04 (soil and stone other than those mentioned in 17-05-03, not hazardous); or
2. 17-09-03* (other construction and demolition wastes (including mixed wastes) containing hazardous substances) or 17-09-04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03).

Where waste is a mirror entry in the LoW, it can be classified via a process of analysis against standard criteria set out in the Waste Framework Directive. The assessment process is described in detail in guidance published by the Irish (EPA Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous, June 2015) and UK regulatory authorities (Guidance on the Classification and Assessment of Waste: Technical Guidance WM3, 2015). The assessment involves comparison of the concentration of various parameters against defined threshold values.

[7] Environment Agency (2018). Technical Guidance WM3 - Guidance on the classification and assessment of waste (1st Edition V1.1 May 2018) Technical Guidance WM3 – page 19.
[8] S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011 (Article 27).
[9] Irish EPA (June 2019), Guidance on Soil and Stone By-Products.
[10] Formerly European Waste Catalogue Codes (EWC Codes)

The specific LoW code which should be applied to the material at each sample location is summarised in Table 4 below. These codes are only applicable where the material is being removed for site as a waste.

GII use HazWasteOnline™, a web-based commercial waste classification software tool which assists in the classification of potentially hazardous materials. This tool was used to determine whether the materials sampled are classified as hazardous or non-hazardous. The use of the online tool is accepted by the EPA (EPA 2014).

The conclusions presented in the report are based on GII's professional opinion. **It should be noted that the environmental regulator (in this case the EPA) and the waste acceptor (in this case a landfill operator) shall decide whether a waste is hazardous or non-hazardous and suitable for disposal at their facility.**

10.1. HazWasteOnLineTM Results

In total, fifteen (15 No.) samples were assessed using the HazWasteOnLine™ Tool. All samples were classified as being non-hazardous. The complete HazWasteOnLine™ report for all samples is included in Appendix 4.

The specific LoW code which should be applied to the material at each SI location is summarised in Table 5 below. The assigning of the LoW code is based on observations recorded in the trial pits, an estimation of the % of anthropogenic material present and the results of the HazWasteOnline™ output. The final LoW codes applied at the time of disposal may vary due to variations in % of anthropogenic material observed in the excavation phase. Where there is in excess of 2%[11] anthropogenic material observed the LoW code 17 09 04 may be applied.

Table 5 LoW Codes

SI Location	Depth (m)	Hazardous/Non-Hazardous	Asbestos Type if Present	LoW Code
TP-01	0.00-1.10	Non-Hazardous	Chrysotile <0.001%	17 09 04
TP-01	1.10-1.50	Non-Hazardous	NAD[12]	17 05 04
TP-02	0.00-1.10	Non-Hazardous	Chrysotile <0.001%	17 09 04
TP-03	0.00-1.50	Non-Hazardous	Chrysotile <0.001%	17 09 04
TP-04	0.00-1.70	Non-Hazardous	NAD	17 09 04
TP-05	0.00-1.00	Non-Hazardous	NAD	17 09 04
TP-05	1.00-1.90	Non-Hazardous	NAD	17 09 04
TP-05	1.90-2.30	Non-Hazardous	NAD	17 05 04
TP-06	0.00-2.10	Non-Hazardous	Chrysotile <0.001%	17 09 04
TP-07	0.00-1.20	Non-Hazardous	NAD	17 09 04
TP-08	0.00-0.80	Non-Hazardous	NAD	17 09 04
TP-09	0.00-0.70	Non-Hazardous	NAD	17 09 04

[11] EPA (2020) - Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities.
[12] NAD – no asbestos detected.

SI Location	Depth (m)	Hazardous/Non-Hazardous	Asbestos Type if Present	LoW Code
TP-09	0.70-1.10	Non-Hazardous	NAD	17 05 04
TP-10	0.50	Non-Hazardous	NAD	17 05 04
TP-13	0.50	Non-Hazardous	NAD	17 05 04

10.2. Landfill Waste Acceptance Criteria

Waste Acceptance Criteria (WAC) have been agreed by the EU (Council Decision 2003/33/EC) and are only applicable to material if it is to be disposed of as a waste at a landfill facility. Each individual member state and licensed operators of landfills may apply more stringent WAC. WAC limits and the associated laboratory analysis are not suitable for use in the determination of whether a waste is hazardous or non-hazardous. The data have been compared to the WAC limits set out in Council Decision 2003/33/EC as well as the specific WAC which the EPA have applied to the Integrated Materials Solutions (IMS) Landfill in north County Dublin. The IMS landfill has higher limits for a range of parameters while still operating under an inert landfill licence. The WAC data considered in combination with the waste classification outlined in Section 12.0 allows the most suitable waste category to be applied to the material tested. The applicable waste categories are summarised in Table 6. A summary of the WAC data is presented in Appendix 5. The waste category assigned to each sample is summarised in Table 7.

Table 6 Waste Category for Disposal/Recovery

Waste Category	Classification Criteria
Category A Unlined Soil Recovery Facilities	Soil and Stone only which are free from[13] anthropogenic materials such as concrete, brock timber. Soil must be free from "contamination" e.g. PAHs, Hydrocarbons[14].
Category B1 Inert Landfill	Reported concentrations within inert waste limits, which are set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results also found to be non-hazardous using the HWOL[15] application.
Category B2 Inert Landfill	Reported concentrations greater than Category B1 criteria but less than IMS Hollywood Landfill acceptance criteria, as set out in their Waste Licence W0129-02. Results also found to be non-hazardous using the HWOL application.
Category C Non-Haz Landfill	Reported concentrations greater than Category B2 criteria but within non-haz landfill waste acceptance limits set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002).

[13] Free from equates to less than 2%.
[14] Total BTEX 0.05mg/kg, Mineral Oil 50mg/kg, Total PAHs 1mg/kg, Total PCBs 0.05mg/kg and Asbestos No Asbestos Detected – EPA Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities, 2020.
[15] HazWasteOnLine™ Tool.

	Results also found to be non-hazardous using the HWOL application.
Category C 1 Non-Haz Landfill	As Category C but containing < 0.001% w/w asbestos fibres.
Category C 2 Non-Haz Landfill	As Category C but containing >0.001% and <0.01% w/w asbestos fibres
Category C 3 Non-Haz Landfill	As Category C but containing >0.01% and <0.1% w/w asbestos fibres.
Category D Hazardous Treatment	Results found to be hazardous using HWOL Application.
Category D 1 Hazardous Disposal	Results found to be hazardous due to the presence of asbestos (>0.1%).

10.3. Final Waste Categorisation

All samples were assessed in terms of waste classification using the HazWasteOnLine™ tool and also the WAC set out in Council Decision 2003/33/EC and the IMS specific WAC to give a final waste categorisation to determine the most appropriate disposal route for any waste generated. The final and most applicable waste category for each sample is summarised in Table 7 and Figure 9.

Table 7 Individual Sample Waste Category

Sample ID	Sample Depth (m)	Material Type	Waste Category	LoW Code
TP-01	0.00-1.10	Made Ground	Category C1	17 09 04
TP-01	1.10-1.50	Clay	Category A	17 05 04
TP-02	0.00-1.10	Made Ground	Category C1	17 09 04
TP-03	0.00-1.50	Made Ground	Category C1	17 09 04
TP-04	0.00-1.70	Made Ground	Category B1	17 09 04
TP-05	0.00-1.00	Made Ground	Category B1	17 09 04
TP-05	1.00-1.90	Made Ground	Category B2	17 09 04
TP-05	1.90-2.30	Clay	Category B1	17 05 04
TP-06	0.00-2.10	Made Ground	Category C1	17 09 04
TP-07	0.00-1.20	Made Ground	Category B1	17 09 04
TP-08	0.00-0.80	Made Ground	Category B1	17 09 04
TP-09	0.00-0.70	Made Ground	Category B2	17 09 04
TP-09	0.70-1.10	Clay	Category A	17 05 04
TP-10	0.50	Clay	Category A	17 05 04
TP-13	0.50	Clay	Category A	17 05 04

11.0 Suitable for Use Assessment

GII assessed the soil data collected from the trial pits against the LQM/CIEH S4ULs for Human Health Risk Assessment (S4ULs)[16]. The S4ULs present soil assessment criteria for an extended range of 89

[16] LQM/CIEH 'Suitable 4 Use Levels' (S4ULs). Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3746. All rights reserved.

substances. For each substance, S4ULs have been derived for a range of generic land uses and Soil Organic Matter (%SOM) contents. All toxicological and physical-chemical inputs used in the derivation of the S4ULs are clearly identified and discussed. For each substance, S4ULs have been derived for six generic land uses (including the two Public Open Space land uses defined in C4SL guidance) and a range of Soil Organic Matter contents (organic contaminants only). All toxicological and physical-chemical data inputs used in the derivation of the S4ULs are presented and discussed in the publication. The proposed future use of the site is residential. In order to be conservative in terms of assessing any potential risk to future site users, the residential with homegrown produce S4UL criteria have been applied to the data.

The levels of Dibenzo(ah)anthracene in the sample TP-02 between ground level and 1.1m exceeded the residential with homegrown produce S4UL.

All remaining samples were all within the residential without homegrown produce S4ULs. A full summary of the S4UL data is presented in Appendix 6.

12.0 Conclusions & Recommendations

The conclusions and recommendations given and opinions expressed in this report are based on the findings of the site investigation works and laboratory testing undertaken. Where any opinion is expressed on the classification of material between site investigations locations, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for conditions which have not been revealed by the findings at the site investigation locations.

12.1. Conclusions

12.1.1. Waste Type

The waste material encountered on site is comprised of construction and demolition waste. There was no evidence of potentially hazardous waste such as hydrocarbon based materials, asbestos containing waste or clinical waste encountered during the trial pitting. There was no evidence of organic or household waste noted.

12.1.2. Waste Classification

Based on the results of the HazWasteOnLine™ tool the material sampled across the site can be classified as non-hazardous.

12.1.3. Waste Categories

The most applicable waste category for each of the samples has been presented in Table 7 and Figure 9.

12.1.4. Asbestos

Asbestos was detected in several locations at a level lower than the detection limit of the laboratory.

12.2. S4UL Assessment

The levels of Dibenzo(ah)anthracene in the sample TP-02 exceeded the residential with homegrown produce S4UL.

12.2.1. Surface Water

The waste body is not having a significant impact on the local surface water.

12.3. Recommendations

12.4. S4UL Assessment

The levels of Dibenzo(ah)anthracene in the sample TP-02 exceeded the residential with homegrown produce S4UL. In the case that the material is not to be excavated and removed from site it is not suitable for retention on site at surface level. There is no special action required for the material which exceed the S4UL where it will underly the footprint of the proposed building or any hard-standing areas such as roadways or footpaths. The material at TP-02 is suitable for use on site in soft landscaped areas if covered with at least 1m of clean suitable inert soil which would short circuit potential human contact routes i.e. dermal contact, ingestion or inhalation.

12.5. Trace Asbestos

There is no special action required for materials which contains trace levels of asbestos subsoils which will underly the footprint of the proposed building or any hard-standing areas such as roadways or footpaths. The materials which contains trace levels of asbestos are suitable for use on site if covered with at least 1m of clean suitable inert soil which would short circuit potential human contact routes i.e. dermal contact, ingestion or inhalation.

12.5.1. Waste Transfer

In the event that material is excavated for removal from site, any firm engaged to transport waste material from site and the operator of any waste facility that will accept subsoils excavated from this site should be furnished with, at a minimum, copies of the **full unabridged** laboratory reports and HazWasteOnLine™ report for all samples presented in this report.

The material on site if excavated should be removed to the most appropriate facility under the waste categories and LoW codes identified in Table 7 and Figure 9. Potential outlets for the various waste categories are presented in Appendix 7, this list is not exhaustive and applicable at the time of the writing this report.

The non-hazardous material across the site if excavated as a waste should be removed from site to an appropriate facility under either the LoW codes 17 05 04 or 17 09 04. Where during excavation there is noted to be in excess of 2% anthropogenic material the appropriate LoW code which should be applied is 17 09 04.

The material which has trace levels of asbestos if excavated as a waste should be removed from site to an appropriate facility licensed to accept waste which contains trace levels of asbestos under either the LoW

codes 17 05 04 or 17 09 04. Where during excavation there is noted to be in excess of 2% anthropogenic material the appropriate LoW code which should be applied is 17 09 04.

12.6. Ground Gases

In the even that development is to take place on or adjacent to the waste body it is recommended that ground gas monitoring is undertaken to assess the risk of ground gas generation associated with the waste material.

13.0 References

Environment Agency (2013). *Waste Sampling and Testing for Disposal to Landfill.* Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/321207/Sampling_and_testing_of_waste_for_landfill.pdf

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Nathanial, C.P.; McCaffrey, C.; Gillett, A.G.; Ogden, R.C. & Nathanial, J.F., *The LQM/CIEH S4ULs for Human Health Risk Assessment*, Land Quality Press, Nottingham (2015).

APPENDIX 1 - Figures

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client:
Cladwell Estates

Project Title:
Back Road Malahide

Drawing Title:
Figure 1 Site Location

GII Project Reference:
E10226-03-20

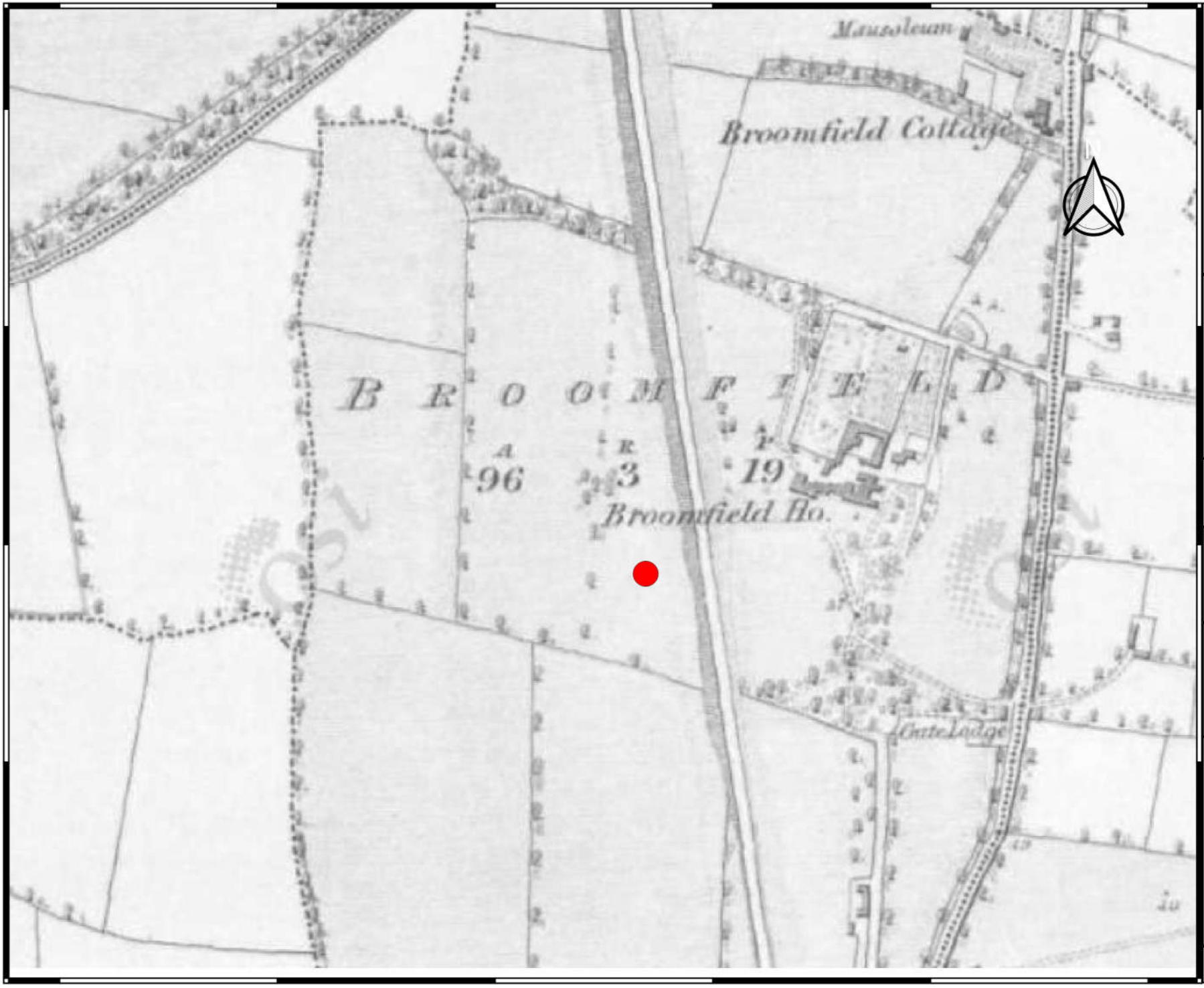
0 40 80 120 m

Drawn By:
BS

Date:
04/03/2020

Site Location

Indicative Site Boundary



Indicative Site Location

A LYNAM COMPANY

Client:

CE CLADEWELL ESTATES LTD

Project Code:
9527-03-20

Project Title:
Back Road Malahide

Drawing Title:
Figure 2 OSI 6-Inch Map

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Ground Investigations Ireland Ltd.
Catherinstown House,
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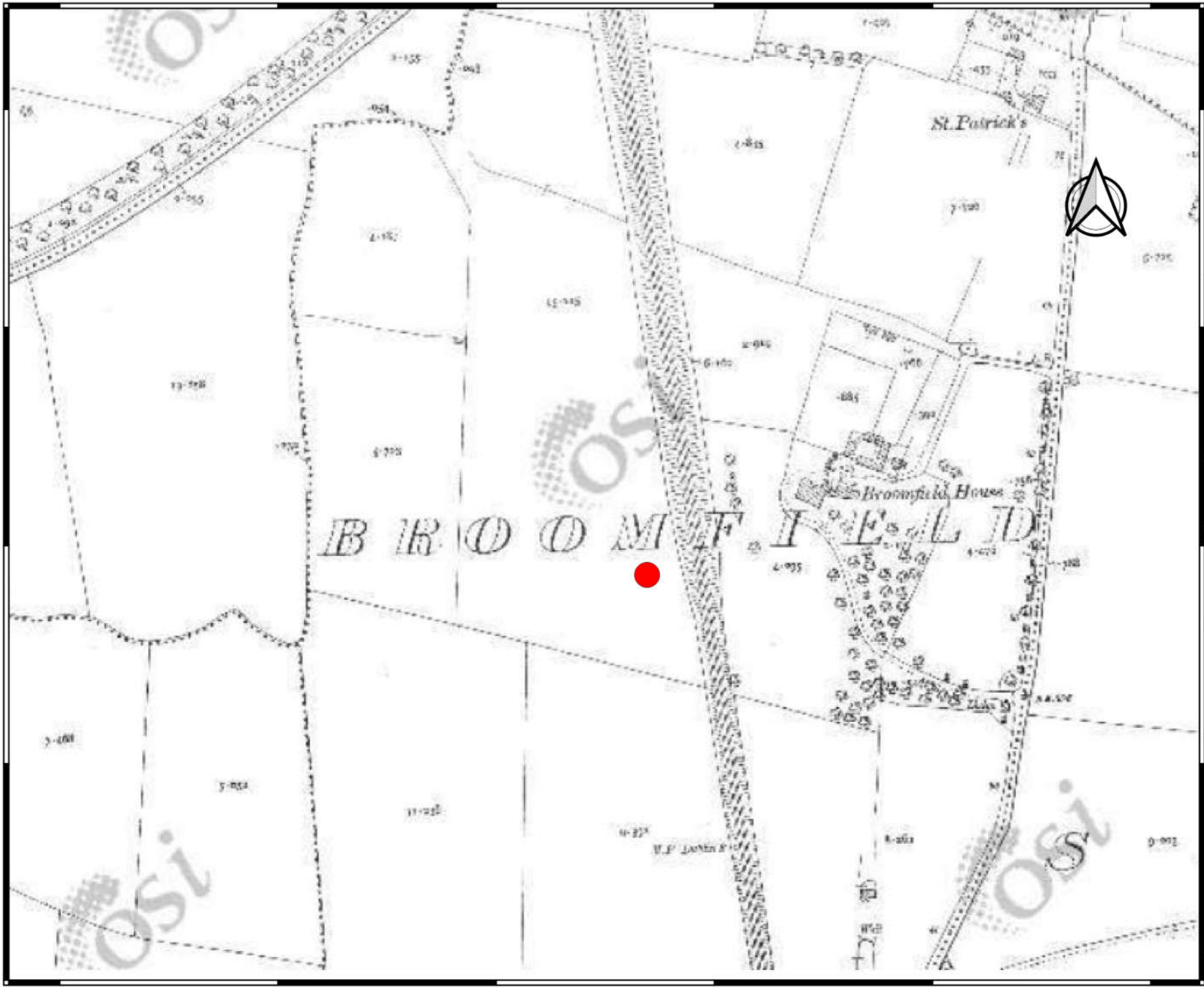
Drawn By:	Date:
BS	09/04/2020



Indicative Site Location

A LYNAM COMPANY

Client:

CE CLADEWELL ESTATES LTD

Project Code:
9527-03-20

Project Title:
Back Road Malahide

Drawing Title:
Figure 3 OSI 25-Inch Map

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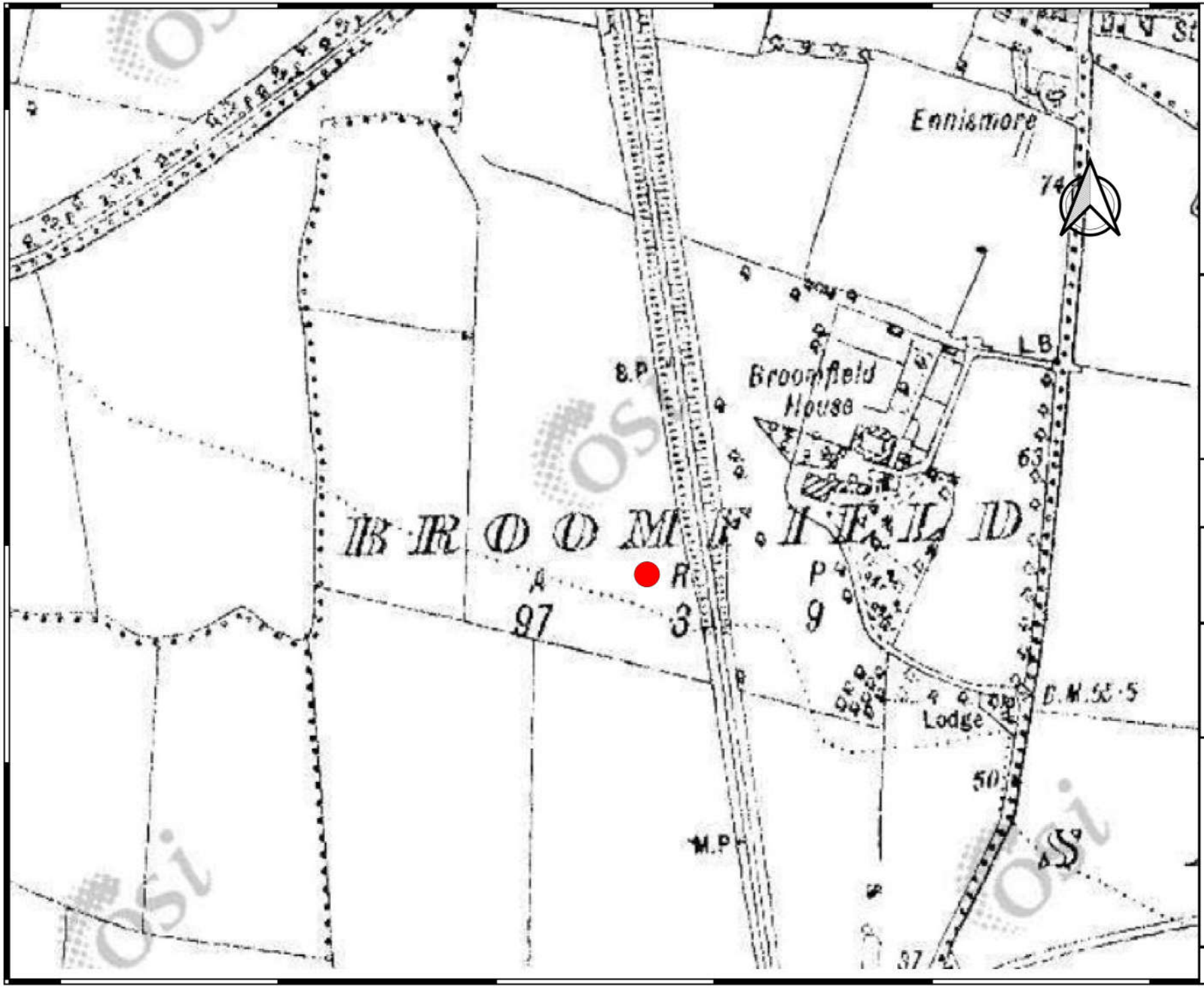
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Drawn By:	Date:
BS	09/04/2020



Indicative Site Location

A LYNAM COMPANY

Client:

CE CLADEWELL ESTATES LTD

Project Code:
9527-03-20

Project Title:
Back Road Malahide

Drawing Title:
Figure 4 OSI Cassini Map

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Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Drawn By:	Date:
BS	09/04/2020

Indicative Site Location

A LYNAM COMPANY

Client:

CE CLADEWELL ESTATES LTD

Project Code:
9527-03-20

Project Title:
Back Road Malahide

Drawing Title:
Figure 5 OSI 1995 Aerial Image

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Drawn By:	Date:
BS	09/04/2020

Indicative Site Location

A LYNAM COMPANY

Client:

CE CLADEWELL ESTATES LTD

Project Code:
9527-03-20

Project Title:
Back Road Malahide

Drawing Title:
Figure 6 OSI 2000 Aerial Image

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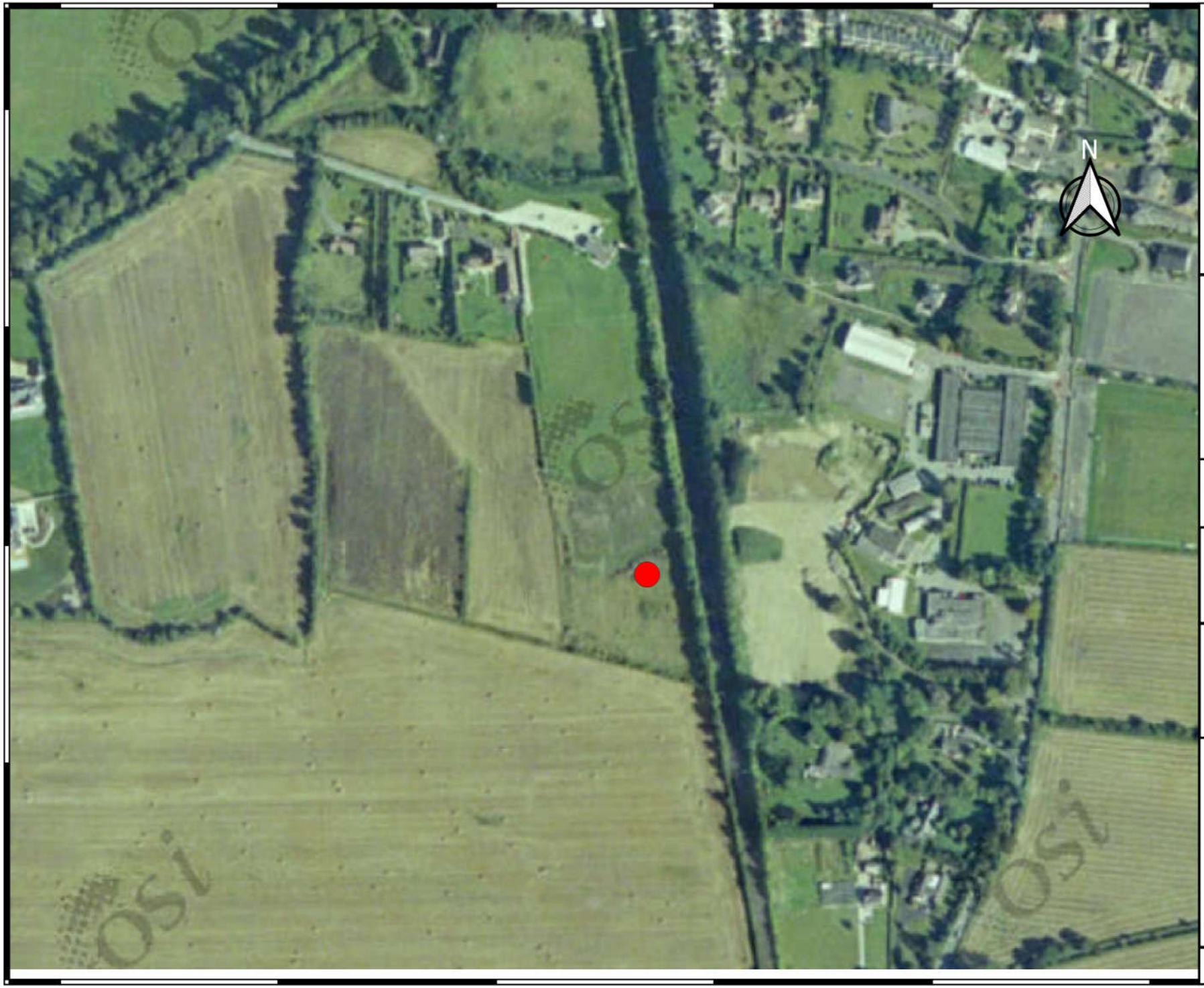
Drawn By:	Date:
BS	09/04/2020



Indicative Site Location

A LYNAM COMPANY

Client:

CE CLADEWELL ESTATES LTD

Project Code:
9527-03-20

Project Title:
Back Road Malahide

Drawing Title:
Figure 7 OSI 2005 Aerial Image

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BS	09/04/2020

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Client: A LYNAM COMPANY

CE CLADEWELL ESTATES LTD

0 20 40 60 m

Project Title:
Back Road Malahide

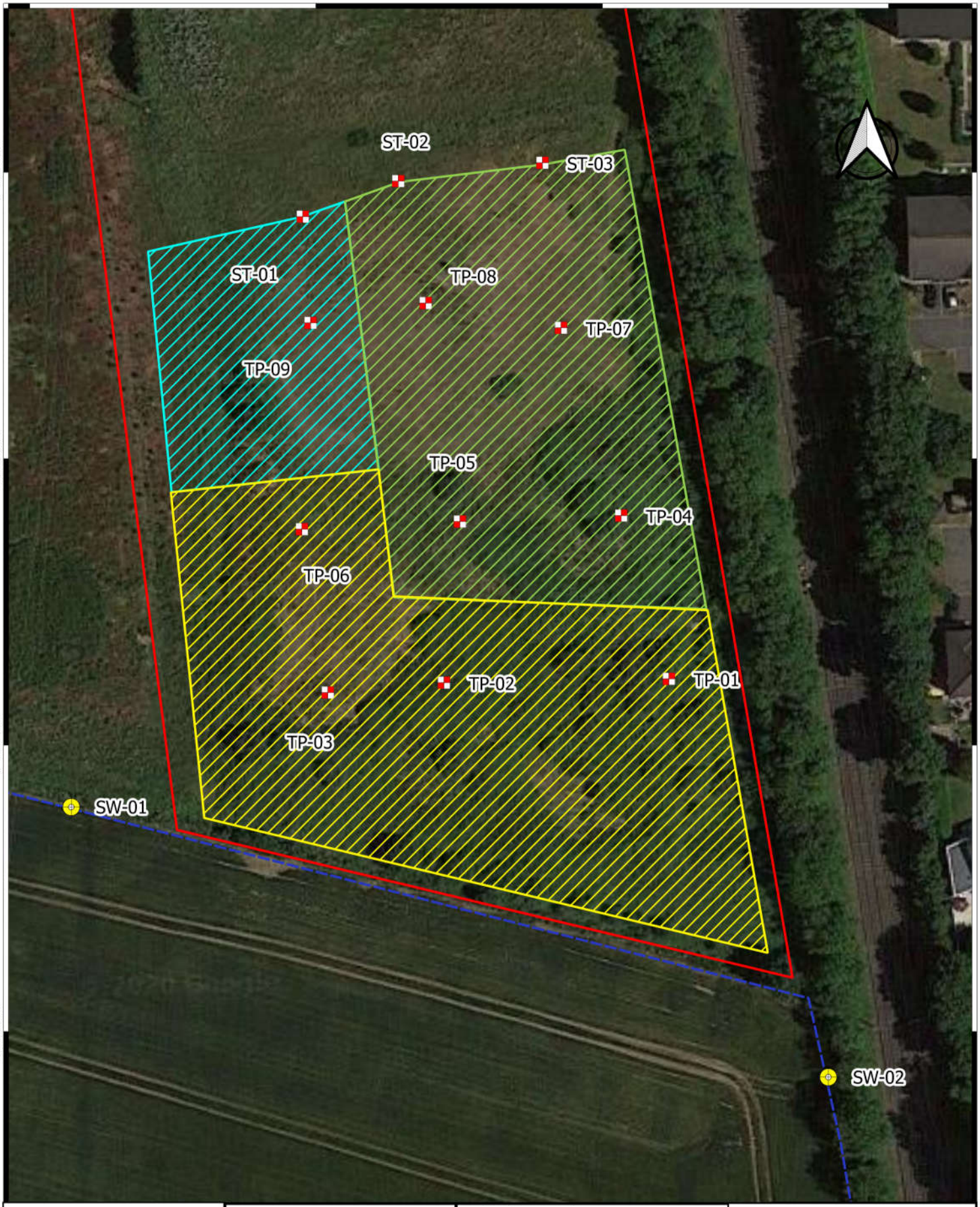
Drawing Title:
Figure 8 SI Locations

GII Project Reference:
9527-03-20

Drawn By:
BS

Date:
09/04/2020

- Indicative Site Boundary
- Backfilled Area
- Trial Pit/Slit Trench
- Surface Water Sample
- Drain
- Knotweed Exclusion Zone



