ARUP

Carmarthenshire County Council

Machynys Hotel

Geotechnical and geoenvironmental desk study

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Job number

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1. Introduction

1.1 Appointment

Ove Arup & Partners Ltd (Arup) have been appointed by Carmarthenshire County Council (CCC) to provide multidisciplinary consultancy services to support the proposed development of Machynys Hotel. As part of these services Arup have prepared the following Geotechnical and geoenvironmental desk study and preliminary risk assessment to support the planning submission.

1.2 Objectives and scope of report

This desk study report has been prepared to support the planning application for a proposed hotel site in Machynys, providing a summary of available information on the history, environmental setting and previous ground investigations for the site and presents geotechnical and geoenvironmental constraints and considerations in relation to the proposed development. The site of the proposed hotel is located on a relatively flat area, situated approximately 2.1 miles to the south of Llanelli and the B4304 Coastal Link Road.

In 2016 Arup prepared a Geotechnical and Geoenvironmental Desk Study for the Llanelli Wellness and Life Science Village (LWLV) [1] for CCC, in support of the pre-application consultation submission for the Llanelli Wellness and Life Science Village. The Machynys hotel site was included within this study. Due to flood risk, the previous planning application was withdrawn. The proposed site has subsequently moved west of the previous application site following extensive flood monitoring and investigation. As a result, this report has been updated to support a new planning application for the hotel development.

The proposed development comprises a hotel up to five storeys with associated car parking, access roads, landscape and infrastructure works.

The Application Boundary occupies an area within the West of the Applicant's Land Ownership boundary, as seen in Drawing 1. The site is represented by the redline boundary, and anything outside of this boundary will be referred to as off-site.

The site is subject to risks including flooding and contamination, and certain areas of the proposed hotel development, particularly towards the eastern corner as well as the adjacent B3404 lie within a ‘blue’ zone categorised as “extent of 0.1% AEP+CC flooding (limit development in area, avoid raising levels)”, although the level of flooding will only be minor, and is not anticipated to pose a risk to the proposed development.

1.3 Use of report and limitations

This report has been prepared by Arup for use by CCC. It should not be relied upon by any third-party except as provided for in Arup’s appointment with CCC. Arup has based this report on the sources detailed within it and believes them to be reliable but cannot and does not guarantee the authenticity or reliability of third-party information. Reasonable skill and care have been exercised in preparation for this report in accordance with the technical requirements of the brief. Notwithstanding the efforts made by the professional team in undertaking assessment, it is possible that ground conditions and contamination other than that potentially indicated by this report may exist at the site.

This report has been prepared based on current legislation, statutory requirements, planning policy and industry good practice at the time of writing. Any subsequent changes or new guidance may require the findings, conclusions and recommendations made in this report to be reassessed in the light of the circumstances. Should additional relevant information become available the findings of this report should be reviewed.

2. The site

2.1 Proposed development

A concept masterplan is demonstrated in Drawing 2, which shows the proposed hotel development located towards the north of the site. Design development work is ongoing, and therefore Drawing 2 is intended to illustrate the intended location of the proposed hotel only. The initial design work includes:

- A five storey L 'shaped' hotel comprising 120 bedrooms.
- Associated car parking; up to 140 space car park spaces for guests and up to 40 staff (landscaped).
- Hotel vehicular access; B4304.
- Hotel garden/ terrace/ event space incorporating Sustainable Urban Drainage Systems (SuDS).
- Sensitive landscape integration with open parkland.

2.2 Current conditions

The site is bounded to the north by the B4304 Coastal Link Road, to the west by the Nicklaus Avenue access road to the Machynys Peninsular Golf & Country Club, to the south by residential properties and to the east by grassland. Commercial properties are situated across the B4304 to the north off-site (Heavy Engineering Company Ltd, LBS Builders Merchants, Delta Lakes Enterprise Centre).

The application boundary is almost rectangular in shape and approximately 370 * 400 m in size or 3.5ha in area, although the hotel is proposed to occupy a section towards the north of this application boundary, occupying almost half of the area. The topography of the northern part of the site is relatively flat, lying at approximately 8 m OD. At present, according to historical mapping, north of the boundary comprises a brownfield area with two areas of infilled land of unknown nature and composition which were former reservoirs, and the south of the site comprises a large area of grassland and scrubs with some trees, sitting at a slightly higher elevation of around 15m OD.

According to aerial images, there does not appear to be any existing structures or hardstanding occupying the site, such as made ground, historic foundations or rubble, although the presence of foundations or structures below ground cannot be discounted and should be confirmed following further intrusive investigation.

2.3 Site history

This section of the report provides a summary and interpretation of the site history and its influence on the site ground conditions, based on historical plans, maps and information. A significant portion of this information has been summarised from the desk study [1].

Date	Development	Comments
1889	Directly east of the site was the Machynys Brick Works, comprising several brick fields and a clay mill, as well as several unlabelled buildings and associated tramways. There is also a chemical works located less than 1 km towards the northeast.	Off-site
1889	There is a reservoir occupying a large corner within the far eastern boundary, which was backfilled between 1965 and 1973, which is anticipated to be associated with the nearby Burry Works (tin plate) or the Machynys Brick Works.	On site
1900-1901	Little to no change.	On and off-site

Date	Development	Comments
1907-1908	Several more buildings now occupy the site towards the centre, including a school and a chapel. A larger reservoir is now present north/ northwest of the existing reservoir, again likely associated with the Bury Works east of the sit boundary.	On site
1921	Little to no change.	On site
1921	A lot of the infrastructure associated with the Machynys Brick Works and Burry Works has now been removed, with only a few buildings and tramway lines remaining.	Off-site
1938	Little to no change.	On site
1938	Almost all the infrastructure associated with the Brick Works east of the site has now been removed, including the tramway lines.	Off-site
1939-1945	During WWII it was reported that the Llanelli National Shell Factory was present directly to the west off-site, where the Burry Extension Works were, which engaged in the manufacture of 6" shells. An adjacent factory was engaged in the rectification of 6" shells.	Off-site
1958	The Machynys Brickworks is now labelled "disused".	Off-site
1964-1965	Substantial redevelopment had occurred by this time, with several new buildings occupying almost the entirety of the site, and the reservoirs also appear to have been infilled or in the process of being infilled (infilled between 1965 and 1973).	On site
1964-1965	Off site, to the east replacing the former brick works is a succession of rectangular sheds, facilitated by rail and tram lines, which at one point would have likely been associated with the Burry Works west off-site, which was developed into an engineering works in 1973.	Off-site
1999	The engineering works remained until 1999, where there is no evidence of the former industries which once surrounded the site.	Off-site
1999	The site now appears vacant, with no visual evidence of the former historical developments and reservoirs.	On-site
2005	The housing southwest off site is shown to have been developed since 1999, and the Machynys Golf and Country Club to the south and east of the site opened in 2005. Since 2005, there appears to have been little to no changes.	Off-site

To summarise the above, it is likely that most of the site's history has provided the potential for contamination to be present. Particularly, contamination is anticipated to be present within the subsurface, specifically within the backfilled reservoirs of unknown composition, which could potentially have been infilled with industrial waste from the surrounding industries such as the brick and tin plate works. This could not only pose contamination risks, but also stability issues for construction due to the potential of settlement because of soft/ loose ground.

3. Environmental setting

3.1 Geology

The geology of the site has been interpreted from the published 1:10,560 scale BGS geological map Sheet SS 59 NW and the BGS memoir for the area (Sheet 247) [2] has also been consulted, as well as the BGS Geoindex [3].

There is a mapped contact within the superficial deposits underlying the site: Glaciofluvial Ice Contact Deposits (Devensian – Sand and Gravel) towards the west of the site and Raised Storm Beach Deposits (Sand and Gravel) towards the east. Overlying the superficial deposits is a cover of Artificial Ground covering the entirety of the proposed site (indicating Made Ground).

The solid geology comprises the Hughes Beds of the Upper Coal Measures. The geological plan indicates that the Hughes Beds are predominantly interbedded sandstones, mudstones and coal seams. The general dip of the beds is around 15° to the north.

700m east of the site is a south trending Box Fault, which intersects the Swansea Two Feet coal seam, but this is not within the site boundary therefore the risk of past mining is not anticipated to cause any risks, and can therefore be discounted (see Section 3.4)

The geology plan describes details of the Machynys Borehole sunk to the south of the site in 1888. The log states that the drift cover was found to be 127 feet (38m) thick at this point. Another borehole approximately 600m to the east of the site describes 140 feet (42m) to rock.

3.2 Hydrology and hydrogeology

3.2.1 Hydrology

The New Dafen River is located approximately 250m to the north of the site. This river is controlled by a sluice gate, which connects immediately to the River Lliedi (west) and beyond to the Loughor Estuary.

The New Dafen River was subject to the previous “River Quality Objectives” RQO scheme. The scheme classification was used for planning water quality improvements until 2006 when the scheme ended. The RQO class of the New Dafen River is 3 (there are five classes ranging in order of decreasing quality from 1-5). From 1995 to 1998 (inclusive), the river water was recorded to “significantly fail” the Class 3 criteria (which includes unionised ammonia of 0.021mg/l and copper from 300ug/l to 2000ug/l subject to hardness class). From 1999 to 2006, the samples of river water were recorded to meet the Class 3 criteria.

Loughor Estuary is located around 500m south and west of the site.

As part of the Machynys Golf and Country Club to the south-east of the site, there are various lakes and watercourses that form part of the golf course.

3.2.2 Hydrogeology

The Environment Agency aquifer maps (now Natural Resource Wales) show the Raised Storm Beach Deposits underlying the site to be designated as ‘Secondary Undifferentiated’ strata [3].

The Glaciofluvial Deposits are designated as a ‘Secondary A’ aquifer. Secondary A aquifers are defined as having permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers. The underlying Hughes Beds of the Upper Coal Measures bedrock is designated as a ‘Secondary A’ aquifer.

Based on available ground investigation information for the wider Llanelli area, groundwater is present within the more permeable layers in the Raised Beach Deposits (granular) subject to locally confining layers above and below. A groundwater body lies within the glaciofluvial deposits predominantly controlled by flow to the west and southwest. The groundwater in the glaciofluvial deposits is expected to be in some level of continuity with the Estuary.

The site does not lie within a source protection zone (SPZ) and no groundwater abstraction points are known to lie within the site area. Based on previous desk study information, the groundwater is likely to be brackish.

3.3 Flood risk

Following the previous study, detailed flood monitoring has been undertaken and has identified that the new proposed area for the hotel site would be suitable for development as it is not located within an area of low flood risk.

3.4 Mining

A detailed review of the mining risks to development has been undertaken as part of the 2016 Arup LWLV Desk Study [1] including the proposed development site. A summary of this information is provided below.

The site is underlain by the Hughes Beds of the Upper Coal Measures. The town of Llanelli is known to have been mined for coal in the past, and the geological map shows several mining related features.

There is no evidence to suggest the site was mined for non-coal sources, for example metalliferous ironstones or rock quarries for construction aggregate.

The Coal Authority online interactive map viewer [4] does not show any mine shafts or adits within the development site, and the site is not shown to be located within a 'Development High Risk Area.'

A Coal Authority report was also obtained for the site. The report concludes that the site is not within a zone of likely physical influence on the surface from any past or present underground workings and there are no known coal mine entries within the site or within 20m of the site boundaries.

The preliminary assessment is that there is no significant potential for subsidence associated with any workings within coal seams beneath the site, making it low risk

3.5 Unexploded Ordnance (UXO)

In accordance with CIRIA C681 'Unexploded ordnance (UXO), guide for the construction industry' (2009), as part of the 2016 LWLV Desk Study, a preliminary unexploded ordnance (UXO) risk assessment has been carried out for the site by UXO specialist Zetica. A summary of the findings is provided below.

The following strategic targets were in or in the vicinity of the site:

- Industry including tinplate works, a foundry and chemical works.
- Docks, including landing stages.
- Military training grounds.
- Transport infrastructure.

During WWII the borough of Llanelli recorded a low regional bombing density, however readily available records indicate that several bombs fell near the site during a raid in July 1940.

The Llanelli National Shell Factory (NSF) was located directly to the west, and it was a part of the Burry extension works which engaged in the manufacture of 6" shells and an adjacent factory was engaged in the rectification of 6" shells.

The historical maps from 1889 show a rifle range on the southern end of the Machynys peninsula, approximately 700m from the site. This is shown as disused by 1973.

Because of the above, a detailed risk assessment was recommended to assess, and potentially zone, the Unexploded Ordnance (UXO) hazard level on the site.

A detailed UXO risk assessment for the site was undertaken by UXO specialist Dynasafe BACTEC. The report concluded that Dynasafe BACTEC consider the site to be of low risk from UXO.

3.6 Radon gas

Radon is a naturally occurring radioactive gas that can seep out of the ground and build up in buildings, the highest levels are usually found in underground spaces such as basements.

The site is shown on the UKRadon.org interactive map [5] as being in the lowest band of radon potential, with less than 1% above the Action Level. Therefore, no radon protection measures are required for the proposed development.

4. Previous ground investigations (GI)

4.1 GI undertaken

There is previous ground investigation information available for the site, sourced from the British Geological Survey (BGS) Archives, Arup's LWLV Desk Study [1] and a factual report of a ground investigation undertaken previously for Carmarthenshire County Council. The location of the exploratory holes on-site is shown in Appendix A. A summary of the type of exploratory hole in each investigation is provided in the table below.

Table 1: Summary of previous ground investigations

Previous Ground Investigation	Source	Location	Exploratory Holes	Testing and Monitoring
Machynys Redevelopment, Thyssen Geotechnical (1987)	BGS Archive	Off-site	Four trial pits	N/A
Machynys Peninsula Study, Exploration Associates (1995)	BGS Archive	Off-site	Two boreholes, One trial pit	N/A
Nicklaus Hotel, Machynys, Llanelli, Integral Géotechnique (2008)	Integral Géotechnique Factual Report	Off-site	Five boreholes, 13 trial pits	In-situ Static Cone Penetration testing (SCPT) in 8no locations including dissipation testing Laboratory chemical testing on soil, leachate and groundwater samples Laboratory analysis of a gas bomb sample and VOC sample taken Six rounds of ground gas monitoring & 4no rounds of groundwater monitoring (installations within made ground and superficial geology)
Machynys Mound, Soil Mechanics (2011)	Arup Geotechnical & Geoenvironmental Desk Study LWLV	On-site	Two boreholes (up to 8m bgl), 10 trial pits	In-situ Standard Penetration Tests (SPTs) at regular intervals throughout the depth of the cable percussive boreholes Sampling of soils and groundwater in both borehole and trial pit excavations for geotechnical and chemical laboratory testing Three rounds of ground gas monitoring (installations within made ground)

4.2 Ground conditions

Based on the available ground investigation information for the current site (two boreholes and 10 trial pits), a summary of the ground conditions is presented in the table below.

Table 2: Summary of ground conditions

Depth (m bgl)	Stratum
GL to 2.0	MADE GROUND: medium dense brown silty sandy subangular to rounded fine to coarse GRAVEL of sandstone with medium cobble content. Cobbles are subrounded of sandstone. Within the footprint of the backfilled reservoir, the thickness of made ground is anticipated to be around 2m comprising silty sandy fine to coarse gravel of sandstone with medium cobble content (lower layer comprising silty sandy gravel to sandy gravelly clay. Gravel comprises brick, concrete, metal, slag, clinker and industrial waste i.e. plastic, pipes etc.).
2.0 to 3.0	MADE GROUND: medium dense dark grey silty sandy angular to subrounded fine to coarse GRAVEL of sandstone and slag with occasional fragments of brick and concrete with medium cobble content. Cobbles are angular to subangular of sandstone and slag.
3.0 to 4.0	SAND: very loose brown silty fine to coarse SAND (Potentially Raised Storm Beach Deposits based upon geological mapping)
4.50 to 7.0	GRAVEL: dense locally very dense dark brown clayey sandy subangular to subrounded fine to coarse GRAVEL of sandstone with medium to high cobble content. Cobbles are subangular to subrounded of sandstone. (Potentially Glaciofluvial Ice Contact Deposits based upon geological mapping) 6.50 to 6.89 m: very dense. Did not go below 7.0 m therefore the base is unproven.

4.2.1 Soil Mechanics, 2011 GI (on site)

The ground conditions across the site generally consist of gravel overlain by sand and Made Ground of varying compositions (see table above). Groundwater seepages were typically observed between depths of 1 and 3m below ground level, predominantly encountered within the made ground. No groundwater strike was recorded in the borehole which was advanced to 7m below ground (0.2 m AOD), or in the borehole which was advanced to 8 m below ground.

Although no groundwater strikes were recorded in what were described as glacial deposits during fieldwork, groundwater was recorded in the standpipe piezometer from the borehole which was installed in the glacial deposits, which indicated the presence of an aquifer in these deposits.

Depths to water within the standpipes varied considerably and is likely to have changed since 2011. Further monitoring was recommended to be carried out to confirm the results and to include monitoring over a tidal cycle to check whether the piezometer was influenced by the tidal fluctuations in the nearby Loughor Estuary; there is no record of this being undertaken, and to confirm whether the ground investigations remain consistent with the findings of the 2011 report.

During the investigation strong hydrocarbon odours were recorded at the base of the made ground encountered within one trial pit excavated near the site boundary. No other visual or olfactory evidence of contamination was observed during the ground investigation (except for the made ground itself).

4.2.2 Integral Géotechnique, 2008 GI (east offsite)

Groundwater was struck within the made ground in the trial pits at depths varying from 1.5m to 2m bgl with slow to medium inflow rates. The groundwater was recorded as rising from the base of several trial pits. Groundwater levels in the boreholes ranged between 3,90 mAOD and 3.38 mAOD

The groundwater monitoring indicated that there is a discontinuous perched groundwater within the made ground sitting above the underlying Raised Storm Deposits.

No fall in head was interpreted across the site from the groundwater levels recorded. However given the hydrology of the surrounding areas, it is assumed that groundwater flow is to the south/southwest towards the Loughor Estuary. The groundwater body may be affected by tidal movement.

Some minor visual or olfactory evidence of contamination of fill materials was observed during the excavation of the trial pits. This comprised groundwater with a slight to very slight hydrocarbon sheen encountered in 5no locations (TP1, TP2, TP9, TP10 and TP13) and a slight hydrocarbon odour encountered in one location (TP2). No potential asbestos containing materials were visually identified during the site investigation.

5. Contamination potential

5.1 Conceptual Site Model (CSM)

This section details the Conceptual Site Model for the site based on reviewed desk study and available ground investigation information. Constraints associated with geo-environmental issues identified are provided in Section 6.2 of this report.

5.1.1 Potential sources

Because of the history of the site presented in Section 2.2, the primary sources of contamination on the site are associated with the site's industrial history, the made ground present under the site and the backfilling of the reservoirs. A summary of the potential sources of contamination is provided below.

Table 3: Potential sources of contamination

Potential Source	Potentially Contaminative
On Site	
Made Ground within and near the site area related to the historical use as Machynys Brick Works.	Likely to have been imported during industry construction. Asbestos, Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn), sulphate, phenol, petroleum and polycyclic aromatic hydrocarbons, volatile compounds and cyanide considered potential contaminants, and can pose a particular risk to human health if present in high enough concentrations. Potential for leachable contaminants
Backfilled reservoir	Based on available ground investigation information the historical reservoir was infilled with materials comprising silty sandy gravel to sandy gravelly clay. Gravel is of brick, concrete, metal, slag, clinker and industrial waste i.e. plastic, pipes etc. (thickness of at least 2m).
Existing bunds	Materials forming the bunds are of unknown nature and origin. Asbestos, Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn), sulphate, phenol, petroleum and polycyclic aromatic hydrocarbons, volatile compounds and cyanide considered potential contaminants, and can pose a particular risk to human health if present in high enough concentrations. Potential for leachable contaminants.
Off Site	
Historical railway and tram lines (east of the site)	Hydrocarbons (including petroleum hydrocarbons and polycyclic aromatic hydrocarbons) fuel oils, lubricating oils, greases, solvents, paints, heavy metals, asbestos, phenols and creosote considered likely contaminants. Possible historical herbicides used to control growth on tracks and sidings.
Engineering works and other industrial units including shell factory	Specific activities undertaken within historical works units (iron, steel and tin plate works as part of "Burry Works' and Llanelli National Shell Factory). Potential contaminants therefore considered to be:

Potential Source	Potentially Contaminative
	Asbestos, metals, sulphate, pH, total petroleum hydrocarbons, polycyclic aromatic hydrocarbons, semi volatile and volatile organic compounds, PCBs, phenol and cyanide.