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Geotechnical & Environmental

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Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client: A LYNAM COMPANY

CE CLADEWELL ESTATES LTD

0 10 20 30 m

Project Title:
Back Road Malahide

Drawing Title:
Figure 9 Waste Categories

GII Project Reference:
9527-03-20

Drawn By:
BS

Date:
09/04/2020

- Indicative Site Boundary
- Trial Pit/Slit Trench
- Surface Water Sample
- Category B1 Waste
- Category B2 Waste
- Category C1 Waste

APPENDIX 2 – Trial Pit Records

Ground Investigations Ireland Ltd

www.gii.ie

Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-01
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.30mW x 2.20mL x 1.50mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722511.6 E 744661.4 N	**Dates** 12/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Dark brown sandy clayey slightly gravelly TOPSOIL with occasional rootlets.		
					0.30			
0.50	EN				(0.80)	MADE GROUND: Light brown silty sandy clayey fine to coarse subangular to subrounded GRAVEL with occasional subangular to subrounded cobbles and boulders and occasional fragments of plastic timber red brick concrete metal wavin pipe and ceramics.		
					1.10			
					(0.40)	Firm light brown silty sandy very gravelly CLAY with occasional subangular to subrounded cobbles and boulders.		
1.50	EN				1.50	Complete at 1.50m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-01

Ground Investigations Ireland Ltd
www.gii.ie

Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-02
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.30mW x 2.80mL x 1.70mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722472.4 E 744660.8 N	**Dates** 12/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.10	EN				(1.10)	MADE GROUND: Light brown silty sandy clayey fine to coarse subangular to subrounded GRAVEL with occasional subangular to subrounded cobbles and boulders and occasional fragments of plastic timber red brick yellow brick concrete metal wavin pipe and ceramics.		
1.10-1.60	EN				1.10 (0.60) 1.70	Firm light brown silty sandy very gravelly CLAY with occasional subangular to subrounded cobbles and boulders. Complete at 1.70m		

Plan

Remarks

Sidewalls spalling at 0.50m

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-02

Ground Investigations Ireland Ltd
www.gii.ie

Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-03
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.30mW x 3.10mL x 2.00mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722452.1 E 744659 N	**Dates** 12/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.50	EN				(0.30) 0.30	Light brown sandy clayey slightly gravelly TOPSOIL with occasional rootlets.		
					(1.20)	MADE GROUND: Dark brown silty sandy clayey fine to coarse subangular to subrounded GRAVEL with occasional subangular to subrounded cobbles and boulders and occasional fragments of red and yellow brick metal plastic concrete ceramics and cloth with occasional concrete blocks.		
1.50-2.00	EN				1.50 (0.50) 2.00	Firm light brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles and boulders.		
						Complete at 2.00m		

Plan

Remarks

Sidewalls spalling at 0.40m

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-03

Ground Investigations Ireland Ltd
www.gii.ie

Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-04
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.30mW x 3.00mL x 2.30mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722503.3 E 744689.9 N	**Dates** 12/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.70	EN				(1.70)	MADE GROUND: Greyish brown silty sandy very clayey fine to coarse subangular to subrounded GRAVEL with occasional subangular to subrounded cobbles and boulders and occasional fragments of red and yellow brick metal plastic glass concrete and ceramics with occasional concrete blocks.		
1.70-2.30	EN				1.70 (0.60) 2.30	Firm light brown silty slightly sandy very gravelly CLAY with occasional subangular to subrounded cobbles and boulders.		
						Complete at 2.30m		

Plan

Remarks

Sidewalls spalling at 0.50m
Sidewalls spalling at 1.60m

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-04

Ground Investigations Ireland Ltd

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Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-05
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.30mW x 2.80mL x 2.30mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722475.1 E 744688.9 N	**Dates** 12/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	EN				(1.20)	MADE GROUND: Light brown silty sandy very clayey fine to coarse subangular to subrounded GRAVEL with occasional subangular to subrounded cobbles and boulders and occasional fragments of red brick plastic and electric cables.		
1.00-1.90	EN				1.20 (0.70)	MADE GROUND: Dark grey silty sandy clayey fine to coarse subangular to subrounded GRAVEL with occasional subangular to subrounded cobbles and boulders and occasional fragments of red brick rebar concrete and plastic.		
1.90-2.30	EN				1.90 (0.40)	Light brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.		
					2.30	Complete at 2.30m		

Plan

Remarks

Sidewalls spalling at 0.70m

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-05

Ground Investigations Ireland Ltd
www.gii.ie

Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-06
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.30mW x 3.00mL x 2.50mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722447.6 E 744687.5 N	**Dates** 12/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-2.10	EN				(0.30) 0.30	Dark brown sandy slightly gravelly TOPSOIL with occasional rootlets.		
					(1.80)	MADE GROUND: Light brown silty sandy very clayey fine to coarse subangular to subrounded GRAVEL with occasional subangular to subrounded cobbles and boulders and occasional fragments of red brick concrete plastic metal slate and white insulation foam with occasional concrete blocks.		
2.10-2.50	EN				2.10 (0.40) 2.50	Firm grey slightly sandy slightly gravelly silty CLAY with occasional subangular to subrounded cobbles.		
						Complete at 2.50m		

Plan

Remarks

Sidewalls spalling at 0.70m
Sidewalls spalling at 2.00m

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-06

Ground Investigations Ireland Ltd
www.gii.ie

Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-07
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.30mW x 3.20mL x 1.80mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722492.8 E 744722.7 N	**Dates** 11/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.20	EN				(0.20)	Dark brown sandy clayey slightly gravelly TOPSOIL with occasional rootlets.		
					0.20	MADE GROUND: Light brown silty sandy very clayey fine to coarse subangular to subrounded GRAVEL with occasional subangular to subrounded cobbles and boulders and occasional fragments of red brick plastic metal and white insulation foam with occasional concrete blocks.		
					(1.00)			
1.20-1.80	EN				1.20	Firm light brown silty slightly sandy very gravelly CLAY with occasional subangular to subrounded cobbles and boulders.		
					(0.60)			
					1.80	Complete at 1.80m		

Plan

Remarks

Sidewalls spalling at 0.50m

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-07

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Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-08
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.30mW x 3.10mL x 1.80mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722469.1 E 744727 N	**Dates** 11/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.80	EN				(0.80)	MADE GROUND: Light brown silty sandy very clayey fine to coarse subangular to subrounded GRAVEL with occasional subangular to subrounded cobbles and boulders and occasional fragments of red brick plastic metal and white insulation foam with occasional concrete blocks.		
0.80-1.30	EN				0.80 (1.00)	Firm light brown silty slightly sandy very gravelly CLAY with occasional subangular to subrounded cobbles and boulders.		
					1.80	Complete at 1.80m		

Plan

Remarks

Sidewalls spalling at 0.50m

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-08

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Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-09
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.30mW x 3.20mL x 1.10mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722449.1 E 744723.6 N	**Dates** 11/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.70	EN				(0.70)	MADE GROUND: Dark brown silty sandy very clayey fine to coarse subangular to subrounded GRAVEL with occasional subangular to subrounded cobbles and boulders and occasional fragments of red and yellow brick and ceramics with occasional concrete blocks.		
0.70-1.10	EN				0.70 (0.40) 1.10	Firm light brown silty slightly sandy very gravelly CLAY with occasional subangular to subrounded cobbles and boulders.		
						Complete at 1.10m		

Plan

Remarks

Sidewalls spalling at 0.50m

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-09

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Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-10
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.20mW x 3.60mL x 1.70mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722484.6 E 744785.4 N	**Dates** 11/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Light brown sandy slightly gravelly very clayey TOPSOIL with occasional rootlets.		
					0.30	Firm light brown silty slightly sandy very gravelly CLAY with occasional subangular to subrounded cobbles and boulders.		
0.50	EN				(1.40)			
1.50	EN				1.70	Complete at 1.70m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-10

Ground Investigations Ireland Ltd
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Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-11
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.30mW x 3.80mL x 1.80mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722440.3 E 744816.8 N	**Dates** 11/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Light brown sandy slightly gravelly very clayey TOPSOIL with occasional rootlets.		
					0.30			
0.50	EN				(1.50)	Firm light brown silty slightly sandy very gravelly CLAY with occasional subangular to subrounded cobbles and boulders.		
1.50	EN				1.80	Complete at 1.80m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-11

Ground Investigations Ireland Ltd
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Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-12
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.20mW x 3.70mL x 1.80mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722471 E 744843.9 N	**Dates** 11/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Light brown sandy slightly gravelly very clayey TOPSOIL with occasional rootlets.		
					0.30			
0.50	EN				(0.60)	Light brown silty sandy very clayey subangular to subrounded fine to coarse GRAVEL with occasional subangular to subrounded cobbles and boulders.		
					0.90			
					(0.40)	Light brown clayey gravelly fine to coarse SAND.		
					1.30			
1.50	EN				(0.50)	Firm light brownish grey silty slightly sandy very gravelly CLAY with occasional subangular to subrounded cobbles and boulders.		
					1.80	Complete at 1.80m		

Plan

Remarks

Sidewalls spalling at 0.50m
Sidewalls spalling at 1.30m

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-12

Ground Investigations Ireland Ltd
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Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-13
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.20mW x 3.90mL x 1.70mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 72242.49 E 744866 N	**Dates** 11/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Dark brown sandy slightly gravelly very clayey TOPSOIL with occasional rootlets.		
					0.30			
0.50	EN					Firm light brownish grey silty slightly sandy very gravelly CLAY with occasional subangular to subrounded cobbles and boulders.		
					(1.40)			
1.50	EN							
					1.70	Complete at 1.70m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-13

Ground Investigations Ireland Ltd
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Site Waste Assessment Back Road Malahide			**Trial Pit Number** TP-14
Machine : 12 Tonne Tracked Excavator **Method :** Trial Pit	**Dimensions** 1.30mW x 4.00mL x 1.70mD	**Ground Level (mOD)**	**Client** Cladwell Estates	**Job Number** 9527-03-20
	Location 722464.9 E 744889.3 N	**Dates** 11/03/2020	**Project Contractor** Ground Investigations Ireland	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Dark brown sandy slightly gravelly very clayey TOPSOIL with occasional rootlets.		
					0.30			
0.50	EN					Firm light brownish grey silty slightly sandy very gravelly CLAY with occasional subangular to subrounded cobbles and boulders.		
					(1.40)			
1.50	EN							
					1.70	Complete at 1.70m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	PM	9527-03-20.TP-14

APPENDIX 3 – Laboratory Testing

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland

Attention :	Barry Sexton
Date :	27th March, 2020
Your reference :	9527-03-20
Our reference :	Test Report 20/3992 Batch 1
Location :	Waste Assesment Back Road Malahide
Date samples received :	13th March, 2020
Status :	Final report
Issue :	1

Two samples were received for analysis on 13th March, 2020 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Bruce Leslie
Project Manager

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-9	10-18									LOD/LOR	Units	Method No.
Sample ID	SW-01	SW-02											
Depth													
COC No / misc													
Containers	V H HN HCL Z P BOD G	V H HN HCL Z P BOD G											
Sample Date	13/03/2020	13/03/2020											
Sample Type	Surface Water	Surface Water											
Batch Number	1	1											
Date of Receipt	13/03/2020	13/03/2020											
Dissolved Arsenic #	4.0	3.6									<2.5	ug/l	TM30/PM14
Dissolved Boron	45	70									<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	7.2									<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7									<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5									<5	ug/l	TM30/PM14
Dissolved Manganese #	103	63									<2	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2									<2	ug/l	TM30/PM14
Dissolved Phosphorus #	20	44									<5	ug/l	TM30/PM14
Dissolved Potassium #	0.6	1.4									<0.1	mg/l	TM30/PM14
Dissolved Selenium #	<3	<3									<3	ug/l	TM30/PM14
Dissolved Zinc #	<3	<3									<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Acenaphthene #	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Fluorene #	<0.014	<0.014									<0.014	ug/l	TM4/PM30
Phenanthrene #	<0.011	<0.011									<0.011	ug/l	TM4/PM30
Anthracene #	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Fluoranthene #	<0.012	<0.012									<0.012	ug/l	TM4/PM30
Pyrene #	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.015	<0.015									<0.015	ug/l	TM4/PM30
Chrysene #	<0.011	<0.011									<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.018	<0.018									<0.018	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.016	<0.016									<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.011	<0.011									<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.01	<0.01									<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.011	<0.011									<0.011	ug/l	TM4/PM30
PAH 16 Total #	<0.195	<0.195									<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01									<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01									<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	85	89									<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	103	109									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	109	112									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-9	10-18											
Sample ID	SW-01	SW-02											
Depth													
COC No / misc													
Containers	V H HN HCL Z P BOD G	V H HN HCL Z P BOD G											
Sample Date	13/03/2020	13/03/2020											
Sample Type	Surface Water	Surface Water											
Batch Number	1	1											
Date of Receipt	13/03/2020	13/03/2020											

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10									<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10									<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10									<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10									<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Phenol #	<0.01	<0.01									<0.01	mg/l	TM26/PM0
Sulphate as SO4 #	106.5	106.7									<0.5	mg/l	TM38/PM0
Chloride #	37.1	37.4									<0.3	mg/l	TM38/PM0
Nitrate as N #	0.99	1.05									<0.05	mg/l	TM38/PM0
Nitrite as N #	0.032	0.031									<0.006	mg/l	TM38/PM0
Total Cyanide #	<0.01	<0.01									<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as NH3 #	0.06	0.10									<0.03	mg/l	TM38/PM0
Hexavalent Chromium	<0.006	<0.006									<0.006	mg/l	TM38/PM0
BOD (Settled) #	<1	<1									<1	mg/l	TM58/PM0
COD (Settled) #	18	20									<7	mg/l	TM57/PM0
Electrical Conductivity @25C #	933	922									<2	uS/cm	TM76/PM0
pH #	7.99	7.98									<0.01	pH units	TM73/PM0
Total Suspended Solids #	<10	<10									<10	mg/l	TM37/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

VOC Report : **Liquid**

EMT Sample No.	1-9	10-18											
Sample ID	SW-01	SW-02											
Depth													
COC No / misc													
Containers	V H HN HCL Z P BOD G	V H HN HCL Z P BOD G											
Sample Date	13/03/2020	13/03/2020											
Sample Type	Surface Water	Surface Water											
Batch Number	1	1											
Date of Receipt	13/03/2020	13/03/2020											

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2	<2									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5									<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
Chloroform #	<2	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Styrene	<2	<2									<2	ug/l	TM15/PM10
Bromoform #	<2	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3									<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3									<3	ug/l	TM15/PM10
Naphthalene	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	103	109									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	109	112									<0	%	TM15/PM10

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 20/3992						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/3992

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 20/3992

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

EMT Job No: 20/3992

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM37	Modified methods USEPA 160.2, EN872:2005 and SMWW 2540D. Gravimetric determination of Total Suspended Solids. Sample is filtered through a 1.5um pore size glass fibre filter and the resulting residue is dried and weighed.	PM0	No preparation is required.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes			
TM57	Modified US EPA Method 410.4. Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	PM0	No preparation is required.	Yes			
TM58	APHA Standard Methods for the extraction of water and waste water (SMEWW) 5210B. Comparible with ISO 5815:1989. Measurement of Biochemical Oxygen Demand. When cBOD (Carbonaceous BOD) is requested a nitrification inhibitor is added which prevents the oxidation of reduced forms of nitrogen, such as ammonia, nitrite and organic nitrogen which exert a nitrogenous demand. Determination of Dissolved Oxygen using the Hach HQ30D Oxygen Meter.	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1. Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			

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Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland

Attention :	Barry Sexton
Date :	27th March, 2020
Your reference :	9527-03-20
Our reference :	Test Report 20/3992 Batch 2
Location :	Waste Assesment Back Road Malahide
Date samples received :	13th March, 2020
Status :	Final report
Issue :	1

Thirty seven samples were received for analysis on 13th March, 2020 of which fifteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Bruce Leslie
Project Manager

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	43-45	46-48	49-51	55-57	61-63	67-69	70-72	73-75	76-78	82-84	LOD/LOR	Units	Method No.
Sample ID	TP-01	TP-01	TP-02	TP-03	TP-04	TP-05	TP-05	TP-05	TP-06	TP-07			
Depth	0.00-1.10	1.10-1.50	0.00-1.10	0.00-1.50	0.00-1.70	0.00-1.00	1.00-1.90	1.90-2.30	0.00-2.10	0.00-1.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	11/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020	12/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020			
Antimony	-	3	-	-	3	3	3	3	-	3	<1	mg/kg	TM30/PM15
Arsenic #	-	22.4	-	-	10.9	12.7	12.1	16.3	-	12.1	<0.5	mg/kg	TM30/PM15
Barium #	-	150	-	-	90	132	99	116	-	121	<1	mg/kg	TM30/PM15
Cadmium #	-	1.9	-	-	1.3	1.3	1.8	1.6	-	1.1	<0.1	mg/kg	TM30/PM15
Chromium #	-	92.4	-	-	50.6	78.0	48.1	103.7	-	82.1	<0.5	mg/kg	TM30/PM15
Copper #	-	70	-	-	31	39	38	40	-	27	<1	mg/kg	TM30/PM15
Lead #	-	39	-	-	57	51	35	57	-	41	<5	mg/kg	TM30/PM15
Mercury #	-	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	mg/kg	TM30/PM15
Molybdenum #	-	7.3	-	-	4.8	6.8	5.2	8.3	-	6.2	<0.1	mg/kg	TM30/PM15
Nickel #	-	35.7	-	-	35.5	39.9	41.4	47.8	-	40.4	<0.7	mg/kg	TM30/PM15
Selenium #	-	1	-	-	1	1	6	2	-	2	<1	mg/kg	TM30/PM15
Zinc #	-	204	-	-	107	120	102	123	-	123	<5	mg/kg	TM30/PM15
Antimony	3	-	2	4	-	-	-	-	2	-	<1	mg/kg	TM30/PM62
Arsenic	14.5	-	11.4	15.5	-	-	-	-	13.8	-	<0.5	mg/kg	TM30/PM62
Barium	150	-	94	94	-	-	-	-	88	-	<1	mg/kg	TM30/PM62
Cadmium	3.1	-	1.5	1.8	-	-	-	-	1.3	-	<0.1	mg/kg	TM30/PM62
Chromium	19.2	-	20.1	21.2	-	-	-	-	25.7	-	<0.5	mg/kg	TM30/PM62
Copper	61	-	50	42	-	-	-	-	40	-	<1	mg/kg	TM30/PM62
Lead	110	-	76	56	-	-	-	-	57	-	<5	mg/kg	TM30/PM62
Mercury	<0.1	-	<0.1	<0.1	-	-	-	-	<0.1	-	<0.1	mg/kg	TM30/PM62
Molybdenum	7.1	-	3.7	2.7	-	-	-	-	2.7	-	<0.1	mg/kg	TM30/PM62
Nickel	55.3	-	44.3	39.4	-	-	-	-	43.7	-	<0.7	mg/kg	TM30/PM62
Selenium	3	-	2	2	-	-	-	-	1	-	<1	mg/kg	TM30/PM62
Zinc	134	-	94	117	-	-	-	-	112	-	<5	mg/kg	TM30/PM62

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	43-45	46-48	49-51	55-57	61-63	67-69	70-72	73-75	76-78	82-84	LOD/LOR	Units	Method No.
Sample ID	TP-01	TP-01	TP-02	TP-03	TP-04	TP-05	TP-05	TP-05	TP-06	TP-07			
Depth	0.00-1.10	1.10-1.50	0.00-1.10	0.00-1.50	0.00-1.70	0.00-1.00	1.00-1.90	1.90-2.30	0.00-2.10	0.00-1.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	11/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020	12/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020			
PAH MS													
Naphthalene #	0.10	<0.04	0.08	<0.04	<0.04	<0.04	0.05	<0.04	0.07	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	0.39	<0.03	<0.03	<0.03	0.06	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	0.32	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.20	<0.03	2.72	0.28	0.23	0.07	0.44	<0.03	0.63	0.06	<0.03	mg/kg	TM4/PM8
Anthracene #	0.07	<0.04	1.75	0.08	<0.04	<0.04	0.14	<0.04	0.13	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.30	<0.03	4.42	0.53	0.30	0.13	0.79	<0.03	0.80	0.21	<0.03	mg/kg	TM4/PM8
Pyrene #	0.28	<0.03	3.60	0.50	0.27	0.12	0.69	<0.03	0.72	0.25	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.24	<0.06	2.06	0.46	0.21	0.09	0.59	<0.06	0.51	0.37	<0.06	mg/kg	TM4/PM8
Chrysene #	0.18	<0.02	2.21	0.37	0.19	0.08	0.52	<0.02	0.41	0.33	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.34	<0.07	3.33	0.81	0.35	0.13	0.95	<0.07	0.76	0.65	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.18	<0.04	2.03	0.53	0.17	0.07	0.49	<0.04	0.42	0.44	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	0.13	<0.04	1.24	0.25	0.13	<0.04	0.33	<0.04	0.24	0.25	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	0.32	0.08	<0.04	<0.04	0.08	<0.04	0.08	0.05	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.14	<0.04	1.12	0.28	0.13	<0.04	0.33	<0.04	0.24	0.25	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	0.23	<0.04	<0.04	<0.04	0.06	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	1.09	<0.22	12.14	2.40	1.08	0.33	2.89	<0.22	2.46	1.80	<0.22	mg/kg	TM4/PM8
PAH 17 Total	2.16	<0.64	25.89	4.17	1.98	0.69	5.52	<0.64	5.13	2.86	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.24	<0.05	2.40	0.58	0.25	0.09	0.68	<0.05	0.55	0.47	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.10	<0.02	0.93	0.23	0.10	0.04	0.27	<0.02	0.21	0.18	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	96	105	97	100	74	105	103	104	103	103	<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	<30	<30	33	<30	<30	140	<30	<30	<30	mg/kg	TM5/PM8/PM16
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7	<7	<7	15	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	<7	23	33	<7	26	115	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	<7	<7	<7	<7	<7	<7	10	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	<26	<26	<26	33	<26	26	140	<26	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	<10	<10	<10	<10	45	<10	<10	<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	<10	<10	18	24	<10	23	86	<10	<10	<10	mg/kg	TM5/PM8/PM16

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	43-45	46-48	49-51	55-57	61-63	67-69	70-72	73-75	76-78	82-84	LOD/LOR	Units	Method No.
Sample ID	TP-01	TP-01	TP-02	TP-03	TP-04	TP-05	TP-05	TP-05	TP-06	TP-07			
Depth	0.00-1.10	1.10-1.50	0.00-1.10	0.00-1.50	0.00-1.70	0.00-1.00	1.00-1.90	1.90-2.30	0.00-2.10	0.00-1.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	11/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020	12/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020			
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	15	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	56	56	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	<7	12	13	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	<26	83	69	<26	<26	<26	<26	<26	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	<52	83	69	<52	<52	<52	140	<52	<52	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 #	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	<10	30	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	<10	42	50	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5	<5 SV	<5	<5	<5 SV	<5	<5 SV	<5	<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5 SV	<5	<5	<5 SV	<5	<5 SV	<5	<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5 SV	<5	<5	<5 SV	<5	<5 SV	<5	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5 SV	<5	<5	<5 SV	<5	<5 SV	<5	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5 SV	<5	<5	<5 SV	<5	<5 SV	<5	<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5 SV	<5	<5	<5 SV	<5	<5 SV	<5	<5	ug/kg	TM36/PM12
PCB 28 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	ug/kg	TM17/PM8
Natural Moisture Content	14.8	19.3	18.9	16.9	14.5	16.9	13.4	24.0	14.4	22.5	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	12.9	16.2	15.9	14.4	12.6	14.4	11.9	19.4	12.6	18.3	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Chromium III	-	92.4	-	-	50.6	78.0	48.1	103.7	-	82.1	<0.5	mg/kg	NONE/NONE
Chromium III	19.2	-	20.1	21.2	-	-	-	-	25.7	-	<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	NDP	0.38	NDP	NDP	0.96	1.29	0.85	1.78	NDP	0.99	<0.02	%	TM21/PM24
pH #	8.53	8.41	8.53	8.54	8.54	8.23	8.17	7.77	8.63	8.33	<0.01	pH units	TM73/PM11
Mass of raw test portion	0.1035	0.1079	0.0995	0.1068	0.1036	0.102	0.1034	0.1124	0.1063	0.1112		kg	NONE/PM17

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	43-45	46-48	49-51	55-57	61-63	67-69	70-72	73-75	76-78	82-84			
Sample ID	TP-01	TP-01	TP-02	TP-03	TP-04	TP-05	TP-05	TP-05	TP-06	TP-07			
Depth	0.00-1.10	1.10-1.50	0.00-1.10	0.00-1.50	0.00-1.70	0.00-1.00	1.00-1.90	1.90-2.30	0.00-2.10	0.00-1.20	Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	11/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020	12/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	LOD/LOR	Units	Method No.
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09		kg	NONE/PM17

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	88-90	94-96	97-99	100-102	118-120								
Sample ID	TP-08	TP-09	TP-09	TP-10	TP-13								
Depth	0.00-0.80	0.00-0.70	0.70-1.10	0.50	0.50								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	12/03/2020	12/03/2020	12/03/2020	11/03/2020	11/03/2020								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	2	2	2	2	2								
Date of Receipt	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020								

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Antimony	2	2	3	3	2						<1	mg/kg	TM30/PM15
Arsenic #	12.5	11.6	14.4	11.7	10.5						<0.5	mg/kg	TM30/PM15
Barium #	108	83	100	96	81						<1	mg/kg	TM30/PM15
Cadmium #	1.8	1.7	1.1	1.4	1.1						<0.1	mg/kg	TM30/PM15
Chromium #	47.4	47.7	90.0	74.2	61.8						<0.5	mg/kg	TM30/PM15
Copper #	38	35	36	28	25						<1	mg/kg	TM30/PM15
Lead #	47	36	27	19	17						<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM30/PM15
Molybdenum #	5.5	5.6	8.2	7.2	5.0						<0.1	mg/kg	TM30/PM15
Nickel #	40.7	39.1	51.4	36.5	36.5						<0.7	mg/kg	TM30/PM15
Selenium #	3	2	2	2	<1						<1	mg/kg	TM30/PM15
Zinc #	100	89	111	93	77						<5	mg/kg	TM30/PM15
Antimony	-	-	-	-	-						<1	mg/kg	TM30/PM62
Arsenic	-	-	-	-	-						<0.5	mg/kg	TM30/PM62
Barium	-	-	-	-	-						<1	mg/kg	TM30/PM62
Cadmium	-	-	-	-	-						<0.1	mg/kg	TM30/PM62
Chromium	-	-	-	-	-						<0.5	mg/kg	TM30/PM62
Copper	-	-	-	-	-						<1	mg/kg	TM30/PM62
Lead	-	-	-	-	-						<5	mg/kg	TM30/PM62
Mercury	-	-	-	-	-						<0.1	mg/kg	TM30/PM62
Molybdenum	-	-	-	-	-						<0.1	mg/kg	TM30/PM62
Nickel	-	-	-	-	-						<0.7	mg/kg	TM30/PM62
Selenium	-	-	-	-	-						<1	mg/kg	TM30/PM62
Zinc	-	-	-	-	-						<5	mg/kg	TM30/PM62

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	88-90	94-96	97-99	100-102	118-120							
Sample ID	TP-08	TP-09	TP-09	TP-10	TP-13							
Depth	0.00-0.80	0.00-0.70	0.70-1.10	0.50	0.50							
COC No / misc												
Containers	V J T	V J T	V J T	V J T	V J T							
Sample Date	12/03/2020	12/03/2020	12/03/2020	11/03/2020	11/03/2020							
Sample Type	Soil	Soil	Soil	Soil	Soil							
Batch Number	2	2	2	2	2							
Date of Receipt	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020							

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
PAH MS													
Naphthalene #	<0.04	0.05	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.12	0.14	<0.03	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.12	0.07	<0.03	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Pyrene #	0.11	0.06	<0.03	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.11	0.08	<0.06	<0.06	<0.06						<0.06	mg/kg	TM4/PM8
Chrysene #	0.07	0.07	<0.02	<0.02	<0.02						<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.10	<0.07	<0.07	<0.07	<0.07						<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.06	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
PAH 6 Total #	0.28	<0.22	<0.22	<0.22	<0.22						<0.22	mg/kg	TM4/PM8
PAH 17 Total	0.69	<0.64	<0.64	<0.64	<0.64						<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.07	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.03	<0.02	<0.02	<0.02	<0.02						<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	<1						<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	100	106	107	100	99						<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	<30	<30	<30						<30	mg/kg	TM5/PM8/PM16
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	<26	<26	<26	<26						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16

Please include all sections of this report if it is reproduced
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Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	88-90	94-96	97-99	100-102	118-120						LOD/LOR	Units	Method No.
Sample ID	TP-08	TP-09	TP-09	TP-10	TP-13								
Depth	0.00-0.80	0.00-0.70	0.70-1.10	0.50	0.50								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	12/03/2020	12/03/2020	12/03/2020	11/03/2020	11/03/2020								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	2	2	2	2	2								
Date of Receipt	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020								
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	<26	<26	<26	<26						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	<52	<52	<52	<52						<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 #	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
MTBE #	<5 SV	<5 SV	<5	<5	<5						<5	ug/kg	TM36/PM12
Benzene #	<5 SV	<5 SV	<5	<5	<5						<5	ug/kg	TM36/PM12
Toluene #	<5 SV	<5 SV	<5	<5	<5						<5	ug/kg	TM36/PM12
Ethylbenzene #	<5 SV	<5 SV	<5	<5	<5						<5	ug/kg	TM36/PM12
m/p-Xylene #	<5 SV	<5 SV	<5	<5	<5						<5	ug/kg	TM36/PM12
o-Xylene #	<5 SV	<5 SV	<5	<5	<5						<5	ug/kg	TM36/PM12
PCB 28 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35	<35	<35						<35	ug/kg	TM17/PM8
Natural Moisture Content	12.5	13.3	20.8	13.8	13.2						<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	11.1	11.7	17.3	12.1	11.7						<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3						<0.3	mg/kg	TM38/PM20
Chromium III	47.4	47.7	90.0	74.2	61.8						<0.5	mg/kg	NONE/NONE
Chromium III	-	-	-	-	-						<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.93	0.99	0.49	0.28	0.25						<0.02	%	TM21/PM24
pH #	8.37	8.10	8.38	8.70	8.73						<0.01	pH units	TM73/PM11
Mass of raw test portion	0.1016	0.1021	0.1075	0.1025	0.1033							kg	NONE/PM17

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	88-90	94-96	97-99	100-102	118-120								
Sample ID	TP-08	TP-09	TP-09	TP-10	TP-13								
Depth	0.00-0.80	0.00-0.70	0.70-1.10	0.50	0.50								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	12/03/2020	12/03/2020	12/03/2020	11/03/2020	11/03/2020								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	2	2	2	2	2								
Date of Receipt	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020								
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09							kg	NONE/PM17