5.1.2 Potential receptors

The receptors considered relevant to any existing contamination within the subsurface associated with the proposed development are identified as follows:

During Construction:

- Construction workers involved in the development works.
- Off-site residents and workers.
- Surface waters, including that within Loughor estuary and the existing reen east-west of the site and lakes and watercourses that form part of the golf course; and
- Groundwater beneath the site ('A' aquifer).

During Operation:

- Site end-users (hotel guests, visitors and employees).
- On-site maintenance workers.
- Groundwater beneath the site (secondary 'A' aquifer).
- Surface waters, including that within Loughor estuary and the existing reen east-west of the site and lakes and watercourses that form part of the golf course; and
- Building materials used in new development (including services).

5.1.3 Potential pathways

For a risk to exist the (potential) sources and receptors must be connected by a viable pathway. Potential pathways by which human and environmental receptors may be impacted upon are as identified below:

- **Ingestion of contaminated soils and dust**: during construction of the proposed development, site workers who are dealing closely with excavated soils may encounter contaminants through ingestion of soils and dust.

  Site end users may also be impacted by the ingestion of soils and dust should existing site soils be present at or near surface level post completion of the development, particularly in any areas of landscaping

  Workers, or users of the neighbouring residential or commercial areas may be impacted by the ingestion of soils and dust should areas of open soils be present post development, or dust be created during development.

- **Dermal contact with soils and dust**: during site development, site workers who are engaged in ground works and handling of excavated soils may come into skin contact with impacted material and groundwater.

Following development, site end users (primarily hotel guests, visitors and employees) and maintenance workers may also come into direct skin contact with shallow soils, should these remain at or near surface level post completion of the development in areas of soft

- **Inhalation of vapours, dust and gases**: volatilisation of hydrocarbons and the emission of soil gases including carbon dioxide, methane, or other toxic and explosive gases may occur in the subsurface and be present in both indoor and outdoor air. Ground gas, potentially generated by made ground and the fill of the historical reservoir if organic materials are present, which may migrate into confined spaces within the proposed building. Generation of dust through earthworks to facilitate the proposed development, may impact construction workers.

- **Gas Migration**: from backfill of reservoir, made ground and estuarine deposits directly beneath or adjacent to the site and into the proposed hotel building if organic materials are present. Should piling be the preferred foundation option for the building these could act as a conduit for ground gas migration. Service trenches and the possible installation of band drains could also act as a pathway for ground gas migration.

- **Lateral and vertical migration of contaminants**: contaminants released to the ground through spillage or leaks may migrate vertically or laterally through the underlying strata. There is potential for lateral migration of contaminants through contaminated shallow perched groundwater within the made ground. However, in the east, this is discontinuous perched water over cohesive alluvium which acts as an aquitard and therefore significant vertical migration is not anticipated and is likely applicable to this site also.

  Service trenches and piled foundations for the building could all act as a conduit for lateral and vertical migration of contamination.

- **Leachate generation and migration**: there is potential for the generation and migration of leachate from impacted soils which may enter and migrate within the underlying groundwater bodies.

- **Surface water run off** may occur onto nearby land and surface water receptors during construction. Post development the site will comprise some hardstanding at surface level and drainage to manage surface water run-off.

- **Direct contact with building materials – corrosion:** there is potential for chemical attack of concrete and pipe materials (of services) because of aggressive ground conditions (pH and sulphates) encountered.

5.2 Preliminary Risk Assessment (PRA)

The purpose of this section is to identify the plausible pollution linkages (based on their probability and consequence) and whether there is enough information to characterise them.

The following method of risk evaluation is a qualitative method of interpreting the source pathway receptor linkages identified and is based on that presented in the Land Contamination Risk Management (LCRM) guidance and involves the classification of the magnitude of the potential consequence (severity) of a risk occurring and the magnitude of the probability of the risk occurring.

Once the consequence and probability have been classified these can then compared to produce a risk category which informs the scope of any further ground investigation required.

The identification and justification of the plausible pollution linkages and the associated risk classification are presented in Table 4 of this section.

The proposed development is to comprise a hotel (commercial end use) with associated access and car parking areas and areas of soft landscaping. The available ground investigation data (chemical test results and gas and

groundwater monitoring information) has been reviewed in accordance with the proposed land use, the plausible pollution linkages and the current guidance and screening values to further confirm risks posed to human health and the environment and risks from ground gas. In reference to CLEA assessments, used to assess the potential risk of contamination to human health, it is important to note that the hotel being commercial end use is likely to be conservative, and as such suitable for initial assessments.

With regards to the previous ground investigation and risk assessments carried out by Soil Mechanics on-site (2011) and Integral Géotechnique off-site (2008), the screening criteria previously used have been updated. The chemical data from the previous ground investigations has been re-screened against the following criteria.

Soil Analysis:

The Defra Category 4 Screening Levels (C4SLs) and the Land Quality Management (LQM) / Chartered institute of environmental health (CIEH) 'Suitable 4 Use Levels' (S4ULs) have been used for the following scenarios:

- Residential without plant uptake end use criteria to assess risks posed to construction and maintenance workers (acute exposure);
- Commercial end use criteria to assess risks posed to site end users in proposed building and car parking areas; and
- Public open space (Park) criteria to assess risks posed to site end users in areas of soft landscaping.

Leachate & Groundwater Analysis:

Considering the potential controlled water receptors identified as part of the CSM (reen south of the site) the freshwater Environmental Quality Standards (EQS) have been used or UK Drinking Water Standards in the absence of EQS.

5.2.1 Soil analysis results

Soil Mechanics, 2011 GI (on-site)

Eighteen soil samples were obtained for laboratory chemical analyses. Most of the soil samples were obtained from the made ground. The soil samples were submitted for a range of dry weight chemical tests.

Concentrations of arsenic, lead and vanadium were recorded more than the residential without plant uptake criteria.

Asbestos fibres identified as chrysotile were found within six of the eighteen samples of made ground between 0.3m and 2m below ground level. No quantification testing was undertaken on the identified fibres.

Generally, concentrations of hydrocarbons were recorded to be low in samples of made ground and were below the commercial and public open space criteria. All concentrations of hydrocarbons were below the residential with no plant uptake criteria except for benzo(a)pyrene in one location. Several TPH aliphatic and aromatic levels were recorded more than the residential with no plant uptake criteria in one location within the natural strata at 3m below ground level.

No PCBs were recorded above the laboratory limit of detection in the three samples of made ground analysed.

The results of the VOC and SVOC analyses undertaken on nine samples of made ground indicated generally less than detectable concentrations below all criteria. However, several detected Polycyclic Aromatic Hydrocarbons were above the residential with no plant uptake (analysed for as part of the VOC suite).

Integral Géotechnique, 2008 GI (east off-site)

A total of 15 samples were tested as part of the 2008 GI and these were taken from the made ground. The chemical analysis comprised:

- metals (arsenic, cadmium, total chromium, copper, lead, selenium, mercury, boron, nickel, zinc),
- speciated PAHs
- speciated TPHs (aliphatic-aromatic split),
- sulphate, pH, LOI, TOC, cyanide and phenols

There were several exceedances, including:

- Nine exceedances of arsenic
- one exceedance of PAH (Dibenzo (a,h) anthracene)
- Seven exceedances of lead
- One exceedance of arsenic and Dibenzo (a,h) anthracene was recorded in made ground.

Overall, the chemical analysis carried out as part of the GI indicated a lesser contamination status for the site than the one expected based on the site's history. Although this does not mean it will be consistent with the proposed site despite being in proximity, so further testing is recommended.

5.2.2 Leachate analysis results

Soil Mechanics, 2011 GI (on-site)

Seven samples of made ground were submitted for laboratory leachate analysis for a suite of chemical determinants. The leachate results showed the made ground across the site to contain elevated concentrations of the following:

- leachable copper
- zinc
- arsenic
- molybdenum

all of which were above the assessment criteria.

Integral Géotechnique, 2008 GI (east off-site)

A total of seven samples were tested as part of the 2008 GI and these were taken from the granular (six) and cohesive made ground (one). The chemical analysis comprised:

- metals (arsenic, cadmium, total chromium, copper, lead, selenium, mercury, boron, nickel, zinc)
- speciated PAHs
- sulphates
- pH, LOI, TOC, phenols and cyanide.

Within the made ground samples, the following contaminants were recorded above the screening criteria:

- Elevated cadmium, copper and zinc

- One sample recorded elevated phenols (total).

5.2.3 Groundwater analysis results

Soil Mechanics, 2011 GI (on-site)

Three groundwater samples taken from the two boreholes were submitted for laboratory analysis for a suite of chemical determinants. The samples were obtained from the shallow standpipe installations, within the made ground strata.

Dissolved concentrations of nickel, zinc, chloride and ammoniacal nitrogen were recorded marginally above the EQS values. Other results were well below the screening values or below the laboratory detection limits.

Generally, the concentrations of organic contaminants in samples of groundwater were recorded to be low and below the EQS values. This was except for fluoranthene, which was recorded more than the applied criteria in both groundwater samples obtained from the two boreholes.

One detectable concentration of di-n-butyl phthalate of 0.025mg/l was recorded in the groundwater obtained from one of the two boreholes. No other volatile or semi volatile organic compounds were detected in the samples of groundwater obtained.

Integral Géotechnique, 2008 GI (east off-site)

Four rounds of groundwater monitoring were carried out as part of the 2008 GI. Groundwater sampling and testing was only carried out in three of the four rounds. Monitoring standpipes were installed within the made ground (three), granular alluvium (one) and cohesive alluvium (one). Groundwater samples were taken from all wells and were subject to chemical testing. Wells were purged until the pH, temperature and conductivity of the purged water had stabilised. Samples were taken immediately after purging. The chemical analysis comprised metals (arsenic, cadmium, total chromium, copper, lead, selenium, mercury, boron, nickel, zinc), speciated PAHs, phenols, sulphate and pH (two of the three rounds) and TPH (banded) (all three rounds).

Elevated zinc was recorded above the assessment criteria in all boreholes. Elevated copper and lead were also recorded above the assessment criteria in the boreholes installed within the alluvium and selenium was recorded above the assessment criteria in two boreholes (installed within the alluvium and the made ground). During the first round, the presence of TPH >C24-C40 was identified in all wells, and the presence of TPH>C16-24 was identified in one borehole (installed with the alluvium). No hydrocarbons were detected in any of the boreholes over the next two rounds.

5.2.4 Ground gas

Soil Mechanics, 2011 GI (on-site)

Three rounds of ground gas monitoring were undertaken from the standpipes within the made ground of the two boreholes.

A maximum methane concentration of 4.1 % vol and a maximum flow rate of 2 l/hr were recorded within the monitoring wells providing a GSV of 0.082 l/hr for made ground.

Integral Geotechnique, 2008 GI (east off-site)

Six rounds of ground gas monitoring were undertaken from the standpipes within the made ground. In accordance with the methodology provided in CIRIA C665, as a worst-case scenario, a maximum methane concentration of 1.9% v/v and a maximum flow rate of 0.1 l/hr across all monitoring wells provides a GSV of 0.0019 l/hr for methane and a maximum carbon dioxide concentration of 5.8% v/v and flow rate of 0.1 l/hr provides a GSV of 0.0058 l/hr for carbon dioxide. To confirm this, further monitoring would need to be undertaken as part of future ground investigation.

The underlying alluvium with and backfilled reservoir are also potential sources of ground gas (methane, carbon dioxide) and these have not been investigated (installations within made ground only). Further ground

investigation is required to confirm the ground gas regime under the site and to inform on the requirement for gas protection measures.

Table 4: Preliminary Risk Assessment

Source	Receptor	Pathway	Likelihood	Severity	Risk	Comment
Contaminated made ground within site area related to historical site use (Machynys Brick Works, Historical Railway and tram lines) including contaminated perched groundwater within the made ground Existing bunds of unknown origin and nature Contamination related to Engineering Works & Shell Factory (W off-site)	Site End Users (hotel guests, visitors and employees	Direct dermal	Unlikely	Medium	Moderate	Previous GI has indicated asbestos in the form of chrysotile fibres was identified within the made ground across the site (6/18 samples). It is therefore likely to encountered on site and as such further ground investigation is required to further understand the distribution across site and quantification testing should be undertaken on the identified fibres. If levels are proposed to be raised significantly, risks will be lowered with the importing of fill for the raising of the site levels for flood risk mitigation. made ground remain at or close to surface following site development in areas of soft landscaping. Mitigation measures such as removal of hotspots/suitable capping may be required in these areas. It is unlikely that groundwater is encountered by end site users beneath site as part of the proposed development. Therefore, the risk will be low. Although testing for metals, speciated PAHs, speciated TPHs, sulphate, pH, LOI, TOC, cyanide and phenols was undertaken, showing some risk to site users and given the industrial history of the site other sources or results are likely to be identified. Therefore, further GI and assessment is required to confirm the risks posed to site end users, targeting the entirety of the proposed development, particularly in relation to asbestos.
		Ingestion	Unlikely	Medium	Moderate	
		Inhalation of vapours	Unlikely	Medium	Low	
		Contact with contaminated water	Unlikely	Medium	Low	
	Construction & maintenance Workers	Direct dermal	Likely	Medium	Moderate	Previous ground investigations indicated elevated arsenic, lead, vanadium, PAHs, TPH and isolated Dibenzo (a,h) anthracene within the made ground. Elevated concentrations of leachable copper, zinc, arsenic and molybdenum were also above the assessment criteria, along with asbestos in the form of chrysotile fibres was also identified within the made ground. Constructions workers likely to be exposed as part of development works, during earthworks and enabling works. However, exposure duration will be short term only. Use of PPE and good hygiene practice throughout earthworks and
		Ingestion	Likely	Medium	Moderate	
		Inhalation of vapours	Likely	Medium	Moderate	
		Contact with contaminated groundwater	Likely	Medium	Moderate	

Source	Receptor	Pathway	Likelihood	Severity	Risk	Comment
						construction phase is considered sufficient to mitigate risks presented. Further GI and assessment will be required to confirm risks posed to construction and maintenance workers particularly in relation to asbestos (no testing previously carried out). For groundwater, dissolved concentrations of nickel, zinc, chloride and ammoniacal nitrogen were recorded marginally above the EQS. For organic contaminants, fluoranthene was recorded more than the applied criteria in both groundwater samples. One detectable concentration of di-n-butyl phthalate of 0.025mg/l was recorded in one borehole. Further GI and laboratory testing will be required to better understand the distribution and concentration of potential contaminants within the groundwater which could potentially pose a risk to site users, as only 2 boreholes and 3 samples were taken, which were done in 2011 and therefore likely outdated.
	Surface water receptors (Estuary, existing reen south of the site)	Surface water run-off Leachate migration of temporarily stockpiled and exposed excavated soils	Likely	Medium	Moderate	The risk from surface water run-off during construction will be reduced by the preparation of a Construction Environmental Management Plan prior to any work undertaken on site to minimise or mitigate effects on the environment and the surrounding area. Post development the site will likely comprise both landscaping and buildings at surface level. Drainage will manage surface water run-off.
	Groundwater body (within the sand and gravels)	Leaching into groundwater and subsequent flow beneath site	Unlikely	Medium	Low	Previous GI indicated that dissolved concentrations of nickel, zinc, chloride and ammoniacal nitrogen were recorded to be marginally above the EQS values. Fluoranthene was also recorded more than the applied criteria in both groundwater samples. One concentration of di-n-butyl phthalate of 0.025mg/l was recorded within the groundwater obtained from one borehole. Only three rounds of monitoring within two boreholes targeting the granular material under the site has been undertaken which

Source	Receptor	Pathway	Likelihood	Severity	Risk	Comment
						was undertaken 13 years ago A review of the current groundwater regime – and contamination beneath the site including further groundwater monitoring and testing is required to confirm risks and further characterise contaminant distribution across the proposed site.
		Preferential pathway for migration created through service trenches, vertical band drains & piled foundations	Likely	Medium	Moderate	The proposed development will create preferential pathways for vertical migration through piling, service trenches and the possible installation of band drains. A Foundation Works Risk Assessment may required to inform on selection of an appropriate piling method any mitigation measures required.
	Building materials (including services)	Direct contact with building materials - corrosion	Likely	Medium	Moderate	Possible chemical attack of concrete and pipe materials (of services) will require assessment to ensure appropriate, resistant materials are used during construction.
	Off-site residents and workers	Ingestion and inhalation of airborne dust	Low likelihood	Mild	Low	Considered dust suppression measures will be adopted during earthworks which will mitigate risks.
	Off-site surface water receptor (Loughor estuary, reen south of the site and lakes and watercourses that form part of the golf course)	Surface water run-off	Unlikely	Mild	Very Low	Post development the site will likely comprise both landscaping and buildings at surface level. Drainage will manage surface water run-off.

Source	Receptor	Pathway	Likelihood	Severity	Risk	Comment
Ground gas related to the made ground under the site backfilled reservoir.	Site End Users (hotel guests, visitors and employees) using confined spaces	Ground gas migration into confined space and inhalation is anticipated if piled foundations are to be included in the design (TBC - (including pathway created through piled foundations, band drains and service trenches).	Unlikely	Severe	Low Risk	Made ground present under the site is a potential source of ground gas. Review of ground gas monitoring results within the made ground from the previous GI on-site (2008) indicates a CS2 classification (based on the results and C665 gas protection measures recommendations – gas protection measures will be necessary). Further gas monitoring is recommended from any existing monitoring wells (if these are still functioning) and further monitoring wells during GI covering a wider area of the site to confirm the ground gas regime and whether gas protection measures are required by further assessing the distribution.
Ground gas related to the backfilled reservoir.	Site End Users (hotel guests, visitors and employees) using confined spaces	Ground gas migration into confined space and inhalation (including pathway created through piled foundations, band drains and service trenches)	Likely	Severe	Moderate Risk	The backfilled reservoir partially present within the northwestern part of the site is a potential source of ground gas. The Made Ground is historic and did not appear to have significant generation potential. Previous ground gas monitoring concluded that the concentrations were generally low, and although carbon dioxide and methane were identified, without further assessment it is difficult to assess the risks. Therefore, further gas monitoring required to target the backfilled reservoir to confirm level of risk and requirement of ground gas protection measures and support future developments.

6. Preliminary considerations and constraints for site development

6.1 Geotechnical considerations

A review of available information pertaining to the development site has been undertaken, which has identified several geotechnical constraints and potential issues that should be considered as development progresses. These are summarised below.

6.1.1 Obstructions and site clearance

Buried obstructions are expected to be encountered from the historical use of the site. These include disused building foundations (possibly including piles as well as shallow foundations and substructure), disused railways and associated railway infrastructure. As part of the initial site preparation works, de-vegetation and topsoil clearance will be required, where buildings and infrastructure are proposed. Foundations and obstructions, including the backfill of the historical reservoirs which are of unknown extent and composition, should be evaluated as part of the site clearance works to avoid difficulties during later construction of buried services and foundation due to the risk of obstructions and soft/ loose ground.

Any excavations required for shallow foundations or services trenches are anticipated to be within the Raised Storm Beach Deposits and Glaciofluvial Ice Contact Deposits (sand and gravels). Excavation will be possible with conventional earthmoving equipment, however where large obstructions are encountered in the Made Ground the use of a hydraulic breaker may be required. Potential obstructions include the various historical building foundations that may remain on site, in addition to the inclusions within the Made Ground encountered on site, including brick, concrete, metal, slag and industrial waste.

Many trial pits undertaken were recorded as loose and unstable, having a tendency to cave in at the sides within the granular made ground and therefore temporary support measures or very shallow batters may be required for the sides of excavations.

Based on previous ground investigation, groundwater is expected at around 1.10m bgl to 3 m bgl. If excavation below the groundwater level is required, then temporary drainage and dewatering measures may be required; perched water exists locally within the made ground, which may result in moderate water ingress.

Groundwater beneath the site may possibly be affected by tidal effects; a groundwater monitoring survey carried out to identify the extent of tidal effects may need to be considered once development proposals are better defined.

There is potential for buried unexploded ordnance (UXO) within the site, which may be encountered within excavations. The detailed risk assessment undertaken by UXO specialist Dynasafe BACTEC concluded this risk to be low and did not propose any mitigation measures.

6.1.2 Ground raising

As part of the development the ground levels in the hotel, car park and hardstanding areas may potentially require raising. If the levels are raised significantly, the total and differential settlements caused by loading of the underlying ground will need to be assessed when proposed raised ground levels have been determined.

Settlements will occur both in the Made Ground and in the superficial deposits, the likely settlement under loading from the proposed upfilling should be assessed.

Relatively uniform loading over large areas will cause more even settlement, whilst more localised variations in load are likely to result in greater differential settlements with greater magnitude. Further investigation into the settlement characteristics of the superficial deposits is recommended once the development proposals and design are better defined.