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	43-45	46-48	49-51	55-57	61-63	67-69	70-72	73-75	76-78	82-84	LOD/LOR	Units	Method No.
Sample ID	TP-01	TP-01	TP-02	TP-03	TP-04	TP-05	TP-05	TP-05	TP-06	TP-07			
Depth	0.00-1.10	1.10-1.50	0.00-1.10	0.00-1.50	0.00-1.70	0.00-1.00	1.00-1.90	1.90-2.30	0.00-2.10	0.00-1.20			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	11/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020	12/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	2	2	2	2	2	2	2	2	2	2			
Date of Receipt	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020			
Dissolved Antimony #	<0.002	<0.002	0.004	<0.002	<0.002	<0.002	<0.002	0.003	0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	0.03	0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	0.0041	0.0040	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	0.041	0.040	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.006	0.012	0.011	0.011	0.009	0.010	0.016	0.021	0.011	0.009	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.06	0.12	0.11	0.11	0.09	0.10	0.16	0.21	0.11	0.09	<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.019	0.004	0.014	0.015	0.010	0.010	0.014	0.008	0.011	0.009	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.19	0.04	0.14	0.15	0.10	0.10	0.14	0.08	0.11	0.09	<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	0.003	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	0.03	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	0.003	<0.003	0.004	<0.003	<0.003	<0.003	<0.003	0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	0.00006	<0.00001	0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00002	<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	0.0006	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM26/PM0
Fluoride	0.5	0.8	0.6	0.5	0.6	0.7	0.5	0.6	0.6	0.4	<0.3	mg/l	TM173/PM0
Fluoride	5	8	6	5	6	7	5	6	6	4	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	2.4	6.5	4.1	3.5	4.5	3.2	213.4	44.1	2.9	0.5	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	24	65	41	35	45	32	2133	441	29	<5	<5	mg/kg	TM38/PM0
Chloride #	0.5	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	1.2	0.4	0.4	<0.3	mg/l	TM38/PM0
Chloride #	5	3	<3	<3	<3	<3	<3	12	4	4	<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	4	4	4	4	4	5	2	4	3	7	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	40	40	40	40	40	50	<20	40	30	70	<20	mg/kg	TM60/PM0
pH	8.30	8.21	8.44	8.39	8.28	8.19	8.04	7.94	8.41	8.32	<0.01	pH units	TM73/PM0
Total Dissolved Solids #	132	93	87	187	107	102	385	180	146	133	<35	mg/l	TM20/PM0
Total Dissolved Solids #	1320	930	870	1870	1070	1020	3849	1800	1461	1329	<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

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All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	88-90	94-96	97-99	100-102	118-120							
Sample ID	TP-08	TP-09	TP-09	TP-10	TP-13							
Depth	0.00-0.80	0.00-0.70	0.70-1.10	0.50	0.50							
COC No / misc												
Containers	V J T	V J T	V J T	V J T	V J T							
Sample Date	12/03/2020	12/03/2020	12/03/2020	11/03/2020	11/03/2020							
Sample Type	Soil	Soil	Soil	Soil	Soil							
Batch Number	2	2	2	2	2							
Date of Receipt	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020							

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Dissolved Antimony #	0.002	<0.002	<0.002	0.002	<0.002						<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02						<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025						<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	<0.025	<0.025						<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.004	0.014	<0.003	0.004	0.004						<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.04	0.14	<0.03	0.04	0.04						<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005						<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	<0.005	<0.005						<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015						<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015						<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	<0.007						<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	<0.07	<0.07						<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005	<0.005	<0.005	<0.005						<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.035	0.019	<0.002	0.005	0.007						<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.35	0.19	<0.02	0.05	0.07						<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	<0.002						<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02						<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	<0.003						<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03						<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	<0.003	<0.003	<0.003						<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03						<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001						<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001						<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01						<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM26/PM0
Fluoride	0.6	0.5	0.6	0.6	0.4						<0.3	mg/l	TM173/PM0
Fluoride	6	5	6	6	4						<3	mg/kg	TM173/PM0
Sulphate as SO4 #	5.3	114.8	4.7	<0.5	<0.5						<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	53	1149	47	<5	<5						<5	mg/kg	TM38/PM0
Chloride #	0.4	<0.3	<0.3	<0.3	<0.3						<0.3	mg/l	TM38/PM0
Chloride #	4	<3	<3	<3	<3						<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	2	<2	2	<2	<2						<2	mg/l	TM60/PM0
Dissolved Organic Carbon	<20	<20	20	<20	<20						<20	mg/kg	TM60/PM0
pH	8.58	8.08	8.24	8.49	8.32						<0.01	pH units	TM73/PM0
Total Dissolved Solids #	60	269	83	45	40						<35	mg/l	TM20/PM0
Total Dissolved Solids #	600	2691	830	450	400						<350	mg/kg	TM20/PM0

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : EN12457_2

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	43-45	46-48	49-51	55-57	61-63	67-69	70-72	73-75	76-78	82-84						
Sample ID	TP-01	TP-01	TP-02	TP-03	TP-04	TP-05	TP-05	TP-05	TP-06	TP-07						
Depth	0.00-1.10	1.10-1.50	0.00-1.10	0.00-1.50	0.00-1.70	0.00-1.00	1.00-1.90	1.90-2.30	0.00-2.10	0.00-1.20						
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	11/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020	12/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	2	2	2	2	2	2	2	2	2	2						
Date of Receipt	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis																
Total Organic Carbon #	NDP	0.38	NDP	NDP	0.96	1.29	0.85	1.78	NDP	0.99	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025	<0.025 SV	<0.025	<0.025	<0.025 SV	<0.025	<0.025 SV	<0.025	6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs #	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30	<30	<30	33	<30	<30	140	<30	<30	500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	1.09	<0.22	12.14	2.40	1.08	0.33	2.89	<0.22	2.46	1.80	-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	2.16	<0.64	25.89	4.17	1.98	0.69	5.52	<0.64	5.13	2.86	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	<0.025	0.041	0.040	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.06	0.12	0.11	0.11	0.09	0.10	0.16	0.21	0.11	0.09	20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	0.0006	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.19	0.04	0.14	0.15	0.10	0.10	0.14	0.08	0.11	0.09	0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	0.03	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	0.03	0.02	<0.02	0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	1320	930	870	1870	1070	1020	3849	1800	1461	1329	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	40	40	40	40	40	50	<20	40	30	70	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1035	0.1079	0.0995	0.1068	0.1036	0.102	0.1034	0.1124	0.1063	0.1112	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	86.7	83.1	90.2	84.1	87.2	88.0	86.8	79.7	84.5	80.7	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.886	0.882	0.89	0.883	0.887	0.888	0.886	0.877	0.884	0.878	-	-	-		l	NONE/PM17
Eluate Volume	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	-	-	-		l	NONE/PM17
pH #	8.53	8.41	8.53	8.54	8.54	8.23	8.17	7.77	8.63	8.33	-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	5	8	6	5	6	7	5	6	6	4	-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	24	65	41	35	45	32	2133	441	29	<5	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	5	3	<3	<3	<3	<3	<3	12	4	4	800	15000	25000	<3	mg/kg	TM38/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton
EMT Job No: 20/3992

Report : **EN12457_2**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	88-90	94-96	97-99	100-102	118-120						Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	TP-08	TP-09	TP-09	TP-10	TP-13											
Depth	0.00-0.80	0.00-0.70	0.70-1.10	0.50	0.50											
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T											
Sample Date	12/03/2020	12/03/2020	12/03/2020	11/03/2020	11/03/2020											
Sample Type	Soil	Soil	Soil	Soil	Soil											
Batch Number	2	2	2	2	2											
Date of Receipt	13/03/2020	13/03/2020	13/03/2020	13/03/2020	13/03/2020											
Solid Waste Analysis																
Total Organic Carbon #	0.93	0.99	0.49	0.28	0.25						3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025 SV	<0.025 SV	<0.025	<0.025	<0.025						6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs #	<0.035	<0.035	<0.035	<0.035	<0.035						1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30	<30	<30	<30						500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	0.28	<0.22	<0.22	<0.22	<0.22						-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	0.69	<0.64	<0.64	<0.64	<0.64						100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	<0.025	<0.025	<0.025	<0.025						0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.04	0.14	<0.03	0.04	0.04						20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	<0.005	<0.005	<0.005						0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	<0.015	<0.015	<0.015	<0.015						0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	<0.07	<0.07	<0.07						2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001						0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.35	0.19	<0.02	0.05	0.07						0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	<0.02	<0.02	<0.02						0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	<0.05	<0.05	<0.05	<0.05						0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	<0.02	<0.02	<0.02	<0.02						0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03	<0.03						0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	<0.03	<0.03	<0.03	<0.03						4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	600	2691	830	450	400						4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	<20	<20	20	<20	<20						500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1016	0.1021	0.1075	0.1025	0.1033						-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	88.3	87.9	83.9	87.5	87.0						-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.888	0.888	0.883	0.887	0.887						-	-	-		l	NONE/PM17
Eluate Volume	0.8	0.8	0.8	0.8	0.8						-	-	-		l	NONE/PM17
pH #	8.37	8.10	8.38	8.70	8.73						-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1						1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	6	5	6	6	4						-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	53	1149	47	<5	<5						1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	4	<3	<3	<3	<3						800	15000	25000	<3	mg/kg	TM38/PM0

Client Name: Ground Investigations Ireland

Reference: 9527-03-20

Location: Waste Assesment Back Road Malahide

Contact: Barry Sexton

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
20/3992	2	TP-01	0.00-1.10	43-45	No interpretation possible
20/3992	2	TP-01	1.10-1.50	46-48	No interpretation possible
20/3992	2	TP-02	0.00-1.10	49-51	PAH's
20/3992	2	TP-03	0.00-1.50	55-57	PAH's & Possible lubricating oil
20/3992	2	TP-04	0.00-1.70	61-63	Possible lubricating oil
20/3992	2	TP-05	0.00-1.00	67-69	No interpretation possible
20/3992	2	TP-05	1.00-1.90	70-72	Possible lubricating oil & Possible PAH's
20/3992	2	TP-05	1.90-2.30	73-75	Unknown hydrocarbons
20/3992	2	TP-06	0.00-2.10	76-78	No interpretation possible
20/3992	2	TP-07	0.00-1.20	82-84	No interpretation possible
20/3992	2	TP-08	0.00-0.80	88-90	No interpretation possible
20/3992	2	TP-09	0.00-0.70	94-96	No interpretation possible
20/3992	2	TP-09	0.70-1.10	97-99	No interpretation possible
20/3992	2	TP-10	0.50	100-102	No interpretation possible
20/3992	2	TP-13	0.50	118-120	No interpretation possible

Client Name: Ground Investigations Ireland
Reference: 20/03/9527
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/3992	2	TP-01	0.00-1.10	44	18/03/2020	**General Description (Bulk Analysis)**	soil-stones
					18/03/2020	**Asbestos Fibres**	Fibre Bundles
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	Chrysotile
					18/03/2020	**Asbestos Level Screen**	less than 0.1%
					19/03/2020	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					19/03/2020	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					19/03/2020	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
20/3992	2	TP-01	1.10-1.50	47	18/03/2020	**General Description (Bulk Analysis)**	soil-stones
					18/03/2020	**Asbestos Fibres**	NAD
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	NAD
					18/03/2020	**Asbestos Level Screen**	NAD
20/3992	2	TP-02	0.00-1.10	50	18/03/2020	**General Description (Bulk Analysis)**	soil.stones
					18/03/2020	**Asbestos Fibres**	Fibre Bundles
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	Chrysotile
					18/03/2020	**Asbestos Level Screen**	less than 0.1%
					19/03/2020	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					19/03/2020	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					19/03/2020	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
20/3992	2	TP-03	0.00-1.50	56	18/03/2020	**General Description (Bulk Analysis)**	Soil/Stones
					18/03/2020	**Asbestos Fibres**	Fibre Bundles
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	Chrysotile
					18/03/2020	**Asbestos Level Screen**	less than 0.1%
					19/03/2020	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					19/03/2020	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					19/03/2020	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
20/3992	2	TP-04	0.00-1.70	62	18/03/2020	**General Description (Bulk Analysis)**	soil.stones
					18/03/2020	**Asbestos Fibres**	NAD
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	NAD
					18/03/2020	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland
Reference: 20/03/9527
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/3992	2	TP-05	0.00-1.00	68	18/03/2020	**General Description (Bulk Analysis)**	soil.stones
					18/03/2020	**Asbestos Fibres**	NAD
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	NAD
					18/03/2020	**Asbestos Level Screen**	NAD
20/3992	2	TP-05	1.00-1.90	71	18/03/2020	**General Description (Bulk Analysis)**	soil-stones
					18/03/2020	**Asbestos Fibres**	NAD
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	NAD
					18/03/2020	**Asbestos Level Screen**	NAD
20/3992	2	TP-05	1.90-2.30	74	18/03/2020	**General Description (Bulk Analysis)**	soil.stones
					18/03/2020	**Asbestos Fibres**	NAD
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	NAD
					18/03/2020	**Asbestos Level Screen**	NAD
20/3992	2	TP-06	0.00-2.10	77	18/03/2020	**General Description (Bulk Analysis)**	soil.stones
					18/03/2020	**Asbestos Fibres**	Fibre Bundles
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	Chrysotile
					18/03/2020	**Asbestos Level Screen**	less than 0.1%
					19/03/2020	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					19/03/2020	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					19/03/2020	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
20/3992	2	TP-07	0.00-1.20	83	18/03/2020	**General Description (Bulk Analysis)**	Soil/Stones
					18/03/2020	**Asbestos Fibres**	NAD
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	NAD
					18/03/2020	**Asbestos Level Screen**	NAD
20/3992	2	TP-08	0.00-0.80	89	18/03/2020	**General Description (Bulk Analysis)**	Soil/Stones
					18/03/2020	**Asbestos Fibres**	NAD
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	NAD
					18/03/2020	**Asbestos Level Screen**	NAD
20/3992	2	TP-09	0.00-0.70	95	18/03/2020	**General Description (Bulk Analysis)**	soil-stones
					18/03/2020	**Asbestos Fibres**	NAD
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	NAD
					18/03/2020	**Asbestos Level Screen**	NAD
20/3992	2	TP-09	0.70-1.10	98	18/03/2020	**General Description (Bulk Analysis)**	soil.stones
					18/03/2020	**Asbestos Fibres**	NAD
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	NAD
					18/03/2020	**Asbestos Level Screen**	NAD
20/3992	2	TP-10	0.50	101	18/03/2020	**General Description (Bulk Analysis)**	Soil/Stones
					18/03/2020	**Asbestos Fibres**	NAD

Client Name: Ground Investigations Ireland
Reference: 20/03/9527
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/3992	2	TP-10	0.50	101	18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	NAD
					18/03/2020	**Asbestos Level Screen**	NAD
20/3992	2	TP-13	0.50	119	18/03/2020	**General Description (Bulk Analysis)**	Soil/Stones
					18/03/2020	**Asbestos Fibres**	NAD
					18/03/2020	**Asbestos ACM**	NAD
					18/03/2020	**Asbestos Type**	NAD
					18/03/2020	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland

Reference: 9527-03-20

Location: Waste Assesment Back Road Malahide

Contact: Barry Sexton

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Method No.	NDP Reason
20/3992	2	TP-01	0.00-1.10	43-45	TM21/PM24	Asbestos detected in sample
20/3992	2	TP-02	0.00-1.10	49-51	TM21/PM24	Asbestos detected in sample
20/3992	2	TP-03	0.00-1.50	55-57	TM21/PM24	Asbestos detected in sample
20/3992	2	TP-06	0.00-2.10	76-78	TM21/PM24	Asbestos detected in sample

Client Name: Ground Investigations Ireland
Reference: 9527-03-20
Location: Waste Assesment Back Road Malahide
Contact: Barry Sexton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 20/3992						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/3992

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 20/3992

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3: 1990/USEPA 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 20/3992

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM17	Modified method BS EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060, APHA Standard Methods for Examination of Water and Wastewater 5310B, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes

EMT Job No: 20/3992

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM61	Modified US EPA methods 245.7 and 200.7. Determination of Mercury by Cold Vapour Atomic Fluorescence.	PM0	No preparation is required.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM131	Quantification of Asbestos Fibres and ACM, based on HSG248 and SCA method.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM17	Modified method BS EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	

EMT Job No: 20/3992

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

APPENDIX 4 – HazWasteOnLine™ Report

Waste Classification Report

6U6UQ-P3PME-KNZP7

Job name

Back Road Malahide 17 05 04

Description/Comments

Project

9527-03-20

Site

Back Road Malahide

Related Documents

#	Name	Description
1	Back Road Malahide.hwol	.hwol file used to create the Job
2	Classification Report-Back Road Malahide.pdf	Classification for Job: Back Road Malahide

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name:
Barry Sexton
Date:
09 Apr 2020 11:03 GMT
Telephone:
00353876119640

Company:
Ground Investigations Ireland
Catherinestown House,
Hazelhatch Road, Newcastle
Co. Dublin

HazWasteOnline™ Training Record:

Course	Date
Hazardous Waste Classification	09 Apr 2019
Advanced Hazardous Waste Classification	10 Apr 2019

Report

Created by: Barry Sexton
Created date: 09 Apr 2020 11:03 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP-01-12/03/2020-1.10-1.50m		Non Hazardous		2
2	TP-05-12/03/2020-1.90-2.30m		Non Hazardous		5
3	TP-09-12/03/2020-0.70-1.10m		Non Hazardous		8
4	TP-10-11/03/2020-0.50m		Non Hazardous		11
5	TP-13-11/03/2020-0.50m		Non Hazardous		14

Classification of sample: TP-01-12/03/2020-1.10-1.50m

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

Sample details

Sample Name:
TP-01-12/03/2020-1.10-1.50m
Moisture content:
16.2%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16.2% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		3 mg/kg	1.197	3.01 mg/kg	0.000301 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		22.4 mg/kg	1.32	24.784 mg/kg	0.00248 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.9 mg/kg	1.142	1.819 mg/kg	0.000182 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		92.4 mg/kg	1.462	113.17 mg/kg	0.0113 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		70 mg/kg	1.126	66.045 mg/kg	0.0066 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	39 mg/kg	1.56	50.978 mg/kg	0.00327 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		7.3 mg/kg	1.5	9.177 mg/kg	0.000918 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		35.7 mg/kg	2.976	89.04 mg/kg	0.0089 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1 mg/kg	2.554	2.14 mg/kg	0.000214 %	✓	
12	zinc { zinc chromate }	024-007-00-3				204 mg/kg	2.774	474.246 mg/kg	0.0474 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
19		pH				8.41	pH		8.41	pH	8.41 pH		
				PH									
20		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-912-4	206-44-0									
27		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-883-8	191-24-2									
36		polychlorobiphenyls; PCB				<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
37		barium { barium oxide }				150	mg/kg	1.117	140.345	mg/kg	0.014 %	✓	
			215-127-9	1304-28-5									
38		coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
39		benzo[j]fluoranthene				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		601-035-00-X	205-910-3	205-82-3									
										Total:	0.101 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP-05-12/03/2020-1.90-2.30m

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

Sample details

Sample Name:
TP-05-12/03/2020-1.90-2.30m
Moisture content:
19.4%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 19.4% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
1		antimony { antimony trioxide } 051-005-00-X / 215-175-0 / 1309-64-4		3 mg/kg	1.197	2.895 mg/kg	0.000289 %	✓	
2		arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		16.3 mg/kg	1.32	17.346 mg/kg	0.00173 %	✓	
3		cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		1.6 mg/kg	1.142	1.473 mg/kg	0.000147 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		103.7 mg/kg	1.462	122.16 mg/kg	0.0122 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<LOD
6		copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		40 mg/kg	1.126	36.299 mg/kg	0.00363 %	✓	
7		lead { lead chromate } 082-004-00-2 / 231-846-0 / 7758-97-6	1	57 mg/kg	1.56	71.661 mg/kg	0.00459 %	✓	
8		mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
9		molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		8.3 mg/kg	1.5	10.036 mg/kg	0.001 %	✓	
10		nickel { nickel chromate } 028-035-00-7 / 238-766-5 / 14721-18-7		47.8 mg/kg	2.976	114.666 mg/kg	0.0115 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		2 mg/kg	2.554	4.116 mg/kg	0.000412 %	✓	
12		zinc { zinc chromate } 024-007-00-3		123 mg/kg	2.774	275.023 mg/kg	0.0275 %	✓	
13		TPH (C6 to C40) petroleum group TPH		140 mg/kg		112.84 mg/kg	0.0113 %	✓	
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18		xylene	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]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19		pH			PH		7.77	pH		7.77	pH	7.77 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21		acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23		fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24		phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25		anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26		fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27		pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35		benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37		barium { barium oxide }		215-127-9	1304-28-5		116	mg/kg	1.117	104.389	mg/kg	0.0104 %	✓	
38		coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39		benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
											Total:	0.085 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Solid waste without liquid phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0113%)

Classification of sample: TP-09-12/03/2020-0.70-1.10m

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

Sample details

Sample Name:
TP-09-12/03/2020-0.70-1.10m
Moisture content:
17.3%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17.3% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		3 mg/kg	1.197	2.97 mg/kg	0.000297 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14.4 mg/kg	1.32	15.723 mg/kg	0.00157 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.1 mg/kg	1.142	1.039 mg/kg	0.000104 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		90 mg/kg	1.462	108.784 mg/kg	0.0109 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		36 mg/kg	1.126	33.52 mg/kg	0.00335 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	27 mg/kg	1.56	34.829 mg/kg	0.00223 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		8.2 mg/kg	1.5	10.173 mg/kg	0.00102 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		51.4 mg/kg	2.976	126.514 mg/kg	0.0127 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2 mg/kg	2.554	4.224 mg/kg	0.000422 %	✓	
12	zinc { zinc chromate }	024-007-00-3				111 mg/kg	2.774	254.658 mg/kg	0.0255 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
19		pH				8.38	pH		8.38	pH	8.38 pH		
				PH									
20		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-912-4	206-44-0									
27		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-883-8	191-24-2									
36		polychlorobiphenyls; PCB				<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
37		barium { barium oxide }				100	mg/kg	1.117	92.335	mg/kg	0.00923 %	✓	
			215-127-9	1304-28-5									
38		coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
39		benzo[j]fluoranthene				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		601-035-00-X	205-910-3	205-82-3									
										Total:	0.0727 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP-10-11/03/2020-0.50m

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

Sample details

Sample Name:
TP-10-11/03/2020-0.50m
Moisture content:
12.1%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12.1% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
1		antimony { antimony trioxide }		3 mg/kg	1.197	3.157 mg/kg	0.000316 %	✓	
		051-005-00-X / 215-175-0 / 1309-64-4							
2		arsenic { arsenic trioxide }		11.7 mg/kg	1.32	13.579 mg/kg	0.00136 %	✓	
		033-003-00-0 / 215-481-4 / 1327-53-3							
3		cadmium { cadmium oxide }		1.4 mg/kg	1.142	1.406 mg/kg	0.000141 %	✓	
		048-002-00-0 / 215-146-2 / 1306-19-0							
4		chromium in chromium(III) compounds { chromium(III) oxide }		74.2 mg/kg	1.462	95.325 mg/kg	0.00953 %	✓	
		/ 215-160-9 / 1308-38-9							
5		chromium in chromium(VI) compounds { chromium(VI) oxide }		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<LOD
		024-001-00-0 / 215-607-8 / 1333-82-0							
6		copper { dicopper oxide; copper (I) oxide }		28 mg/kg	1.126	27.71 mg/kg	0.00277 %	✓	
		029-002-00-X / 215-270-7 / 1317-39-1							
7		lead { lead chromate }	1	19 mg/kg	1.56	26.05 mg/kg	0.00167 %	✓	
		082-004-00-2 / 231-846-0 / 7758-97-6							
8		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							
9		molybdenum { molybdenum(VI) oxide }		7.2 mg/kg	1.5	9.494 mg/kg	0.000949 %	✓	
		042-001-00-9 / 215-204-7 / 1313-27-5							
10		nickel { nickel chromate }		36.5 mg/kg	2.976	95.489 mg/kg	0.00955 %	✓	
		028-035-00-7 / 238-766-5 / 14721-18-7							
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		2 mg/kg	2.554	4.489 mg/kg	0.000449 %	✓	
		034-002-00-8 / /							
12		zinc { zinc chromate }		93 mg/kg	2.774	226.778 mg/kg	0.0227 %	✓	
		024-007-00-3 / /							
13		TPH (C6 to C40) petroleum group		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
		/ / TPH							
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		603-181-00-X / 216-653-1 / 1634-04-4							

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18		xylene	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]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19		pH			PH		8.7	pH		8.7	pH	8.7 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21		acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23		fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24		phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25		anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26		fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27		pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35		benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37		barium { barium oxide }		215-127-9	1304-28-5		96	mg/kg	1.117	94.215	mg/kg	0.00942 %	✓	
38		coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39		benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
											Total:	0.0643 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP-13-11/03/2020-0.50m

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

Sample details

Sample Name:
TP-13-11/03/2020-0.50m
Moisture content:
11.7%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2 mg/kg	1.197	2.114 mg/kg	0.000211 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10.5 mg/kg	1.32	12.241 mg/kg	0.00122 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.1 mg/kg	1.142	1.11 mg/kg	0.000111 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		61.8 mg/kg	1.462	79.756 mg/kg	0.00798 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		25 mg/kg	1.126	24.854 mg/kg	0.00249 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	17 mg/kg	1.56	23.414 mg/kg	0.0015 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		5 mg/kg	1.5	6.623 mg/kg	0.000662 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		36.5 mg/kg	2.976	95.924 mg/kg	0.00959 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
12	zinc { zinc chromate }	024-007-00-3				77 mg/kg	2.774	188.617 mg/kg	0.0189 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
19		pH				8.73	pH		8.73	pH	8.73 pH		
				PH									
20		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-912-4	206-44-0									
27		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-883-8	191-24-2									
36		polychlorobiphenyls; PCB				<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
37		barium { barium oxide }				81	mg/kg	1.117	79.856	mg/kg	0.00799 %	✓	
			215-127-9	1304-28-5									
38		coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
39		benzo[j]fluoranthene				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		601-035-00-X	205-910-3	205-82-3									
										Total:	0.0563 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

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

Conversion factor: 1.462
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 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

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

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

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
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

pH (CAS Number: PH)

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

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)

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.
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
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

- **barium oxide** (EC Number: 215-127-9, CAS Number: 1304-28-5)

Conversion factor: 1.117
Description/Comments: Data from ECHA's C&L Inventory Database, Sigma Aldrich SDS dated 6/2/20
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/88825
Data source date: 02 Apr 2020
Hazard Statements: Acute Tox. 1 H332 , Eye Dam. 1 H318 , Skin Corr. 1B H314 , Acute Tox. 3 H301

- **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

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

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

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

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 (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

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. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

barium {barium oxide}

Cr VI not detected

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2020.88.4220.8373 (28 Mar 2020)
HazWasteOnline Database: 2020.88.4220.8373 (28 Mar 2020)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
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 Wastes 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
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

Waste Classification Report

75LYA-QFPWZ-W299S

Job name

Back Road Malahide 17 09 04

Description/Comments

Project

9527-03-20

Site

Back Road Malahide

Related Documents

#	Name	Description
1	Back Road Malahide.hwol	.hwol file used to create the Job
2	Classification Report-Back Road Malahide.pdf	Classification for Job: Back Road Malahide

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name:
Barry Sexton
Date:
09 Apr 2020 11:05 GMT
Telephone:
00353876119640

Company:
Ground Investigations Ireland
Catherinestown House,
Hazelhatch Road, Newcastle
Co. Dublin

HazWasteOnline™ Training Record:

Course	Date
Hazardous Waste Classification	09 Apr 2019
Advanced Hazardous Waste Classification	10 Apr 2019

Report

Created by: Barry Sexton
Created date: 09 Apr 2020 11:05 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP-01-11/03/2020-0.00-1.10m		Non Hazardous		3
2	TP-02-12/03/2020-0.00-1.10m		Non Hazardous		6
3	TP-03-12/03/2020-0.00-1.50m		Non Hazardous		9
4	TP-04-11/03/2020-0.00-1.70m		Non Hazardous		12
5	TP-05-12/03/2020-0.00-1.00m		Non Hazardous		15
6	TP-05-12/03/2020-1.00-1.90m		Non Hazardous		18
7	TP-06-12/03/2020-0.00-2.10m		Non Hazardous		21
8	TP-07-11/03/2020-0.00-1.20m		Non Hazardous		24
9	TP-08-12/03/2020-0.00-0.80m		Non Hazardous		27
10	TP-09-12/03/2020-0.00-0.70m		Non Hazardous		30

Classification of sample: TP-01-11/03/2020-0.00-1.10m

Non Hazardous Waste
Classified as **17 09 04**
in the List of Waste

Sample details

Sample Name:
TP-01-11/03/2020-0.00-1.10m
Moisture content:
12.9%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 09 04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03)

Hazard properties

None identified

Determinands

Moisture content: 12.9% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		3 mg/kg	1.197	3.128 mg/kg	0.000313 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14.5 mg/kg	1.32	16.675 mg/kg	0.00167 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3.1 mg/kg	1.142	3.084 mg/kg	0.000308 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		19.2 mg/kg	1.462	24.442 mg/kg	0.00244 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		61 mg/kg	1.126	59.82 mg/kg	0.00598 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	110 mg/kg	1.56	149.446 mg/kg	0.00958 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		7.1 mg/kg	1.5	9.277 mg/kg	0.000928 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		55.3 mg/kg	2.976	143.356 mg/kg	0.0143 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				3 mg/kg	2.554	6.673 mg/kg	0.000667 %	✓	
12	zinc { zinc chromate }	024-007-00-3				134 mg/kg	2.774	323.782 mg/kg	0.0324 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
15		benzene 601-020-00-8 / 200-753-7 / 71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16		toluene 601-021-00-3 / 203-625-9 / 108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17		ethylbenzene 601-023-00-4 / 202-849-4 / 100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18		xylene 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]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19		pH / / PH		8.53 pH		8.53 pH	8.53 pH		
20		naphthalene 601-052-00-2 / 202-049-5 / 91-20-3		0.1 mg/kg		0.0871 mg/kg	0.00000871 %	✓	
21		acenaphthylene / 205-917-1 / 208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22		acenaphthene / 201-469-6 / 83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23		fluorene / 201-695-5 / 86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24		phenanthrene / 201-581-5 / 85-01-8		0.2 mg/kg		0.174 mg/kg	0.0000174 %	✓	
25		anthracene / 204-371-1 / 120-12-7		0.07 mg/kg		0.061 mg/kg	0.0000061 %	✓	
26		fluoranthene / 205-912-4 / 206-44-0		0.3 mg/kg		0.261 mg/kg	0.0000261 %	✓	
27		pyrene / 204-927-3 / 129-00-0		0.28 mg/kg		0.244 mg/kg	0.0000244 %	✓	
28		benzo[a]anthracene 601-033-00-9 / 200-280-6 / 56-55-3		0.24 mg/kg		0.209 mg/kg	0.0000209 %	✓	
29		chrysene 601-048-00-0 / 205-923-4 / 218-01-9		0.18 mg/kg		0.157 mg/kg	0.0000157 %	✓	
30		benzo[b]fluoranthene 601-034-00-4 / 205-911-9 / 205-99-2		0.24 mg/kg		0.209 mg/kg	0.0000209 %	✓	
31		benzo[k]fluoranthene 601-036-00-5 / 205-916-6 / 207-08-9		0.1 mg/kg		0.0871 mg/kg	0.00000871 %	✓	
32		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3 / 200-028-5 / 50-32-8		0.18 mg/kg		0.157 mg/kg	0.0000157 %	✓	
33		indeno[123-cd]pyrene / 205-893-2 / 193-39-5		0.13 mg/kg		0.113 mg/kg	0.0000113 %	✓	
34		dibenz[a,h]anthracene 601-041-00-2 / 200-181-8 / 53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35		benzo[ghi]perylene / 205-883-8 / 191-24-2		0.14 mg/kg		0.122 mg/kg	0.0000122 %	✓	
36		polychlorobiphenyls; PCB 602-039-00-4 / 215-648-1 / 1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37		asbestos 650-013-00-6 / - - - - - - - / 12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
38		barium { barium oxide } / 215-127-9 / 1304-28-5		150 mg/kg	1.117	145.871 mg/kg	0.0146 %	✓	
39		coronene / 205-881-7 / 191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
40		benzo[j]fluoranthene 601-035-00-X / 205-910-3 / 205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
								Total:	0.0898 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP-02-12/03/2020-0.00-1.10m

Non Hazardous Waste
Classified as **17 09 04**
in the List of Waste

Sample details

Sample Name:
TP-02-12/03/2020-0.00-1.10m
Moisture content:
15.9%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 09 04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03)