It is likely that engineering measures to deal with otherwise excessive settlements of the ground will be needed, for example by causing most of the settlement magnitude to occur prior to construction of the site infrastructure. As the levels and filling is yet to be confirmed, if a significant amount of fill is specified within the design, appropriate measures may include:

- allowing for a waiting period between raising of the site and construction of site infrastructure.
- accelerating settlement rates by techniques such as 'surcharging' and /or use of vertical band drains.

The re-use of excavated material within the proposed development is encouraged, however this would be subject to a geotechnical and geo-environmental assessment. The Glaciofluvial Ice Contact Deposits (sand and gravels) could be suitable for use as engineered or landscape fill. The Made Ground is likely to be highly variable and may contain material that is suitable for re-use as engineered or landscape fill, subject to the geo-environmental assessment.

6.1.3 Foundations

The applied loads from the proposed hotel building are likely to be relatively high and the settlement criteria exceeded if founded directly on the Made Ground or superficial deposits underlying the site.

It is anticipated that the hotel building will need to be piled. A range of pile types would be suitable, depending on the loading conditions.

Displacement piles, such as pre-cast driven piles, driven cast in-situ and auger displacement piles have the advantage that no spoil is generated during installation, which can be expensive to manage and dispose off-site. The main disadvantages of these types of piles are the environmental impact of noise and vibration during installation. The buried historical structures potentially underlying the site may also cause an obstruction to displacement piling methods.

Bored piles are less noisy to install with less vibration. They do however generate spoil that would be disposed off-site or alternatively ways to re-use the material on site could be investigated. Conventional bored piles generally need temporary casing or bentonite fluid to support the bore.

Continuous Flight Auger (CFA) piles have the advantage that they generally do not require temporary casing, as the concrete is installed as the auger is removed, and they are generally much quicker to install. The depth of CFA piles is limited to the length of the augers available, which is commonly in the region of 25m.

There are no overhead lines present within the site, so there are no anticipated constraints to piling techniques available in terms of working headroom.

There is potential for ground gases to be emitted from the Made Ground present on site. This will need a detailed assessment during development of the foundation options and there is potential for protection measures to be required, i.e. under floor void venting and/or gas membranes.

6.2 Geoenvironmental considerations

A review of available information and data pertaining to the development site has been undertaken, which has identified several geo-environmental constraints to the proposed development. These are summarised below.

6.2.1 Human health

The previous ground investigation undertaken on-site has indicated areas of contamination. Asbestos was identified in the form of chrysotile fibres within six of the 18 samples across the site within the made ground across the site. The ground investigation has also indicated elevated arsenic, lead, vanadium, PAHs and TPH (aliphatic and aromatic) within the made ground.

Construction workers are likely to be exposed as part of the development works, during earthworks and enabling works. However, exposure duration will be short term only. Evidence of hydrocarbon contamination has been identified within the perched groundwater within the made ground off site to the south, and this may

be encountered as part of the works. The use of PPE and good hygiene practice throughout earthworks and construction phase is considered sufficient to mitigate the risks presented.

Post development, there is a moderate risk to site end users, should areas of existing made ground remain at or close to surface in areas of soft landscaping, if levels are proposed to be raised using imported fill, this should be utilised only in the hotel, car park and hardstanding areas to minimize the volume of imported material. The risk will be lowered with the adoption of remediation measures, e.g. suitable capping within areas of soft landscaping, removal of hotspots if required etc.

The previous ground investigations on the site were limited in scope and coverage. As such further ground investigation and assessment is likely to be required to support the design of the development.

6.2.2 Controlled waters

During construction, there is a risk from surface water run-off and leachate migration of temporarily stockpiled and exposed excavated soils towards the existing reen present along the southern site boundary. The risk will need to be addressed in the contractor's Construction Environmental Management Plan prior to any works undertaken on site to minimise or mitigate effects on the environment and the surrounding area.

Post development the site will comprise both landscaping, hardstanding areas and buildings at surface level. Drainage will manage the surface water run-off.

Towards the east off-site, groundwater present within the made ground is discontinuous perched water over cohesive alluvium which act as an aquitard, and if applicable to the proposed site significant vertical migration is not anticipated but should be confirmed. The risk from contamination migration towards the deeper groundwater body within the raised beach deposits and underlying glaciofluvial deposits is currently unknown. Further ground investigation is intended to confirm and replace the pre-existing groundwater assessment as it is outdated, therefore as a part of the further ground investigation the status of groundwater on site will be assessed.

The proposed development may create preferential pathways for vertical migration through piling and the possible installation of band drains. A Foundation Works Risk Assessment is required to inform on the selection of an appropriate piling method, design of the band drains and any mitigation measures which may be required.

6.2.3 Ground gas

There are potential sources of ground gas under the site including the made ground and backfilled reservoir if organic materials are present. There is a risk from ground gas migration into the proposed building including the potential pathway created through piled foundations and service trenches.

A review of ground gas monitoring results within the made ground from the previous GI indicates a CS2 situation; protective gas measures would be required for the proposed building.

The backfilled reservoir under the site (of different nature than the made ground present under the site) have not been investigated as part of the ground gas monitoring carried out.

Further gas monitoring is required to confirm the ground gas regime under the site and the requirement of gas protection measures.

6.2.4 Building materials

The nature of the made ground and fill material on the site is such that there is a potential risk of corrosion to building and service pipe materials. As such additional assessments will be required to confirm these risks and the appropriate selection of materials used, to ensure durability within the subsurface.

6.2.5 Imported fill

If the levels are going to be raised, dependent on the amount, it is anticipated that clean fill material will be imported to raise the site levels in the hotel, car park and hardstanding areas. This material will need to comply with an appropriate specification to be re used within the proposed development. There may also be a requirement to import some material to be used as capping in the areas of soft landscaping.

6.2.6 Existing bunds and screening

It is understood that the existing bund at the northern boundary will be retained, and the screen planting will be extended and enhanced where necessary. There is no ground investigation information available for the existing bunds on site. An assessment of the shallow subsurface in these areas, and the existing surface cover, will be required to assess the risks posed to human health. It cannot be ruled out at this stage that some form of remediation and/or mitigation measures will be required in these areas.

7. Conclusions

Although the site, including the proposed residential area is subject to risks including flooding and contamination, this has been suitably designed into the proposal through utilising the available flood monitoring to ensure the development avoids these high-risk areas. The application will also consider and assess the contamination risks present within the confirmed red-line boundary and propose remedial measures to remove or treat any unsuitable or contaminated soils to a standard required for residential development. This risk can be mitigated through suitable planning and an appropriate remediation strategy and/ or avoiding contaminated soils, with details to be confirmed as part of the planning permission.

8. Recommendations for further work and ground investigation

A data gap analysis has been carried out as part of the review of the available ground investigation information for the site. The findings of the analysis are summarised below:

- The previous ground investigations do not cover the entire extent of the site, therefore the nature of materials below ground, and the extent and distribution of contamination on site is poorly understood.
- Very little geotechnical testing has been carried out as part of the previous ground investigation, limited to in-situ Standard Penetration Tests.
- Three rounds of ground gas monitoring were undertaken within the Made Ground, but there has been no gas monitoring installation within the backfilled reservoir present under the site.
- There have been no gas monitoring installations within the superficial deposits.
- There have been no groundwater monitoring installations with the glaciofluvial deposits and the granular sand and gravels.
- No quantification asbestos testing has been carried out as part of the previous ground investigation, despite chrysolite being detected.
- Sampling of soils and groundwater in both boreholes and trial pit excavations were taken, but do not cover the entirety of the site and are likely outdated.
- No Waste Acceptance Criteria testing has been carried out as part of the previous ground investigation.
- The last ground investigation was undertaken in 2011, likely outdated.

Based on the above, further information is required to ascertain the full thickness and consolidation characteristics of the estuarine alluvium across the site and to provide more robust data on soil, groundwater and gas contamination, for subsequent risk assessments to be undertaken.

It is recommended that a ground investigation including the following is specified and undertaken on the proposed development site in line with BS10175:2011 (Investigation of Potentially Contaminated Sites – Code of Practice):

- A number of machine excavated or hand dug pits in the existing bund of the site to provide samples for geo-environmental testing;
- A number of cable percussive boreholes taken into the underlying glacial deposits at around 15-20m depth, with undisturbed samples within the superficial deposits and combined groundwater and gas standpipes to provide appropriate samples for testing.
- Ground gas monitoring from any existing monitoring wells on-site (if these are still functioning) to confirm the ground gas regime and requirement of gas protection measures.
- Installation of boreholes within shallow made ground comprising the backfilled reservoir on the site for ground gas monitoring.
- Installation of boreholes within the deeper Raised Storm Beach and Glaciofluvial deposits below the water table for groundwater monitoring.
- Geotechnical testing of samples taken from the boreholes including the consolidation characteristics of the superficial deposits

- Geo-environmental testing of soil, leachate and groundwater samples from the boreholes and trial pits including asbestos identification and quantification, heavy metals, PAH, TPH, VOCs and SVOCs, PCBs to inform human health and controlled waters risk assessments and WAC testing to inform off-site disposal options should excavated materials be not suitable for re-use.

9. References

[1] Arup, “Llanelli Wellness and Life Science Village (LWLV) - Geotechnical and Geo-environmental Desk Study,” 2016.

[2] B. G. S. (BGS), *Map Sheet 247, Swansea - Bedrock and Superficial (1:50,000)*, 2011.

[3] B. G. S. (BGS), “GeoIndex Onshore,” 6 August 2024. [Online]. Available: https://mapapps2.bgs.ac.uk/geoindex/home.html.

[4] C. Authority, “Map Viewer,” [Online]. Available: https://datamine-cauk.hub.arcgis.com/. [Accessed 4 October 2024].

[5] U. H. S. Agency, “UKRadon,” [Online]. Available: https://www.ukradon.org/#:~:text=Welcome%20to%20UKradon.%20Every%20building%20has%20radon%20and%20in%20most. [Accessed 4 October 2024].

Drawings

Drawing 1: Site boundaries
Drawing 2: Development proposals

A4

03/10/2024 08:43

Application Land Ownership
Application Boundary
Inferred Proposed Hotel Boundary

Coordinate System: British National Grid
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Metres
0 25 50 100

Rev	Date	By	Chkd	Appd	Authd
P01	03/10/2024	CG	ST	TS	ARUP

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Client
Carmarthenshire County Council

Project Name
Machynys Hotel Geotechnical and Geoenvironmental Desk Study

Drawing Title
Site Boundaries

Scale at A4
1:5,000

Role
Geo-Environmental

Suitability
Issue

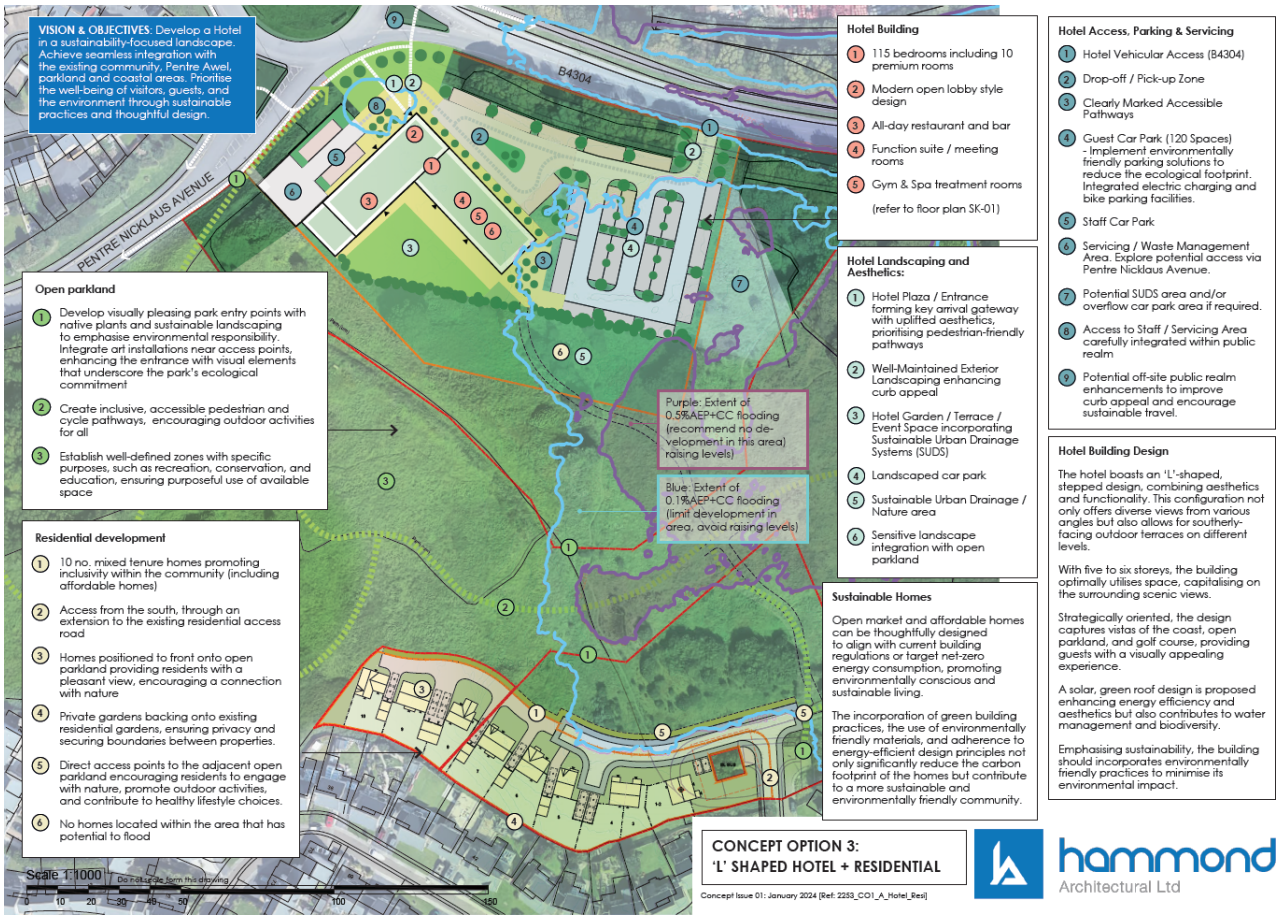
Project Number	Rev
278688	P01

Drawing Name

J:\278000\278688-00\4 Internal Project Data\4-70 Technical Notes\Geotechnics\GIS\Machynys Desk Study Note.aprx

ARUP

Job number	PJN
Date	10 September 2024



Appendix A

Previous ground investigation

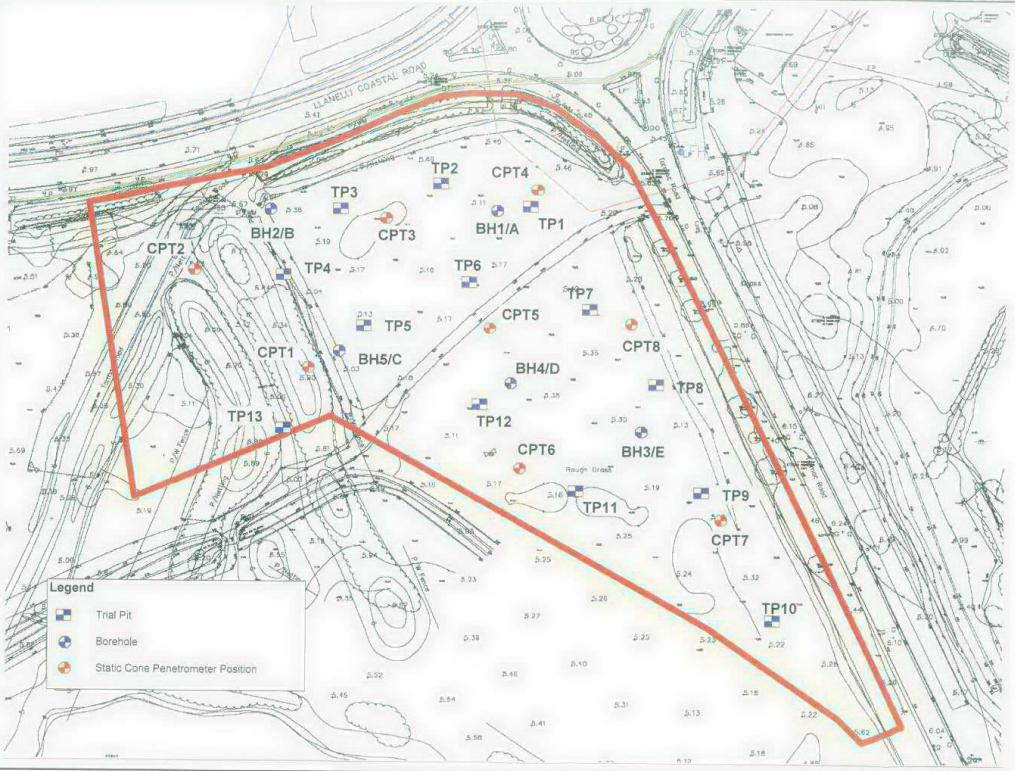


FIGURE 2 - Site Plan

Machynys Hotel Site, Llanelli

Integral Géotechnique

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Integral Geotechnique 50 Cathedral Road Cardiff CF11 9LL Tel. 029 20220462 Fax. 029 2034 0789 mail@integralgeotec.com	Project Name : **Machynys Hotel**	Project No.: **9811**	Trial Pit No.: **TP01** Sheet 1 of 1
Location : Llanelli	Client : Machynys Homes	Logged By : TAW	Scale : 1:25
Equipment : JCB3CX	Coordinates : -	Dimensions 2.00m	
Date Excavated : 17/04/2008	Level : -	Depth : 2.50m	0.70m

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.10			TOPSOIL Soft brown slightly gravelly sandy silty CLAY with much organic matter and rootlets.
0.30-0.60	D					MADE GROUND Medium dense locally dense black brown gravelly silty clayey SAND. Localy cohesive. Slightly ashy with rare gravel sized fragments of metal, slag, and plastic.
			2.50			Trial Pit Complete at 2.50 m

Remarks:

Groundwater : Groundwater encountered at 2.0m with slight hydrocarbon sheen.

Stability : Slightly Unstable

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

HoleBASE 3.1 (R4 412.24) Standard Trialpit Log v2 dated 27th Nov 03

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Project Name :	Project No.:	Trial Pit No.:
Machynys Hotel	**9811**	**TP02** Sheet 1 of 1

Location :	Client :	Logged By :	Scale :
Llanelli	Machynys Homes	TAW	1:25

Equipment :	Coordinates :	Dimensions
JCB3CX	-	2.00m
Date Excavated :	Level :	Depth : 2.10m
17/04/2008	-	0.70m

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.10			TOPSOIL Reeds growing in soft dark brown slightly gravelly sandy silty CLAY with much organic matter and rootlets.
0.30-0.60	D					MADE GROUND Medium dense locally dense orange becoming black brown silty clayey sandy GRAVEL with occasional cobbles and boulders. Slightly ashy with occasional gravel to boulder sized fragments of brick.
2.00	D		2.10			Trial Pit Complete at 2.10 m

0 1 2 3 4 5

Remarks:

Groundwater : Groundwater encountered at 2.0m with slight hydrocarbon sheen and odour.

Stability : Slightly Unstable

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

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Project Name :	Project No.:	Trial Pit No.:
Machynys Hotel	**9811**	**TP03** Sheet 1 of 1

Location :	Client :	Logged By :	Scale :
Llanelli	Machynys Homes	TAW	1:25

Equipment :	Coordinates :	Dimensions
JCB3CX	-	2.00m; Depth : 1.50m; 0.70m

Date Excavated :	Level :
17/04/2008	-

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.10			TOPSOIL Reeds growing in soft dark brown slightly gravelly sandy silty CLAY with much organic matter and rootlets.
			0.40			Firm locally stiff gravelly slightly sandy silty CLAY
						Firm locally soft blue grey silty CLAY.
1.50	D		1.50			Trial Pit Complete at 1.50 m

0 1 2 3 4 5

Remarks:

Groundwater : Saturated topsoil. Trial pit dry.

Stability : Stable

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

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Project Name :	Project No.:	Trial Pit No.:
Machynys Hotel	**9811**	**TP04** Sheet 1 of 1

Location :	Client :	Logged By :	Scale :
Llanelli	Machynys Homes	TAW	1:25

Equipment : JCB3CX	Coordinates : -	Dimensions: Depth : 1.50m	2.00m / 0.70m
Date Excavated : 17/04/2008	Level : -		

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.10			TOPSOIL Soft dark brown slightly gravelly sandy silty CLAY with much organic matter and rootlets.
0.30-0.60	D					MADE GROUND Firm grey brown silty CLAY
			1.30			MADE GROUND Dense black cobbley gravelly SAND with orange iron discolouration and occasional slag.
1.50	D		1.50			Trial Pit Complete at 1.50 m

Remarks:

Groundwater : No groundwater encountered.

Stability : Stable

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

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Project Name :	Project No.:	Trial Pit No.:
Machynys Hotel	**9811**	**TP05** Sheet 1 of 1

Location :	Client :	Logged By :	Scale :
Llanelli	Machynys Homes	TAW	1:25

Equipment :	Coordinates :	Dimensions
JCB3CX	-	2.00m
Date Excavated : 17/04/2008	Level : -	Depth : 2.50m, 0.70m

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.10			TOPSOIL Soft dark brown slightly gravelly sandy silty CLAY with much organic matter and rootlets.
			0.30			MADE GROUND dark brown silty sandy GRAVEL.
0.30-0.60	D					MADE GROUND Soft locally firm reworked grey brown silty CLAY.
			0.60			MADE GROUND Medium dense orange black brown silty clayey sandy GRAVEL with occasional cobbles and boulders. Slightly ashy.
			1.50			Soft locally firm grey silty CLAY becoming saturated uncompact clayey SILT below 2.0mbgl.
2.00	D					
			2.50			Trial Pit Complete at 2.50 m

Remarks:

Groundwater : Saturated below 2.0m

Stability : Stable

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

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Project Name : Machynys Hotel	Project No.: 9811	Trial Pit No.: TP06 Sheet 1 of 1
Location : Llanelli / Client : Machynys Homes	Logged By : TAW	Scale : 1:25
Equipment : JCB3CX / Coordinates : -	Dimensions: 2.00m × 0.70m	
Date Excavated : 17/04/2008 / Level : -	Depth : 2.30m	

Samples & In-situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
			0.10			TOPSOIL Soft dark brown slightly gravelly sandy silty CLAY with much organic matter and rootlets.
0.30-0.60	D		2.30			MADE GROUND Medium dense black brown iron stained silty very sandy GRAVEL with occasional cobbles and boulders. Slightly ashy with occasional gravel sized fragments of slag. Locally cohesive.
						Trial Pit Complete at 2.30 m

Remarks:

Groundwater : Groundwater encountered at 2.0m.

Stability : Slightly Unstable

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name :	Project No.:	Trial Pit No.:
Machynys Hotel	**9811**	**TP07** Sheet 1 of 1

Location :	Client :	Logged By :	Scale :
Llanelli	Machynys Homes	TAW	1:25

Equipment :	Coordinates :	Dimensions
JCB3CX	-	2.00m; Depth : 2.10m; 0.70m
Date Excavated : 17/04/2008	Level : -	

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.10			TOPSOIL Soft brown slightly gravelly sandy silty CLAY with much organic matter and rootlets.
0.30-0.60	D					MADE GROUND Medium dense orange black brown silty clayey sandy GRAVEL with occasional cobbles and boulders. Glass bottle of "Yellow Label" recovered at 1.50mbgl. Becoming dense to very dense below 2.0m
			2.10			Trial Pit Complete at 2.10 m

0 1 2 3 4 5

Remarks:

Groundwater : No groundwater encountered.

Stability : Slightly unstable in granular made ground.

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name :	Project No.:	Trial Pit No.:
Machynys Hotel	**9811**	**TP08** Sheet 1 of 1

Location :	Client :	Logged By :	Scale :
Llanelli	Machynys Homes	TAW	1:25

Equipment :	Coordinates :	Dimensions
JCB3CX	-	2.00m (0.70m)
Date Excavated :	Level :	Depth :
17/04/2008	-	2.10m

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.10			TOPSOIL Soft brown slightly gravelly sandy silty CLAY with much organic matter and rootlets.
						MADE GROUND Medium dense orange black brown silty clayey sandy GRAVEL with occasional cobbles. Becoming dense to very dense below 1.5m
0.30-0.60	D					
2.00	D					
			2.10			Trial Pit Complete at 2.10 m

Remarks:

Groundwater : No groundwater encountered.

Stability : Stable but with some overbreak.

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name :	Project No.:	Trial Pit No.:
Machynys Hotel	**9811**	**TP09** Sheet 1 of 1

Location :	Client :	Logged By :	Scale :
Llanelli	Machynys Homes	TAW	1:25

Equipment :	Coordinates :	Dimensions
JCB3CX	-	Depth : 2.00m; 0.70m; 2.00m
Date Excavated : 17/04/2008	Level : -	

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.10			TOPSOIL Soft black slightly gravelly sandy silty CLAY with much organic matter and rootlets.
0.30-0.60	D					MADE GROUND Medium dense black silty clayey sandy GRAVEL with occasional cobbles. Slightly ashy with occasional gravel to cobble sized fragments of slag.
			2.00			Trial Pit Complete at 2.00 m

Remarks:

Groundwater : Groundwater encountered at 1.5m with slight sheen.

Stability : Relatively stable.

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name :	Project No.:	Trial Pit No.:
Machynys Hotel	9811	**TP10** Sheet 1 of 1

Location : Llanelli	Client : Machynys Homes	Logged By : TAW	Scale : 1:25
Equipment : JCB3CX	Coordinates : -	Dimensions: 2.00m x 0.70m; Depth : 2.00m	
Date Excavated : 17/04/2008	Level : -		

Samples & In-situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
			0.10			TOPSOIL Soft dark brown slightly gravelly sandy silty CLAY with much organic matter and rootlets.
0.30-0.60	D		2.00			MADE GROUND Medium dense brown red silty clayey sandy GRAVEL with occasional cobbles and boulders in layers. Slightly ashy with occasional gravel to cobble sized fragments of slag.
						Trial Pit Complete at 2.00 m

Remarks:

Groundwater : Groundwater encountered at 1.5m.

Stability : Relatively stable.

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Integral Geotechnique — 50 Cathedral Road, Cardiff CF11 9LL, Tel. 029 20220462, Fax. 029 2034 0789, mail@integralgeotec.com	Project Name : Machynys Hotel	Project No.: 9811	Trial Pit No.: TP11 Sheet 1 of 1
Location : Llanelli	Client : Machynys Homes	Logged By : TAW	Scale : 1:25
Equipment : JCB3CX	Coordinates : -	Dimensions 2.00m	
Date Excavated : 17/04/2008	Level : -	Depth : 2.00m, 0.70m	

Samples & In-situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
			0.10			TOPSOIL Soft dark brown slightly gravelly sandy silty CLAY with much organic matter and rootlets.
			0.30			Loose to medium dense gravelly SAND of ash and slag.
0.30-0.60	D		2.00			MADE GROUND Medium dense orange becoming black dark brown silty clayey sandy GRAVEL with occasional cobbles and boulders.
						Trial Pit Complete at 2.00 m

Remarks:

Groundwater : Groundwater encountered at 1.6m

Stability : Relatively stable

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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HoleBASE 3.1 (Bld 412.24) Standard Trialpit Log v2 dated 27th Nov 03

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Project Name :	Project No.:	Trial Pit No.:
Machynys Hotel	**9811**	**TP12** Sheet 1 of 1

Location :	Client :	Logged By :	Scale :
Llanelli	Machynys Homes	TAW	1:25

Equipment :	Coordinates :	Dimensions
JCB3CX	-	Depth : 2.00m; 0.70m; 2.00m

Date Excavated : 17/04/2008 — Level : -

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.10			TOPSOIL Soft dark brown slightly gravelly sandy silty CLAY with much organic matter and rootlets.
0.30-0.60	D					MADE GROUND Medium dense orange becoming black dark brown silty clayey sandy GRAVEL with occasional cobbles and boulders. With much slag from 1.5 to 2.0m. Intact wooden rail sleeper recovered at 0.3m
			2.00			Trial Pit Complete at 2.00 m

Remarks:

Groundwater : Slow groundwater inflow at 1.7m with rising groundwater from base of pit at 2.0m.

Stability : Stable

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name :	Project No.:	Trial Pit No.:
Machynys Hotel	**9811**	**TP13** Sheet 1 of 1

Location :	Client :	Logged By :	Scale :
Llanelli	Machynys Homes	TAW	1:25

Equipment :	Coordinates :	Dimensions
JCB3CX	-	2.00m × 0.70m

Date Excavated :	Level :	Depth :
17/04/2008	-	2.30m

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.20			TOPSOIL Soft dark brown slightly gravelly sandy silty CLAY with much organic matter and rootlets.
0.30-0.60	D					MADE GROUND Medium dense black dark brown slightly gravelly SAND with rare metal and occasional cobbles and rare boulders of brick between 0.6 and 1.0mbgl.
			2.30			Trial Pit Complete at 2.30 m

0 1 2 3 4 5

Remarks:

Groundwater : Slight groundwater inflow encountered at 1.8m with very slight hydrocarbon sheen.

Stability : Relatively stable

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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APPENDIX D

BOREHOLE LOGS

Integral House 7 Beddau Way
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Project Name :	Project No.:	Borehole No.:
Machynys Hotel	**9811**	**BH1** Sheet 1 of 1

Location : Llanelli	Client: Machynys Homes	Coordinates : - -	Hole Type : Cable
Equipment : Dando 2000	Diameter of Casing : 200 mm	Level : -	Scale : 1:50
Diameter of Boring : 200mm	Depth of Casing : 6.00 mBGL	Dates 30/06/2008	Logged By : M.B

Well	Water Strikes	Samples & In-situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
		1.00 1.00	CPT B	N=6 (2,1,1,1,2,2)				MADE GROUND Black brown orange silty clayey sandy GRAVEL with occasional cobbles with occasional fragments of brick and tile.
	Rising to 2.30 m 2.40 m	2.00 2.00	CPT B	N=3 (1,0,1,0,1,1)				
		3.00 3.00	SPT B	N=3 (1,0,1,0,1,1)	2.80			Soft grey silty CLAY.
	Rising to 3.40 m 4.00 m	4.00	SPT	N=2 (1,0,1,0,1,0)				
		5.00	SPT	N=6 (1,1,1,2,1,2)	4.80			Soft to firm brown PEAT
		6.00	SPT	N=5 (1,1,2,1,1,1)				
					6.40 6.50			Soft grey silty CLAY. End of Borehole at 6.50 m

Depth (m)	Type	Results

Remarks :

Key :

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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Project Name : **Machynys Hotel**		Project No.: **9811**	Borehole No.: **BH2** Sheet 1 of 1
Location : Llanelli	Client: Machynys Homes	Coordinates : - -	Hole Type : Cable
Equipment : Dando 2000	Diameter of Casing : 200 mm	Level : -	Scale : 1:50
Diameter of Boring : 200mm	Depth of Casing : 7.00 mBGL	Dates 01/07/2008	Logged By : M.B

Samples & In-situ Testing

Depth (m)	Type	Results
1.00	CPT	N=3 (3,2,1,1,0,1)
1.00	B	
2.00	SPT	N=2 (0,1,0,1,0,1)
2.00	B	
3.00	SPT	N=3 (1,0,1,0,1,1)
4.00	SPT	N=3 (1,0,1,0,1,1)
5.00	SPT	N=4 (1,0,1,1,1,1)
6.00	SPT	N=7 (1,2,1,2,2,2)

Depth (m)	Level (m AOD)	Stratum Description
0.00–1.10		MADE GROUND Black brown orange silty clayey sandy GRAVEL with occasional cobbles with occasional fragments of brick and tile.
1.10		Soft brown sandy silty CLAY with much organic matter. Buried topsoil.
1.40		Uncompact clayey SILT.
2.50		Soft grey silty CLAY.
5.50		Firm brown PEAT
6.70		Soft grey silty CLAY.
7.00		End of Borehole at 7.00 m

Remarks :
No Groundwater Encountered

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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Project Name : Machynys Hotel		Project No.: 9811	Borehole No.: BH3 Sheet 1 of 1
Location : Llanelli	Client: Machynys Homes	Coordinates : - -	Hole Type : Cable
Equipment : Dando 2000	Diameter of Casing : 200 mm	Level : -	Scale : 1:50
Diameter of Boring : 200mm	Depth of Casing : 6.00 mBGL	Dates 03/07/2008	Logged By : M.B

Water Strikes	Sample Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Stratum Description
						MADE GROUND Black brown orange silty clayey sandy GRAVEL with occasional cobbles with occasional fragments of rubble with reworked natural ground.
	1.00	CPT	N=5 (1,1,1,1,1,2)			
	1.00	B				
Rising to 2.00 m; 2.40 m	2.00	CPT	N=8 (1,0,4,1,2,1)			
	2.00	B				
	3.00	CPT	N=10 (3,8,3,2,1,4)			
	3.00	B				
				3.60		Soft grey silty CLAY.
	4.00	SPT	N=3 (1,0,1,1,0,1)			
	4.00	B				
				4.60		Soft to firm brown PEAT
	5.00	SPT	N=2 (1,0,0,1,0,1)			
				5.60		Soft grey silty CLAY.
				6.00		End of Borehole at 6.00 m

Remarks :

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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HoleBASE 3.1 (B6 412.24) Standard Borehole Log v2 dated 27th Nov 03

Integral Geotechnique	Project Name : **Machynys Hotel**	Project No.: **9811**	Borehole No.: **BH4** Sheet 1 of 3
Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com			
Location : Llanelli	Client: Machynys Homes	Coordinates : - -	Hole Type : Cable
Equipment : Dando 2000	Diameter of Casing : 150 mm	Level : -	Scale : 1:50
Diameter of Boring : 150mm	Depth of Casing : 21.40 mBGL	Dates 04/07/2008 - 07/07/2008	Logged By : M.B

Well	Water Strikes	Samples & In-situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
		1.00 1.00	CPT B	N=8 (1,0,3,2,1,2)				MADE GROUND Brown grey silty clayey sandy GRAVEL with occasional cobbles with occasional rubble.
		2.00 2.00	CPT B	N=5 (1,1,2,1,1,1)				
	Rising to 2.90 m 3.00 m	3.00 3.00	CPT B	N=3 (0,1,0,1,1,1)				
					3.70			Soft grey silty CLAY.
		4.00 4.00	SPT B	N=4 (1,0,1,1,1,1)				
					4.20			Soft to firm brown PEAT
		5.00	U	7				
					5.80			Soft grey silty peaty CLAY.
					7.30			Soft to firm brown PEAT.
					7.70			Soft grey silty sandy CLAY.
	Rising to 8.10 m 8.50 m	8.00	U	6				
		Depth (m)	Type	Results				(Continued next sheet)

Remarks :

Key :

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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Project Name : **Machynys Hotel**		Project No.: **9811**	Borehole No.: **BH4** Sheet 2 of 3
Location : Llanelli	Client: Machynys Homes	Coordinates : - -	Hole Type : Cable
Equipment : Dando 2000	Diameter of Casing : 150 mm	Level : -	Scale : 1:50
Diameter of Boring : 150mm	Depth of Casing : 21.40 mBGL	Dates 04/07/2008 - 07/07/2008	Logged By : M.B

Well	Water Strikes	Samples & In-situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
								Soft grey silty sandy CLAY.
					10.50			Uncompact sandy SILT with some thin peat bands.
		11.00	U	4				
		14.00	U	3				

Depth scale: 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

(Continued next sheet)

Remarks :

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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Project Name :	Project No.:	Borehole No.:
Machynys Hotel	**9811**	**BH4** Sheet 3 of 3

Location :	Client:	Coordinates :	Hole Type :
Llanelli	Machynys Homes	- -	Cable

Equipment :	Diameter of Casing :	Level :	Scale :
Dando 2000	150 mm	-	1:50

Diameter of Boring :	Depth of Casing :	Dates	Logged By :
150mm	21.40 mBGL	04/07/2008 - 07/07/2008	M.B

Well	Water Strikes	Samples & In-situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
								Uncompact sandy SILT with some thin peat bands.
		21.00	B		20.70			Medium dense to dense clayey silty cobbly GRAVEL.
					21.40			Chiselling 1hr from 21.3m to 21.4m
								End of Borehole at 21.40 m

Depth (m)	Type	Results

Remarks :

Key :

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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Project Name :	Project No.:	Borehole No.:
Machynys Hotel	**9811**	**BH5** Sheet 1 of 3

Location : Llanelli	Client: Machynys Homes	Coordinates : - -	Hole Type : Cable
Equipment : Dando 2000	Diameter of Casing : 150 mm	Level : -	Scale : 1:50
Diameter of Boring : 150mm	Depth of Casing : 20.50 mBGL	Dates 11/07/2008 - 14/07/2008	Logged By : M.B

Well	Water Strikes	Samples & In-situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
								MADE GROUND Brown grey silty clayey sandy GRAVEL with occasional cobbles with ash, slag and rubble. Chiselling 0.5hr from 0.4m to 0.6m
		1.00 1.00	CPT B	N=6 (2,2,1,1,1,3)				
					1.80			
		2.00 2.00	CPT B	N=5 (1,1,1,1,1,2)				Soft to firm grey silty CLAY.
	Rising to 2.40 m 2.50 m				2.50			Loose grey silty SAND.
		3.00	U	6				
		4.00	SPT	N=3 (1,0,1,0,1,1)				
					4.50			Firm brown PEAT
		5.00 5.00	SPT B	N=9 (1,1,2,2,2,3)				
					6.30			Soft grey silty peaty CLAY.
		6.50	U	5				
		8.00	SPT	N=4 (1,0,1,1,1,1)				
	Rising to 8.70m 9.00 m							
		9.50	U	5				
		Depth (m)	Type	Results				

(Continued next sheet)

Remarks :

Key :
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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Project Name :	Project No.:	Borehole No.:
Machynys Hotel	**9811**	**BH5** Sheet 2 of 3

Location :	Client: Machynys Homes	Coordinates :	Hole Type :
Llanelli		- -	Cable
Equipment : Dando 2000	Diameter of Casing : 150 mm	Level : -	Scale : 1:50
Diameter of Boring : 150mm	Depth of Casing : 20.50 mBGL	Dates 11/07/2008 - 14/07/2008	Logged By : M.B

Well	Water Strikes	Samples & In-situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
								Soft grey silty peaty CLAY.
		11.00	SPT	N=1 (0,0,1,0,0,0)				
		12.50	SPT	N=0 (0,0,0,0,0,0)				
					12.70			Loose grey silty SAND.
		14.00	SPT	N=1 (0,0,0,1,0,0)				
		15.50	SPT	N=2 (0,0,0,1,0,1)				
		17.00	SPT	N=10 (1,2,2,2,3,3)				
		18.50	SPT	N=12 (1,0,2,3,3,4)				
					19.80			
		Depth (m)	Type	Results				(Continued next sheet)

Remarks :

Key :

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

AGS

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Castlegate Business Park
Caerphilly CF83 2AX
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Project Name :	Project No.:	Borehole No.:
Machynys Hotel	**9811**	**BH5** Sheet 3 of 3

Location :	Client: Machynys Homes	Coordinates :	Hole Type :
Llanelli		- -	Cable
Equipment : Dando 2000	Diameter of Casing : 150 mm	Level : -	Scale : 1:50
Diameter of Boring : 150mm	Depth of Casing : 20.50 mBGL	Dates 11/07/2008 - 14/07/2008	Logged By : M.B

Well	Water Strikes	Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		20.00	SPT	N=64 (13,14,15,16,16,17)				Stiff silty sandy gravelly cobbly CLAY.
		20.00	B					Chiselling 2hr from 20.1m to 20.5m
					20.50			End of Borehole at 20.50 m
		Depth (m)	Type	Results				

Remarks :

Key :

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

AGS

ESG Environmental Scientifics Group

Soil Mechanics

Report No H1003-11

Machynys Mound, Machynys

Factual Report on Ground Investigation

Carried out for:

Carmarthenshire County Council

Engineer:

Ove Arup & Partners

March 2011

Soil Mechanics
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Soil Mechanics part of Environmental Scientifics Group

MACHYNYS MOUND, MACHYNYS

FACTUAL REPORT ON GROUND INVESTIGATION

Report No: H1003-11

Date: March 2011

Employer:

Carmarthenshire County Council
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Carmarthen
SA31 1HQ

Engineer:

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Issue No	Date	Details
1	March 2011	Draft Factual Report

CONTENTS

1 INTRODUCTION

During January 2011 Soil Mechanics (SM) were commissioned by Carmarthenshire County Council (CCC), to carry out a ground investigation at Machynys Mound, Llanelli. The investigation was required to obtain geotechnical and geoenvironmental information for future development of the site.

The scope of the investigation, which was specified by Ove Arup & Partners (Arup), comprised cable percussion boreholes, trial pits, in situ testing and laboratory testing. The investigation was carried out in accordance with the contract specification and relevant standards (see References). The fieldwork was carried out between 20th January and 8th February 2011.