Hazard properties

None identified

Determinands

Moisture content: 15.9% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2 mg/kg	1.197	2.014 mg/kg	0.000201 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11.4 mg/kg	1.32	12.658 mg/kg	0.00127 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.5 mg/kg	1.142	1.441 mg/kg	0.000144 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		20.1 mg/kg	1.462	24.706 mg/kg	0.00247 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		50 mg/kg	1.126	47.344 mg/kg	0.00473 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	76 mg/kg	1.56	99.697 mg/kg	0.00639 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3.7 mg/kg	1.5	4.668 mg/kg	0.000467 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		44.3 mg/kg	2.976	110.885 mg/kg	0.0111 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2 mg/kg	2.554	4.295 mg/kg	0.00043 %	✓	
12	zinc { zinc chromate }	024-007-00-3				94 mg/kg	2.774	219.307 mg/kg	0.0219 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		83 mg/kg		69.803 mg/kg	0.00698 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**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]									
19		pH				8.53	pH		8.53	pH	8.53 pH		
				PH									
20		naphthalene				0.08	mg/kg		0.0673	mg/kg	0.00000673 %	✓	
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				0.39	mg/kg		0.328	mg/kg	0.0000328 %	✓	
			205-917-1	208-96-8									
22		acenaphthene				0.07	mg/kg		0.0589	mg/kg	0.00000589 %	✓	
			201-469-6	83-32-9									
23		fluorene				0.32	mg/kg		0.269	mg/kg	0.0000269 %	✓	
			201-695-5	86-73-7									
24		phenanthrene				2.72	mg/kg		2.288	mg/kg	0.000229 %	✓	
			201-581-5	85-01-8									
25		anthracene				1.75	mg/kg		1.472	mg/kg	0.000147 %	✓	
			204-371-1	120-12-7									
26		fluoranthene				4.42	mg/kg		3.717	mg/kg	0.000372 %	✓	
			205-912-4	206-44-0									
27		pyrene				3.6	mg/kg		3.028	mg/kg	0.000303 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				2.06	mg/kg		1.732	mg/kg	0.000173 %	✓	
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				2.21	mg/kg		1.859	mg/kg	0.000186 %	✓	
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				2.4	mg/kg		2.018	mg/kg	0.000202 %	✓	
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				0.93	mg/kg		0.782	mg/kg	0.0000782 %	✓	
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				2.03	mg/kg		1.707	mg/kg	0.000171 %	✓	
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				1.24	mg/kg		1.043	mg/kg	0.000104 %	✓	
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				0.32	mg/kg		0.269	mg/kg	0.0000269 %	✓	
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				1.12	mg/kg		0.942	mg/kg	0.0000942 %	✓	
			205-883-8	191-24-2									
36		polychlorobiphenyls; PCB				<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
37		asbestos				<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
38		barium { barium oxide }				94	mg/kg	1.117	88.264	mg/kg	0.00883 %	✓	
			215-127-9	1304-28-5									
39		coronene				0.23	mg/kg		0.193	mg/kg	0.0000193 %	✓	
			205-881-7	191-07-1									
40		benzo[j]fluoranthene				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		601-035-00-X	205-910-3	205-82-3									

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
								Total:	0.0683 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Solid waste without liquid phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00698%)

Classification of sample: TP-03-12/03/2020-0.00-1.50m

Non Hazardous Waste
Classified as **17 09 04**
in the List of Waste

Sample details

Sample Name:
TP-03-12/03/2020-0.00-1.50m
Moisture content:
14.4%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 09 04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03)

Hazard properties

None identified

Determinands

Moisture content: 14.4% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		4	mg/kg	1.197	4.099	mg/kg	0.00041 %	✓	
2		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15.5	mg/kg	1.32	17.518	mg/kg	0.00175 %	✓	
3		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.8	mg/kg	1.142	1.76	mg/kg	0.000176 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		21.2	mg/kg	1.462	26.523	mg/kg	0.00265 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<**LOD**
6		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		42	mg/kg	1.126	40.478	mg/kg	0.00405 %	✓	
7		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	56	mg/kg	1.56	74.771	mg/kg	0.00479 %	✓	
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<**LOD**
9		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.7	mg/kg	1.5	3.467	mg/kg	0.000347 %	✓	
10		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		39.4	mg/kg	2.976	100.379	mg/kg	0.01 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2	mg/kg	2.554	4.372	mg/kg	0.000437 %	✓	
12		zinc { zinc chromate }	024-007-00-3				117	mg/kg	2.774	277.836	mg/kg	0.0278 %	✓	
13		TPH (C6 to C40) petroleum group			TPH		69	mg/kg		59.064	mg/kg	0.00591 %	✓	
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**

#		Determinand	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number											
15		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
19		pH				8.54	pH		8.54	pH	8.54 pH		
				PH									
20		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				0.28	mg/kg		0.24	mg/kg	0.000024 %	✓	
			201-581-5	85-01-8									
25		anthracene				0.08	mg/kg		0.0685	mg/kg	0.00000685 %	✓	
			204-371-1	120-12-7									
26		fluoranthene				0.53	mg/kg		0.454	mg/kg	0.0000454 %	✓	
			205-912-4	206-44-0									
27		pyrene				0.5	mg/kg		0.428	mg/kg	0.0000428 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				0.46	mg/kg		0.394	mg/kg	0.0000394 %	✓	
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				0.37	mg/kg		0.317	mg/kg	0.0000317 %	✓	
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				0.58	mg/kg		0.496	mg/kg	0.0000496 %	✓	
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				0.23	mg/kg		0.197	mg/kg	0.0000197 %	✓	
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				0.53	mg/kg		0.454	mg/kg	0.0000454 %	✓	
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				0.25	mg/kg		0.214	mg/kg	0.0000214 %	✓	
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				0.08	mg/kg		0.0685	mg/kg	0.00000685 %	✓	
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				0.28	mg/kg		0.24	mg/kg	0.000024 %	✓	
			205-883-8	191-24-2									
36		polychlorobiphenyls; PCB				<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
37		asbestos				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
38		barium { barium oxide }				94	mg/kg	1.117	89.839	mg/kg	0.00898 %	✓	
			215-127-9	1304-28-5									
39		coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
40		benzo[j]fluoranthene				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		601-035-00-X	205-910-3	205-82-3									

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
								Total:	0.0689 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Solid waste without liquid phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00591%)

Classification of sample: TP-04-11/03/2020-0.00-1.70m

Non Hazardous Waste
Classified as **17 09 04**
in the List of Waste

Sample details

Sample Name:
TP-04-11/03/2020-0.00-1.70m
Moisture content:
12.6%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 09 04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03)

Hazard properties

None identified

Determinands

Moisture content: 12.6% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		3 mg/kg	1.197	3.139 mg/kg	0.000314 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10.9 mg/kg	1.32	12.578 mg/kg	0.00126 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.3 mg/kg	1.142	1.298 mg/kg	0.00013 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		50.6 mg/kg	1.462	64.636 mg/kg	0.00646 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		31 mg/kg	1.126	30.505 mg/kg	0.00305 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	57 mg/kg	1.56	77.707 mg/kg	0.00498 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		4.8 mg/kg	1.5	6.294 mg/kg	0.000629 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		35.5 mg/kg	2.976	92.345 mg/kg	0.00923 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1 mg/kg	2.554	2.232 mg/kg	0.000223 %	✓	
12	zinc { zinc chromate }	024-007-00-3				107 mg/kg	2.774	259.433 mg/kg	0.0259 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
19		pH				8.54	pH		8.54	pH	8.54 pH		
				PH									
20		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				0.23	mg/kg		0.201	mg/kg	0.0000201 %	✓	
			201-581-5	85-01-8									
25		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				0.3	mg/kg		0.262	mg/kg	0.0000262 %	✓	
			205-912-4	206-44-0									
27		pyrene				0.27	mg/kg		0.236	mg/kg	0.0000236 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				0.21	mg/kg		0.184	mg/kg	0.0000184 %	✓	
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				0.19	mg/kg		0.166	mg/kg	0.0000166 %	✓	
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				0.25	mg/kg		0.219	mg/kg	0.0000219 %	✓	
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				0.1	mg/kg		0.0874	mg/kg	0.00000874 %	✓	
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				0.17	mg/kg		0.149	mg/kg	0.0000149 %	✓	
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				0.13	mg/kg		0.114	mg/kg	0.0000114 %	✓	
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				0.13	mg/kg		0.114	mg/kg	0.0000114 %	✓	
			205-883-8	191-24-2									
36		polychlorobiphenyls; PCB				<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
37		barium { barium oxide }				90	mg/kg	1.117	87.824	mg/kg	0.00878 %	✓	
			215-127-9	1304-28-5									
38		coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
39		benzo[j]fluoranthene				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		601-035-00-X	205-910-3	205-82-3									
										Total:	0.0666 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP-05-12/03/2020-0.00-1.00m

Non Hazardous Waste
Classified as **17 09 04**
in the List of Waste

Sample details

Sample Name:
TP-05-12/03/2020-0.00-1.00m
Moisture content:
14.4%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 09 04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03)

Hazard properties

None identified

Determinands

Moisture content: 14.4% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		3 mg/kg	1.197	3.074 mg/kg	0.000307 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12.7 mg/kg	1.32	14.354 mg/kg	0.00144 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.3 mg/kg	1.142	1.271 mg/kg	0.000127 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		78 mg/kg	1.462	97.585 mg/kg	0.00976 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		39 mg/kg	1.126	37.587 mg/kg	0.00376 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	51 mg/kg	1.56	68.095 mg/kg	0.00437 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		6.8 mg/kg	1.5	8.732 mg/kg	0.000873 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		39.9 mg/kg	2.976	101.653 mg/kg	0.0102 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1 mg/kg	2.554	2.186 mg/kg	0.000219 %	✓	
12	zinc { zinc chromate }	024-007-00-3				120 mg/kg	2.774	284.96 mg/kg	0.0285 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
18		xylene	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]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
19		pH			PH		8.23	pH		8.23	pH	8.23 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
21		acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
22		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
23		fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
24		phenanthrene		201-581-5	85-01-8		0.07	mg/kg		0.0599	mg/kg	0.00000599 %	✓	
25		anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
26		fluoranthene		205-912-4	206-44-0		0.13	mg/kg		0.111	mg/kg	0.0000111 %	✓	
27		pyrene		204-927-3	129-00-0		0.12	mg/kg		0.103	mg/kg	0.0000103 %	✓	
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.09	mg/kg		0.077	mg/kg	0.0000077 %	✓	
29		chrysene	601-048-00-0	205-923-4	218-01-9		0.08	mg/kg		0.0685	mg/kg	0.00000685 %	✓	
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.09	mg/kg		0.077	mg/kg	0.0000077 %	✓	
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.04	mg/kg		0.0342	mg/kg	0.00000342 %	✓	
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.07	mg/kg		0.0599	mg/kg	0.00000599 %	✓	
33		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
35		benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
36		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<**LOD**
37		barium { barium oxide }		215-127-9	1304-28-5		132	mg/kg	1.117	126.156	mg/kg	0.0126 %	✓	
38		coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
39		benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
											Total:	0.0776 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP-05-12/03/2020-1.00-1.90m

Non Hazardous Waste
Classified as **17 09 04**
in the List of Waste

Sample details

Sample Name:
TP-05-12/03/2020-1.00-1.90m
Moisture content:
11.9%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 09 04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03)

Hazard properties

None identified

Determinands

Moisture content: 11.9% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		3 mg/kg	1.197	3.164 mg/kg	0.000316 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12.1 mg/kg	1.32	14.075 mg/kg	0.00141 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.8 mg/kg	1.142	1.812 mg/kg	0.000181 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		48.1 mg/kg	1.462	61.935 mg/kg	0.00619 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		38 mg/kg	1.126	37.692 mg/kg	0.00377 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	35 mg/kg	1.56	48.097 mg/kg	0.00308 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		5.2 mg/kg	1.5	6.873 mg/kg	0.000687 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		41.4 mg/kg	2.976	108.554 mg/kg	0.0109 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				6 mg/kg	2.554	13.498 mg/kg	0.00135 %	✓	
12	zinc { zinc chromate }	024-007-00-3				102 mg/kg	2.774	249.29 mg/kg	0.0249 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
19		pH				8.17	pH		8.17	pH	8.17 pH		
				PH									
20		naphthalene				0.05	mg/kg		0.0441	mg/kg	0.00000441 %	✓	
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				0.06	mg/kg		0.0529	mg/kg	0.00000529 %	✓	
			205-917-1	208-96-8									
22		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				0.44	mg/kg		0.388	mg/kg	0.0000388 %	✓	
			201-581-5	85-01-8									
25		anthracene				0.14	mg/kg		0.123	mg/kg	0.0000123 %	✓	
			204-371-1	120-12-7									
26		fluoranthene				0.79	mg/kg		0.696	mg/kg	0.0000696 %	✓	
			205-912-4	206-44-0									
27		pyrene				0.69	mg/kg		0.608	mg/kg	0.0000608 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				0.59	mg/kg		0.52	mg/kg	0.000052 %	✓	
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				0.52	mg/kg		0.458	mg/kg	0.0000458 %	✓	
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				0.68	mg/kg		0.599	mg/kg	0.0000599 %	✓	
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				0.27	mg/kg		0.238	mg/kg	0.0000238 %	✓	
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				0.49	mg/kg		0.432	mg/kg	0.0000432 %	✓	
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				0.33	mg/kg		0.291	mg/kg	0.0000291 %	✓	
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				0.08	mg/kg		0.0705	mg/kg	0.00000705 %	✓	
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				0.33	mg/kg		0.291	mg/kg	0.0000291 %	✓	
			205-883-8	191-24-2									
36		polychlorobiphenyls; PCB				<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
37		barium { barium oxide }				99	mg/kg	1.117	97.381	mg/kg	0.00974 %	✓	
			215-127-9	1304-28-5									
38		coronene				0.06	mg/kg		0.0529	mg/kg	0.00000529 %	✓	
			205-881-7	191-07-1									
39		benzo[j]fluoranthene				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		601-035-00-X	205-910-3	205-82-3									
										Total:	0.0684 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP-06-12/03/2020-0.00-2.10m

Non Hazardous Waste
Classified as **17 09 04**
in the List of Waste

Sample details

Sample Name:
TP-06-12/03/2020-0.00-2.10m
Moisture content:
12.6%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 09 04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03)

Hazard properties

None identified

Determinands

Moisture content: 12.6% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.093	mg/kg	0.000209 %	✓	
2		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13.8	mg/kg	1.32	15.925	mg/kg	0.00159 %	✓	
3		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.3	mg/kg	1.142	1.298	mg/kg	0.00013 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		25.7	mg/kg	1.462	32.829	mg/kg	0.00328 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		40	mg/kg	1.126	39.361	mg/kg	0.00394 %	✓	
7		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	57	mg/kg	1.56	77.707	mg/kg	0.00498 %	✓	
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.7	mg/kg	1.5	3.54	mg/kg	0.000354 %	✓	
10		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		43.7	mg/kg	2.976	113.675	mg/kg	0.0114 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1	mg/kg	2.554	2.232	mg/kg	0.000223 %	✓	
12		zinc { zinc chromate }	024-007-00-3				112	mg/kg	2.774	271.556	mg/kg	0.0272 %	✓	
13		TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
15		benzene 601-020-00-8 / 200-753-7 / 71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16		toluene 601-021-00-3 / 203-625-9 / 108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17		ethylbenzene 601-023-00-4 / 202-849-4 / 100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18		xylene 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]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19		pH / / PH		8.63 pH		8.63 pH	8.63 pH		
20		naphthalene 601-052-00-2 / 202-049-5 / 91-20-3		0.07 mg/kg		0.0612 mg/kg	0.00000612 %	✓	
21		acenaphthylene / 205-917-1 / 208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22		acenaphthene / 201-469-6 / 83-32-9		0.07 mg/kg		0.0612 mg/kg	0.00000612 %	✓	
23		fluorene / 201-695-5 / 86-73-7		0.05 mg/kg		0.0437 mg/kg	0.00000437 %	✓	
24		phenanthrene / 201-581-5 / 85-01-8		0.63 mg/kg		0.551 mg/kg	0.0000551 %	✓	
25		anthracene / 204-371-1 / 120-12-7		0.13 mg/kg		0.114 mg/kg	0.0000114 %	✓	
26		fluoranthene / 205-912-4 / 206-44-0		0.8 mg/kg		0.699 mg/kg	0.0000699 %	✓	
27		pyrene / 204-927-3 / 129-00-0		0.72 mg/kg		0.629 mg/kg	0.0000629 %	✓	
28		benzo[a]anthracene 601-033-00-9 / 200-280-6 / 56-55-3		0.51 mg/kg		0.446 mg/kg	0.0000446 %	✓	
29		chrysene 601-048-00-0 / 205-923-4 / 218-01-9		0.41 mg/kg		0.358 mg/kg	0.0000358 %	✓	
30		benzo[b]fluoranthene 601-034-00-4 / 205-911-9 / 205-99-2		0.55 mg/kg		0.481 mg/kg	0.0000481 %	✓	
31		benzo[k]fluoranthene 601-036-00-5 / 205-916-6 / 207-08-9		0.21 mg/kg		0.184 mg/kg	0.0000184 %	✓	
32		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3 / 200-028-5 / 50-32-8		0.42 mg/kg		0.367 mg/kg	0.0000367 %	✓	
33		indeno[123-cd]pyrene / 205-893-2 / 193-39-5		0.24 mg/kg		0.21 mg/kg	0.000021 %	✓	
34		dibenz[a,h]anthracene 601-041-00-2 / 200-181-8 / 53-70-3		0.08 mg/kg		0.0699 mg/kg	0.00000699 %	✓	
35		benzo[ghi]perylene / 205-883-8 / 191-24-2		0.24 mg/kg		0.21 mg/kg	0.000021 %	✓	
36		polychlorobiphenyls; PCB 602-039-00-4 / 215-648-1 / 1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37		asbestos 650-013-00-6 / - - - - - - - / 12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
38		barium { barium oxide } / 215-127-9 / 1304-28-5		88 mg/kg	1.117	85.873 mg/kg	0.00859 %	✓	
39		coronene / 205-881-7 / 191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
40		benzo[j]fluoranthene 601-035-00-X / 205-910-3 / 205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
								Total:	0.0687 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP-07-11/03/2020-0.00-1.20m

Non Hazardous Waste
Classified as **17 09 04**
in the List of Waste

Sample details

Sample Name:
TP-07-11/03/2020-0.00-1.20m
Moisture content:
18.3%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 09 04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03)

Hazard properties

None identified

Determinands

Moisture content: 18.3% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		3 mg/kg	1.197	2.934 mg/kg	0.000293 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12.1 mg/kg	1.32	13.052 mg/kg	0.00131 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.1 mg/kg	1.142	1.027 mg/kg	0.000103 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		82.1 mg/kg	1.462	98.035 mg/kg	0.0098 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		27 mg/kg	1.126	24.836 mg/kg	0.00248 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	41 mg/kg	1.56	52.249 mg/kg	0.00335 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		6.2 mg/kg	1.5	7.599 mg/kg	0.00076 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		40.4 mg/kg	2.976	98.237 mg/kg	0.00982 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2 mg/kg	2.554	4.173 mg/kg	0.000417 %	✓	
12	zinc { zinc chromate }	024-007-00-3				123 mg/kg	2.774	278.777 mg/kg	0.0279 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
19		pH				8.33	pH		8.33	pH	8.33 pH		
				PH									
20		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				0.06	mg/kg		0.049	mg/kg	0.0000049 %	✓	
			201-581-5	85-01-8									
25		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				0.21	mg/kg		0.172	mg/kg	0.0000172 %	✓	
			205-912-4	206-44-0									
27		pyrene				0.25	mg/kg		0.204	mg/kg	0.0000204 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				0.37	mg/kg		0.302	mg/kg	0.0000302 %	✓	
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				0.33	mg/kg		0.27	mg/kg	0.000027 %	✓	
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				0.47	mg/kg		0.384	mg/kg	0.0000384 %	✓	
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				0.18	mg/kg		0.147	mg/kg	0.0000147 %	✓	
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				0.44	mg/kg		0.359	mg/kg	0.0000359 %	✓	
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				0.25	mg/kg		0.204	mg/kg	0.0000204 %	✓	
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				0.05	mg/kg		0.0409	mg/kg	0.00000409 %	✓	
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				0.25	mg/kg		0.204	mg/kg	0.0000204 %	✓	
			205-883-8	191-24-2									
36		polychlorobiphenyls; PCB				<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
37		barium { barium oxide }				121	mg/kg	1.117	110.374	mg/kg	0.011 %	✓	
			215-127-9	1304-28-5									
38		coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
39		benzo[j]fluoranthene				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		601-035-00-X	205-910-3	205-82-3									
										Total:	0.0729 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP-08-12/03/2020-0.00-0.80m

Non Hazardous Waste
Classified as **17 09 04**
in the List of Waste

Sample details

Sample Name:
TP-08-12/03/2020-0.00-0.80m
Moisture content:
11.1%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 09 04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03)

Hazard properties

None identified

Determinands

Moisture content: 11.1% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
1		antimony { antimony trioxide } 051-005-00-X / 215-175-0 / 1309-64-4		2 mg/kg	1.197	2.128 mg/kg	0.000213 %	✓	
2		arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		12.5 mg/kg	1.32	14.672 mg/kg	0.00147 %	✓	
3		cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		1.8 mg/kg	1.142	1.828 mg/kg	0.000183 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		47.4 mg/kg	1.462	61.588 mg/kg	0.00616 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
6		copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		38 mg/kg	1.126	38.035 mg/kg	0.0038 %	✓	
7		lead { lead chromate } 082-004-00-2 / 231-846-0 / 7758-97-6	1	47 mg/kg	1.56	65.174 mg/kg	0.00418 %	✓	
8		mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9		molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		5.5 mg/kg	1.5	7.335 mg/kg	0.000734 %	✓	
10		nickel { nickel chromate } 028-035-00-7 / 238-766-5 / 14721-18-7		40.7 mg/kg	2.976	107.688 mg/kg	0.0108 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		3 mg/kg	2.554	6.81 mg/kg	0.000681 %	✓	
12		zinc { zinc chromate } 024-007-00-3		100 mg/kg	2.774	246.622 mg/kg	0.0247 %	✓	
13		TPH (C6 to C40) petroleum group TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18		xylene	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]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19		pH			PH		8.37	pH		8.37	pH	8.37 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21		acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23		fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24		phenanthrene		201-581-5	85-01-8		0.12	mg/kg		0.107	mg/kg	0.0000107 %	✓	
25		anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26		fluoranthene		205-912-4	206-44-0		0.12	mg/kg		0.107	mg/kg	0.0000107 %	✓	
27		pyrene		204-927-3	129-00-0		0.11	mg/kg		0.0978	mg/kg	0.00000978 %	✓	
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.11	mg/kg		0.0978	mg/kg	0.00000978 %	✓	
29		chrysene	601-048-00-0	205-923-4	218-01-9		0.07	mg/kg		0.0622	mg/kg	0.00000622 %	✓	
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.07	mg/kg		0.0622	mg/kg	0.00000622 %	✓	
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.03	mg/kg		0.0267	mg/kg	0.00000267 %	✓	
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.06	mg/kg		0.0533	mg/kg	0.00000533 %	✓	
33		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35		benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37		barium { barium oxide }		215-127-9	1304-28-5		108	mg/kg	1.117	107.198	mg/kg	0.0107 %	✓	
38		coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39		benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
											Total:	0.069 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP-09-12/03/2020-0.00-0.70m

Non Hazardous Waste
Classified as **17 09 04**
in the List of Waste

Sample details

Sample Name:
TP-09-12/03/2020-0.00-0.70m
Moisture content:
11.7%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 09 04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03)

Hazard properties

None identified

Determinands

Moisture content: 11.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2 mg/kg	1.197	2.114 mg/kg	0.000211 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11.6 mg/kg	1.32	13.524 mg/kg	0.00135 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.7 mg/kg	1.142	1.715 mg/kg	0.000171 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		47.7 mg/kg	1.462	61.559 mg/kg	0.00616 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		35 mg/kg	1.126	34.796 mg/kg	0.00348 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	36 mg/kg	1.56	49.583 mg/kg	0.00318 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		5.6 mg/kg	1.5	7.418 mg/kg	0.000742 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		39.1 mg/kg	2.976	102.756 mg/kg	0.0103 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2 mg/kg	2.554	4.51 mg/kg	0.000451 %	✓	
12	zinc { zinc chromate }	024-007-00-3				89 mg/kg	2.774	218.012 mg/kg	0.0218 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
19		pH				8.1	pH		8.1	pH	8.1 pH		
				PH									
20		naphthalene				0.05	mg/kg		0.0442	mg/kg	0.00000441 %	✓	
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				0.14	mg/kg		0.124	mg/kg	0.0000124 %	✓	
			201-581-5	85-01-8									
25		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				0.07	mg/kg		0.0618	mg/kg	0.00000618 %	✓	
			205-912-4	206-44-0									
27		pyrene				0.06	mg/kg		0.053	mg/kg	0.0000053 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				0.08	mg/kg		0.0706	mg/kg	0.00000706 %	✓	
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				0.07	mg/kg		0.0618	mg/kg	0.00000618 %	✓	
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-883-8	191-24-2									
36		polychlorobiphenyls; PCB				<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
37		barium { barium oxide }				83	mg/kg	1.117	81.828	mg/kg	0.00818 %	✓	
			215-127-9	1304-28-5									
38		coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
39		benzo[j]fluoranthene				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		601-035-00-X	205-910-3	205-82-3									
										Total:	0.0615 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

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

Conversion factor: 1.462
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 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

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

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

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
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

pH (CAS Number: PH)

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

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)

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.
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
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

- **barium oxide** (EC Number: 215-127-9, CAS Number: 1304-28-5)

Conversion factor: 1.117
Description/Comments: Data from ECHA's C&L Inventory Database, Sigma Aldrich SDS dated 6/2/20
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/88825
Data source date: 02 Apr 2020
Hazard Statements: Acute Tox. 1 H332 , Eye Dam. 1 H318 , Skin Corr. 1B H314 , Acute Tox. 3 H301

- **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

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

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

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

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 (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

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. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

barium {barium oxide}

Cr VI not detected

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2020.88.4220.8373 (28 Mar 2020)
HazWasteOnline Database: 2020.88.4220.8373 (28 Mar 2020)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
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 Wastes 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
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

APPENDIX 5 – WAC Summary Data

Waste Categorisation Summary Table
Back Road Malahide, March 2020

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Sample ID	TP-01	TP-01	TP-02	TP-03	TP-04	TP-05	TP-05	TP-05					
Sample Depth (m)	0.00-1.10	1.10-1.50	0.00-1.10	0.00-1.50	0.00-1.70	0.00-1.00	1.00-1.90	1.90-2.30					
Material Description	Made Ground	Clay	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Clay					
Sample Date	11/03/2020	12/03/2020	12/03/2020	12/03/2020	11/03/2020	12/03/2020	12/03/2020	12/03/2020					
LoW Code	17 09 04	17 05 04	17 09 04	17 09 04	17 09 04	17 09 04	17 09 04	17 05 04	Inert Criteria	IMS* Criteria	Hazardous Criteria	LOD LOR	Units
Waste Category	Category C1	Category A	Category C1	Category C1	Category B1	Category B1	Category B2	Category B1					
Metals													
Antimony	3	3	2	4	3	3	3	3	-	-	HazWaste	<1	mg/kg
Arsenic	14.5	22.4	11.4	15.5	10.9	12.7	12.1	16.3	-	-	HazWaste	<0.5	mg/kg
Barium	150	150	94	94	90	132	99	116	-	-	HazWaste	<1	mg/kg
Cadmium	3.1	1.9	1.5	1.8	1.3	1.3	1.8	1.6	-	-	HazWaste	<0.1	mg/kg
Chromium	19.2	92.4	20.1	21.2	50.6	78	48.1	103.7	-	-	HazWaste	<0.5	mg/kg
Copper	61	70	50	42	31	39	38	40	-	-	HazWaste	<1	mg/kg
Lead	110	39	76	56	57	51	35	57	-	-	HazWaste	<5	mg/kg
Mercury	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	HazWaste	<0.1	mg/kg
Molybdenum	7.1	7.3	3.7	2.7	4.8	6.8	5.2	8.3	-	-	HazWaste	<0.1	mg/kg
Nickel	55.3	35.7	44.3	39.4	35.5	39.9	41.4	47.8	-	-	HazWaste	<0.7	mg/kg
Selenium	3	1	2	2	1	1	6	2	-	-	HazWaste	<1	mg/kg
Zinc	134	204	94	117	107	120	102	123	-	-	HazWaste	<5	mg/kg
Hexavalent Chromium	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	-	HazWaste	<0.3	mg/kg
pH (solid sample)	8.53	8.41	8.53	8.54	8.54	8.23	8.17	7.77	-	-	HazWaste	<0.01	pH units
alkali reserve	-	-	-	-	-	-	-	-	-	-	-	<0.000	gNaOH/100g
Asbestos													
Asbestos (Dry Weight)	<0.001	NAD	<0.001	<0.001	NAD	NAD	NAD	NAD	-	-	-	-	%
Asbestos (Moisture Corrected Weight)	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	-	-	0.1	<0.001	%
ACM Detected	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	-	-	-	Presence	Presence
PAHs													
Naphthalene	0.1	<0.04	0.08	<0.04	<0.04	<0.04	0.05	<0.04	-	-	HazWaste	<0.04	mg/kg
Acenaphthylene	<0.03	<0.03	0.39	<0.03	<0.03	<0.03	0.06	<0.03	-	-	HazWaste	<0.03	mg/kg
Acenaphthene	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	HazWaste	<0.05	mg/kg
Fluorene	<0.04	<0.04	0.32	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	HazWaste	<0.04	mg/kg
Phenanthrene	0.2	<0.03	2.72	0.28	0.23	0.07	0.44	<0.03	-	-	HazWaste	<0.03	mg/kg
Anthracene	0.07	<0.04	1.75	0.08	<0.04	<0.04	0.14	<0.04	-	-	HazWaste	<0.04	mg/kg
Fluoranthene	0.3	<0.03	4.42	0.53	0.3	0.13	0.79	<0.03	-	-	HazWaste	<0.03	mg/kg
Pyrene	0.28	<0.03	3.6	0.5	0.27	0.12	0.69	<0.03	-	-	HazWaste	<0.03	mg/kg
Benzo(a)anthracene	0.24	<0.06	2.06	0.46	0.21	0.09	0.59	<0.06	-	-	HazWaste	<0.06	mg/kg
Chrysene	0.18	<0.02	2.21	0.37	0.19	0.08	0.52	<0.02	-	-	HazWaste	<0.02	mg/kg
Benzo(bk)fluoranthene	0.34	<0.07	3.33	0.81	0.35	0.13	0.95	<0.07	-	-	HazWaste	<0.07	mg/kg
Benzo(a)pyrene	0.18	<0.04	2.03	0.53	0.17	0.07	0.49	<0.04	-	-	HazWaste	<0.04	mg/kg
Indeno(123cd)pyrene	0.13	<0.04	1.24	0.25	0.13	<0.04	0.33	<0.04	-	-	HazWaste	<0.04	mg/kg
Dibenzo(ah)anthracene	<0.04	<0.04	0.32	0.08	<0.04	<0.04	0.08	<0.04	-	-	HazWaste	<0.04	mg/kg
Benzo(ghi)perylene	0.14	<0.04	1.12	0.28	0.13	<0.04	0.33	<0.04	-	-	HazWaste	<0.04	mg/kg
Coronene	<0.04	<0.04	0.23	<0.04	<0.04	<0.04	0.06	<0.04	-	-	HazWaste	<0.04	mg/kg
PAH 6 Total	1.09	<0.22	12.14	2.4	1.08	0.33	2.89	<0.22	-	-	-	<0.22	mg/kg
PAH 17 Total	2.16	<0.64	25.89	4.17	1.98	0.69	5.52	<0.64	100	100	-	<0.64	mg/kg
Benzo(b)fluoranthene	0.24	<0.05	2.4	0.58	0.25	0.09	0.68	<0.05	-	-	HazWaste	<0.05	mg/kg
Benzo(k)fluoranthene	0.1	<0.02	0.93	0.23	0.1	0.04	0.27	<0.02	-	-	HazWaste	<0.02	mg/kg
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1	-	-	HazWaste	<1	mg/kg
Hydrocarbons													
TPH (C5-40)	<52	<52	83	69	<52	<52	<52	140	-	-	HazWaste	<52	mg/kg
MTBE	<5	<5	<5	<5	<5	<5	<5	<5	-	-	HazWaste	<5	ug/kg
Benzene	<5	<5	<5	<5	<5	<5	<5	<5	-	-	HazWaste	<5	ug/kg
Toluene	<5	<5	<5	<5	<5	<5	<5	<5	-	-	HazWaste	<5	ug/kg
Ethylbenzene	<5	<5	<5	<5	<5	<5	<5	<5	-	-	HazWaste	<5	ug/kg
m/p-Xylene	<5	<5	<5	<5	<5	<5	<5	<5	-	-	HazWaste	<5	ug/kg
o-Xylene	<5	<5	<5	<5	<5	<5	<5	<5	-	-	HazWaste	<5	ug/kg
Total 7 PCBs	<35	<35	<35	<35	<35	<35	<35	<35	1,000	1,000	HazWaste	<35	ug/kg
WAC Solid Sample Summary**													
Total Organic Carbon *	NDP	0.38	NDP	NDP	0.96	1.29	0.85	1.78	3	6	-	<0.02	%
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	6	6	-	<0.025	mg/kg
Sum of 7 PCBs	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1	1	-	<0.035	mg/kg
Mineral Oil	<30	<30	<30	<30	33	<30	<30	140	500	500	-	<30	mg/kg
PAH Sum of 6	1.09	<0.22	12.14	2.40	1.08	0.33	2.89	<0.22	-	-	-	<0.22	mg/kg
PAH Sum of 17	2.16	<0.64	25.89	4.17	1.98	0.69	5.52	<0.64	100	100	-	<0.64	mg/kg
WAC Leachate Data**													
Arsenic	<0.025	<0.025	0.041	0.040	<0.025	<0.025	<0.025	<0.025	0.5	1.5	-	<0.025	mg/kg
Barium	0.06	0.12	0.11	0.11	0.09	0.10	0.16	0.21	20	20	-	<0.03	mg/kg
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	0.04	-	<0.005	mg/kg
Chromium	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.5	0.5	-	<0.015	mg/kg
Copper	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	2	2	-	<0.07	mg/kg
Mercury	0.0006	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.01	0.01	-	<0.0001	mg/kg
Molybdenum	0.19	0.04	0.14	0.15	0.10	0.10	0.14	0.08	0.5	1.5	-	<0.02	mg/kg
Nickel	0.03	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	0.4	0.4	-	<0.02	mg/kg
Lead	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	0.5	-	<0.05	mg/kg
Antimony	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	0.03	0.06	0.18	-	<0.02	mg/kg
Selenium	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	0.3	-	<0.03	mg/kg
Zinc	<0.03	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	4	4	-	<0.03	mg/kg
Total Dissolved Solids	1320	930	870	1870	1070	1020	3849	1800	4000	12,000	-	<350	mg/kg
Dissolved Organic Carbon	40	40	40	40	40	50	<20	40	500	500	-	<20	mg/kg
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	1	-	<0.1	mg/kg
Sulphate as SO4	24	65	41	35	45	32	2,133	441	1000	3,000	-	<0.5	mg/kg
Chloride	5	3	<3	<3	<3	<3	<3	12	800	2,400	-	<3	mg/kg