This report presents the factual records of the fieldwork and laboratory testing. The data is also presented separately in digital format following AGS (2005).

A previous investigation had been carried out by Thyssen Geotechnical (7414/8055, June 1992). A partial copy of their report comprising borehole and trial pit logs was made available to SM by Arup at the outset of the current investigation.

2 THE SITE AND GEOLOGY

2.1 The Site

The site is situated on the southern side of the B4304 road, approximately 2km south of Llanelli town centre, see Site Location Plan in Enclosure F. The centre of the site is at National Grid reference SS 508 982.

The site is bounded to the north by the B4304 road, to the west by an unnamed road, to the south by residential properties and to the east by grassland.

The site is divided into two main areas of investigation. To the north the site comprises a relatively level brownfield area. The south of the site comprises an elevated unmanaged grassed area. Based on information supplied by Arup the site has had several uses in the past including a residential area, reservoirs and brick works.

2.2 Published Geology

The published geological map covering the site, GS Sheet 247 (1972) shows the superficial deposits to comprise Marine or Estuarine Alluvium.

The solid geology is indicated to comprise of interbedded sandstones, mudstones and coal seams of the Hughes Beds, Upper Coal Measures of Carboniferous age.

The north – south trending Box Fault is located approximately 700m to the east of the site and intersects the Swansea Two Feet coal seam.

3 FIELDWORK

3.1 General

The fieldwork was carried out in general accordance with BS EN 1997-2 (2007) and its related standards together with the relevant section of BS 5930 (1999).

The exploratory hole locations were selected by Arup. The locations were set out from local features. The co-ordinates and reduced levels were surveyed by John Vincent Survey to National Grid and Ordnance Datum. The exploratory hole locations are shown on the Exploratory Hole Location Plan in Enclosure F.

3.2 Exploratory Holes

The exploratory holes are listed in the following table.

SUMMARY OF EXPLORATORY HOLES

TYPE	QUANTITY	MAXIMUM DEPTH (m)	REMARKS
Cable Percussion Boring	2	8.00	Designated BH1 and 2
Trial Pits (Machine Excavated)	10	4.50	Designated TP1 to 10

The exploratory hole records are presented in Enclosure A and should be read in conjunction with the Key included therein. The records provide descriptions of the materials encountered, in accordance with the standards referenced on the Key, details of the samples taken, together with

observations made during boring and pitting. Photographs of the trial pits are presented in Enclosure E.

On completion of the fieldwork all geotechnical samples were transported to the Bridgend laboratory of Soil Mechanics for temporary retention and testing. Geoenvironmental samples were transported directly from site to the Scientifics laboratory in Burton on Trent.

3.3 Instrumentation and Monitoring

The instruments installed in the exploratory holes are shown on the logs and detailed in Enclosure B. Records of groundwater and gas monitoring carried out by SM during and after the fieldwork period are presented in Enclosure B.

Gas monitoring was carried out by measuring gas concentrations from double valved gas bungs and comprised the measurement of gas concentrations whilst they were being recycled in a closed system within the standpipe installation. In addition to gas concentrations, flow rate, differential pressure and barometric pressure were also recorded.

In situ water monitoring involved the measurement of temperature, pH value, dissolved oxygen, redox potential and conductivity during purging of the standpipes. Readings were taken at 1 well volume. On completion of the testing water samples were collected to facilitate geoenvironmental testing.

4 LABORATORY TESTING

4.1 Geotechnical Testing

The testing was scheduled by Arup and was carried out in accordance with BS 1377 (1990) unless otherwise stated. The testing is summarised below and the results are presented in Enclosure C.

SUMMARY OF GEOTECHNICAL LABORATORY TESTING

TYPE	REMARKS
Moisture Content Determination	10no.
Atterberg Limit Determination	10no.
Particle Size Distribution Analysis	5no.

TYPE	REMARKS
Dry Density / Moisture Content Relationship, Heavy Compaction, 4.5kg Rammer	2no.
pH and Water Soluble Sulphate Content of Soils	10no.
Organic Matter content	3no.

4.2 Geoenvironmental Testing

The testing was scheduled by Arup and was carried out by Scientifics at their Burton on Trent laboratory. The results are presented in Enclosure D.

Prepared By	**Aled Henry BSc. FGS**
Reviewed By	**Andrew Figgis BSc.**
Approved for Issue By	

REFERENCES

AGS : 2005 : Electronic transfer of geotechnical and geoenvironmental data (Edition 3.1 including addendum May 2005). Association of Geotechnical and Geoenvironmental Specialists.

BS 1377 : 1990 : Methods of test for soils for civil engineering purposes. British Standards Institution.

BS 5930 : 1999 : Code of practice for site investigations. British Standards Institution.

BS EN ISO 1997-2 : 2007 : Eurocode 7 - Geotechnical design - Part 2 - Ground investigation and testing. British Standards Institution.

GS England and Wales Sheet 247 : 1972 : Swansea. 1:63360 geological map (drift). Geological Survey of Great Britain

ENCLOSURE A
EXPLORATORY HOLE RECORDS

Key to Exploratory Hole Records

SAMPLES

Undisturbed

U	Driven tube sample
TW	Pushed thin wall tube sample } nominally 100 mm diameter and full recovery unless otherwise stated
P	Pushed piston sample
L	Liner sample (from Windowless or similar sampler), full recovery unless otherwise stated
CBR	CBR mould sample
BLK	Block sample
CS	Core sample (from rotary core) taken for laboratory testing
AMAL	Amalgamated sample

Disturbed

D	Small sample
B	Bulk sample

Other

W	Water sample
G	Gas sample
	Environmental chemistry samples (in more than one container where appropriate)
ES	Soil sample
EW	Water sample

Comments Sample reference numbers are assigned to every sample taken. A sample reference of 'NR' indicates that attempt was made to take a tube sample, however, there was no recovery.

Monitoring samples taken after completion of hole construction are not shown on the exploratory hole logs.

TESTS

SPT S or SPT C — Standard Penetration Test, open shoe (S) or solid cone (C)

The Standard Penetration Test is defined in BS EN ISO 22476-3 (2005). The incremental blow counts are given in the Field Records column; each increment is 75 mm unless stated otherwise and any penetration under self weight in mm (SW) is noted. Where the full 300 mm test drive is achieved the total number of blows for the test drive is presented as N = ** in the Test column. Where the test drive blows reach 50 the total blow count beyond the seating drive is given (without the N = prefix).

IV	*in situ* Vane shear strength, peak (p) and remoulded (r)
HV	Hand vane shear strength, peak (p) and remoulded (r)
PP	Pocket penetrometer test, converted to shear strength
KFH, KRH, KPI	Permeability tests (KFH = falling head, KRH = rising head; KPI = packer inflow); results provided in Field Records column (one value per stage for packer tests)

DRILLING RECORDS

The mechanical indices (TCR/SCR/RQD & If) are defined in BS 5930 with Amendment 1(1999/2007)

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
If	Fracture spacing, mm. Minimum, typical and maximum spacings are presented. The term non-intact (NI) is used where the core is fragmented.

Flush returns, estimated percentage with colour where relevant, are given in the Records column

CRF	Core recovered (length in m) in the following run
AZCL	Assessed zone of core loss
NR	Not recovered

GROUNDWATER

▼	Groundwater strike
▽	Groundwater level after standing period

Notes:

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Key

Key to Exploratory Hole Records

INSTALLATION

Standpipe/ piezometer

Details of standpipe/piezometer installations are given on the Record. Legend column shows installed instrument depths including slotted pipe section or tip depth, response zone filter material type and layers of backfill.

The type of instrument installed is indicated by a code in the Legend column at the depth of the response zone:

SP	Standpipe
SPIE	Standpipe piezometer
PPIE	Pneumatic piezometer
EPIE	Electronic piezometer

Inclinometer or Slip Indicator

The installation of vertical profiling instruments is indicated on the Record. The base of tubing is shown in the Legend column.

The type of instrument installed is indicated by a code in the Legend column at the base of the tubing:

ICE	Biaxial inclinometer
ICM	Inclinometer tubing for use with probe
SLIP	Slip indicator

Settlement Points or Pressure Cells

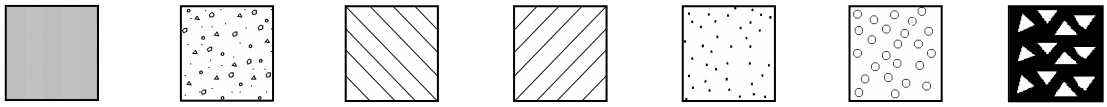
The installation of single point instruments is indicated on the Record. The location of the measuring device is shown in the Legend column.

The type of instrument installed is indicated by a code in the Legend column:

ESET	Electronic settlement cell/gauge
ETM	Magnetic extensometer settlement point
EPCE	Electronic embedment pressure cell
PPCE	Electronic push in pressure cell

INSTALLATION LEGENDS

A legend describing the installation is shown in the rightmost column. Legends additional to BS5930 are used to describe the backfill materials as indicated below.



NOTES

1 Soils and rocks are described in accordance with BS EN ISO 14688-1 (2002), 14688-2 (2004), 14689-1 (2003) and BS 5930 with Amendment 1 (1999/2007) as clarified by Baldwin et al (2007).

2 Strata legends are in accordance with BS 5930 with Amendment 1 (1999/2007).

3 Water level observations of discernible entries during the advancing of the exploratory hole are given at the foot of the log and in the Legend column. The term "none observed" is used where no discrete entries are identified although this does not necessarily indicate that the hole has not been advanced below groundwater level. Under certain conditions groundwater cannot be observed, for instance, drilling with water flush or overwater, or boring at a rate much faster than water can make its way into the borehole (ref BS5930 : 1999, Clause 47.2.7). In addition, where appropriate, water levels in the hole at the time of recovering individual samples or carrying out in situ tests and at shift changes are given in the Records column.

4 Evidence of the occurrence of very coarse particles (cobbles and boulders) is presented on the logs, however, because of their size in relation to the exploratory hole these records may not be fully representative of their size and frequency in the ground mass.

5 The borehole logs present the results of Standard Penetration Tests recorded in the field without correction or interpretation. However, in certain ground conditions (eg high hydraulic head or where very coarse particles are present) some judgement may be necessary in considering whether the results are representative of in situ mass conditions.

6 The declination of bedding and joints is given with respect to the normal to the core axis. Thus in a vertical borehole this will be the dip.

7 The assessment of SCR, RQD and Fracture Spacing excludes artificial fractures

Key to Exploratory Hole Records

REFERENCES

Baldwin M, Gosling R C and Brownlie N : 2007 : Soil and rock descriptions - a practical guide to the implementation of BS EN ISO 14688 and 14689. Ground Engineering, Vol 40 No 7 July.

BS EN ISO 14688-1 : 2002 : Geotechnical investigation and testing - Identification and classification of soil - Part 1 Identification and description. British Standards Institution.

BS EN ISO 14688-2 : 2004 : Geotechnical investigation and testing - Identification and classification of soil - Part 2 Principles for a classification. British Standards Institution.

BS EN ISO 14689-1 : 2003 : Geotechnical investigation and testing - Identification and classification of rock - Part 1 Identification and description. British Standards Institution.

BS EN ISO 22476-3 : 2005 : Geotechnical investigation and testing - Field testing - Part 3 Standard penetration test. British Standards Institution.

BS 5930 with Amendment 1 : 1999/2007 : Code of Practice for site investigations. British Standards Institution

Updated July 2009

PRELIMINARY

Borehole Log

Soil Mechanics

Drilled RB **Logged** AH **Checked**	**Start** 02/02/2011 **End** 04/02/2011	**Equipment, Methods and Remarks** Dando 2000 Inspection pit excavated by hand GL - 1.20m. Light cable percussion boring 1.20 - 8.00m. Terminated on engineer's instruction.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 5.00m / 200mm / 5.00m 5.00m / 8.00m / 150mm / 8.00m	**Ground Level** +6.18 mOD **Coordinates** E 250920.06 **National Grid** N 198255.44 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.20-0.50	B 1		02/04/2011	1200
0.30	ES 2			
0.60	ES 3			
0.90-1.20	B 4			
1.00	ES 5			
1.20-1.65	SPT C	* N=4 (1,2/1,1,1,1)		dry
1.20	ES 6			
1.20-1.70	B 7			
2.00-2.45	SPT C	N=6 (2,2/1,2,2,1)	2.00	dry
2.00	ES 8			
2.00-2.50	B 9		02/04/2011	1700
			2.50	dry
2.50-2.70	B 10		04/02/2011	0800
2.70-3.00	B 11		2.50	dry
3.00	ES 12		3.00	
3.00-3.50	B 13			
3.00-3.50	U NR	10 blows No recovery		dry
3.50-4.00	U 14	15 blows 450 mm rec	3.50	2.50
4.00-4.10	D 15			
4.50-4.95	SPT S	N=4 (1,1/1,1,1,1)	4.50	3.00
4.50-4.95	D 16			
4.50-5.00	B 17			
5.00-5.50	U 18	10 blows 450 mm rec	5.00	3.00
5.50-5.60	D 19			
5.60-6.05	SPT S	N=5 (1,2/1,2,1,1)	5.60	3.50
5.60-6.05	D 20			
5.60-6.10	B 21			
6.10-6.60	U 22	45 blows 225 mm rec	6.10	4.50
6.60-6.70	D 23			
6.70-7.15	SPT C	N=34 (5,5/6,7,9,12)	6.70	4.50
6.70-7.20	B 24			
7.20-7.65	SPT C	N=29 (9,9/6,7,8,8)	7.20	4.50
7.20-7.70	B 25			
			04/02/2011	1700
			8.00	4.50
~~8.00-8.45~~	~~SPT C~~	~~N=45 (10,10/7,11,16,11)~~	~~8.00~~	~~4.50~~

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
MADE GROUND: Brown clayey sandy angular to subrounded fine to coarse GRAVEL of sandstone and occasional fragments of brick and concrete with medium cobble content. Cobbles are subangular to subrounded of sandstone and brick.	(0.80)		SPLE
	0.80 *+5.38*		
MADE GROUND: Very loose to loose black to dark grey silty sandy angular to subangular fine to coarse ashy GRAVEL of clinker and occasional fragments of sandstone, slag, brick and concrete with low cobble content. Cobbles are subangular of slag and brick.	(1.20)		
	2.00 *+4.18*		
MADE GROUND: Loose dark grey to dark brown clayey sandy subangular to subrounded fine to coarse GRAVEL of sandstone with medium cobble content. Cobbles are subangular of sandstone.	(0.70)		1
	2.70 *+3.48*		1 SP
Firm dark grey slightly sandy locally sandy slightly organic CLAY.	(0.80)		
	3.50 *+2.68*		
Soft locally firm grey brown slightly sandy CLAY.	(1.50)		
	5.00 *+1.18*		
Soft grey green slightly sandy slightly gravelly CLAY grading to amorphous PEAT. Gravel is subangular to subrounded of sandstone.	(0.50)		
	5.50 *+0.68*		
Soft dark brown pseudo-fibrous PEAT.	(0.60)		
6.00-6.10 m Becoming clayey	6.10 *+0.08*		
Very stiff, locally stiff brown slightly sandy gravelly CLAY with medium cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone.	(1.90)		
EXPLORATORY HOLE ENDS AT 8.00 m	8.00 *-1.82*		

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	3.00	Rose to 2.50 m after 20 minutes.	3.50

Depth Related Remarks *

From	to (m)	
1.20	8.00	SPT Hammer ID: SM09 (1.5" Whitworth rods)

Chiselling

Depths (m)	Time	Tools used
6.70 -7.20	60 mins	Chisel
7.20 -7.40	60 mins	Chisel
7.40 -7.90	60 mins	Chisel

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Borehole

BH1

PRELIMINARY

Borehole Log

Soil Mechanics

Drilled RB **Logged** AH **Checked**	**Start** 07/02/2011 **End** 08/02/2011	**Equipment, Methods and Remarks** Dando 2000 Inspection pit excavated by hand GL - 1.20m. Light cable percussion boring 1.20 - 7.00m. Terminated on engineer's instruction	**Depth from** 0.00m 3.00m	**to** 3.00m 7.00m	**Diameter** 200mm 150mm	**Casing Depth** 3.00m 7.00m	**Ground Level** +7.22 mOD **Coordinates** E 250841.47 **National Grid** N 198355.46 **Chainage**		

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			07/02/2011	1200
0.30	ES 1			
0.40-0.70	B 2			
0.60	ES 3			
1.00	ES 4	*		
1.20-1.65	SPT C	N=22 (4,5/4,7,7,4)	1.20	damp
1.20-1.70	B 5			
1.50	ES 6			
2.00-2.45	SPT C	N=27 (4,6/5,13,5,4)	2.00	1.00
2.00	ES 7			
2.00-2.50	B 8			
3.00-3.45	SPT S	N=4 (1,1/1,1,1,1)	3.00	2.00
3.00-3.50	B 10			
3.00	ES 11			
3.00-3.45	D 9			
			07/02/2011	1700
			4.00	2.00
4.00-4.45	SPT S	N=3 (1,1/1,1,1,0)	~~4.00~~	~~2.00~~
4.00-4.45	D 12		08/02/2011	0800
4.00-4.50	B 13		4.00	2.50
4.00	ES 14			
5.00-5.45	SPT S	N=30 (7,3/4,7,9,10)	5.00	3.00
5.00-5.50	B 15			
6.50-6.89	SPT C	52 (6,5/11,15,20,6 for 10mm)	6.50	4.00
			08/02/2011	1700
			7.00	4.50
~~7.00-7.45~~	~~SPT C~~	~~N=37 (10,12/8,10,9,10)~~	~~7.00~~	~~4.50~~

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
MADE GROUND: Medium dense brown silty sandy subangular to rounded fine to coarse GRAVEL of sandstone with medium cobble content. Cobbles are subrounded of sandstone.	(2.00)		
MADE GROUND: Medium dense dark grey silty sandy angular to subrounded fine to coarse GRAVEL of sandstone and slag with occasional fragments of brick and concrete with medium cobble content. Cobbles are angular to subangular of sandstone and slag.	2.00 *+5.22* (1.00)		
Very soft to soft dark grey slightly sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded of sandstone.	3.00 *+4.22* (1.00)		SP
Very loose brown silty fine to coarse SAND.	4.00 *+3.22* (0.50)		
Dense locally very dense dark brown clayey sandy subangular to subrounded fine to coarse GRAVEL of sandstone with medium to high cobble content. Cobbles are subangular to subrounded of sandstone.	4.50 *+2.72* (2.50)		
6.50-6.89 m very dense			
EXPLORATORY HOLE ENDS AT 7.00 m	7.00 *+0.22*		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)	
1.00	8.00	SPT Hammer ID: SM09 (1.5" Whitworth rods)

Chiselling

Depths (m)	Time	Tools used
1.30 -1.45	30 mins	Chisel
2.30 -2.80	60 mins	Chisel
2.80 -3.00	30 mins	Chisel
5.00 -5.50	60 mins	Chisel
5.50 -6.00	60 mins	Chisel
6.50 -6.90	60 mins	Chisel

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Borehole

BH2

Sheet 1 of 1

PRELIMINARY

Trial Pit Log

Soil Mechanics

Logged AH **Checked**	**Start** 20/01/2011 **End** 20/01/2011	**Equipment, Methods and Remarks** JCB 3CX Machine excavated trial pit GL - 3.90m. Terminated on engineer's instruction.	**Dimensions and Orientation** Width 0.80 m Length 3.40 m A / D / B / C → 100 (Deg)	**Ground Level** +10.08 mOD **Coordinates** E 250636.78 **National Grid** N 198229.34 **Chainage**

Samples and Tests

Depth	Type & No.	Date Records
0.10-0.30	B 1	
0.20	ES 2	
0.50	ES 3	
1.00-1.30	B 4	
1.00	ES 5	
2.00	ES 6	
2.40-2.70	B 7	
3.00	ES 8	
3.50-3.80	B 9	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
1 MADE GROUND: Firm dark brown slightly sandy gravelly CLAY with low cobble content. Gravel is angular to subrounded fine to coarse of sandstone and mudstone. Cobbles are subangular of sandstone.	(0.40)		
	0.40 *+9.68*		
2 MADE GROUND: Reddish brown locally dark grey silty sandy ashy angular to subangular fine to coarse GRAVEL of slag, clinker, brick and sandstone with occasional fragments of metal and medium cobble content. Cobbles are angular to subangular of slag and sandstone.	(1.50)		
	1.90 *+8.18*		
3 MADE GROUND: Dark brown locally dark grey and reddish brown silty sandy angular to subrounded fine to coarse ashy GRAVEL of sandstone, slag, clinker and brick with medium cobble content. Cobbles are angular to subangular of sandstone, slag and brick.	(2.00)		
	3.90 *+6.18*		
EXPLORATORY HOLE ENDS AT 3.90 m			

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour

None observed (see Key Sheet)

Depth Related Remarks *

From **to (m)**

Stability Stable

Shoring None

Weather Dry

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Trial Pit

TP1

Trial Pit Log

PRELIMINARY

Soil Mechanics

Logged AH **Checked**	**Start** 21/01/2011 **End** 21/01/2011	**Equipment, Methods and Remarks** JCB 3CX Machine excavated trial pit GL - 4.40m. Terminated on engineer's instruction.	**Dimensions and Orientation** Width 0.60 m Length 3.60 m A B C D 340 (Deg)	**Ground Level** +15.10 mOD **Coordinates** E 250750.60 **National Grid** N 198191.83 **Chainage**

Samples and Tests

Depth	Type & No.	Date Records
0.10-0.40	B 1	
0.20	ES 2	
0.30	D 3	
0.50	ES 4	
1.00	ES 5	
1.10-1.40	B 6	
2.00	D 7	
2.60-2.90	B 8	
3.90-4.20	B 9	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
1 Firm dark brown slightly sandy slightly gravelly SILT with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone.	(0.40)		
2 Firm orange brown and brown sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone.	0.40 *+14.70* (1.70)		
3 Brown silty very gravelly fine to coarse SAND with high cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone.	2.10 *+13.00* (2.30)		
EXPLORATORY HOLE ENDS AT 4.40 m	4.40 *+10.70*		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour

None observed (see Key Sheet)

Depth Related Remarks *

From **to (m)**

Stability Stable.