NAD- no asbestos detected

* - Integrated Materials Solutions Landfill, Hollywood Great, Nag's Head, The Naul, Co. Dublin

** - limits as specified in Council Decision 2003/33/EC

Waste Categorisation Summary Table
Back Road Malahide, March 2020

Sample ID	TP-06	TP-07	TP-08	TP-09	TP-09	TP-10	TP-13	Inert Criteria	IMS* Criteria	Hazardous Criteria	LOD LOR	Units
Sample Depth (m)	**0.00-2.10**	**0.00-1.20**	**0.00-0.80**	**0.00-0.70**	**0.70-1.10**	**0.50**	**0.50**					
Material Description	**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Clay**	**Clay**	**Clay**					
Sample Date	**12/03/2020**	**11/03/2020**	**12/03/2020**	**12/03/2020**	**12/03/2020**	**11/03/2020**	**11/03/2020**					
LoW Code	**17 09 04**	**17 09 04**	**17 09 04**	**17 09 04**	**17 05 04**	**17 05 04**	**17 05 04**					
Waste Category	**Category C1**	**Category B1**	**Category B1**	**Category B2**	**Category A**	**Category A**	**Category A**					
Metals												
Antimony	2	3	2	2	3	3	2	-	-	HazWaste	<1	mg/kg
Arsenic	13.8	12.1	12.5	11.6	14.4	11.7	10.5	-	-	HazWaste	<0.5	mg/kg
Barium	88	121	108	83	100	96	81	-	-	HazWaste	<1	mg/kg
Cadmium	1.3	1.1	1.8	1.7	1.1	1.4	1.1	-	-	HazWaste	<0.1	mg/kg
Chromium	25.7	82.1	47.4	47.7	90	74.2	61.8	-	-	HazWaste	<0.5	mg/kg
Copper	40	27	38	35	36	28	25	-	-	HazWaste	<1	mg/kg
Lead	57	41	47	36	27	19	17	-	-	HazWaste	<5	mg/kg
Mercury	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	HazWaste	<0.1	mg/kg
Molybdenum	2.7	6.2	5.5	5.6	8.2	7.2	5	-	-	HazWaste	<0.1	mg/kg
Nickel	43.7	40.4	40.7	39.1	51.4	36.5	36.5	-	-	HazWaste	<0.7	mg/kg
Selenium	1	2	3	2	2	2	<1	-	-	HazWaste	<1	mg/kg
Zinc	112	123	100	89	111	93	77	-	-	HazWaste	<5	mg/kg
Hexavalent Chromium	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	-	HazWaste	<0.3	mg/kg
pH (solid sample)	8.63	8.33	8.37	8.1	8.38	8.7	8.73	-	-	HazWaste	<0.01	pH units
alkali reserve	-							-	-	-	<0.000	gNaOH/100g
Asbestos												
Asbestos (Dry Weight)	<0.001	NAD	NAD	NAD	NAD	NAD	NAD	-	-	-	-	%
Asbestos (Moisture Corrected Weight)	NAD	NAD	NAD	NAD	NAD	NAD	NAD	-	-	0.1	<0.001	%
ACM Detected	NAD	NAD	NAD	NAD	NAD	NAD	NAD	-	-	-	Presence	Presence
PAHs												
Naphthalene	0.07	<0.04	<0.04	0.05	<0.04	<0.04	<0.04	-	-	HazWaste	<0.04	mg/kg
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	-	-	HazWaste	<0.03	mg/kg
Acenaphthene	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	HazWaste	<0.05	mg/kg
Fluorene	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	HazWaste	<0.04	mg/kg
Phenanthrene	0.63	0.06	0.12	0.14	<0.03	<0.03	<0.03	-	-	HazWaste	<0.03	mg/kg
Anthracene	0.13	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	HazWaste	<0.04	mg/kg
Fluoranthene	0.8	0.21	0.12	0.07	<0.03	<0.03	<0.03	-	-	HazWaste	<0.03	mg/kg
Pyrene	0.72	0.25	0.11	0.06	<0.03	<0.03	<0.03	-	-	HazWaste	<0.03	mg/kg
Benzo(a)anthracene	0.51	0.37	0.11	0.08	<0.06	<0.06	<0.06	-	-	HazWaste	<0.06	mg/kg
Chrysene	0.41	0.33	0.07	0.07	<0.02	<0.02	<0.02	-	-	HazWaste	<0.02	mg/kg
Benzo(bk)fluoranthene	0.76	0.65	0.1	<0.07	<0.07	<0.07	<0.07	-	-	HazWaste	<0.07	mg/kg
Benzo(a)pyrene	0.42	0.44	0.06	<0.04	<0.04	<0.04	<0.04	-	-	HazWaste	<0.04	mg/kg
Indeno(123cd)pyrene	0.24	0.25	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	HazWaste	<0.04	mg/kg
Dibenzo(ah)anthracene	0.08	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	HazWaste	<0.04	mg/kg
Benzo(ghi)perylene	0.24	0.25	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	HazWaste	<0.04	mg/kg
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	HazWaste	<0.04	mg/kg
PAH 6 Total	2.46	1.8	0.28	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg
PAH 17 Total	5.13	2.86	0.69	<0.64	<0.64	<0.64	<0.64	100	100	-	<0.64	mg/kg
Benzo(b)fluoranthene	0.55	0.47	0.07	<0.05	<0.05	<0.05	<0.05	-	-	HazWaste	<0.05	mg/kg
Benzo(k)fluoranthene	0.21	0.18	0.03	<0.02	<0.02	<0.02	<0.02	-	-	HazWaste	<0.02	mg/kg
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	-	-	HazWaste	<1	mg/kg
Hydrocarbons												
TPH (C5-40)	<52	<52	<52	<52	<52	<52	<52	-	-	HazWaste	<52	mg/kg
MTBE	<5	<5	<5	<5	<5	<5	<5	-	-	HazWaste	<5	ug/kg
Benzene	<5	<5	<5	<5	<5	<5	<5	-	-	HazWaste	<5	ug/kg
Toluene	<5	<5	<5	<5	<5	<5	<5	-	-	HazWaste	<5	ug/kg
Ethylbenzene	<5	<5	<5	<5	<5	<5	<5	-	-	HazWaste	<5	ug/kg
m/p-Xylene	<5	<5	<5	<5	<5	<5	<5	-	-	HazWaste	<5	ug/kg
o-Xylene	<5	<5	<5	<5	<5	<5	<5	-	-	HazWaste	<5	ug/kg
Total 7 PCBs	<35	<35	<35	<35	<35	<35	<35	1,000	1,000	HazWaste	<35	ug/kg
WAC Solid Sample Summary**												
Total Organic Carbon *	NDP	0.99	0.93	0.99	0.49	0.28	0.25	3	6	-	<0.02	%
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	6	6	-	<0.025	mg/kg
Sum of 7 PCBs	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1	1	-	<0.035	mg/kg
Mineral Oil	<30	<30	<30	<30	<30	<30	<30	500	500	-	<30	mg/kg
PAH Sum of 6	2.46	1.80	0.28	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg
PAH Sum of 17	5.13	2.86	0.69	<0.64	<0.64	<0.64	<0.64	100	100	-	<0.64	mg/kg
WAC Leachate Data**												
Arsenic	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.5	1.5	-	<0.025	mg/kg
Barium	0.11	0.09	0.04	0.14	<0.03	0.04	0.04	20	20	-	<0.03	mg/kg
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	0.04	-	<0.005	mg/kg
Chromium	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.5	0.5	-	<0.015	mg/kg
Copper	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	2	2	-	<0.07	mg/kg
Mercury	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.01	0.01	-	<0.0001	mg/kg
Molybdenum	0.11	0.09	0.35	0.19	<0.02	0.05	0.07	0.5	1.5	-	<0.02	mg/kg
Nickel	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	0.4	-	<0.02	mg/kg
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	0.5	-	<0.05	mg/kg
Antimony	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.18	-	<0.02	mg/kg
Selenium	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	0.3	-	<0.03	mg/kg
Zinc	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4	4	-	<0.03	mg/kg
Total Dissolved Solids	1461	1329	600	2691	830	450	400	4000	12,000	-	<350	mg/kg
Dissolved Organic Carbon	30	70	<20	<20	20	<20	<20	500	500	-	<20	mg/kg
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	1	-	<0.1	mg/kg
Sulphate as SO4	29	<5	53	1,149	47	<5	<5	1000	3,000	-	<0.5	mg/kg
Chloride	4	4	4	<3	<3	<3	<3	800	2,400	-	<3	mg/kg

NAD- no asbestos detected

* - Integrated Materials Solutions Landfill, Hollywood Great, Nag's Head, The Naul, Co. Dublin

** - limits as specified in Council Decision 2003/33/EC

APPENDIX 6 – Suitable 4 Use Data

S4UL - Metals (Residential with homegrown produce), Back Road, Malahide, March 2020

Sample ID	TP-01	TP-01	TP-02	TP-03	TP-04	TP-05	TP-05	TP-05	TP-06	TP-07	Max Level Detected	Units	Residential with homegrown produce
Sample Depth (m)	**0.00-1.10**	**1.10-1.50**	**0.00-1.10**	**0.00-1.50**	**0.00-1.70**	**0.00-1.00**	**1.00-1.90**	**1.90-2.30**	**0.00-2.10**	**0.00-1.20**			
Antimony	3	3	2	4	3	3	3	3	2	3	4	mg/kg	ne
Arsenic	14.5	22.4	11.4	15.5	10.9	12.7	12.1	16.3	13.8	12.1	22.4	mg/kg	37
Barium	150	150	94	94	90	132	99	116	88	121	150	mg/kg	ne
Cadmium	3.1	1.9	1.5	1.8	1.3	1.3	1.8	1.6	1.3	1.1	3.1	mg/kg	11
Chromium	19.2	92.4	20.1	21.2	50.6	78	48.1	103.7	25.7	82.1	103.7	mg/kg	910
Copper	61	70	50	42	31	39	38	40	40	27	70	mg/kg	2,400
Lead	110	39	76	56	57	51	35	57	57	41	110	mg/kg	ne
Mercury	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0	mg/kg	1.2
Molybdenum	7.1	7.3	3.7	2.7	4.8	6.8	5.2	8.3	2.7	6.2	8.3	mg/kg	ne
Nickel	55.3	35.7	44.3	39.4	35.5	39.9	41.4	47.8	43.7	40.4	55.3	mg/kg	130
Selenium	3	1	2	2	1	1	6	2	1	2	6	mg/kg	250
Zinc	134	204	94	117	107	120	102	123	112	123	204	mg/kg	3,700
Hexavalent Chromium	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0	mg/kg	6*

S4UL - Metals (Residential with homegrown produce), Back Road, Malahide, March 2020

Sample ID	TP-08	TP-09	TP-09	TP-10	TP-13	Max Level Detected	Units	Residential with homegrown produce
Sample Depth (m)	**0.00-0.80**	**0.00-0.70**	**0.70-1.10**	**0.5**	**0.5**			
Antimony	2	2	3	3	2	3	mg/kg	ne
Arsenic	12.5	11.6	14.4	11.7	10.5	14.4	mg/kg	37
Barium	108	83	100	96	81	108	mg/kg	ne
Cadmium	1.8	1.7	1.1	1.4	1.1	1.8	mg/kg	11
Chromium	47.4	47.7	90	74.2	61.8	90	mg/kg	910
Copper	38	35	36	28	25	38	mg/kg	2,400
Lead	47	36	27	19	17	47	mg/kg	ne
Mercury	<0.1	<0.1	<0.1	<0.1	<0.1	0	mg/kg	1.2
Molybdenum	5.5	5.6	8.2	7.2	5	8.2	mg/kg	ne
Nickel	40.7	39.1	51.4	36.5	36.5	51.4	mg/kg	130
Selenium	3	2	2	2	<1	3	mg/kg	250
Zinc	100	89	111	93	77	111	mg/kg	3,700
Hexavalent Chromium	<0.3	<0.3	<0.3	<0.3	<0.3	0	mg/kg	6*

S4UL - Organic Compounds (Residential with Homegrown Produce), Back Road, Malahide, March 2020

													Residential with homegrown produce		
Residential	**TP-01**	**TP-01**	**TP-02**	**TP-03**	**TP-04**	**TP-05**	**TP-05**	**TP-05**	**TP-06**	**TP-07**	**Max Level**	**Units**	**LQM/CIEH Suitable 4 Use Levels (S4ULs) [mg/kg DW]**		
	0.00-1.10	**1.10-1.50**	**0.00-1.10**	**0.00-1.50**	**0.00-1.70**	**0.00-1.00**	**1.00-1.90**	**1.90-2.30**	**0.00-2.10**	**0.00-1.20**	**Detected**		**1 % SOM**	**2.5 % SOM**	**6 % SOM**
Aliphatics															
>C5-C6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	42	78	160
>C6-C8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	100	230	530
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	27	65	150
>C10-C12	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.00	mg/kg	130	330	760
>C12-C16	<4	<4	<4	<4	<4	<4	<4		<4	<4	0.00	mg/kg	1,100	2,400	4,300
>C16-C21	<7	<7	<7	<7	<7	<7	<7	15	<7	<7	15.00	mg/kg	ne	ne	ne
>C21-C35	<7	<7	<7	23	33	<7	26	115	<7	<7	115.00	mg/kg	ne	ne	ne
>C16-C35	<14	<14	<14	23	33	<14	26	130	<14	<14	130.00	mg/kg	65000	92000	110000
>C35-C40	<7	<7	<7	<7	<7	<7	<7	10	<7	<7	10.00	mg/kg	ne	ne	ne
Total aliphatics C5-40	<26	<26	<26	<26	33	<26	26	140	<26	<26	140.00	mg/kg	ne	ne	ne
>C6-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	ne	ne	ne
>C10-C25	<10	<10	<10	<10	<10	<10	<10	45.00	<10	<10	45.00	mg/kg	ne	ne	ne
>C25-C35	<10	<10	<10	18	24	<10	23	86	<10	<10	86.00	mg/kg	ne	ne	ne
Aromatics															
>C5-EC7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	70	140	300
>EC7-EC8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	130	290	660
>EC8-EC10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	34	83	190
>EC10-EC12	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.00	mg/kg	74	180	380
>EC12-EC16	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	0.00	mg/kg	140	330	660
>EC16-EC21	<7	<7	15	<7	<7	<7	<7	<7	<7	<7	15.00	mg/kg	260	540	930
>EC21-EC35	<7	<7	56	56	<7	<7	<7	<7	<7	<7	56.00	mg/kg	1,100	1,500	1,700
>EC35-EC40	<7	<7	12	13	<7	<7	<7	<7	<7	<7	13.00	mg/kg	ne	ne	ne
Total aromatics C5-40	<26	<26	83	69	<26	<26	<26	<26	<26	<26	83.00	mg/kg	ne	ne	ne
Total aliphatics and aromatics(C5-40)	<52	<52	83	69	<52	<52	<52	140	<52	<52	140.00	mg/kg	ne	ne	ne
>EC6-EC10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	ne	ne	ne
>EC10-EC25	<10	<10	30	<10	<10	<10	<10	<10	<10	<10	30.00	mg/kg	ne	ne	ne
>EC25-EC35	<10	<10	42	50	<10	<10	<10	<10	<10	<10	50.00	mg/kg	ne	ne	ne
BTEX															
MTBE	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00	mg/kg	ne	ne	ne
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00	mg/kg	0.087	0.17	0.37
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00	mg/kg	130	290	660
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00	mg/kg	47	110	260
m/p-Xylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00	mg/kg	56	130	310
o-Xylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.000	mg/kg	60	140	330
TOC	NDP	0.38	NDP	NDP	0.96	1.29	0.85	1.78	NDP	0.99		%			
SOM (Note 1)	NDP	0.65512	NDP	NDP	1.65504	2.22396	1.4654	3.06872	NDP	1.70676					

Note 1 - TOC * 1.724

S4UL - Organic Compounds (Residential with Homegrown Produce), Back Road, Malahide, March 2020

Residential	TP-08	TP-09	TP-09	TP-10	TP-13	Max Level Detected	Units	Residential with homegrown produce LQM/CIEH Suitable 4 Use Levels (S4ULs) [mg/kg DW]		
	0.00-0.80	0.00-0.70	0.70-1.10	0.50	0.50			1 % SOM	2.5 % SOM	6 % SOM
Aliphatics										
>C5-C6	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	42	78	160
>C6-C8	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	100	230	530
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	27	65	150
>C10-C12	<0.2	<0.2	<0.2	<0.2	<0.2	0.00	mg/kg	130	330	760
>C12-C16	<4	<4	<4	<4	<4	0.00	mg/kg	1,100	2,400	4,300
>C16-C21	<7	<7	<7	<7	<7	0.00	mg/kg	ne	ne	ne
>C21-C35	<7	<7	<7	<7	<7	0.00	mg/kg	ne	ne	ne
>C16-C35	<14	<14	<14	<14	<14	0.00	mg/kg	65000	92000	110000
>C35-C40	<7	<7	<7	<7	<7	0.00	mg/kg	ne	ne	ne
Total aliphatics C5-40	<26	<26	<26	<26	<26	0.00	mg/kg	ne	ne	ne
>C6-C10	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	ne	ne	ne
>C10-C25	<10	<10	<10	<10	<10	0.00	mg/kg	ne	ne	ne
>C25-C35	<10	<10	<10	<10	<10	0.00	mg/kg	ne	ne	ne
Aromatics										
>C5-EC7	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	70	140	300
>EC7-EC8	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	130	290	660
>EC8-EC10	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	34	83	190
>EC10-EC12	<0.2	<0.2	<0.2	<0.2	<0.2	0.00	mg/kg	74	180	380
>EC12-EC16	<4	<4	<4	<4	<4	0.00	mg/kg	140	330	660
>EC16-EC21	<7	<7	<7	<7	<7	0.00	mg/kg	260	540	930
>EC21-EC35	<7	<7	<7	<7	<7	0.00	mg/kg	1,100	1,500	1,700
>EC35-EC40	<7	<7	<7	<7	<7	0.00	mg/kg	ne	ne	ne
Total aromatics C5-40	<26	<26	<26	<26	<26	0.00	mg/kg	ne	ne	ne
Total aliphatics and aromatics(C5-40)	<52	<52	<52	<52	<52	0.00	mg/kg	ne	ne	ne
>EC6-EC10	<0.1	<0.1	<0.1	<0.1	<0.1	0.00	mg/kg	ne	ne	ne
>EC10-EC25	<10	<10	<10	<10	<10	0.00	mg/kg	ne	ne	ne
>EC25-EC35	<10	<10	<10	<10	<10	0.00	mg/kg	ne	ne	ne
BTEX										
MTBE	<0.005	<0.005	<0.005	<0.005	<0.005	0.00	mg/kg	ne	ne	ne
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	0.00	mg/kg	0.087	0.17	0.37
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005	0.00	mg/kg	130	290	660
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	0.00	mg/kg	47	110	260
m/p-Xylene	<0.005	<0.005	<0.005	<0.005	<0.005	0.00	mg/kg	56	130	310
o-Xylene	<0.005	<0.005	<0.005	<0.005	<0.005	0.000	mg/kg	60	140	330
TOC	0.93	0.99	0.49	0.28	0.25		%			
SOM (Note 1)	1.60	1.71	0.84	0.48	0.43					

Note 1 - TOC * 1.724

S4UL - PAHs (Residential with Homegrown Produce), Back Road, Malahide, March 2020

	TP-01	TP-01	TP-02	TP-03	TP-04	TP-05	TP-05	TP-05	TP-06	TP-07	Max Level Detected	Units	Residential with homegrown produce LQM/CIEH Suitable 4 Use Levels (S4ULs) [mg/kg DW]		
	0.00-1.10	1.10-1.50	0.00-1.10	0.00-1.50	0.00-1.70	0.00-1.00	1.00-1.90	1.90-2.30	0.00-2.10	0.00-1.20			1 % SOM	2.5 % SOM	6 % SOM
Naphthalene	0.1	<0.04	0.08	<0.04	<0.04	<0.04	0.05	<0.04	0.07	<0.04	0.10	mg/kg	2.3	5.6	13
Acenaphthylene	<0.03	<0.03	0.39	<0.03	<0.03	<0.03	0.06	<0.03	<0.03	<0.03	0.39	mg/kg	170	420	920
Acenaphthene	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	0.07	mg/kg	210	510	1,100
Fluorene	<0.04	<0.04	0.32	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	0.32	mg/kg	170	400	860
Phenanthrene	0.2	<0.03	2.72	0.28	0.23	0.07	0.44	<0.03	0.63	0.06	2.72	mg/kg	95	220	440
Anthracene	0.07	<0.04	1.75	0.08	<0.04	<0.04	0.14	<0.04	0.13	<0.04	1.75	mg/kg	2,400	5,400	11,000
Fluoranthene	0.3	<0.03	4.42	0.53	0.3	0.13	0.79	<0.03	0.8	0.21	4.42	mg/kg	280	560	890
Pyrene	0.28	<0.03	3.6	0.5	0.27	0.12	0.69	<0.03	0.72	0.25	3.60	mg/kg	620	1,200	2,000
Benzo(a)anthracene	0.24	<0.06	2.06	0.46	0.21	0.09	0.59	<0.06	0.51	0.37	2.06	mg/kg	7.2	11	13
Chrysene	0.18	<0.02	2.21	0.37	0.19	0.08	0.52	<0.02	0.41	0.33	2.21	mg/kg	15	22	27
Benzo(bk)fluoranthene	0.34	<0.07	3.33	0.81	0.35	0.13	0.95	<0.07	0.76	0.65	3.33	mg/kg	ne	ne	ne
Benzo(a)pyrene	0.18	<0.04	2.03	0.53	0.17	0.07	0.49	<0.04	0.42	0.44	2.03	mg/kg	2.2	2.7	3
Indeno(123cd)pyrene	0.13	<0.04	1.24	0.25	0.13	<0.04	0.33	<0.04	0.24	0.25	1.24	mg/kg	27	36	41
Dibenzo(ah)anthracene	<0.04	<0.04	0.32	0.08	<0.04	<0.04	0.08	<0.04	0.08	0.05	0.32	mg/kg	0.24	0.28	0.3
Benzo(ghi)perylene	0.14	<0.04	1.12	0.28	0.13	<0.04	0.33	<0.04	0.24	0.25	1.12	mg/kg	320	340	350
Coronene	<0.04	<0.04	0.23	<0.04	<0.04	<0.04	0.06	<0.04	<0.04	<0.04	0.23	mg/kg	ne	ne	ne
PAH 6 Total	1.09	<0.22	12.14	2.4	1.08	0.33	2.89	<0.22	2.46	1.8	12.14	mg/kg	ne	ne	ne
PAH 17 Total	2.16	<0.64	25.89	4.17	1.98	0.69	5.52	<0.64	5.13	2.86	25.89	mg/kg	ne	ne	ne
Benzo(b)fluoranthene	0.24	<0.05	2.4	0.58	0.25	0.09	0.68	<0.05	0.55	0.47	2.40	mg/kg	2.6	3.3	3.7
Benzo(k)fluoranthene	0.1	<0.02	0.93	0.23	0.1	0.04	0.27	<0.02	0.21	0.18	0.93	mg/kg	77	93	100
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.00	mg/kg	ne	ne	ne
TOC	NDP	0.38	NDP	NDP	0.96	1.29	0.85	1.78	NDP	0.99		%			
SOM (Note 1)	NDP	0.66	NDP	NDP	1.66	2.22	1.47	3.07	NDP	1.71					

Note 1 - TOC * 1.724

S4UL - PAHs (Residential with Homegrown Produce), Back Road, Malahide, March 2020

	TP-08	TP-09	TP-09	TP-10	TP-13	Max Level Detected	Units	Residential with homegrown produce LQM/CIEH Suitable 4 Use Levels (S4ULs) [mg/kg DW]		
	0.00-0.80	0.00-0.70	0.70-1.10	0.50	0.50			1 % SOM	2.5 % SOM	6 % SOM
Naphthalene	<0.04	0.05	<0.04	<0.04	<0.04	0.05	mg/kg	2.3	5.6	13
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	170	420	920
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	0.00	mg/kg	210	510	1,100
Fluorene	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	170	400	860
Phenanthrene	0.12	0.14	<0.03	<0.03	<0.03	0.14	mg/kg	95	220	440
Anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2,400	5,400	11,000
Fluoranthene	0.12	0.07	<0.03	<0.03	<0.03	0.12	mg/kg	280	560	890
Pyrene	0.11	0.06	<0.03	<0.03	<0.03	0.11	mg/kg	620	1,200	2,000
Benzo(a)anthracene	0.11	0.08	<0.06	<0.06	<0.06	0.11	mg/kg	7.2	11	13
Chrysene	0.07	0.07	<0.02	<0.02	<0.02	0.07	mg/kg	15	22	27
Benzo(bk)fluoranthene	0.1	<0.07	<0.07	<0.07	<0.07	0.10	mg/kg	ne	ne	ne
Benzo(a)pyrene	0.06	<0.04	<0.04	<0.04	<0.04	0.06	mg/kg	2.2	2.7	3
Indeno(123cd)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	27	36	41
Dibenzo(ah)anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	0.24	0.28	0.3
Benzo(ghi)perylene	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	320	340	350
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	ne	ne	ne
PAH 6 Total	0.28	<0.22	<0.22	<0.22	<0.22	0.28	mg/kg	ne	ne	ne
PAH 17 Total	0.69	<0.64	<0.64	<0.64	<0.64	0.69	mg/kg	ne	ne	ne
Benzo(b)fluoranthene	0.07	<0.05	<0.05	<0.05	<0.05	0.07	mg/kg	2.6	3.3	3.7
Benzo(k)fluoranthene	0.03	<0.02	<0.02	<0.02	<0.02	0.03	mg/kg	77	93	100
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	0.00	mg/kg	ne	ne	ne
TOC	0.93	0.99	0.49	0.28	0.25		%			
SOM (Note 1)	1.60	1.71	0.84	0.48	0.43					

Note 1 - TOC * 1.724

APPENDIX 7 – Potential Material Outlets

Waste Category	Classification Criteria	Potential Outlets
Category A Unlined Soil Recovery Facilities	Soil and Stone only which are free from[17] anthropogenic materials such as concrete, brock timber. Soil must be free from "contamination" e.g. PAHs, Hydrocarbons.	Soil Recovery Facilities, Waste Facility Permitted Sites, COR Sites or potential by-product if deemed not to be a waste and complying with requirements under Article 27 of European Waste Directive Regulations (2011).[18]
Category B1 Inert Landfill	Reported concentrations within inert waste limits, which are set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results also found to be non-hazardous using the HWOL application.	Integrated Materials Solutions Limited Partnership (IMS), Naul, County Dublin W0129-02 Walshestown Landfill Walshestown, Blackhall, Tipperkevin & Bawnoge, Naas, County Kildare W0254-01
Category B2 Inert Landfill	Reported concentrations greater than Category B1 criteria but less than IMS Hollywood Landfill acceptance criteria, as set out in their Waste Licence W0129-02. Results also found to be non-hazardous using the HWOL application*	Integrated Materials Solutions Limited Partnership (IMS), Naul, County Dublin W0129-02 Walshestown Landfill Walshestown, Blackhall, Tipperkevin & Bawnoge, Naas, County Kildare W0254-01[19]
Category C Non-Haz Landfill	Reported concentrations greater than Category B2 criteria but within non-haz landfill waste acceptance limits set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results also found to be non-hazardous using the HWOL application.	Walshestown Landfill Walshestown, Blackhall, Tipperkevin & Bawnoge, Naas, County Kildare W0254-01[20] Ballynagran Landfill, Co. Wicklow. W165-02 Drehid Landfill, Co. Kildare. W0201-01 East Galway Landfill, Co. Galway. W0178-02 Knockharley Landfill, Co. Meath. W0146-02
Category C 1 Non-Haz Landfill	As Category C but containing < 0.001% w/w asbestos fibres.	RILTA Environmental LTD. W0192-03 Enva Portlaoise.

[17] Free from equates to less than 2%.
[18] S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011 (Article 27).
[19] Licenced to accept Category B2 material for recovery.
[20] Licenced to accept Category C material for recovery.

		W0184-02
Category C 2 Non-Haz Landfill	As Category C but containing >0.001% and <0.01% w/w asbestos fibres	RILTA Environmental LTD. W0192-03 Enva Portlaoise. W0184-02
Category C Non-Haz Landfill	As Category C but containing >0.01% and <0.1% w/w asbestos fibres.	RILTA Environmental LTD. W0192-03 Enva Portlaoise. W0184-02
Category D Hazardous Treatment	Results found to be hazardous using HWOL Application.	RILTA Environmental LTD. W0192-03 Enva Portlaoise. W0184-02
Category D 1 Hazardous Treatment	Results found to be hazardous due to the presence of asbestos (>0.1%).	RILTA Environmental LTD. W0192-03

B. Site Investigation Report – Remainder of North Site

S.I. Ltd Contract No: 5798A

Client: EP Lynam Properties / Carroll Estates
Engineer: Waterman Moylan
Contractor: Site Investigations Ltd

Broomfield – North Site,
Back Road, Malahide, Co. Dublin
Site Investigation

Prepared by:

.....
Stephen Letch

Issue Date:	29/03/2021
Status	Final
Revision	1

Contents:

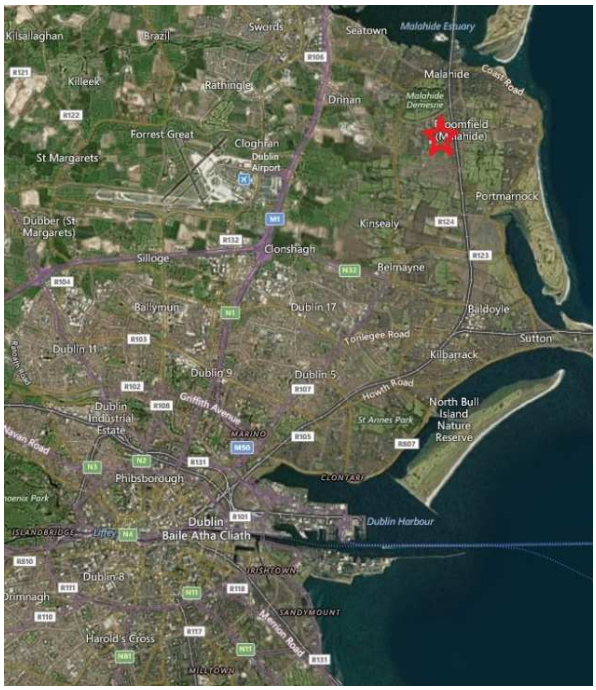
Appendices:

1. Introduction

On the instructions of Waterman Moylan, Site Investigations Ltd (SIL) were appointed to complete a site investigation at Broomfield, Malahide, Co. Dublin. The investigation was completed over two areas of the residential development, one on Back Road and one on Kinsealy Lane. The sites have been separated and this report covers the Back Road site. The investigation was completed in March 2021 on behalf of the client, EP Lynam Properties and Carroll Estates.