Shoring None

Weather Dry

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

AGS

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Trial Pit

TP2

Sheet 1 of 1

PRELIMINARY

Trial Pit Log

Soil Mechanics

Logged AH **Checked**	**Start** 21/01/2011 **End** 21/01/2011	**Equipment, Methods and Remarks** JCB 3CX Machine excavated trial pit GL - 4.30m. Terminated on engineer's instruction.	**Dimensions and Orientation** Width 0.70 m Length 3.60 m A B C D → 020 (Deg)	**Ground Level** +13.38 mOD **Coordinates** E 250804.02 **National Grid** N 198195.30 **Chainage**

Samples and Tests

Depth	Type & No.	Date Records
0.30	ES 1	
0.30-0.50	B 2	
0.50	ES 3	
1.00	ES 4	
1.00-1.30	B 5	
1.20	D 6	
2.00-2.30	B 7	
3.20-3.50	B 8	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
1 Firm dark brown slightly sandy gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone.	(0.80)		
2 Firm orange brown slightly sandy gravelly CLAY with medium cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone.	0.80 *+12.58* (0.60)		
3 Brown silty sandy subrounded to rounded fine to coarse GRAVEL of sandstone with high cobble content. Cobbles are subrounded of sandstone.	1.40 *+11.98* (2.90)		
EXPLORATORY HOLE ENDS AT 4.30 m	4.30 *+9.08*		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour

None observed (see Key Sheet)

Depth Related Remarks *

From **to (m)**

Stability Stable

Shoring None

Weather Dry

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

AGS

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Trial Pit

TP3

Trial Pit Log

PRELIMINARY

Soil Mechanics

Logged AH **Checked**	**Start** 21/01/2001 **End** 21/01/2011	**Equipment, Methods and Remarks** JCB 3CX Machine excavated trial pit GL - 4.30m. Terminated on engineer's instruction.	**Dimensions and Orientation** Width 0.75 m Length 3.70 m 090 (Deg)	**Ground Level** +6.63 mOD **Coordinates** E 250921.08 **National Grid** N 198178.49 **Chainage**

Samples and Tests

Depth	Type & No.	Date Records
0.20	ES 1	
0.30-0.60	B 2	
0.50	ES 3	
1.00	ES 4	
1.00-1.30	B 5	
1.80-2.10	B 6	
2.00	ES 7	
2.70-3.00	B 8	
3.00	ES 9	
3.90-4.20	B 11	
4.00	ES 10	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
1 MADE GROUND: Brown silty locally clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, mudstone, brick and concrete with occasional fragments of plastic, metal and glass. Low cobble content. Cobbles are angular to subrounded of sandstone and brick.	(0.90)		
2 MADE GROUND: Black silty sandy angular to subangular fine to coarse GRAVEL of clinker, slag and brick with medium cobble content. Cobbles are angular to subangular of brick, concrete and sandstone.	0.90 *+5.73* (0.50)		
3 MADE GROUND: Dark brown silty sandy ashy angular to subangular fine to coarse GRAVEL of brick, sandstone and concrete with medium cobble content. Cobbles are angular to subangular of brick and sandstone.	1.40 *+5.23* (0.90)		
4 Light brown grey clayey sandy subangular to rounded fine to coarse GRAVEL of sandstone. 2.50-4.30 m Strong odour of hydrocarbons.	2.30 *+4.33* (2.00)	1	
EXPLORATORY HOLE ENDS AT 4.30 m	4.30 *+2.33*		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	2.40	Seepage.

Depth Related Remarks *

From to (m)

Stability Collapsing 3.00 - 4.30m.

Shoring None

Weather Dry

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Trial Pit

TP4

Sheet 1 of 1

Trial Pit Log

PRELIMINARY

Soil Mechanics

Logged AH **Checked**	**Start** 21/01/2011 **End** 21/01/2011	**Equipment, Methods and Remarks** JCB 3CX Machine excavated trial pit GL - 4.50m. Terminated on engineer's instruction.	**Dimensions and Orientation** Width 0.75 m Length 3.70 m A B C D 200 (Deg)	**Ground Level** +6.28 mOD **Coordinates** E 250925.35 **National Grid** N 198224.17 **Chainage**

Samples and Tests

Depth	Type & No.	Date Records
0.30	ES 1	
0.50-0.80	B 2	
0.60	ES 3	
1.00	ES 4	
1.70-2.00	B 5	
2.00	ES 6	
2.40-2.70	B 7	
2.50	ES 8	
3.30-3.60	B 9	
3.50	D 10	
4.00-4.30	B 11	
4.20	D 12	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
1 MADE GROUND: Dark brown very silty sandy subangular to subrounded fine to coarse GRAVEL of sandstone, brick and concrete with occasional fragments of glass, metal and plastic with medium cobble content and low boulder content. Cobbles are angular to subangular of brick, sandstone and concrete. Boulders are angular of concrete (420 x 200 x 210mm).	(1.20)		
2 MADE GROUND: Black silty sandy angular to subangular fine to coarse ashy GRAVEL of clinker and slag with low cobble content. Cobbles are angular to subangular of slag.	1.20 *+5.08* (1.00)		
3 MADE GROUND: Brown grey silty sandy angular to subangular fine to coarse GRAVEL of sandstone, brick and concrete with high cobble content. Cobbles are angular of brick and concrete.	2.20 *+4.08* (0.70)		
4 Soft to firm light grey slightly sandy slightly gravelly silty organic CLAY. Gravel is subangular to subrounded fine to coarse of sandstone.	2.90 *+3.38* (1.60)		
EXPLORATORY HOLE ENDS AT 4.50 m	4.50 *+1.78*		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	2.10	Slow ingress

Depth Related Remarks *

From to (m)

Stability Stable

Shoring None

Weather Dry

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Trial Pit

TP5

PRELIMINARY

Trial Pit Log

Soil Mechanics

Logged AH **Checked**	**Start** 20/01/2011 **End** 20/01/2011	**Equipment, Methods and Remarks** JCB 3CX Machine excavated trial pit GL - 4.50m. Terminated on engineer's instruction.	**Dimensions and Orientation** Width 0.75 m Length 3.65 m A B C D → 150 (Deg)	**Ground Level** +6.84 mOD **Coordinates** E 250887.55 **National Grid** N 198291.64 **Chainage**

Samples and Tests

Depth	Type & No.	Date Records
		1300
0.30	ES 1	
0.50-0.80	B 2	
0.60	ES 3	
1.00	ES 4	
1.40-1.70	B 5	
1.50	ES 6	
2.00-2.30	B 7	
2.50	D 8	
3.00-3.30	B 9	
4.00-4.30 4.00	B 10 D 11	
		20/01/2011 1430 damp

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
1 MADE GROUND: Brown silty sandy subangular to subrounded fine to coarse GRAVEL of sandstone with medium to high cobble content. Cobbles are subrounded of sandstone.	(1.40)		
2 MADE GROUND: Dark brown locally black clayey sandy angular to subrounded fine to coarse GRAVEL of sandstone, mudstone, brick and occasional fragments of plastic and metal with low cobble content and many rootlets. Cobbles are angular to subangular of sandstone.	1.40 *+5.44* (0.40)		
3 Stiff grey locally orange brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone.	1.80 *+5.04* (2.70)		1
3.90-4.50 m Dark brown			
EXPLORATORY HOLE ENDS AT 4.50 m	4.50 *+2.34*		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	1.80	Slow inflow

Depth Related Remarks *

From to (m)

Stability Stable

Shoring None

Weather Dry

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Trial Pit

TP6

Sheet 1 of 1

Trial Pit Log

PRELIMINARY

Soil Mechanics

Logged AH **Checked**	**Start** 20/01/2011 **End** 20/01/2011	**Equipment, Methods and Remarks** JCB 3CX Machine excavated trial pit GL - 4.40m. Terminated on engineer's instruction.	**Dimensions and Orientation** Width 0.70 m Length 3.40 m A B C D 120 (Deg)	**Ground Level** +7.24 mOD **Coordinates** E 250863.39 **National Grid** N 198324.62 **Chainage**

Samples and Tests

Depth	Type & No.	Date Records
0.30	ES 1	
0.30-0.60	B 2	
0.50	ES 3	
1.00	ES 4	
1.10-1.40	B 5	
2.00	ES 6	
2.40-2.70	B 7	
3.60-3.90	B 8	
4.10	D 9	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
1 MADE GROUND: Brown clayey very sandy subangular to rounded fine to coarse GRAVEL of sandstone with low to medium cobble content. Cobbles are subangular to subrounded of sandstone.	(1.70)		
2 MADE GROUND: Soft to firm dark brown and dark grey slightly sandy gravelly CLAY with many rootlets and medium cobble content. Gravel is angular to subangular fine to coarse of sandstone, mudstone, brick and occasional fragments of plastic and metal. Cobbles are angular to subangular of sandstone and brick.	1.70 *+5.54* (1.50)		1
3 Firm locally stiff dark grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone.	3.20 *+4.04* (1.20)		
EXPLORATORY HOLE ENDS AT 4.40 m	4.40 *+2.84*		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	1.80	Slow inflow

Depth Related Remarks *

From to (m)

Stability Collapsing 0.40 - 1.60m.

Shoring None

Weather Dry

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Trial Pit

TP7

Sheet 1 of 1

PRELIMINARY

Trial Pit Log

Soil Mechanics

Logged AH **Checked**	**Start** 21/01/2011 **End** 21/01/2011	**Equipment, Methods and Remarks** JCB 3CX Machine excavated trial pit GL - 4.50m. Terminated on engineer's instruction.	**Dimensions and Orientation** Width 0.70 m Length 3.65 m A / D / B / C → 220 (Deg)	**Ground Level** +5.25 mOD **Coordinates** E 250989.81 **National Grid** N 198274.60 **Chainage**

Samples and Tests

Depth	Type & No.	Date Records
0.20	ES 1	
0.50	ES 2	
0.80-1.20	B 3	
1.00	ES 4	
1.80-2.10	B 5	
2.00	ES 6	
2.70-3.00	B 7	
3.00	D 8	
4.00-4.30 4.00	B 10 D 9	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
1 MADE GROUND: Black silty sandy ashy angular to subangular fine to coarse GRAVEL of clinker.	(1.70)		
2 MADE GROUND: Dark grey black silty sandy angular to subangular fine to coarse GRAVEL of clinker, slag, brick and concrete with low cobble content. Cobbles are angular to subangular of brick and concrete.	1.70 *+3.55* (0.40)		
3 Soft to firm light grey sandy slightly gravelly slightly organic CLAY. Gravel is subangular to subrounded fine to coarse of sandstone.	2.10 *+3.15* (2.40)		
EXPLORATORY HOLE ENDS AT 4.50 m	4.50 *+0.75*		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	1.10	Fast inflow

Depth Related Remarks *

From to (m)

Stability Stable

Shoring None

Weather Dry

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Trial Pit

TP8

Sheet 1 of 1

PRELIMINARY

Trial Pit Log

Soil Mechanics

Logged AH **Checked**	**Start** 20/01/2011 **End** 20/01/2011	**Equipment, Methods and Remarks** JCB 3CX Machine excavated trial pit GL - 4.40m. Terminated on engineer's instruction.	**Dimensions and Orientation** Width 0.70 m Length 3.70 m A / D / B / C → 200 (Deg)	**Ground Level** +6.68 mOD **Coordinates** E 250927.23 **National Grid** N 198323.40 **Chainage**

Samples and Tests

Depth	Type & No.	Date Records
0.30	ES 1	
0.50-0.80	B 2	
0.60	ES 3	
1.00	ES 4	
1.50	ES 6	
1.70-2.00	B 5	
2.50	D 7	
2.80-3.10	B 8	
3.50	D 9	
3.90-4.20	B 10	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
1 MADE GROUND: Brown silty sandy subangular to rounded fine to coarse GRAVEL of sandstone with medium cobble content. Cobbles are subangular of sandstone.	(1.40)		
2 MADE GROUND: Dark brown locally black very clayey sandy angular to subrounded fine to coarse GRAVEL of sandstone, mudstone and occasional fragments of brick, concrete, metal and plastic with medium cobble content. Cobbles are subangular of brick and sandstone.	1.40 *+5.28* (0.70)		
3 Firm locally stiff light grey slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone.	2.10 *+4.58* (2.30)		
EXPLORATORY HOLE ENDS AT 4.40 m	4.40 *+2.28*		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	2.00	Slow inflow

Depth Related Remarks *

From to (m)

Stability Stable

Shoring None

Weather Dry

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Trial Pit

TP9

Sheet 1 of 1

PRELIMINARY

Trial Pit Log

Soil Mechanics

Logged AH **Checked**	**Start** 21/01/2011 **End** 21/01/2011	**Equipment, Methods and Remarks** JCB 3CX Machine excavated trial pit GL - 4.30m. Terminated on engineer's instruction.	**Dimensions and Orientation** Width 0.75 m Length 3.75 m A B C D → 030 (Deg)	**Ground Level** +14.03 mOD **Coordinates** E 250799.68 **National Grid** N 198245.79 **Chainage**

Samples and Tests

Depth	Type & No.	Date Records
0.30	ES 1	
0.40-0.70	B 2	
0.50	ES 3	
1.00	ES 4	
1.60-1.90	B 5	
2.80-3.10	B 6	
4.00-4.30	B 7	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
1 MADE GROUND: Brown silty sandy subangular to rounded fine to coarse GRAVEL of sandstone with high cobble content. Cobbles are subrounded of sandstone. 0.00-0.30 m Dark brown with many rootlets.	(4.30)		
EXPLORATORY HOLE ENDS AT 4.30 m	4.30 *+9.73*		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour

None observed (see Key Sheet)

Depth Related Remarks *

From **to (m)**

Stability Stable

Shoring None

Weather Dry

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

Project Machynys Mound, Machynys

Project No. H1003-11

Carried out for Carmarthenshire County Council

Trial Pit

TP10

Sheet 1 of 1

ENCLOSURE B

INSTRUMENTATION AND MONITORING

Groundwater Installation Details

Hole No	Instrument ID	Installation Type	Date of Installation	Reference depth (mBGL)	Piezometer Diameter (mm)	Top of response zone (mBGL)	Base of response zone (mBGL)	Tubing Completion Details	Headworks	Remarks
BH1	1	SP	7 Feb 2011	0.00	50	0.70	2.70	Gas tap	Stop cock cover	
BH1	2	SPIE	7 Feb 2011	0.00	19	6.00	8.00	Open	Stop cock cover	
BH2	1	SP	9 Feb 2011	0.00	50	1.00	3.00	Gas tap	Stop cock cover	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Electronic Piezometer Prepared: 10/02/2011 16:43

Groundwater Monitoring - During Fieldwork

Hole ID	Instrument ID	Instrument Type	Base of Instrument (mBGL)	Reading			
				Date	Time (hhmmss)	Water Level (mBGL)	Comments
BH1	1	SP	2.70	8 Feb 2011	10:50	1.51	
BH1	2	SPIE	7.00	8 Feb 2011	10:52	0.61	
BH1	1	SP	2.70	9 Feb 2011	09:25	1.53	
BH1	2	SPIE	7.00	9 Feb 2011	09:30	0.60	
BH2	1	SP	3.00	10 Feb 2011	11:00	2.00	
BH2	1	SP	3.00	11 Feb 2011	10:15	2.02	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Vibrating Wire Piezometer, PWEL - Pumping Well

ESG Soil Mechanics
Unit 15 Crosby Yard,
Wildmill
Bridgend
CF31 1JZ.
Tel: (01656) 646588

Well Development Monitoring and In Situ Water Test Results

Borehole Number	BH1 (50mm)	BH1 (19mm)		BH2 (50mm)			
Base of Standpipe (m)	2.70	7.00		3.00			
Date	24-Feb-11	24-Feb-11		24-Feb-11			
Operator	DB	DB		DB			
Time of start	15:30	15:25		16:30			
Water Level (m)	1.40	0.60		2.03			

Reading taken at 1 well volume

Temperature (^{o}C)	9.7	Insufficient water to test / sample		Insufficient water to test /sample			
pH Value	7.6						
Conductivity (µS/cm)	1400						
Dissolved Oxygen (ppm)	51.0						
Redox Potential (mV)	84.0						

Water Level after Purging (m)	2.70	6.90		2.85			
Time at end of Purge	15:50	15:55		16:50			

Limited water sample

Well Development & In Situ Water Testing	**Machynys Mound, Machynys**	**Contract:**	**H1003-11**
Soil Mechanics	**Carmarthenshire County Council**	**Figure No:**	**Visit 1**

ESG Soil Mechanics
Unit 15 Crosby Yard,
Wildmill
Bridgend
CF31 1JZ.
Tel: (01656) 646588

Well Development Monitoring and In Situ Water Test Results

Borehole Number	BH1 (50mm)	BH1 (19mm)		BH2 (50mm)			
Base of Standpipe (m)	2.70	7.00		3.00			
Date	02-Mar-11	02-Mar-11		02-Mar-11			
Operator	SB	SB		SB			
Time of start	15:06	15:45		16:10			
Water Level (m)	1.50	4.67		2.12			

Reading taken at 1 well volume

Temperature (^{o}C)	9.5	9.3		9.4			
pH Value	7.7	8.0		8.0			
Conductivity (µS/cm)	447	193		44			
Dissolved Oxygen (ppm)	17.6	Insufficient sample		11.9			
Redox Potential (mV)	58.00	0.45		0.26			
		Limited water sample		Limited water sample			

Water Level after Purging (m)	2.80	6.25		2.9			
Time at end of Purge	15:15	16:00		16:20			

Well Development & In Situ Water Testing	**Machynys Mound, Machynys**	**Contract:**	**H1003-11**
Soil Mechanics	**Carmarthenshire County Council**	**Figure No:**	**Visit 2**

ESG Soil Mechanics
Unit 15 Crosby Yard,
Wildmill
Bridgend
CF31 1JZ.
Tel: (01656) 646588

Well Development Monitoring and In Situ Water Test Results

Borehole Number	BH1 (50mm)	BH1 (19mm)		BH2 (50mm)			
Base of Standpipe (m)	2.70	7.00		3.00			
Date	10-Mar-11	10-Mar-11		10-Mar-11			
Operator	AH	AH		AH			
Time of start	7:30	7:50		8:25			
Water Level (m)	1.70	5.15		2.37			

Reading taken at 1 well volume

Temperature (^{o}C)	9.1	9.1		9.3			
pH Value	7.5	7.8		7.9			
Conductivity (µS/cm)	782	223		49			
Dissolved Oxygen (ppm)	23.0	17.0		15.6			
Redox Potential (mV)	41.00	2.80		2.80			
		Limited water sample		Limited water sample			

Water Level after Purging (m)	2.54	7.10		2.92			
Time at end of Purge	7:35	7:55		8:30			

Well Development & In Situ Water Testing	**Machynys Mound, Machynys**	**Contract:** **H1003-11**
Soil Mechanics	**Carmarthenshire County Council**	**Figure No:** **Visit 3**

Borehole:	BH1
Date:	24-Feb
Operator:	DB

Meteorological Conditions/ Installation Details	
Installation depth (m)	2.70
Groundwater level (m)	1.40
Weather conditions	Overcast
Ambient temperature (^{o}C)	13.5
Barometric pressure (millibars)	Before monitoring: 1019 After monitoring: 1019
Differential standpipe pressure (Pa)	0

Equipment Used: LMSx Gas Detector, GF60 Flow Monitor & Dipmeter

Gas Concentration Readings (Valve 1 - suspended tube)
Before Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.0	20.7	0.0	0
30	0.0	15.1	2.1	0
60	0.0	7.5	2.8	0

Gas Concentration Readings (Valve 2)
Before Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.0	20.5	0.0	0
30	0.0	17.0	1.5	0
60	0.0	13.5	1.8	0

Gas Concentration Readings (Circulation Monitoring Method)

Time (mins)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
0	0.0	20.3	0.0	0.0
1	0.0	10.4	2.3	0.0
2	0.0	8.4	2.6	0.0
3	0.0	8.2	2.6	0.0
4	0.0	8.1	2.5	0.0
5	0.0	8.1	2.5	0.0
6	0.0	8.0	2.6	0.0
7	0.0	8.0	2.5	0.0
8	0.0	7.9	2.5	0.0
9	0.0	8.0	2.5	0.0
10	0.0	8.1	2.5	0.0

Gas Concentration Readings (Valve 1 - suspended tube)
After Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.0	20.2	0.1	0
30	0.0	12.3	2.3	0
60	0.0	8.0	2.5	0

Gas Concentration Readings (Valve 2)
After Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.0	20.2	0.1	0
30	0.0	13.0	2.0	0
60	0.0	10.4	2.2	0

Gas Flow Dispacement Readings

Time (mins)	*Flow rate (Litres/hr)*
0	0.0
1	0.1
2	0.1
3	0.1
4	0.0
5	0.1

Time (mins)	*Flow rate (Litres/hr)*
6	0.1
7	0.1
8	0.2
9	0.1
10	0.0

Gas Monitoring Record	**Machynys Mound, Machynys**	**Contract:** **H1003-11**
Soil Mechanics	**Carmarthenshire County Council**	**Figure:** **Visit 1**

Borehole:	BH2
Date:	24-Feb
Operator:	DB

Meteorological Conditions/ Installation Details			
Installation depth (m)	3.00		
Groundwater level (m)	2.03		
Weather conditions	Overcast		
Ambient temperature (^{o}C)	13		
Barometric pressure (millibars)	Before monitoring: 1019	After monitoring:	1019
Differential standpipe pressure (Pa)	0		

Equipment Used: LMSx Gas Detector, GF60 Flow Monitor & Dipmeter

Gas Concentration Readings (Valve 1 - suspended tube)
Before Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	Unable to monitor due to suspended tube being below water level			
30				
60				

Gas Concentration Readings (Valve 2)
Before Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.0	20.8	0.0	0
30	0.0	20.3	0.0	0
60	0.0	20.1	0.0	0

Gas Concentration Readings (Circulation Monitoring Method)

Time (mins)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Gas Concentration Readings (Valve 1 - suspended tube)
After Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5				
30				
60				

Gas Concentration Readings (Valve 2)
After Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5				
30				
60				

Gas Flow Dispacement Readings

Time (mins)	*Flow rate (Litres/hr)*
0	0.0
1	0.1
2	0.0
3	0.1
4	0.2
5	0.1

Time (mins)	*Flow rate (Litres/hr)*
6	0.1
7	0.0
8	0.1
9	0.2
10	0.1

Gas Monitoring Record	**Machynys Mound, Machynys**	**Contract:** **H1003-11**
Soil Mechanics	**Carmarthenshire County Council**	**Figure:** **Visit 1**

Borehole:	BH1
Date:	01-Mar
Operator:	SB

Meteorological Conditions/ Installation Details	
Installation depth (m)	2.70
Groundwater level (m)	1.50
Weather conditions	Dry
Ambient temperature (^{o}C)	10
Barometric pressure (millibars)	Before monitoring: 1033 After monitoring: 1033
Differential standpipe pressure (Pa)	0

Equipment Used: LMSx Gas Detector, GF60 Flow Monitor & Dipmeter

Gas Concentration Readings (Valve 1 - suspended tube)
Before Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	3.9	20.2	1.0	0
30	3.7	20.0	1.0	0
60	3.8	20.0	1.0	0

Gas Concentration Readings (Valve 2)
Before Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	3.6	20.3	0.5	0
30	3.6	19.9	1.0	0
60	3.5	19.9	1.0	0

Gas Concentration Readings (Circulation Monitoring Method)

Time (mins)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
0	3.3	20.5	0.2	0.0
1	3.2	20.3	0.9	0.0
2	3.2	20.3	0.9	0.0
3	3.5	20.1	0.9	0.0
4	3.8	20.0	0.9	0.0
5	3.8	19.9	0.9	0.0
6	3.9	19.8	0.9	0.0
7	4.0	19.8	0.9	0.0
8	4.0	19.7	0.9	0.0
9	4.1	19.7	0.9	0.0
10	4.0	19.6	0.9	0.0

Gas Concentration Readings (Valve 1 - suspended tube)
After Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	3.3	19.9	0.7	0
30	2.7	19.9	0.9	0
60	2.3	19.7	0.8	0

Gas Concentration Readings (Valve 2)
After Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	2.8	19.9	0.7	0
30	3.7	19.9	0.9	0
60	2.3	19.7	0.8	0

Gas Flow Dispacement Readings

Time (mins)	*Flow rate (Litres/hr)*
0	1.2
1	0.6
2	-1.4
3	0.3
4	0.5
5	0.2

Time (mins)	*Flow rate (Litres/hr)*
6	-0.3
7	0.0
8	-1.8
9	-2.3
10	-0.7

Gas Monitoring Record	**Machynys Mound, Machynys**	**Contract:** **H1003-11**
Soil Mechanics	**Carmarthenshire County Council**	**Figure:** **Visit 2**

Borehole:	BH2
Date:	01-Mar
Operator:	SB

Meteorological Conditions/ Installation Details	
Installation depth (m)	3.00
Groundwater level (m)	2.03
Weather conditions	Dry
Ambient temperature (^{o}C)	9
Barometric pressure (millibars)	Before monitoring: 1032 After monitoring: 1033
Differential standpipe pressure (Pa)	0

Equipment Used: LMSx Gas Detector, GF60 Flow Monitor & Dipmeter

Gas Concentration Readings (Valve 1 - suspended tube)
Before Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	1.1	20.0	0.2	0.0
30	1.1	18.0	0.9	0.0
60	1.1	18.0	0.9	0.0

Gas Concentration Readings (Valve 2)
Before Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.0	20.5	0.0	0.0
30	0.0	20.3	0.0	0.0
60	0.0	19.9	0.0	0.0

Gas Concentration Readings (Circulation Monitoring Method)

Time (mins)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
0	0.9	20.4	0.1	0.0
1	0.8	19.5	0.4	0.0
2	0.8	19.1	0.5	0.0
3	0.7	18.7	0.6	0.0
4	0.7	18.6	0.7	0.0
5	0.7	18.5	0.7	0.0
6	0.6	18.6	0.7	0.0
7	0.7	18.8	0.7	0.0
8	0.8	18.9	0.6	0.0
9	0.8	18.9	0.6	0.0
10	0.8	18.9	0.6	0.0

Gas Concentration Readings (Valve 1 - suspended tube)
After Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.7	19.8	0.3	0.0
30	0.9	18.9	0.6	0.0
60	0.8	18.4	0.7	0.0

Gas Concentration Readings (Valve 2)
After Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.4	19.9	0.3	0.0
30	0.5	19.9	0.3	0.0
60	0.5	19.4	0.3	0.0

Gas Flow Dispacement Readings

Time (mins)	*Flow rate (Litres/hr)*
0	0.0
1	1.5
2	2.0
3	1.7
4	0.0
5	0.5

Time (mins)	*Flow rate (Litres/hr)*
6	-0.4
7	0.7
8	0.5
9	0.2
10	0.7

Gas Monitoring Record	**Machynys Mound, Machynys**	**Contract:** **H1003-11**
Soil Mechanics	**Carmarthenshire County Council**	**Figure:** **Visit 2**

Borehole:	BH1
Date:	10-Mar
Operator:	AH

Meteorological Conditions/ Installation Details	
Installation depth (m)	2.70
Groundwater level (m)	1.70
Weather conditions	Cloudy
Ambient temperature (^{o}C)	9
Barometric pressure (millibars)	Before monitoring: 1017 After monitoring: 1018
Differential standpipe pressure (Pa)	0

Equipment Used: LMSx Gas Detector, GF60 Flow Monitor & Dipmeter

Gas Concentration Readings (Valve 1 - suspended tube)
Before Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	1.6	19.1	0.3	0
30	1.9	17.3	2.5	0
60	1.5	8.9	3.1	0

Gas Concentration Readings (Valve 2)
Before Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.2	20.1	0.3	0
30	0.9	17.4	1.9	0
60	1.3	13.8	2.5	0

Gas Concentration Readings (Circulation Monitoring Method)

Time (mins)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
0	3.3	20.5	0.2	0.0
1	3.2	20.3	0.9	0.0
2	3.2	20.3	0.9	0.0
3	3.5	20.1	0.9	0.0
4	3.8	20.0	0.9	0.0
5	3.8	19.9	0.9	0.0
6	3.9	19.8	0.9	0.0
7	4.0	19.8	0.9	0.0
8	4.0	19.7	0.9	0.0
9	4.1	19.7	0.9	0.0
10	4.0	19.6	0.9	0.0

Gas Concentration Readings (Valve 1 - suspended tube)
After Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	2.9	18.5	0.7	0
30	2.7	19.4	1.5	0
60	2.3	19.1	1.3	0

Gas Concentration Readings (Valve 2)
After Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	2.1	20.7	0.4	0
30	2.7	19.9	0.9	0
60	2.1	19.1	1.0	0

Gas Flow Dispacement Readings

Time (mins)	*Flow rate (Litres/hr)*
0	0.2
1	0.4
2	0.0
3	0.2
4	0.0
5	0.0

Time (mins)	*Flow rate (Litres/hr)*
6	0.3
7	0.0
8	0.3
9	0.5
10	-0.2

Gas Monitoring Record	**Machynys Mound, Machynys**	**Contract:** **H1003-11**
Soil Mechanics	**Carmarthenshire County Council**	**Figure:** **Visit 3**

Borehole:	BH2
Date:	10-Mar
Operator:	AH

Meteorological Conditions/ Installation Details	
Installation depth (m)	3.00
Groundwater level (m)	2.37
Weather conditions	Cloudy
Ambient temperature (^{o}C)	9
Barometric pressure (millibars)	Before monitoring: 1017 After monitoring: 1017
Differential standpipe pressure (Pa)	0

Equipment Used: LMSx Gas Detector, GF60 Flow Monitor & Dipmeter

Gas Concentration Readings (Valve 1 - suspended tube)
Before Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.4	20.3	0.2	0.0
30	1.0	19.8	0.7	0.0
60	1.2	18.0	0.9	0.0

Gas Concentration Readings (Valve 2)
Before Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.0	20.6	0.0	0
30	0.0	20.2	0.0	0
60	0.0	19.8	0.0	0

Gas Concentration Readings (Circulation Monitoring Method)

Time (mins)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
0	0.2	20.6	0.1	0.0
1	0.5	19.9	0.3	0.0
2	0.8	19.3	0.4	0.0
3	0.7	18.7	0.6	0.0
4	0.7	18.6	0.6	0.0
5	0.6	18.4	0.6	0.0
6	0.6	18.6	0.7	0.0
7	0.7	18.6	0.9	0.0
8	0.5	18.7	0.8	0.0
9	0.5	18.4	0.6	0.0
10	0.8	18.9	0.8	0.0

Gas Concentration Readings (Valve 1 - suspended tube)
After Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.4	20.0	0.2	0.0
30	0.5	19.5	0.5	0.0
60	0.8	18.4	0.7	0.0

Gas Concentration Readings (Valve 2)
After Circulation Monitoring

Time (secs)	*CH_4 (% v/v)*	*O_2 (% v/v)*	*CO_2 (% v/v)*	*H_2S (ppm)*
5	0.1	20.0	0.2	0.0
30	0.3	19.6	0.4	0.0
60	0.5	19.4	0.4	0.0

Gas Flow Dispacement Readings

Time (mins)	*Flow rate (Litres/hr)*
0	-0.1
1	0.1
2	0.0
3	0.0
4	0.3
5	0.2

Time (mins)	*Flow rate (Litres/hr)*
6	0.0
7	-0.1
8	-0.1
9	0.2
10	0.0

Gas Monitoring Record	**Machynys Mound, Machynys**	**Contract:** **H1003-11**
Soil Mechanics	**Carmarthenshire County Council**	**Figure:** **Visit 3**

ENCLOSURE C

GEOTECHNICAL LABORATORY TEST RESULTS

INDEX PROPERTIES - SUMMARY OF RESULTS

Project No	Project Name
H1003-11	Machynys Mound Machynys

Hole No.	Sample No.	Depth (m) from	Depth (m) to	type	Soil Description	p Mg/m^3	p_d Mg/m^3	w %	< 425 µm sieve %	W_L %	W_P %	I_P	p_s Mg/m^3	Remarks
BH1	14	3.50	4.00	U	Brown grey slightly sandy CLAY			33	99 n	51 a	22	29		
BH1	18	5.00	5.50	U	Brown grey slightly sandy CLAY			23	100 n	51 a	20	31		
TP2	6	1.10	1.40	B	Brown very sandy gravelly CLAY			21	82 n	29 a	19	10		
TP3	2	0.30	0.50	B	Brown slightly sandy very gravelly CLAY			19	73 s	37 a	21	16		
TP5	9	3.30	3.60	B	Grey brown slightly sandy CLAY			29	100 n	37 a	20	17		
TP6	2	0.50	0.80	B	Brown clayey very sandy GRAVEL with high cobble content			7.3	15 n	25 a	12	13		
TP6	9	3.00	3.30	B	Grey brown slightly sandy slightly gravelly CLAY			26	100	43 a	21	22		
TP7	2	0.30	0.60	B	Brown grey clayey very sandy GRAVEL with low cobble content			5.4	19 s	22 a	14	8		
TP8	7	2.70	3.00	B	Grey brown very sandy CLAY			33	100 n	37 a	24	13		
TP9	8	2.80	3.10	B	Brown grey slightly sandy CLAY			36	100 n	55 a	25	30		

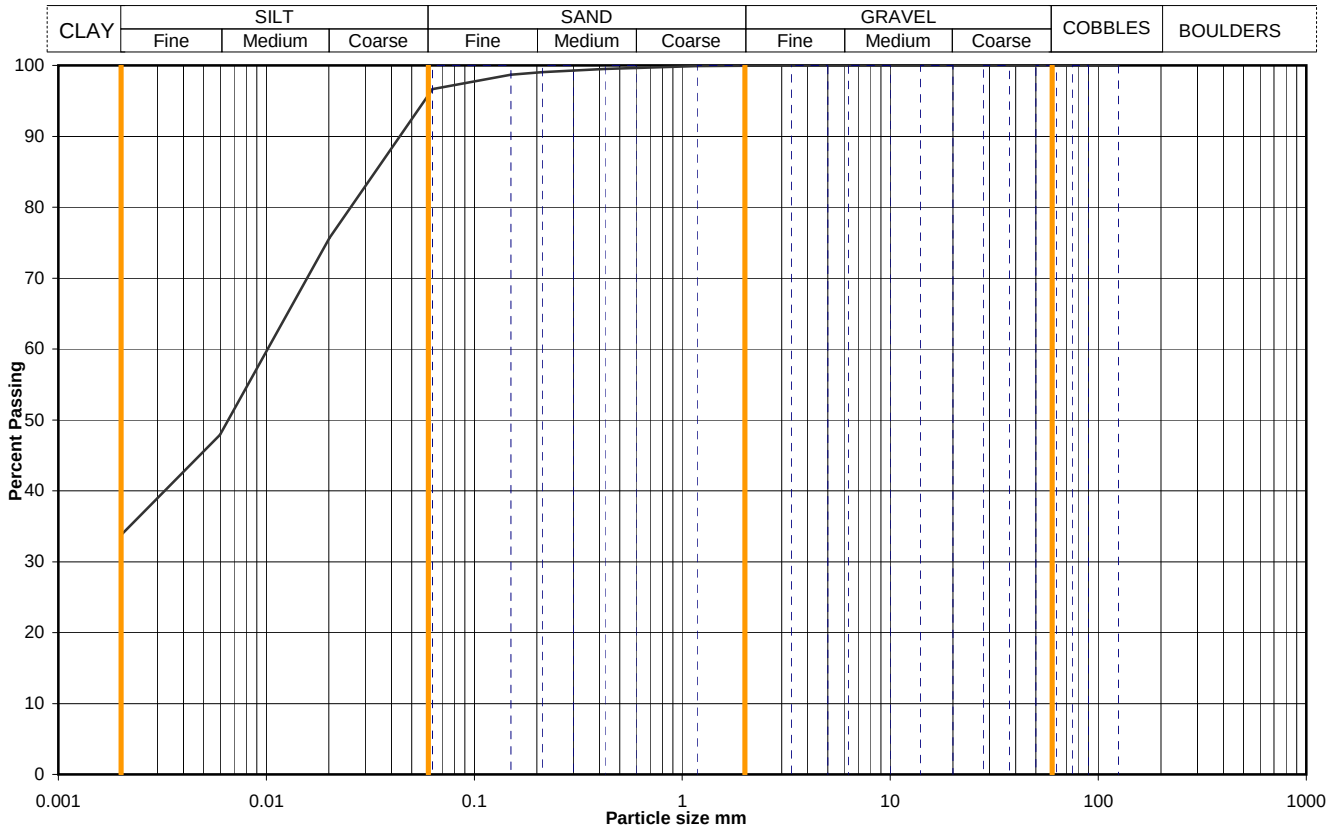
General notes: All above tests carried out to BS1377 : 1990 definitive method in all cases unless annotated otherwise. See individual test reports for further details.