2. Site Location

The site is located on the Back Road, Malahide, Co. Dublin to the north of Dublin city. The map on the left shows the location of Malahide to the north of Dublin city and the second map shows the two site locations, with Back Road in red and Kinsealy Lane in green.



3. Fieldwork

The fieldworks comprised a programme of trial pits and soakaway tests. All fieldwork was carried out in accordance with Eurocode 7: Geotechnical Design and IEI Specification & Related Documents for Ground Investigation in Ireland (2006).

The fieldworks comprised the following:

- 6 No. trial pits with 3 No. soakaway tests

3.1. Trial Pits

6 No. trial pits were excavated using a tracked excavator. The pits were logged and photographed by SIL geotechnical engineer and representative disturbed bulk samples were recovered as the pits were excavated. TP01 and TP02 were terminated at the scheduled depth of 3.00mbgl whilst TP03 to TP06 terminated at depths ranging from 2.00mbgl to 2.70mbgl when boulder obstructions were encountered. The trial pits were backfilled with the arisings immediately upon completion.

The trial pit logs and photographs are presented in Appendix 1.

3.2. Soakaway Tests

At TP01 to TP03, soakaway tests were completed when the pits were 2.10mbgl. The soakaway test is used to identify possible areas for storm water drainage. The pit is filled with water and the level of the groundwater recorded over time. As stipulated by BRE Special Digest 365, 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 test results are provided in Appendix 2.

3.3. 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 4.

4. Laboratory Testing

Geotechnical laboratory testing was completed on representative soil samples in accordance with BS 1377 (1990). Testing included:

- 6 No. Moisture contents
- 6 No. Atterberg limits
- 6 No. Particle size gradings

The geotechnical laboratory test results are presented in Appendix 3.

5. Ground Conditions

5.1. Overburden

The natural ground conditions are consistent across the site with cohesive firm brown slightly sandy slightly gravelly silty CLAY with medium cobble overlying stiff black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content.

These natural soils are over-consolidated lodgement till which is encountered across the North Dublin region with several papers discussing the engineering characteristics of the soil. The brown grey soils are the weathered surface of the underlying black clays and the gravel and cobbles are generally subrounded to subangular and predominantly limestone in origin.

The laboratory tests of the shallow cohesive soils confirm that CLAY soils dominate the site with low to intermediate plasticity indices of 14 to 16% recorded. The particle size distribution curve showed poorly sorted straight-line curves with 32% to 56% fines content.

5.2. Groundwater

Groundwater details in the trial pits during the fieldworks are noted on the logs in Appendix 1. Groundwater was not encountered during excavations.

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. 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.

No numerical test data was completed as part of this investigation but the historical data from the numerous papers completed on these Dublin CLAYs would indicate an allowable bearing capacity range of 125kN/m^2 to 150kN/m^2 in the firm brown CLAY. This increases to between 250kN/m^2 to 300kN/m^2 when the stiff black CLAY is encountered.

If large bearing capacities are required for the proposed structures then further investigation with SPT N-values or dynamic probe N_{100} values would be recommended.

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.

- The foundation is to be 1m wide.
- Foundations are to be constructed on a level formation of uniform material type (described above).
- 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/m^3.

The trial pits recorded good pit wall stability but 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, nearby construction and tides.

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.

No groundwater ingresses were recorded during the fieldworks period. 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. However, based on this information at the exploratory hole locations to date, it is considered likely that any shallow ingress into excavations of the CLAY will be slow.

If localised granular soils are encountered in shallow excavations, then the possibility of water ingressing into an excavation increase with higher ingress rates.

Finally, 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 Design

The soakaway tests recorded no infiltration and therefore, failed the specification. The BRE Digest stipulates that the pit should half empty within 24hrs, and extrapolation indicates this condition would not be satisfied. The test was terminated at the end of the first (of a possible three) fill/empty cycle since further testing would give even slower fall rates due to increased soil saturation. The unsuitability of the soils for soakaways is further suggested by the soil descriptions of the materials in this area of the site where the soakaway was completed, i.e., well compacted clay/silt soils.

Appendix 1

Trial Pit Logs and Photographs

Contract No: 5798A	**Trial Pit Log**				Trial Pit No: **TP01**
Contract:	Broomfield - North Site	Easting:	722388.040	Date:	18/03/2021
Location:	Back Road, Malahide, Co. Dublin	Northing:	745003.074	Excavator:	5T Tracked Excavator
Client:	EP Lynam Properties / Carroll Estates	Elevation:	17.33	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.80 x 0.90 x 3.00	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
	0.10	TOPSOIL.			17.23				
0.5		Firm brown slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subrounded to rounded of limestone. Cobbles are subrounded to rounded of limestone.		17.0					
1.0				16.5		1.00	B	PM01	
1.5				16.0					
	1.60	Stiff black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).			15.73				
2.0				15.5		2.00	B	PM02	
2.5				15.0					
				14.5					
	3.00	**Pit terminated at 3.00m**			14.33				

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	Soakaway test completed when pit 2.10mbgl.	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5798A	**Trial Pit Log**				Trial Pit No: **TP02**
Contract:	Broomfield - North Site	Easting:	722272.729	Date:	18/03/2021
Location:	Back Road, Malahide, Co. Dublin	Northing:	744716.671	Excavator:	5T Tracked Excavator
Client:	EP Lynam Properties / Carroll Estates	Elevation:	12.34	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	3.30 x 0.90 x 3.00	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
0.5		Firm brown slightly sandy slightly gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subrounded to rounded of limestone. Cobbles are subrounded to rounded of limestone.		12.0		0.50	B	PM10	
	0.90			11.5	11.44				
1.0		Firm grey slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).				1.00	B	PM11	
1.5				11.0					
				10.5					
2.0						2.00	B	PM12	
2.5				10.0					
	2.70				9.64				
		Stiff black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).		9.5					
	3.00	**Pit terminated at 3.00m**			9.34	3.00	B	PM13	

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	Soakaway test completed when pit 2.10mbgl.	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5798A	**Trial Pit Log**				Trial Pit No: **TP03**
Contract:	Broomfield - North Site	Easting:	722386.766	Date:	18/03/2021
Location:	Back Road, Malahide, Co. Dublin	Northing:	744709.925	Excavator:	5T Tracked Excavator
Client:	EP Lynam Properties / Carroll Estates	Elevation:	13.42	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.90 x 0.90 x 2.70	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
		TOPSOIL.							
	0.20	Firm brown slightly sandy slightly gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subrounded to rounded of limestone. Cobbles are subrounded to rounded of limestone.			13.22				
0.5				13.0					
1.0				12.5		1.00	B	PM14	
1.5				12.0					
2.0				11.5		2.00	B	PM15	
	2.30	Stiff black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).			11.12				
2.5				11.0		2.50	B	PM16	
	2.70	Obstruction - boulders.			10.72				
		Pit terminated at 2.70m		10.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstructions - possible boulders.	Pit walls stable.	Dry	Soakaway test completed when pit 2.10mbgl.	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5798A	**Trial Pit Log**				Trial Pit No: **TP04**
Contract:	Broomfield - North Site	Easting:	722298.495	Date:	18/03/2021
Location:	Back Road, Malahide, Co. Dublin	Northing:	744833.799	Excavator:	5T Tracked Excavator
Client:	EP Lynam Properties / Carroll Estates	Elevation:	16.34	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.50 x 0.90 x 2.20	Status:	FINAL

Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		Firm grey slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).		16.0					
0.5				15.5					
1.0						1.00	B	PM03	
1.5				15.0					
2.0				14.5					
	2.10				14.24				
	2.20	Stiff black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).			14.14	2.20	B	PM04	
		Obstruction - boulders.		14.0					
		Pit terminated at 2.20m							
2.5				13.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstructions - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5798A	**Trial Pit Log**				Trial Pit No: **TP05**
Contract:	Broomfield - North Site	Easting:	722277.722	Date:	18/03/2021
Location:	Back Road, Malahide, Co. Dublin	Northing:	744793.371	Excavator:	5T Tracked Excavator
Client:	EP Lynam Properties / Carroll Estates	Elevation:	15.06	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.30 x 0.90 x 2.00	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
		TOPSOIL.		15.0					
	0.20	Firm grey slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).			14.86				
0.5				14.5					
1.0				14.0		1.00	B	PM08	
1.5				13.5					
	1.80	Stiff black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).			13.26				
2.0	2.00	Obstruction - boulders.		13.0	13.06	2.00	B	PM09	
		Pit terminated at 2.00m							
2.5				12.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstructions - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5798A	**Trial Pit Log**				Trial Pit No: **TP06**
Contract:	Broomfield - North Site	Easting:	722315.322	Date:	18/03/2021
Location:	Back Road, Malahide, Co. Dublin	Northing:	744744.236	Excavator:	5T Tracked Excavator
Client:	EP Lynam Properties / Carroll Estates	Elevation:	13.39	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.70 x 0.90 x 2.40	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
		TOPSOIL.							
	0.30	Firm brown slightly sandy slightly gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subrounded to rounded of limestone. Cobbles are subrounded to rounded of limestone.		13.0	13.09	0.50	B	PM05	
0.5									
	0.90	Stiff black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).		12.5	12.49				
1.0						1.00	B	PM06	
1.5				12.0					
				11.5		2.00	B	PM07	
2.0									
	2.40	Obstruction - boulders.		11.0	10.99				
2.5		**Pit terminated at 2.40m**							
				10.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstructions - possible boulders.	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

TP06 Sidewall

TP06 Spoil

Appendix 2

Soakaway Test Results

SOAKAWAY TEST

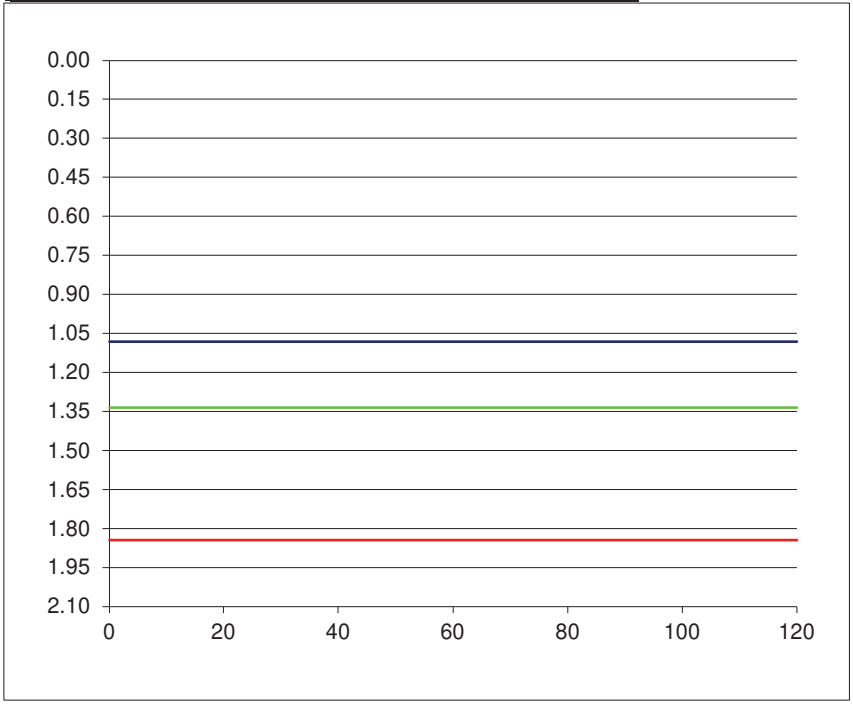
Project Reference:	5798A
Contract name:	Broomfield - North Site
Location:	Back Road, Malahide, Co. Dublin
Test No:	SA01
Date:	18/03/2021

Ground Conditions

From	To	
0.00	0.10	TOPSOIL.
0.10	1.60	Firm brown slightly sandy slightly gravelly silty CLAY with low cobble content.
1.60	2.10	Stiff grey slightly sandy slightly gravelly silty CLAY with low cobble content.

Elapsed Time (mins)	Fall of Water (m)
0	1.08
0.5	1.08
1	1.08
1.5	1.08
2	1.08
2.5	1.08
3	1.08
3.5	1.08
4	1.08
4.5	1.08
5	1.08
6	1.08
7	1.08
8	1.08
9	1.08
10	1.08
12	1.08
14	1.08
16	1.08
18	1.08
20	1.08
25	1.08
30	1.08
40	1.08
50	1.08
60	1.08
75	1.08
90	1.08
120	1.08

Pit Dimensions (m)		
Length (m)	2.80	m
Width (m)	0.90	m
Depth	2.10	m
Water		
Start Depth of Water	1.08	m
Depth of Water	1.02	m
75% Full	1.34	m
25% Full	1.85	m
75%-25%	0.51	m
Volume of water (75%-25%)	**1.29**	m3
Area of Drainage	**15.54**	m2
Area of Drainage (75%-25%)	**6.29**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** **m/min** or **Fail** **m/s**

SOAKAWAY TEST

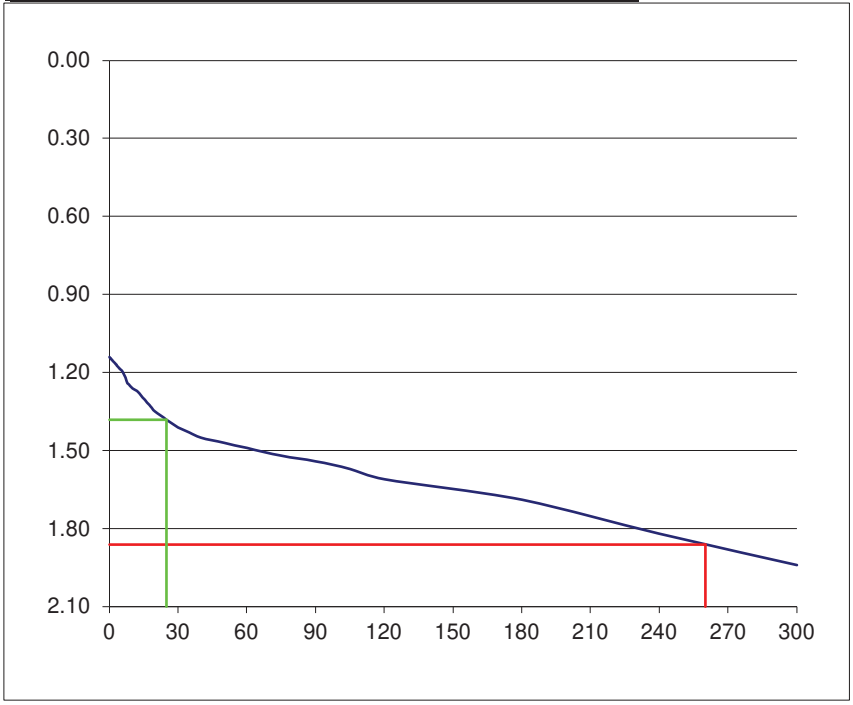
Project Reference:	5798A
Contract name:	Broomfield - North Site
Location:	Back Road, Malahide, Co. Dublin
Test No:	SA02
Date:	18/03/2021

Ground Conditions

From	To	
0.00	0.90	Firm brown slightly sandy slightly gravelly silty CLAY with low cobble content.
0.90	2.10	Stiff grey slightly sandy slightly gravelly silty CLAY with low cobble and boulder content.

Elapsed Time (mins)	Fall of Water (m)
0	1.14
0.5	1.15
1	1.15
1.5	1.16
2	1.16
2.5	1.17
3	1.17
3.5	1.18
4	1.18
4.5	1.19
5	1.19
6	1.20
7	1.22
8	1.24
9	1.25
10	1.26
12	1.27
14	1.29
16	1.31
18	1.33
20	1.35
25	1.38
30	1.41
35	1.43
40	1.45
50	1.47
60	1.49
75	1.52
90	1.54
105	1.57
120	1.61
180	1.69
240	1.82
300	1.94

Pit Dimensions (m)		
Length (m)	2.30	m
Width (m)	0.90	m
Depth	2.10	m
Water		
Start Depth of Water	1.14	m
Depth of Water	0.96	m
75% Full	1.38	m
25% Full	1.86	m
75%-25%	0.48	m
Volume of water (75%-25%)	**0.99**	m3
Area of Drainage	**13.44**	m2
Area of Drainage (75%-25%)	**5.14**	m2
Time		
75% Full	25	min
25% Full	260	min
Time 75% to 25%	**235**	min
Time 75% to 25% (sec)	**14100**	sec



f = 0.00082 m/min or **1.37E-05 m/s**

SOAKAWAY TEST

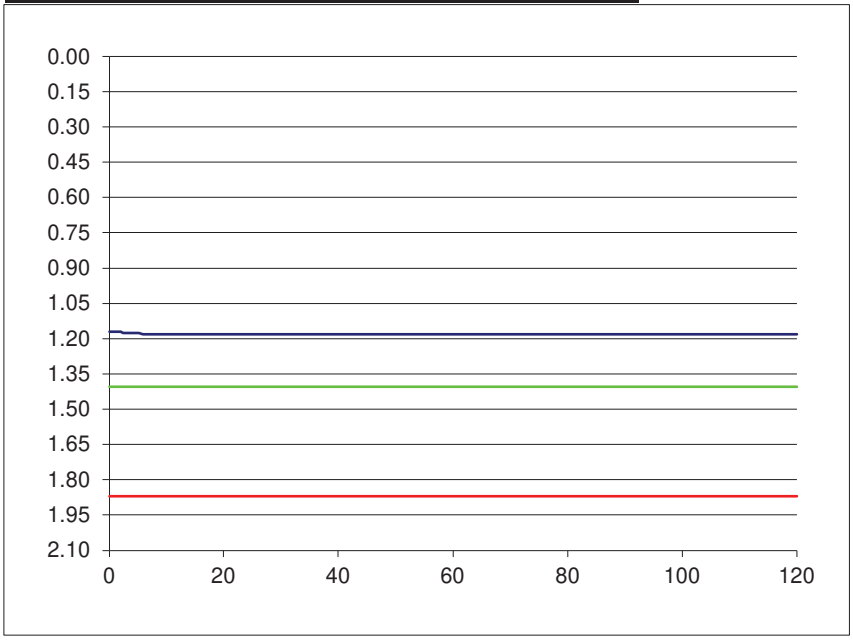
Project Reference:	5798A
Contract name:	Broomfield - North Site
Location:	Back Road, Malahide, Co. Dublin
Test No:	SA03
Date:	18/03/2021

Ground Conditions

From	To	
0.00	0.20	TOPSOIL.
0.20	1.70	Firm brown slightly sandy slightly gravelly silty CLAY with low cobble and boulder content.
1.70	2.10	Stiff black slightly sandy slightly gravelly silty CLAY with low cobble and boulder content.

Elapsed Time (mins)	Fall of Water (m)
0	1.17
0.5	1.17
1	1.17
1.5	1.17
2	1.17
2.5	1.18
3	1.18
3.5	1.18
4	1.18
4.5	1.18
5	1.18
6	1.18
7	1.18
8	1.18
9	1.18
10	1.18
12	1.18
14	1.18
16	1.18
18	1.18
20	1.18
25	1.18
30	1.18
40	1.18
50	1.18
60	1.18
75	1.18
90	1.18
120	1.18

Pit Dimensions (m)		
Length (m)	2.40	m
Width (m)	0.90	m
Depth	2.10	m
Water		
Start Depth of Water	1.17	m
Depth of Water	0.93	m
75% Full	1.40	m
25% Full	1.87	m
75%-25%	0.47	m
Volume of water (75%-25%)	**1.00**	m3
Area of Drainage	**13.86**	m2
Area of Drainage (75%-25%)	**5.23**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** **m/min** or **Fail** **m/s**

Appendix 3

Geotechnical Laboratory Test Results

Classification Tests in accordance with BS1377: Part 4

Client	EP Lynam Properties / Carroll Estates
Site	Broomfield, Malahide - North Site
S.I. File No	5798A / 21
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	24th March 2021

Hole ID	Depth	Sample No	Lab Ref No.	Sample Type	Natural Moisture Content %	Liquid Limit %	Plastic Limit %	Plastic Index %	Min. Dry Density Mg/m^3	Particle Density Mg/m^3	% passing 425um	Comments	**Remarks** **C**=Clay; **M**=Silt **Plasticity**: **L**=Low; **I**=Intermediate; **H**=High; **V**=Very High; **E**=Extremely High
TP01	1.00	PM01	21/222	B	20.9	35	19	16			52.4		CL/CI
TP02	1.00	PM11	21/223	B	11.9	33	18	15			51.2		CL
TP03	1.00	PM14	21/224	B	12.6	34	19	15			54.3		CL
TP04	1.00	PM03	21/225	B	12.1	36	21	15			67.0		CI
TP05	1.00	PM08	21/226	B	12.2	34	20	14			52.7		CL
TP06	1.00	PM06	21/227	B	13.6	34	19	15			66.1		CL

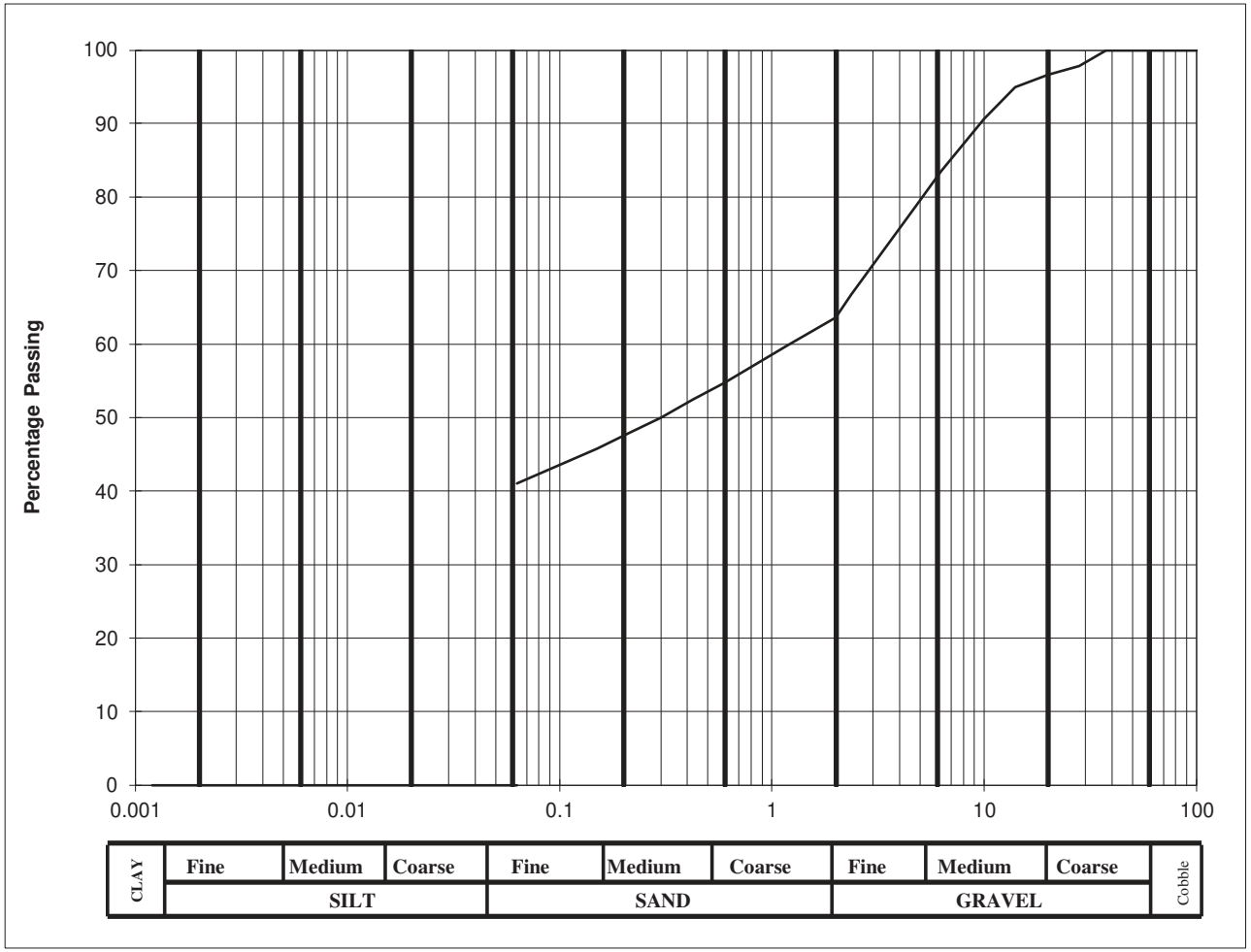
_____Paddy McGonagle
Site Investigations Ltd

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	97.8		
20	96.6		
14	94.9		
10	90.6		
6.3	83.5		
5.0	79.6		
2.36	66.7		
2.00	63.6		
1.18	59.8		
0.600	54.7		
0.425	52.4		
0.300	50		
0.212	47.9		
0.150	45.8		
0.063	41		

Cobbles, %	0
Gravel, %	36
Sand, %	23
Clay / Silt, %	41



Client :	EP Lynam Properties / Carroll Estates
Project :	Broomfield, Malahide - North Site

Lab. No :	21/222
Sample No :	PM01

Hole ID :	TP 01
Depth, m :	1.00

Material description :	slighty sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

Printed 24/03/2021

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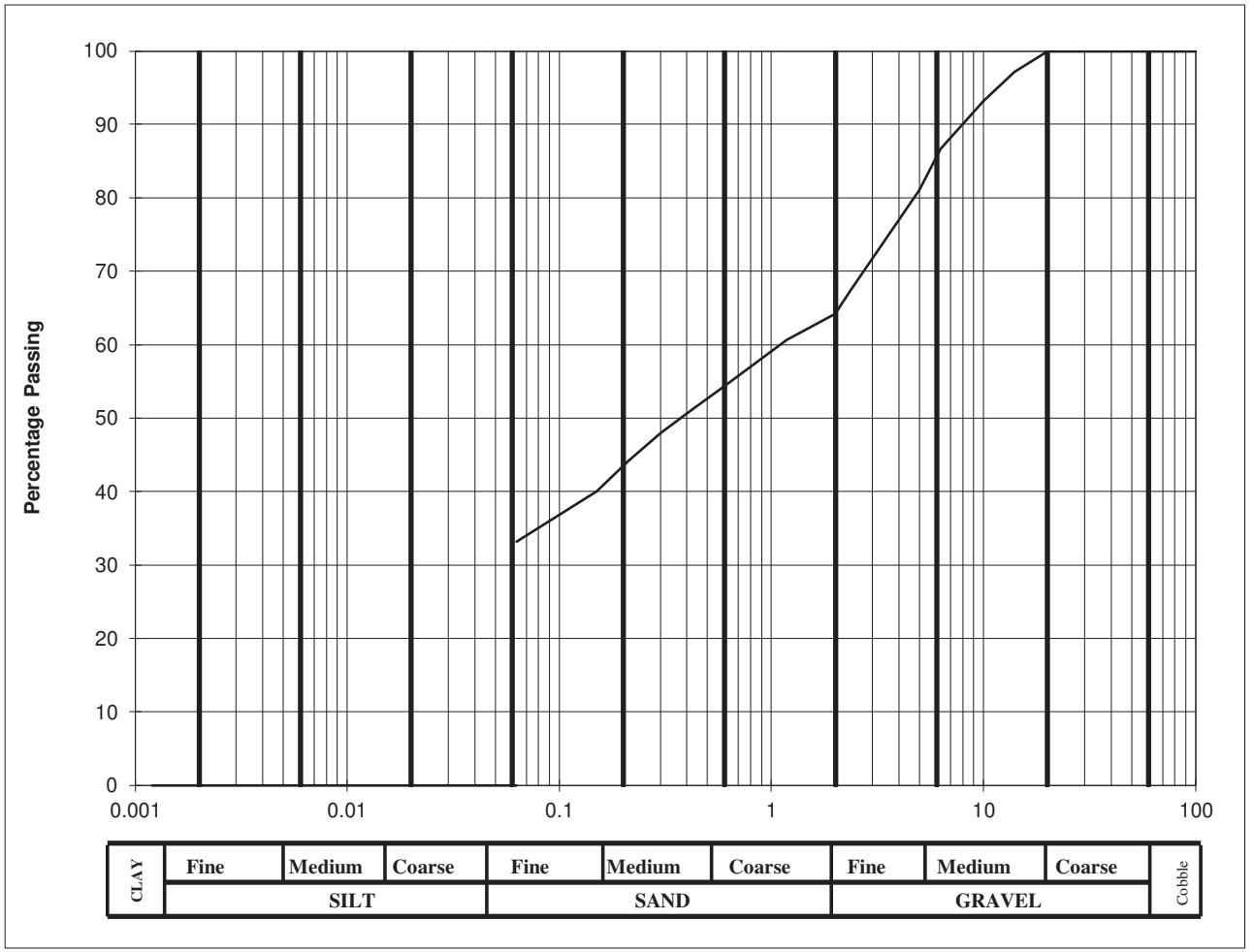
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	100		
14	97.1		
10	93.2		
6.3	86.7		
5.0	81.1		
2.36	67.4		
2.00	64.2		
1.18	60.6		
0.600	54.3		
0.425	51.2		
0.300	48		
0.212	44.2		
0.150	40		
0.063	33		

Cobbles, %	0
Gravel, %	36
Sand, %	31
Clay / Silt, %	33



Client :	EP Lynam Properties / Carroll Estates
Project :	Broomfield, Malahide - North Site

Lab. No :	21/223
Sample No :	PM11

Hole ID :	TP 02
Depth, m :	1.00

Material description :	slighty sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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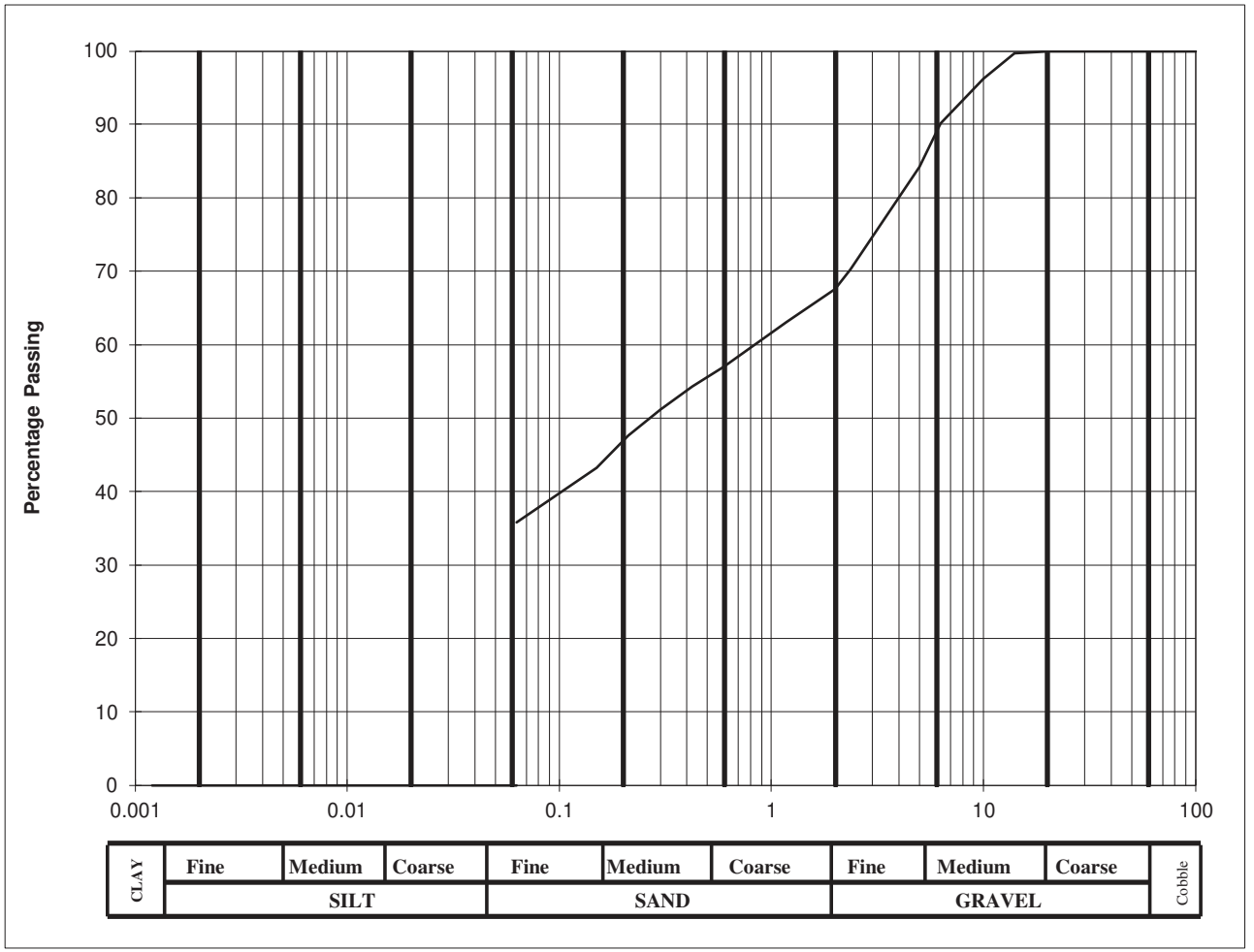
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	100		
14	99.7		
10	96.2		
6.3	90.1		
5.0	84.2		
2.36	70.3		
2.00	67.6		
1.18	63.1		
0.600	57		
0.425	54.3		
0.300	51.2		
0.212	47.6		
0.150	43.2		
0.063	36		

Cobbles, %	0
Gravel, %	32
Sand, %	32
Clay / Silt, %	36



Client :	EP Lynam Properties / Carroll Estates
Project :	Broomfield, Malahide - North Site

Lab. No :	21/224
Sample No :	PM14

Hole ID :	TP 03
Depth, m :	1.00

Material description :	slighty sandy slighty gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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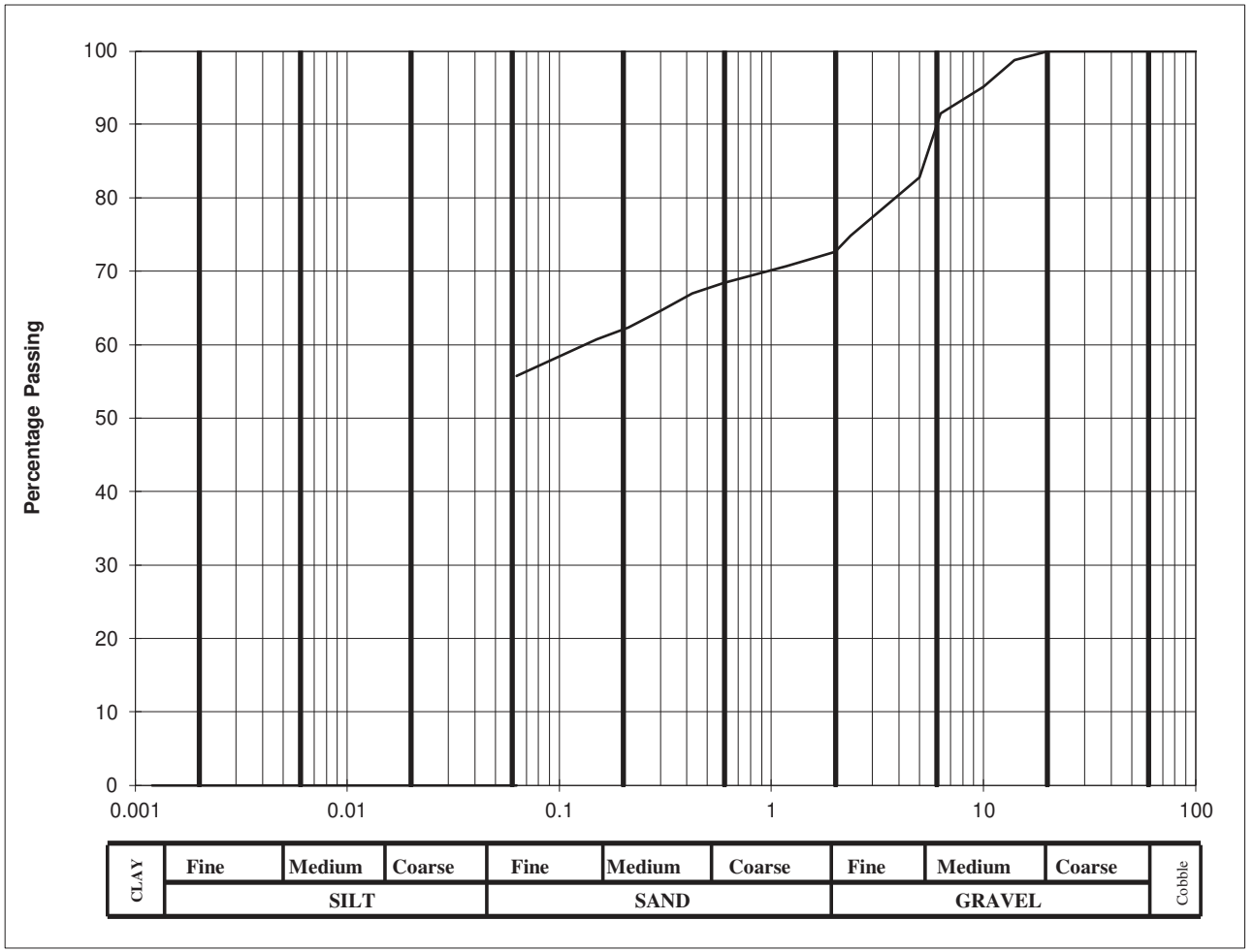
Site Investigations Ltd

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	100		
14	98.7		
10	95.1		
6.3	91.5		
5.0	82.8		
2.36	74.8		
2.00	72.6		
1.18	70.7		
0.600	68.4		
0.425	67		
0.300	64.6		
0.212	62.3		
0.150	60.7		
0.063	56		

Cobbles, %	0
Gravel, %	27
Sand, %	17
Clay / Silt, %	56



Client :	EP Lynam Properties / Carroll Estates
Project :	Broomfield, Malahide - North Site

Lab. No :	21/225
Sample No :	PM03

Hole ID :	TP 04
Depth, m :	1.00

Material description :	slighty sandy slighty gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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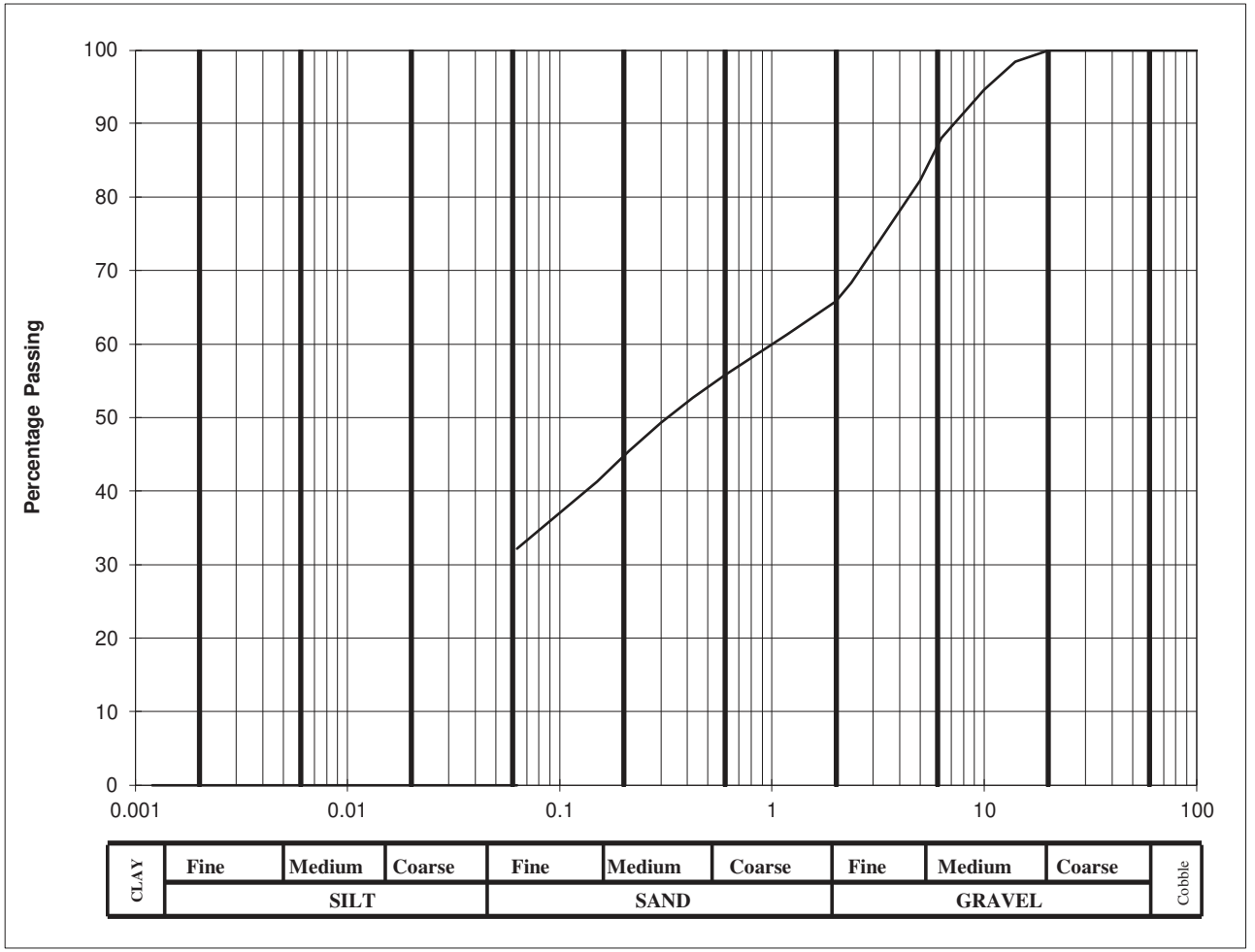
Site Investigations Ltd

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	100		
14	98.4		
10	94.6		
6.3	88		
5.0	82.3		
2.36	68.3		
2.00	65.8		
1.18	61.3		
0.600	55.7		
0.425	52.7		
0.300	49.3		
0.212	45.4		
0.150	41.3		
0.063	32		

Cobbles, %	0
Gravel, %	34
Sand, %	34
Clay / Silt, %	32



Client :	EP Lynam Properties / Carroll Estates
Project :	Broomfield, Malahide - North Site

Lab. No :	21/226
Sample No :	PM08

Hole ID :	TP 05
Depth, m :	1.00

Material description :	slighty sandy slighty gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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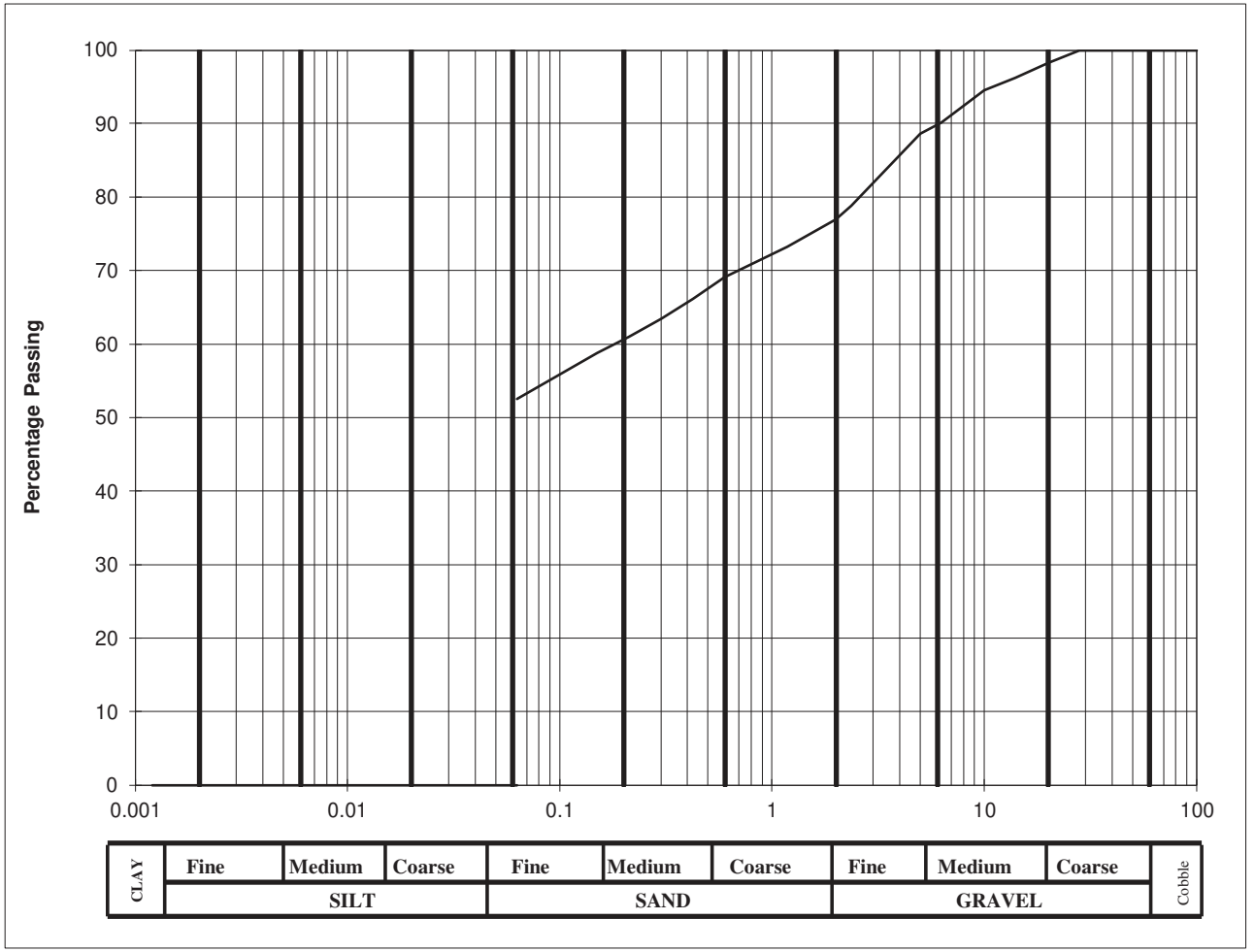
_____Paddy McGonagle
Site Investigations Ltd

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	98.2		
14	96.2		
10	94.5		
6.3	90.1		
5.0	88.6		
2.36	78.8		
2.00	76.9		
1.18	73.2		
0.600	69.1		
0.425	66.1		
0.300	63.4		
0.212	61		
0.150	58.8		
0.063	53		

Cobbles, %	0
Gravel, %	23
Sand, %	24
Clay / Silt, %	53



Client :	EP Lynam Properties / Carroll Estates
Project :	Broomfield, Malahide - North Site

Lab. No :	21/227
Sample No :	PM06

Hole ID :	TP 06
Depth, m :	1.00

Material description :	slighty sandy slighty gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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_____Paddy McGonagle
Site Investigations Ltd

Appendix 4

Survey Data

Survey Data

Location	Irish Transverse Mercator		Elevation	Irish National Grid	
	Easting	Northing		Easting	Northing
Trial Pits					
TP01	722388.040	745003.074	17.33	322463.709	244979.195
TP02	722272.729	744716.671	12.34	322348.376	244692.730
TP03	722386.766	744709.925	13.42	322462.438	244685.983
TP04	722298.495	744833.799	16.34	322374.146	244809.883
TP05	722277.722	744793.371	15.06	322353.369	244769.446
TP06	722315.322	744744.236	13.39	322390.978	244720.301

Contract No:	5798A	Client:	EP Lynam Properties / Carroll Estates	Legend Key
Contract:	Broomfield - North Site	Engineer:	Waterman Moylan	Locations By Type - TP
Location:	Back Road, Malahide, Co. Dublin	Scale:	1:2000	
Title:	Site Plan	Drawn By:	SL	

C. Site Investigation Report – South Site

S.I. Ltd Contract No: 5798B

Client:	EP Lynam Properties / Carroll Estates
Engineer:	Waterman Moylan
Contractor:	Site Investigations Ltd

Broomfield – South Site,
Kinsealy Lane, Malahide, Co. Dublin
Site Investigation

Prepared by:

.....

Stephen Letch

Issue Date:	29/03/2021
Status	Final
Revision	1

Contents:

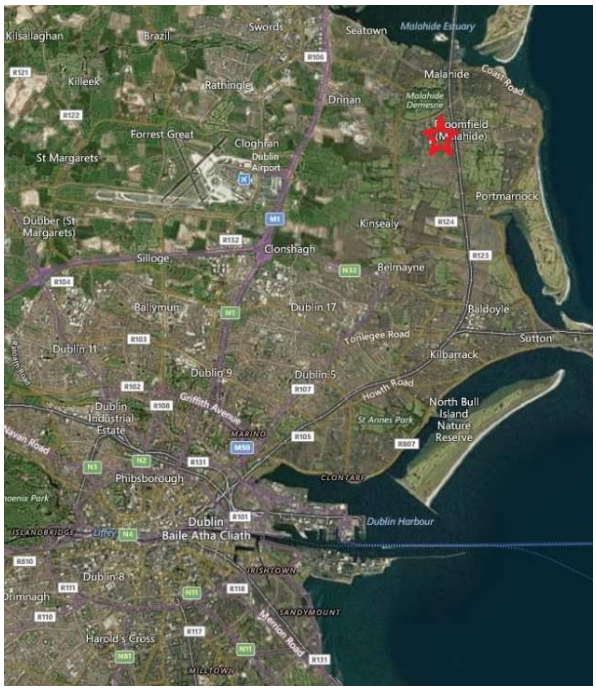
Appendices:

1. Introduction

On the instructions of Waterman Moylan, Site Investigations Ltd (SIL) were appointed to complete a site investigation at Broomfield, Malahide, Co. Dublin. The investigation was completed over two areas of the residential development, one on Back Road and one on Kinsealy Lane. The sites have been separated and this report covers the Kinsealy Lane site. The investigation was completed in March 2021 on behalf of the client, EP Lynam Properties and Carroll Estates.

2. Site Location

The site is located on the Kinsealy Lane, Malahide, Co. Dublin to the north of Dublin city. The map on the left shows the location of Malahide to the north of Dublin city and the second map shows the two site locations, with Back Road in red and Kinsealy Lane in green.



3. Fieldwork

The fieldworks comprised a programme of trial pits and soakaway tests. All fieldwork was carried out in accordance with Eurocode 7: Geotechnical Design and IEI Specification & Related Documents for Ground Investigation in Ireland (2006).

The fieldworks comprised the following:

- 6 No. trial pits with 3 No. soakaway tests

3.1. Trial Pits

6 No. trial pits were excavated using a tracked excavator. The pits were logged and photographed by SIL geotechnical engineer and representative disturbed bulk samples were recovered as the pits were excavated. TP04 was terminated at the scheduled depth of 3.00mbgl whilst the remaining five pits terminated at depths ranging from 1.30mbgl to 2.60mbgl when boulder obstructions were encountered. The trial pits were backfilled with the arisings immediately upon completion.

The trial pit logs and photographs are presented in Appendix 1.

3.2. Soakaway Tests

At TP01 to TP03, soakaway tests were completed, at 2.10mbgl in TP01 and at the base of the pits in TP02 (1.60mbgl) and TP03 (1.30mbgl). The soakaway test is used to identify possible areas for storm water drainage. The pit is filled with water and the level of the groundwater recorded over time. As stipulated by BRE Special Digest 365, 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 test results are provided in Appendix 2.

3.3. 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 4.

4. Laboratory Testing

Geotechnical laboratory testing was completed on representative soil samples in accordance with BS 1377 (1990). Testing included:

- 6 No. Moisture contents
- 6 No. Atterberg limits
- 6 No. Particle size gradings

The geotechnical laboratory test results are presented in Appendix 3.

5. Ground Conditions

5.1. Overburden

The natural ground conditions are consistent across the site with cohesive firm brown slightly sandy slightly gravelly silty CLAY with medium cobble overlying stiff brown grey or black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content.

These natural soils are over-consolidated lodgement till which is encountered across the North Dublin region with several papers discussing the engineering characteristics of the soil. The brown grey soils are the weathered surface of the underlying black clays and the gravel and cobbles are generally subrounded to subangular and predominantly limestone in origin.

The laboratory tests of the shallow cohesive soils confirm that CLAY soils dominate the site with low to intermediate plasticity indices of 14 to 16% recorded. The particle size distribution curve showed poorly sorted straight-line curves with 32% to 56% fines content.

5.2. Groundwater

Groundwater details in the trial pits during the fieldworks are noted on the logs in Appendix 1. Groundwater was ingressed into TP01 at 2.00mbgl and TP03 at 1.20mbgl and were recorded as medium ingresses. The remaining trial pits remained dry during excavation.

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. 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.

No numerical test data was completed as part of this investigation but the historical data from the numerous papers completed on these Dublin CLAYs would indicate an allowable bearing capacity range of 125kN/m^2 to 150kN/m^2 in the firm brown CLAY. This increases to between 250kN/m^2 to 300kN/m^2 when the stiff brown grey or black CLAY is encountered.

If large bearing capacities are required for the proposed structures then further investigation with SPT N-values or dynamic probe N_{100} values would be recommended.

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.

- The foundation is to be 1m wide.
- Foundations are to be constructed on a level formation of uniform material type (described above).
- 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/m^3.

The trial pits recorded good pit wall stability but 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, nearby construction and tides.

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.

Medium groundwater ingresses were recorded in TP01 and TP03 during the fieldworks period. 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. However, based on this information at the exploratory hole locations to date, it is considered likely that any shallow ingress into excavations of the CLAY will be slow to medium.

If localised granular soils are encountered in shallow excavations, then the possibility of water ingressing into an excavation increase with higher ingress rates.

Finally, 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 Design

The soakaway test at TP02 recorded no infiltration and therefore, failed the specification. The pits at TP01 and TP03 encountered ingresses during excavation and the water level rose during testing.

The BRE Digest stipulates that the pit should half empty within 24hrs, and extrapolation indicates this condition would not be satisfied. The test was terminated at the end of the first (of a possible three) fill/empty cycle since further testing would give even slower fall rates due to increased soil saturation. The unsuitability of the soils for soakaways is further suggested by the soil descriptions of the materials in this area of the site where the soakaway was completed, i.e., well compacted clay/silt soils.

Appendix 1

Trial Pit Logs and Photographs

Contract No: 5798B	**Trial Pit Log**				Trial Pit No: **TP01**
Contract:	Broomfield - South Site	Easting:	721999.052	Date:	18/03/2021
Location:	Kinsealy Lane, Malahide, Co. Dublin	Northing:	744287.661	Excavator:	5T Tracked Excavator
Client:	EP Lynam Properties / Carroll Estates	Elevation:	6.10	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	3.00 x 0.50 x 2.60	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
		TOPSOIL.		6.0					
	0.30	Firm brown grey slightly sandy slightly gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subrounded to rounded of limestone. Cobbles are subrounded to rounded of limestone.			5.80				
0.5				5.5					
1.0				5.0		1.00	B	PM01	
1.5				4.5					
	1.90	Stiff black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).			4.20				
2.0				4.0		2.00	B	PM02	▼
2.5									
	2.60	Obstruction - possible boulders.		3.5	3.50				
		Pit terminated at 2.60m							

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstructions - possible boulders.	Pit walls stable.	2.00 Medium	Soakaway test completed when pit 2.10mbgl.	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5798B	**Trial Pit Log**				Trial Pit No: **TP02**
Contract:	Broomfield - South Site	Easting:	722071.255	Date:	18/03/2021
Location:	Kinsealy Lane, Malahide, Co. Dublin	Northing:	744213.682	Excavator:	5T Tracked Excavator
Client:	EP Lynam Properties / Carroll Estates	Elevation:	6.33	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.20 x 0.50 x 1.60	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
		TOPSOIL.							
	0.30	Firm brown grey slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subrounded to rounded of limestone. Cobbles are subrounded to rounded of limestone.		6.0	6.03				
0.5									
1.0				5.5		1.00	B	PM05	
	1.20	Stiff brown grey slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).			5.13				
1.5				5.0		1.50	B	PM06	
	1.60	Obstruction - possible boulders. **Pit terminated at 1.60m**			4.73				
2.0				4.5					
				4.0					
2.5									
				3.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstructions - possible boulders.	Pit walls stable.	Dry	Soakaway test completed at base of pit.	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5798B	**Trial Pit Log**				Trial Pit No: **TP03**
Contract:	Broomfield - South Site	Easting:	722069.502	Date:	18/03/2021
Location:	Kinsealy Lane, Malahide, Co. Dublin	Northing:	744075.275	Excavator:	5T Tracked Excavator
Client:	EP Lynam Properties / Carroll Estates	Elevation:	4.61	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.40 x 0.50 x 1.30	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
		TOPSOIL.		4.5					
	0.20	Firm brown grey slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subrounded to rounded of limestone. Cobbles are subrounded to rounded of limestone.			4.41				
0.5				4.0					
1.0						1.00	B	PM09	
	1.10	Stiff black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).		3.5	3.51				
						1.20	B	PM10	▼
	1.30	Obstruction - possible boulders.			3.31				
1.5		**Pit terminated at 1.30m**		3.0					
2.0				2.5					
2.5				2.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstructions - possible boulders.	Pit walls stable.	1.20 Medium	Soakaway test completed at base of pit.	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5798B	**Trial Pit Log**				Trial Pit No: **TP04**
Contract:	Broomfield - South Site	Easting:	722051.924	Date:	18/03/2021
Location:	Kinsealy Lane, Malahide, Co. Dublin	Northing:	744291.016	Excavator:	5T Tracked Excavator
Client:	EP Lynam Properties / Carroll Estates	Elevation:	5.89	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	3.10 x 0.50 x 3.00	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
		TOPSOIL.							
	0.30	Firm brown grey slightly sandy slightly gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subrounded to rounded of limestone. Cobbles are subrounded to rounded of limestone.			5.59				
0.5				5.5					
				5.0					
1.0						1.00	B	PM03	
				4.5					
1.5									
				4.0					
2.0									
	2.10	Stiff black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).			3.79				
				3.5					
2.5						2.50	B	PM04	
				3.0					
	3.00	**Pit terminated at 3.00m**			2.89				

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5798B	**Trial Pit Log**				Trial Pit No: **TP05**
Contract:	Broomfield - South Site	Easting:	721992.441	Date:	18/03/2021
Location:	Kinsealy Lane, Malahide, Co. Dublin	Northing:	744237.166	Excavator:	5T Tracked Excavator
Client:	EP Lynam Properties / Carroll Estates	Elevation:	6.89	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.50 x 0.50 x 1.70	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
		TOPSOIL.							
	0.30	Firm brown grey slightly sandy slightly gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subrounded to rounded of limestone. Cobbles are subrounded to rounded of limestone.			6.59				
0.5				6.5		0.50	B	PM11	
	0.90	Stiff grey slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).		6.0	5.99				
1.0						1.00	B	PM12	
	1.10	Stiff black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).			5.79				
1.5				5.5		1.50	B	PM13	
	1.70	Obstruction - possible boulders. **Pit terminated at 1.70m**			5.19				
2.0				5.0					
2.5				4.5					
				4.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstructions - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5798B	**Trial Pit Log**				Trial Pit No: **TP06**
Contract:	Broomfield - South Site	Easting:	722023.265	Date:	18/03/2021
Location:	Kinsealy Lane, Malahide, Co. Dublin	Northing:	744153.987	Excavator:	5T Tracked Excavator
Client:	EP Lynam Properties / Carroll Estates	Elevation:	5.99	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.20 x 0.50 x 1.40	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
		TOPSOIL.							
	0.30	Firm brown grey slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subrounded to rounded of limestone. Cobbles are subrounded to rounded of limestone.			5.69				
0.5				5.5					
1.0				5.0		1.00	B	PM07	
	1.10	Stiff brown grey slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 250mm diameter).			4.89	1.30	B	PM08	
	1.40	Obstruction - possible boulders.			4.59				
1.5		**Pit terminated at 1.40m**		4.5					
2.0				4.0					
2.5				3.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstructions - possible boulders.	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

TP06 Sidewall

TP06 Spoil

Appendix 2

Soakaway Test Results

SOAKAWAY TEST

Project Reference:	5798B
Contract name:	Broomfield - South Site
Location:	Kinsealy Lane, Malahide, Co. Dublin
Test No:	SA01
Date:	19/03/2021

Ground Conditions

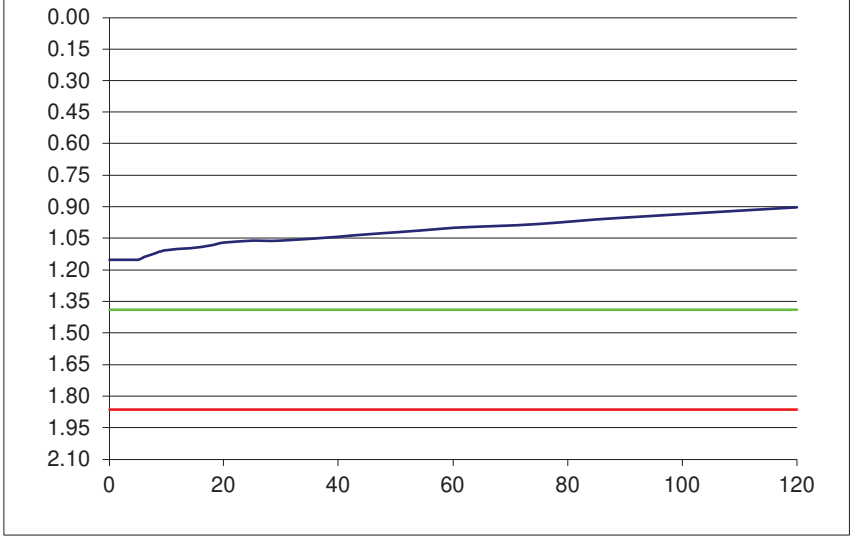
From	To	
0.00	0.30	TOPSOIL.
0.30	1.90	Firm brown grey slightly sandy slightly gravelly silty CLAY with low cobble content.
1.90	2.10	Stiff black slightly sandy slightly gravelly silty CLAY with low cobble and boulder content.

Remarks:

Medium water ingress at 2.00mbgl - water added to pit and water level rises after 6 minutes - unsuitable.

Elapsed Time (mins)	Fall of Water (m)
0	1.15
0.5	1.15
1	1.15
1.5	1.15
2	1.15
2.5	1.15
3	1.15
3.5	1.15
4	1.15
4.5	1.15
5	1.15
6	1.14
7	1.13
8	1.12
9	1.11
10	1.11
12	1.10
14	1.10
16	1.09
18	1.08
20	1.07
25	1.06
30	1.06
40	1.04
50	1.02
60	1.00
75	0.98
90	0.95
120	0.90

Pit Dimensions (m)		
Length (m)	2.80	m
Width (m)	0.90	m
Depth	2.10	m
Water		
Start Depth of Water	1.15	m
Depth of Water	0.95	m
75% Full	1.39	m
25% Full	1.86	m
75%-25%	0.48	m
Volume of water (75%-25%)	**1.20**	m3
Area of Drainage	**15.54**	m2
Area of Drainage (75%-25%)	**6.04**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** **m/min** or **Fail** **m/s**

SOAKAWAY TEST

Project Reference:	5798B
Contract name:	Broomfield - South Site
Location:	Kinsealy Lane, Malahide, Co. Dublin
Test No:	SA02
Date:	19/03/2021

Ground Conditions

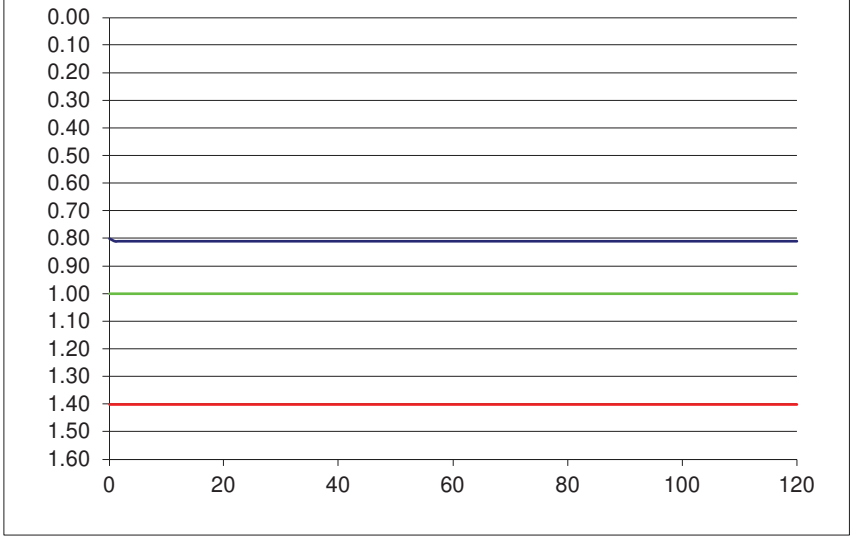
From	To	
0.00	0.30	TOPSOIL.
0.30	1.20	Firm brown grey slightly sandy slightly gravelly silty CLAY with low cobble content.
1.20	1.60	Stiff black slightly sandy slightly gravelly silty CLAY with low cobble and boulder content.

Remarks:

Pit terminated due to boulder obstructions - test completed at base of pit.

Elapsed Time (mins)	Fall of Water (m)
0	0.80
0.5	0.81
1	0.81
1.5	0.81
2	0.81
2.5	0.81
3	0.81
3.5	0.81
4	0.81
4.5	0.81
5	0.81
6	0.81
7	0.81
8	0.81
9	0.81
10	0.81
12	0.81
14	0.81
16	0.81
18	0.81
20	0.81
25	0.81
30	0.81
40	0.81
50	0.81
60	0.81
75	0.81
90	0.81
120	0.81

Pit Dimensions (m)		
Length (m)	2.20	m
Width (m)	0.90	m
Depth	1.60	m
Water		
Start Depth of Water	0.80	m
Depth of Water	0.80	m
75% Full	1.00	m
25% Full	1.40	m
75%-25%	0.40	m
Volume of water (75%-25%)	**0.79**	m3
Area of Drainage	**9.92**	m2
Area of Drainage (75%-25%)	**4.46**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** m/min or **Fail** m/s

SOAKAWAY TEST

Project Reference:	5798B
Contract name:	Broomfield - South Site
Location:	Kinsealy Lane, Malahide, Co. Dublin
Test No:	SA03
Date:	19/03/2021

Ground Conditions

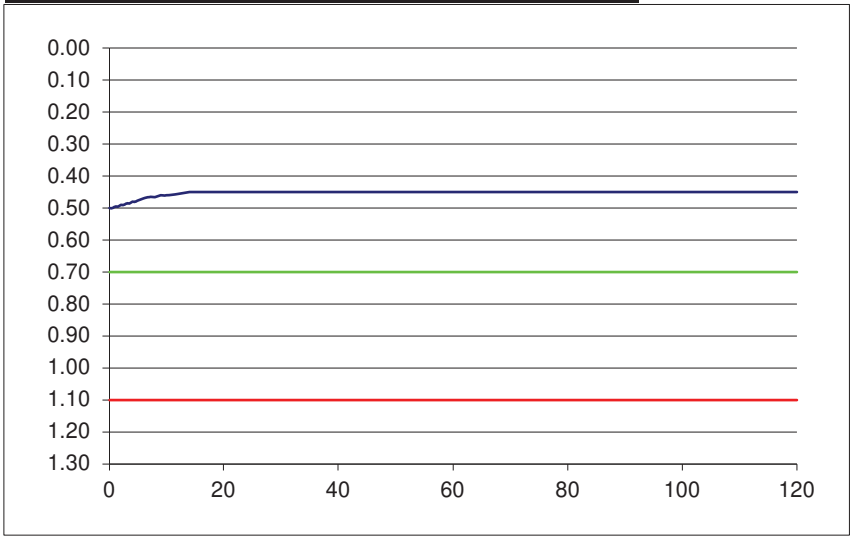
From	To	
0.00	0.20	TOPSOIL.
0.20	1.10	Firm brown grey slightly sandy slightly gravelly silty CLAY with low cobble content.
1.10	1.30	Stiff black slightly sandy slightly gravelly silty CLAY with low cobble and boulder content.

Remarks:

Pit terminated due to boulder obstructions - test completed at base of pit.
Medium water ingress at 1.20mbgl - water added to pit and water level rises after 1.5 minutes - unsuitable.

Elapsed Time (mins)	Fall of Water (m)
0	0.50
0.5	0.50
1	0.50
1.5	0.50
2	0.49
2.5	0.49
3	0.49
3.5	0.49
4	0.48
4.5	0.48
5	0.48
6	0.47
7	0.47
8	0.47
9	0.46
10	0.46
12	0.46
14	0.45
16	0.45
18	0.45
20	0.45
25	0.45
30	0.45
40	0.45
50	0.45
60	0.45
75	0.45
90	0.45
120	0.45

Pit Dimensions (m)		
Length (m)	2.40	m
Width (m)	0.90	m
Depth	1.30	m
Water		
Start Depth of Water	0.50	m
Depth of Water	0.80	m
75% Full	0.70	m
25% Full	1.10	m
75%-25%	0.40	m
Volume of water (75%-25%)	**0.86**	m3
Area of Drainage	**8.58**	m2
Area of Drainage (75%-25%)	**4.80**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** m/min or **Fail** m/s

Appendix 3

Geotechnical Laboratory Test Results

Classification Tests in accordance with BS1377: Part 4

Client	EP Lynam Properties / Carroll Estates
Site	Broomfield, Malahide - South Site
S.I. File No	5798B / 21
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	24th March 2021

Hole ID	Depth	Sample No	Lab Ref No.	Sample Type	Natural Moisture Content %	Liquid Limit %	Plastic Limit %	Plastic Index %	Min. Dry Density Mg/m^3	Particle Density Mg/m^3	% passing 425um	Comments	**Remarks** **C**=Clay; **M**=Silt **Plasticity**: **L**=Low; **I**=Intermediate; **H**=High; **V**=Very High; **E**=Extremely High
TP01	1.00	PM01	21/228	B	18.2	38	20	18			81.9		CI
TP02	1.00	PM05	21/229	B	12.8	32	19	13			39.5		CL
TP03	1.00	PM09	21/230	B	17.2	32	20	12			52.9		CL
TP04	1.00	PM03	21/231	B	19.3	37	21	16			83.0		CI
TP05	1.00	PM12	21/232	B	12.3	32	18	14			36.2		CL
TP06	1.00	PM07	21/233	B	11.1	33	19	14			41.7		CL

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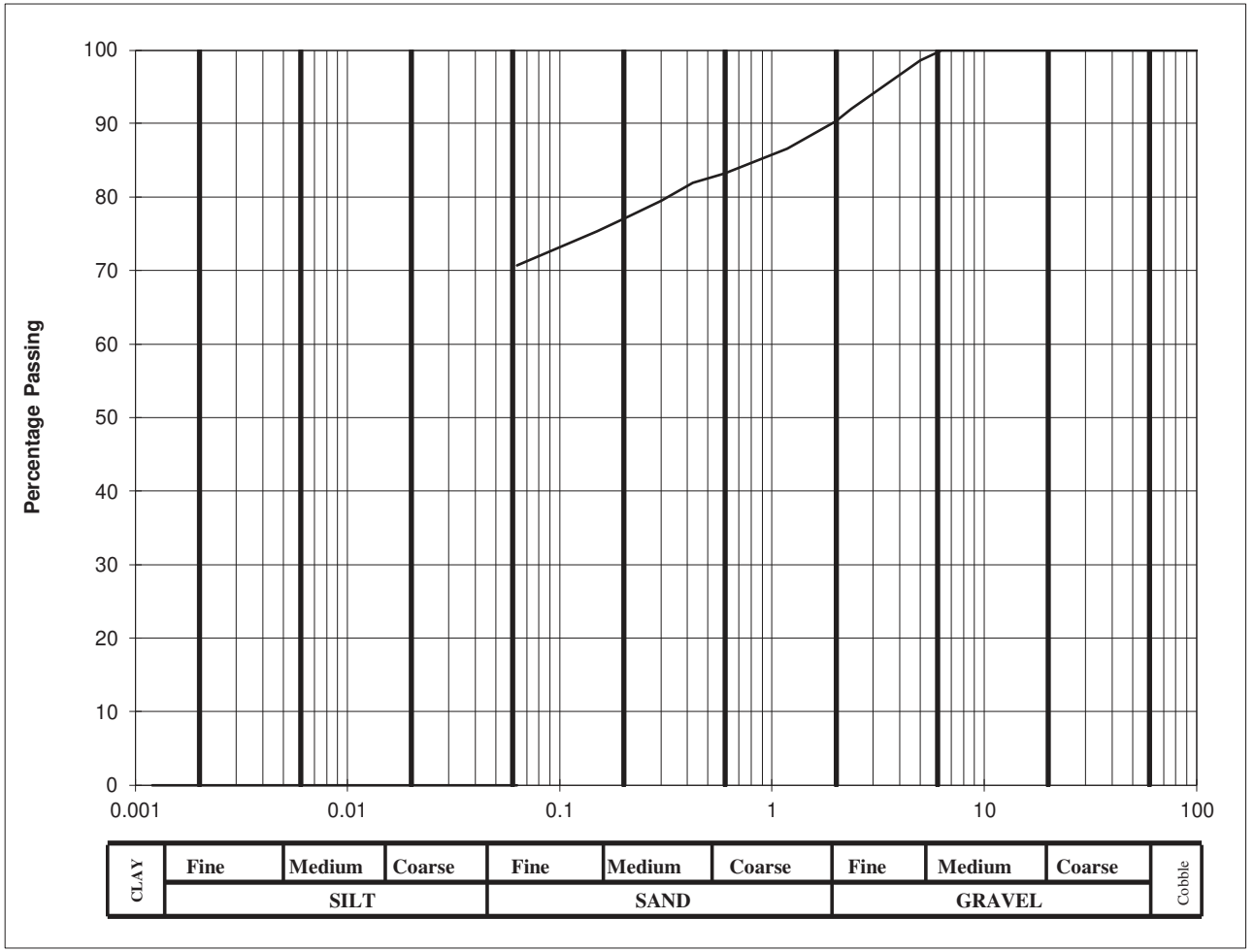
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	98.6		
2.36	92		
2.00	90.3		
1.18	86.6		
0.600	83.2		
0.425	81.9		
0.300	79.5		
0.212	77.4		
0.150	75.3		
0.063	71		

Cobbles, %	0
Gravel, %	10
Sand, %	19
Clay / Silt, %	71



Client :	EP Lynam Properties / Carroll Estates
Project :	Broomfield, Malahide - South Site

Lab. No :	21/228
Sample No :	PM01

Hole ID :	TP 01
Depth, m :	1.00

Material description :	slighty sandy slighty gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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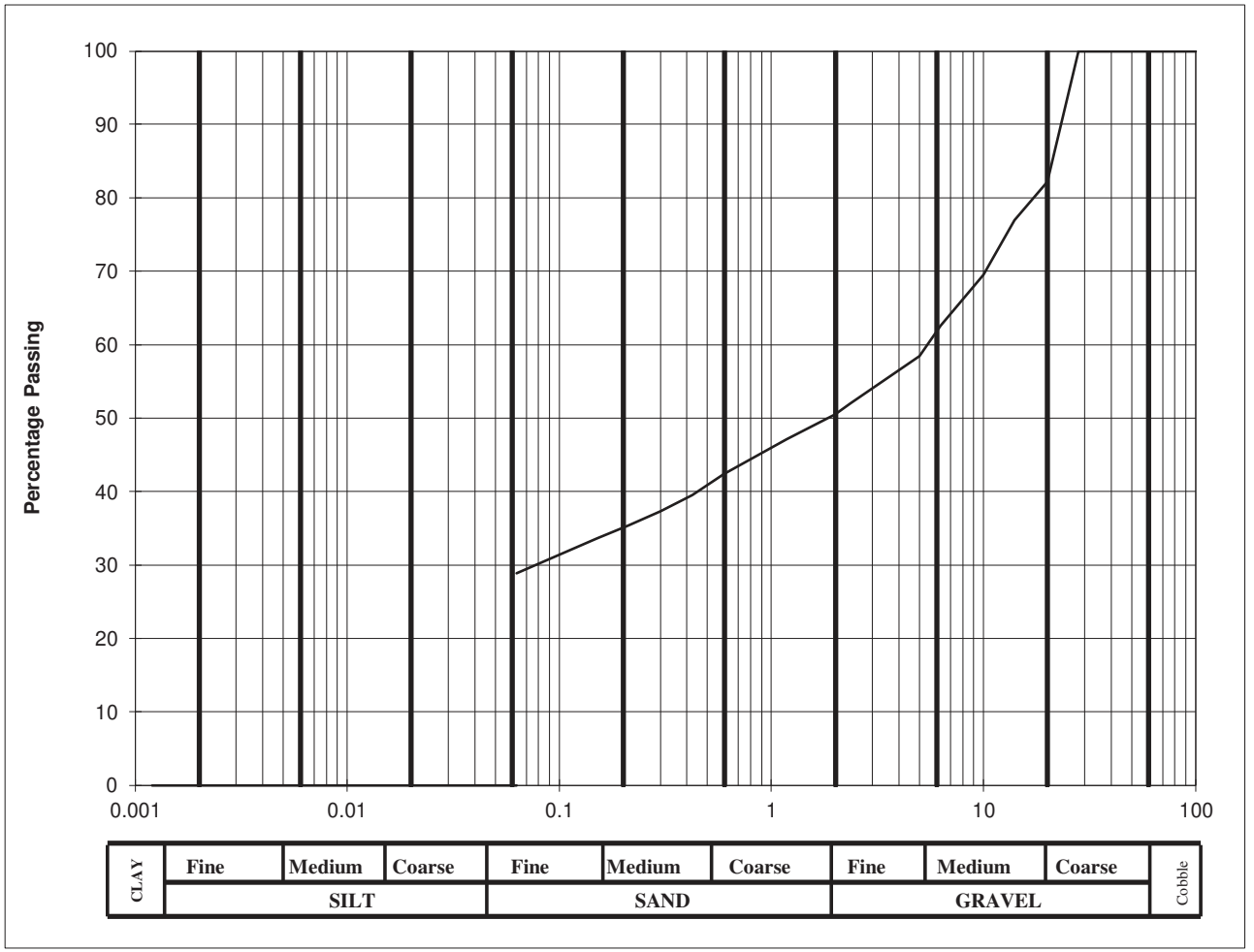
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	82.2		
14	76.9		
10	69.5		
6.3	62.6		
5.0	58.4		
2.36	52		
2.00	50.5		
1.18	47.1		
0.600	42.4		
0.425	39.5		
0.300	37.3		
0.212	35.4		
0.150	33.6		
0.063	29		

Cobbles, %	0
Gravel, %	50
Sand, %	22
Clay / Silt, %	29



Client :	EP Lynam Properties / Carroll Estates
Project :	Broomfield, Malahide - South Site

Lab. No :	21/229
Sample No :	PM05

Hole ID :	TP 02
Depth, m :	1.00

Material description :	slighty sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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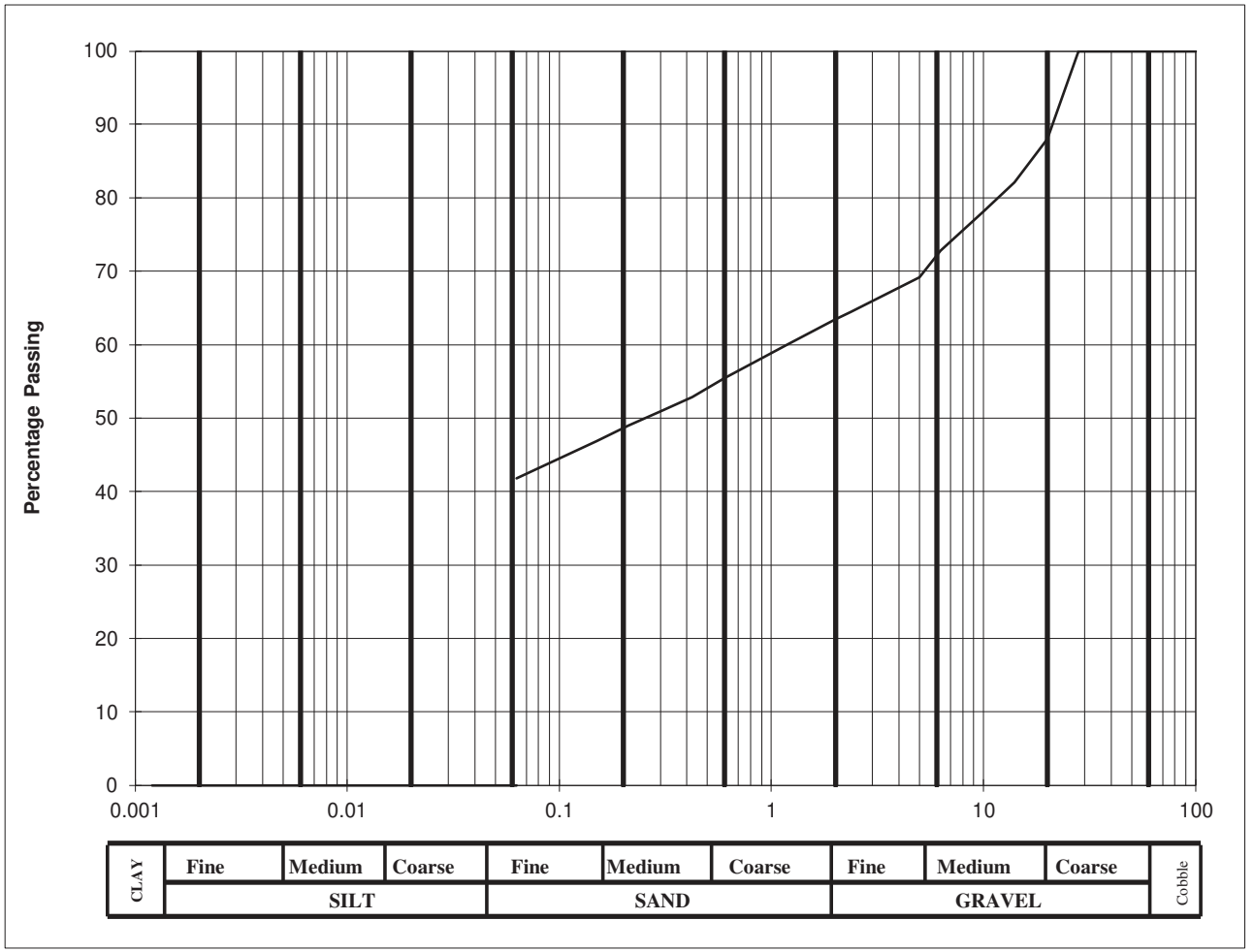
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	88		
14	82.1		
10	78.1		
6.3	72.8		
5.0	69.2		
2.36	64.4		
2.00	63.4		
1.18	60		
0.600	55.4		
0.425	52.9		
0.300	50.9		
0.212	49		
0.150	46.9		
0.063	42		

Cobbles, %	0
Gravel, %	37
Sand, %	21
Clay / Silt, %	42



Client :	EP Lynam Properties / Carroll Estates
Project :	Broomfield, Malahide - South Site

Lab. No :	21/230
Sample No :	PM09

Hole ID :	TP 03
Depth, m :	1.00

Material description :	slighty sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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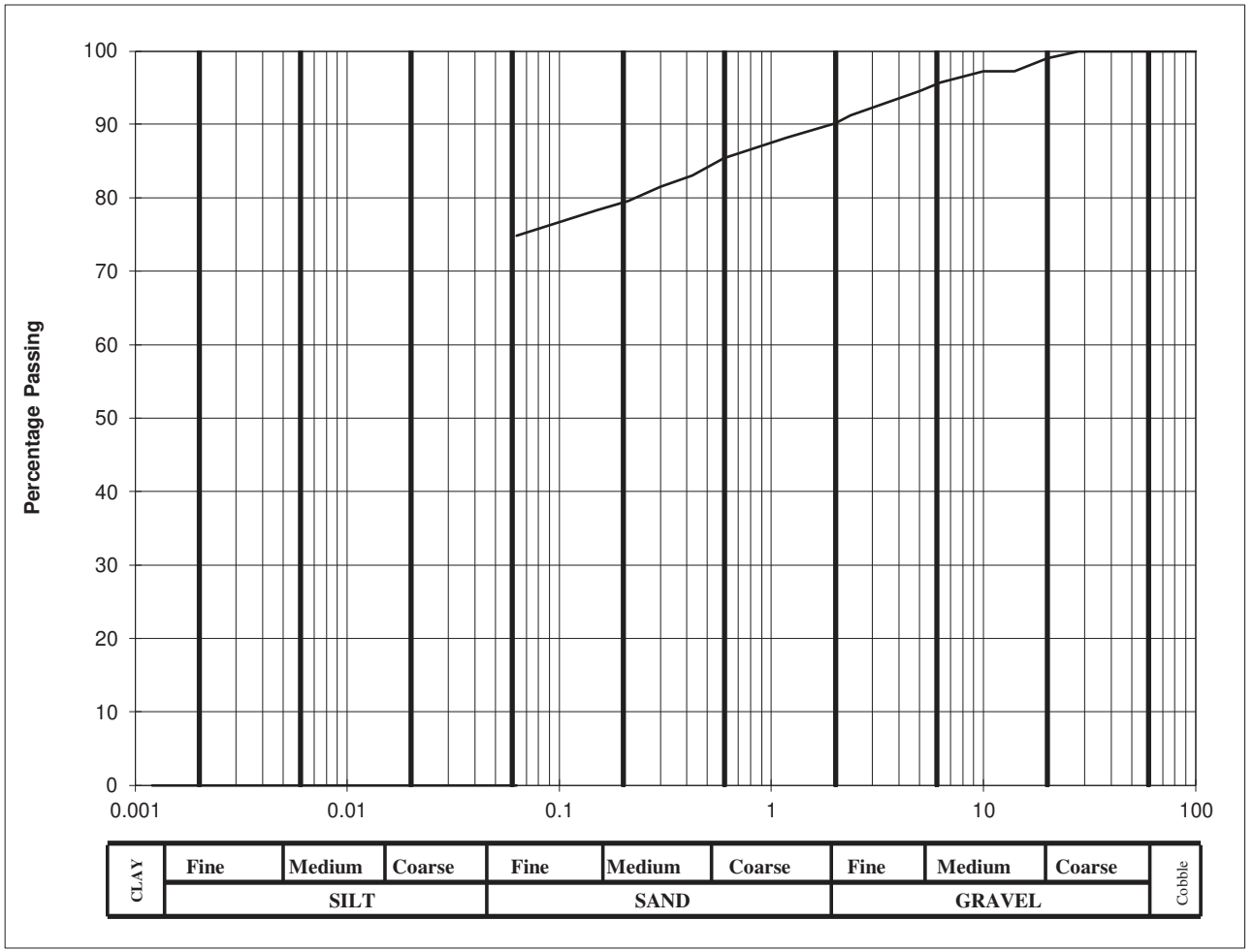
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	99		
14	97.2		
10	97.2		
6.3	95.7		
5.0	94.5		
2.36	91.2		
2.00	90.1		
1.18	88.2		
0.600	85.4		
0.425	83		
0.300	81.5		
0.212	79.6		
0.150	78.3		
0.063	75		

Cobbles, %	0
Gravel, %	10
Sand, %	15
Clay / Silt, %	75



Client :	EP Lynam Properties / Carroll Estates
Project :	Broomfield, Malahide - South Site

Lab. No :	21/231
Sample No :	PM03

Hole ID :	TP 04
Depth, m :	1.00

Material description :	slighty sandy slighty gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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BS 1377 Particle Size Analysis

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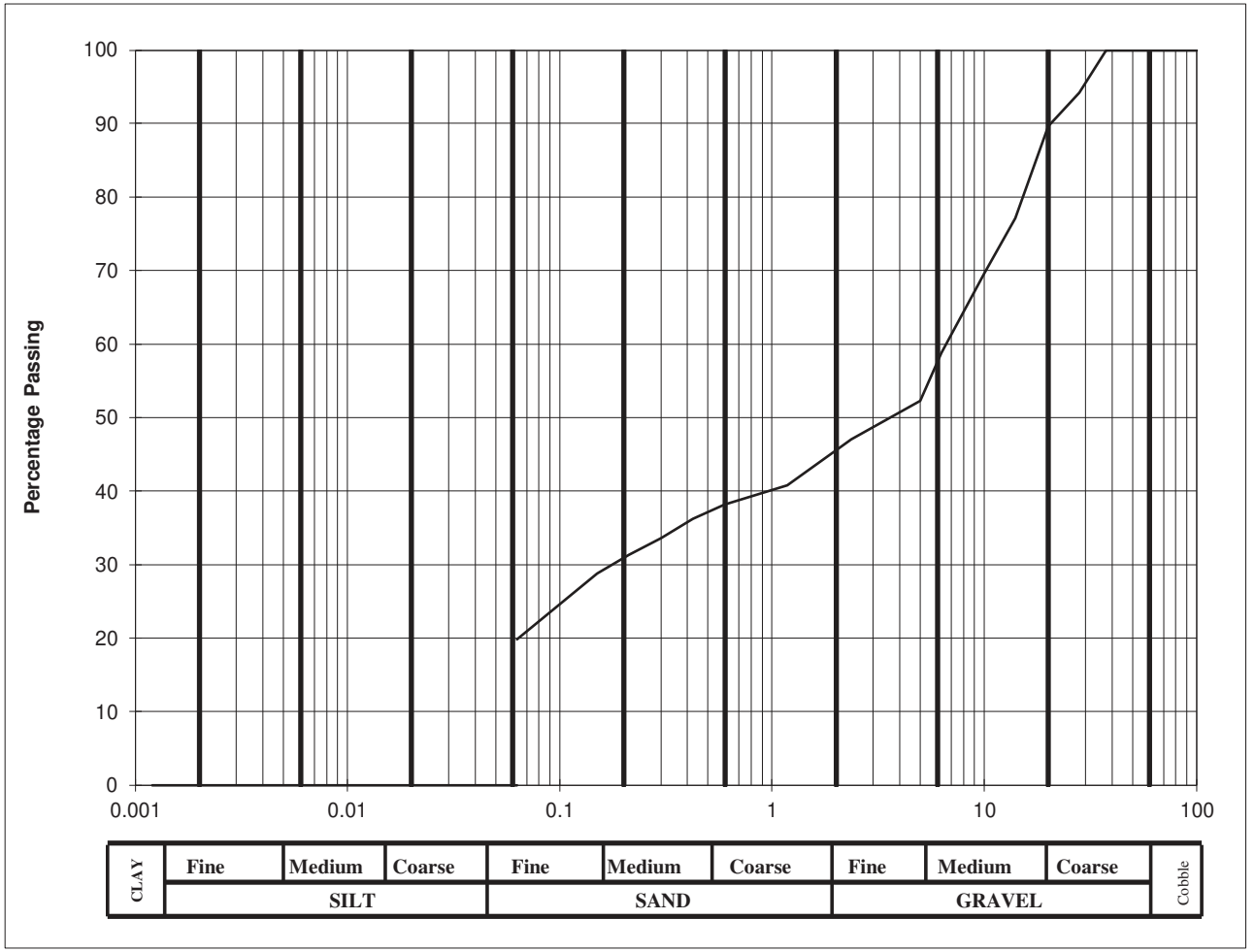
BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	94.2		
20	89.6		
14	77.1		
10	69.6		
6.3	58.8		
5.0	52.3		
2.36	47		
2.00	45.5		
1.18	40.8		
0.600	38.2		
0.425	36.2		
0.300	33.6		
0.212	31.3		
0.150	28.8		
0.063	20		

Cobbles, %	0
Gravel, %	55
Sand, %	26
Clay / Silt, %	20



Client :	EP Lynam Properties / Carroll Estates
Project :	Broomfield, Malahide - South Site

Lab. No :	21/232
Sample No :	PM12

Hole ID :	TP 05
Depth, m :	1.00

Material description :	slighty sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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BS 1377 Particle Size Analysis

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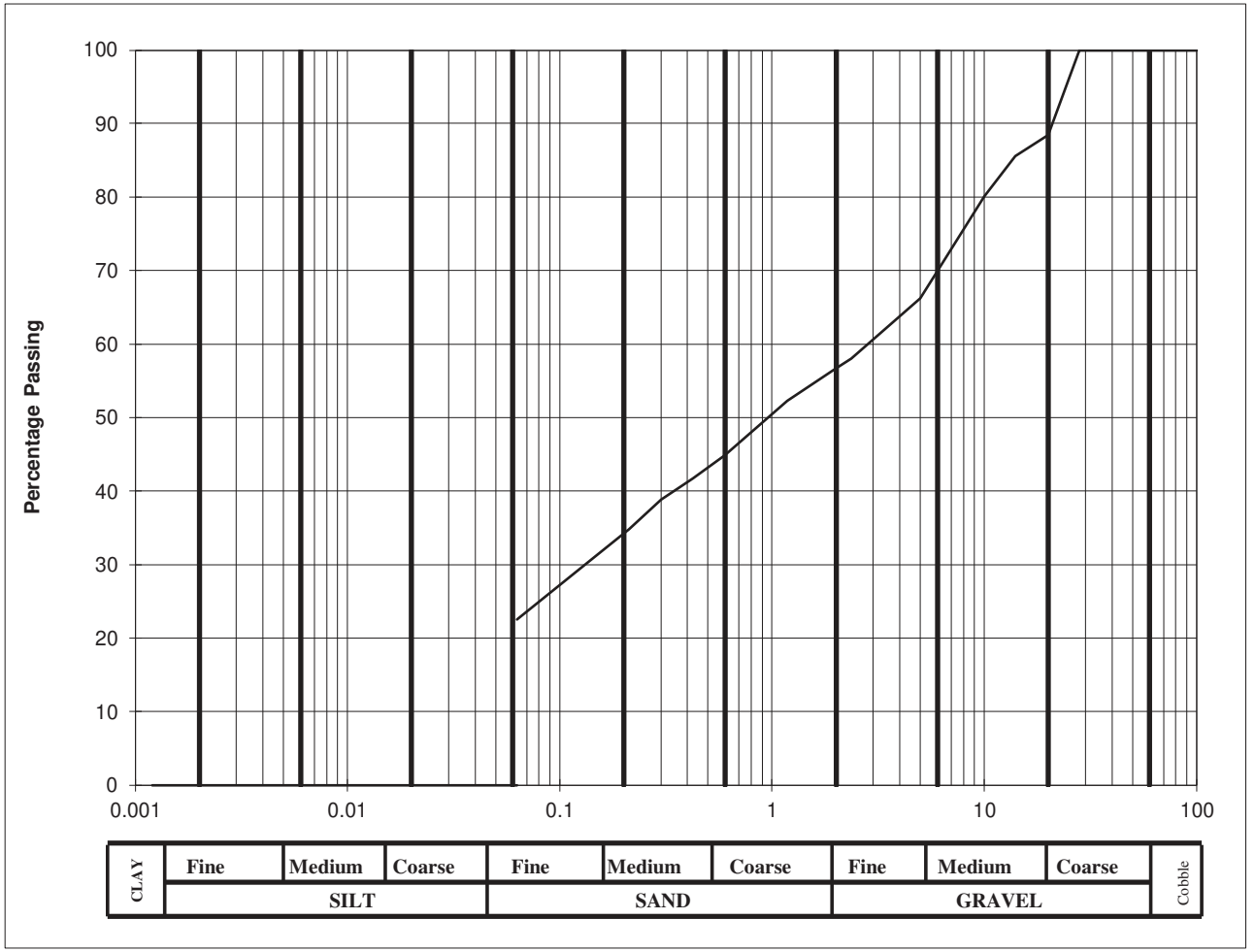
BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	88.4		
14	85.6		
10	80.1		
6.3	70.8		
5.0	66.2		
2.36	58		
2.00	56.7		
1.18	52.3		
0.600	44.8		
0.425	41.7		
0.300	38.8		
0.212	34.8		
0.150	31.3		
0.063	23		

Cobbles, %	0
Gravel, %	43
Sand, %	34
Clay / Silt, %	23



Client :	EP Lynam Properties / Carroll Estates
Project :	Broomfield, Malahide - South Site

Lab. No :	21/233
Sample No :	PM07

Hole ID :	TP 06
Depth, m :	1.00

Material description :	slighty sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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Appendix 4

Survey Data

Survey Data

Location	Irish Transverse Mercator		Elevation	Irish National Grid	
	Easting	Northing		Easting	Northing
Trial Pits					
TP01	721999.052	744287.661	6.10	322074.645	244263.625
TP02	722071.255	744213.682	6.33	322146.865	244189.630
TP03	722069.502	744075.275	4.61	322145.113	244051.193
TP04	722051.924	744291.016	5.89	322127.529	244266.981
TP05	721992.441	744237.166	6.89	322068.034	244213.119
TP06	722023.265	744153.987	5.99	322098.865	244129.922

Contract No:	5798B	Client:	EP Lynam Properties / Carroll Estates	Legend Key
Contract:	Broomfield - South Site	Engineer:	Waterman Moylan	Locations By Type - TP
Location:	Kinsealy Lane, Malahide, Co. Dublin	Scale:	1:1250	
Title:	Site Plan	Drawn By:	SL	

UK and Ireland Office Locations