Key :

p	bulk density, linear	W_L Liquid limit	W_P	Plastic limit	<425um preparation	p_s particle density
p_d	dry density	a 4 point cone test	NP	non - plastic	n from natural soil	-g = gas jar
w	moisture content	b 1 point cone test	I_P	Plasticity Index	s sieved specimen	-p = small pyknometer

Particle Size Distribution Analysis

Project No	H1003-11	Sample Details:	Hole No	BH1		
Project Name	Machynys Mound Machynys		Depth (m BGL)	3.50		
			Samp No	14	Type	U
			ID	ESGH1003-1120110209984025		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	76
90	100	0.0060	48
75	100	0.0020	34
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	100		
0.425	99	2.65 assumed	
0.300	99	Dry mass of sample, kg	
0.212	99		
0.150	99	1.0	
0.063	97		

Soil description	Brown grey slightly sandy CLAY		
Preparation / Pretreatment	Sieve: pre dried, Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	4	4
	Silt	62	62
	Clay	34	34

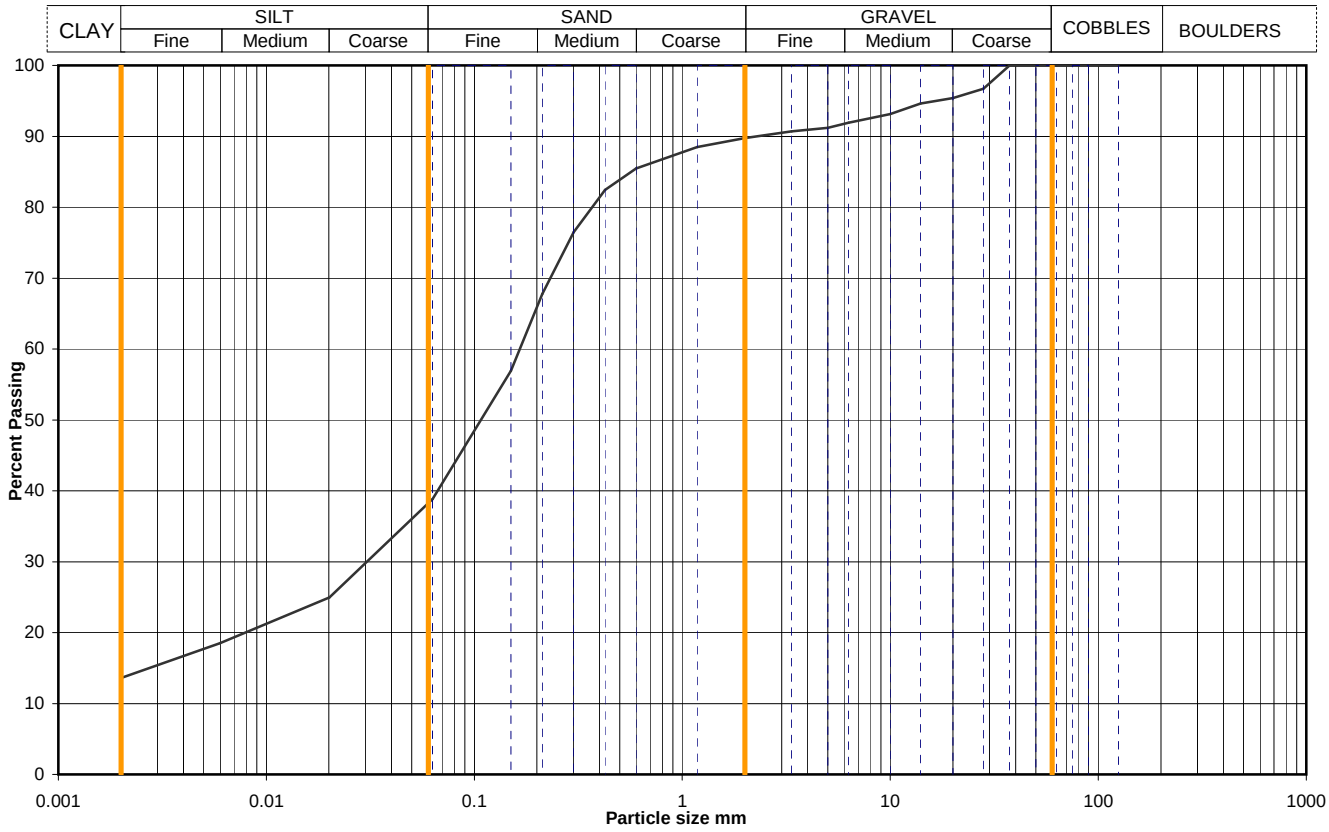
Uniformity Coefficient	D_{60} / D_{10}	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

QA Ref SLR 2,9 Rev 84 Sept 08	Soil Mechanics	UKAS TESTING 4089	Printed:15/03/2011 12:30	**Figure** **PSD 1**

Particle Size Distribution Analysis

Project No	H1003-11	Sample Details:	Hole No	TP2		
Project Name	Machynys Mound Machynys		Depth (m BGL)	1.10		
			Samp No	6	Type	B
			ID	ESGH1003-11201101260000000015		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	25
90	100	0.0060	19
75	100	0.0020	14
63	100		
50	100		
37.5	100		
28	97		
20	95		
14	95		
10	93		
6.3	92		
5.0	91		
3.35	91		
2.00	90		
1.18	88	Particle density, Mg/m3	
0.600	85		
0.425	82	2.65 assumed	
0.300	76	Dry mass of sample, kg	
0.212	68		
0.150	57	5.5	
0.063	39		

Soil description	Brown very sandy gravelly CLAY		
Preparation / Pretreatment	Sieve: pre dried, Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	10	10
	Sand	52	52
	Silt	25	25
	Clay	13	13

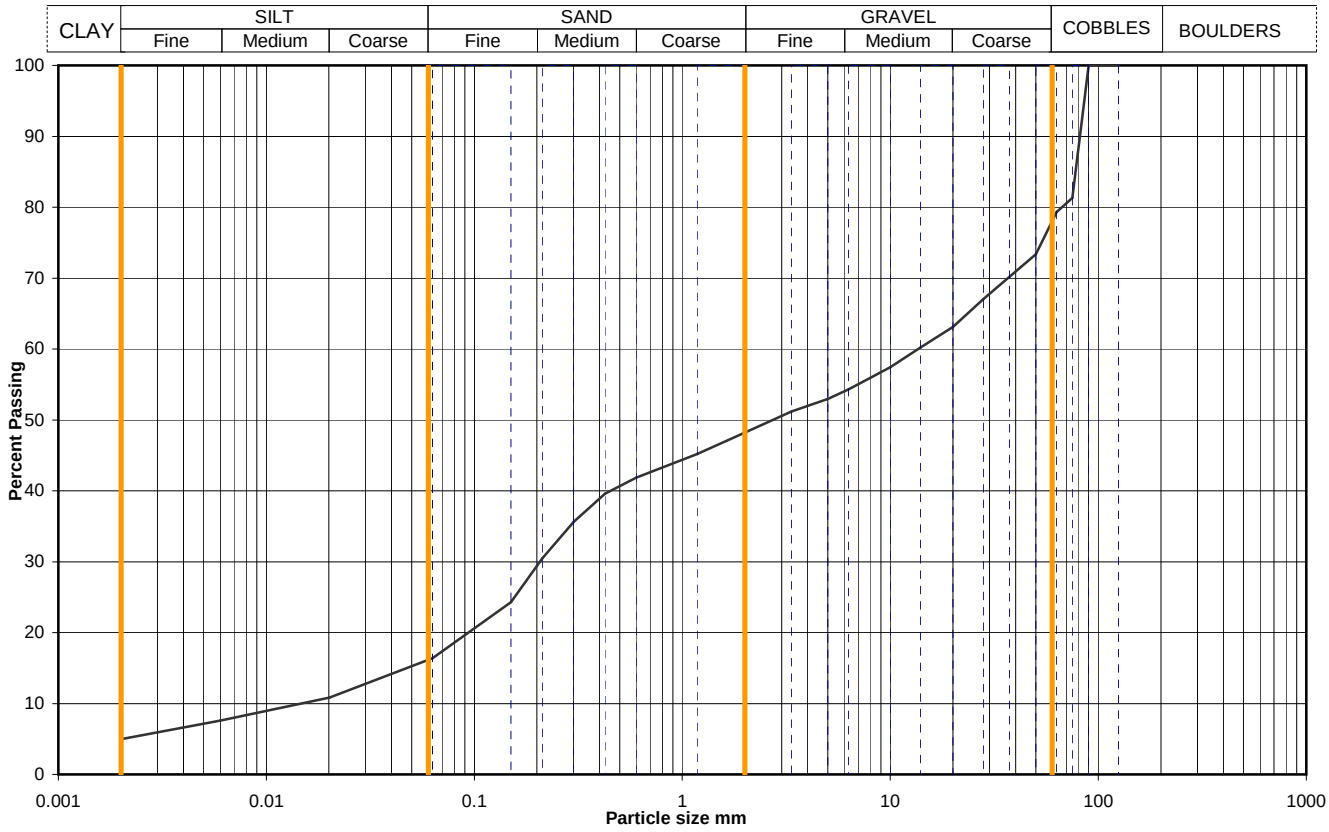
Uniformity Coefficient	D_{60} / D_{10}	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

QA Ref SLR 2,9 Rev 84 Sept 08	Soil Mechanics	UKAS TESTING 4089	Printed:15/03/2011 12:30	**Figure** **PSD 2**

Particle Size Distribution Analysis

Project No	H1003-11	Sample Details:	Hole No	TP2		
Project Name	Machynys Mound Machynys		Depth (m BGL)	2.60		
			Samp No	8	Type	B
			ID	ESGH1003-11201101260000000017		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	11
90	100	0.0060	8
75	81	0.0020	5
63	79		
50	73		
37.5	70		
28	67		
20	63		
14	60		
10	57		
6.3	54		
5.0	53		
3.35	51		
2.00	48		
1.18	45	Particle density, Mg/m3	
0.600	42		
0.425	40	2.65 assumed	
0.300	36	Dry mass of sample, kg	
0.212	30		
0.150	24	19.3	
0.063	16		

Soil description	Brown silty very gravelly SAND with high cobble content		
Preparation / Pretreatment	Sieve: pre dried, Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	22	0
	Gravel	30	38
	Sand	32	41
	Silt	11	14
	Clay	5	6

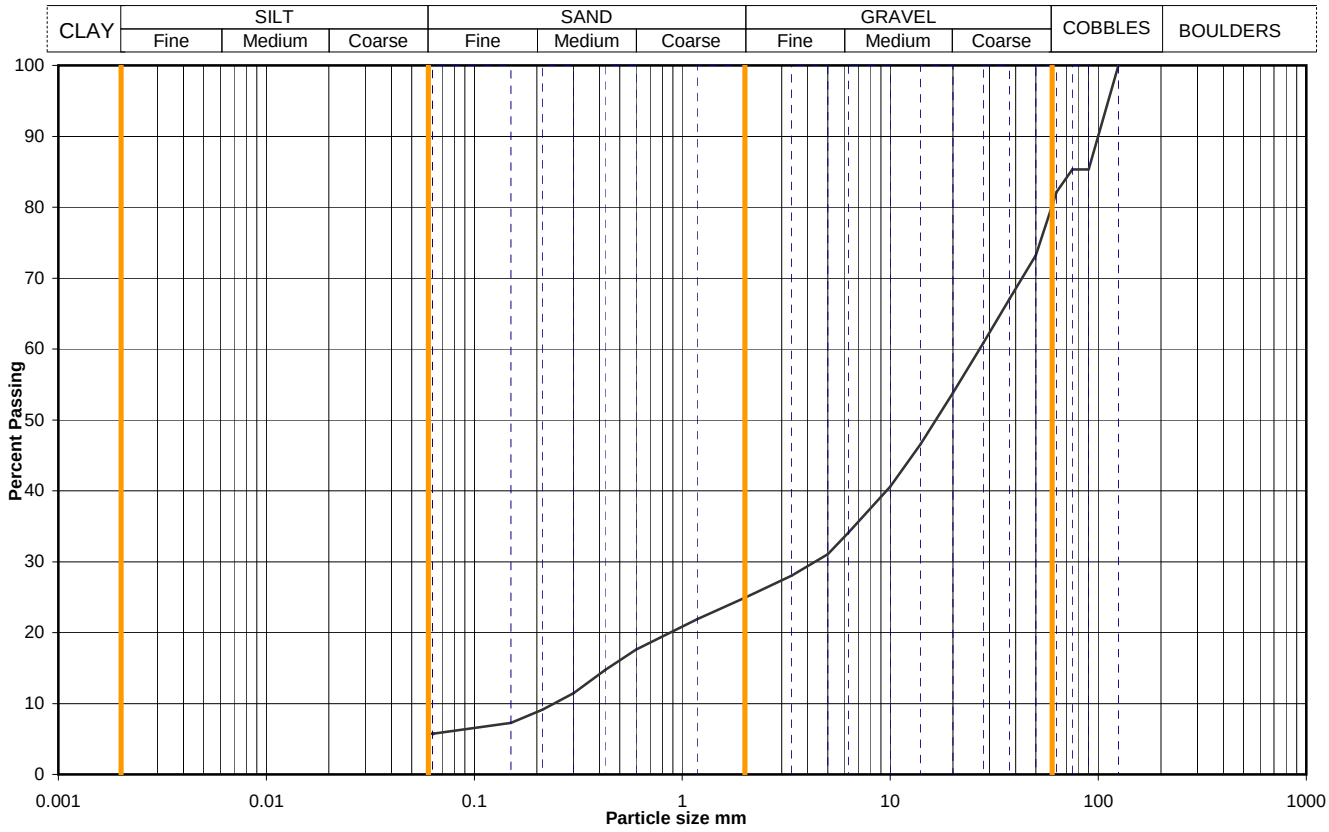
Uniformity Coefficient	D_{60} / D_{10}	924

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

QA Ref SLR 2,9 Rev 84 Sept 08	Soil Mechanics	UKAS TESTING 4089	Printed:15/03/2011 12:30	**Figure** **PSD 3**

Particle Size Distribution Analysis

Project No	H1003-11	Sample Details:	Hole No	TP6		
Project Name	Machynys Mound Machynys		Depth (m BGL)	0.50		
			Samp No	2	Type	B
			ID	ESGH1003-11201101270000000058		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	85		
75	85		
63	82		
50	73		
37.5	67		
28	61		
20	54		
14	47		
10	41		
6.3	34		
5.0	31		
3.35	28		
2.00	25		
1.18	22		
0.600	18		
0.425	15		
0.300	11	Dry mass of sample, kg	
0.212	9		
0.150	7	17.0	
0.063	6		

Soil description	Brown clayey very sandy GRAVEL with high cobble content		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	20	0
	Gravel	55	69
	Sand	19	24
	Silt	silt+clay =	
	Clay	6	8

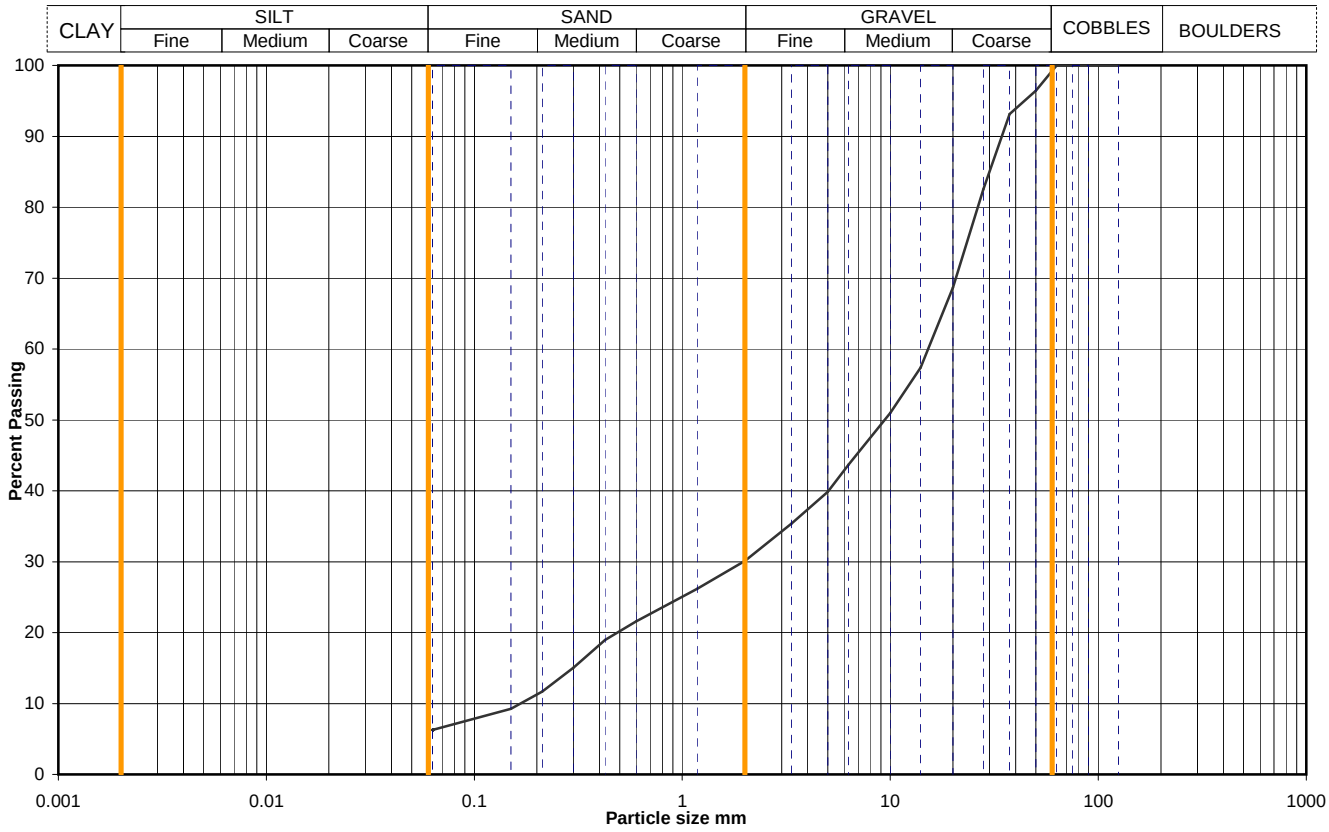
Uniformity Coefficient	D_{60} / D_{10}	111

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

QA Ref SLR 2,9 Rev 84 Sept 08	Soil Mechanics	UKAS TESTING 4089	Printed:15/03/2011 12:30	**Figure** **PSD 4**

Particle Size Distribution Analysis

Project No	H1003-11	Sample Details:	Hole No	TP7		
Project Name	Machynys Mound Machynys		Depth (m BGL)	0.30		
			Samp No	2	Type	B
			ID	ESGH1003-11201101270000000069		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	96		
37.5	93		
28	83		
20	69		
14	57		
10	51		
6.3	44		
5.0	40		
3.35	35		
2.00	30		
1.18	26		
0.600	22		
0.425	19		
0.300	15	Dry mass of sample, kg	
0.212	12		
0.150	9	18.0	
0.063	6		

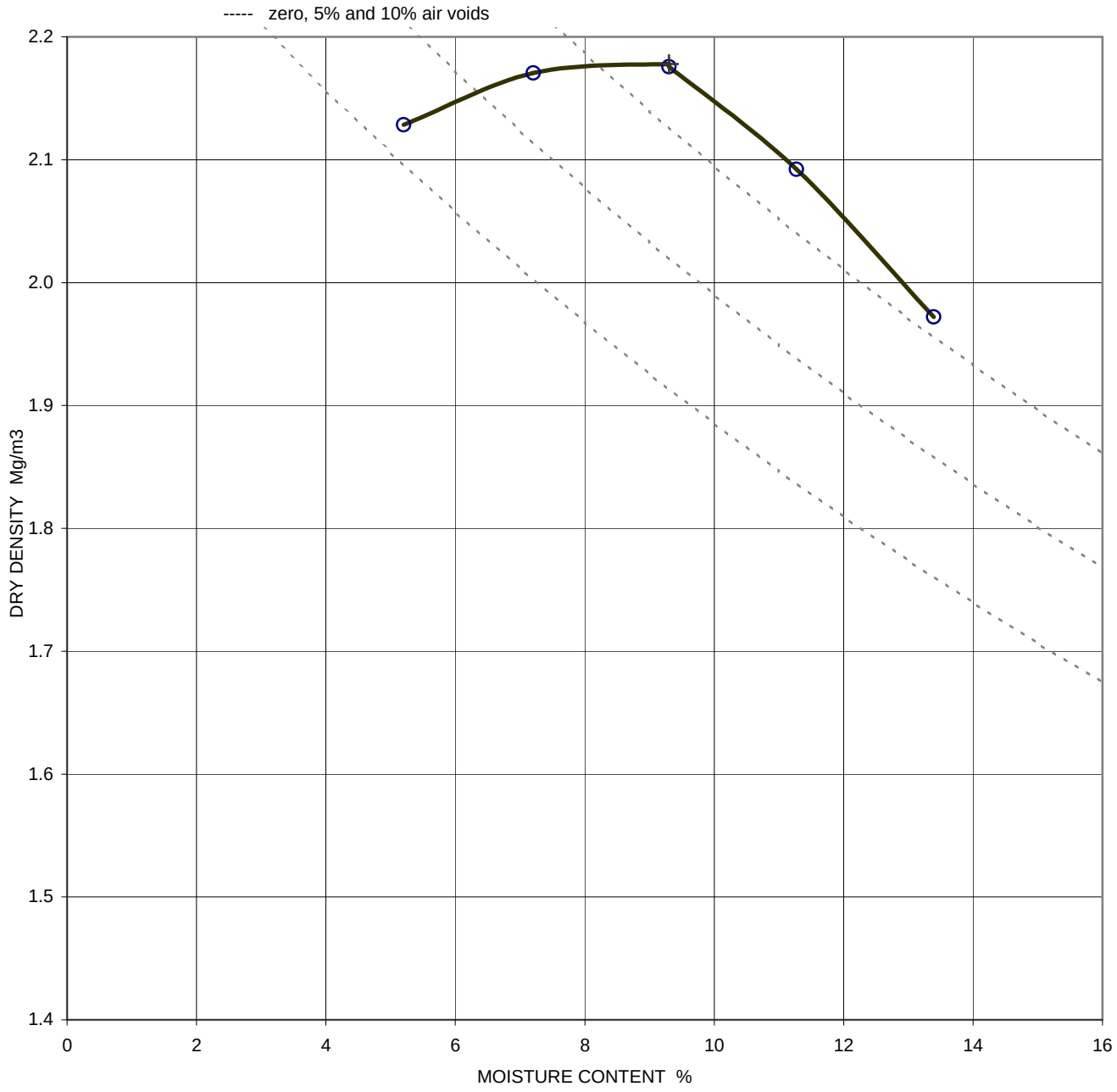
Soil description	Brown grey clayey very sandy GRAVEL with low cobble content		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	1	0
	Gravel	69	70
	Sand	24	24
	Silt	silt+clay =	
	Clay	6	6

Uniformity Coefficient	D_{60} / D_{10}	91

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Project No	H1003-11	Sample Details:	Hole No	TP6		
Project Name	Machynys Mound Machynys		Depth (m BGL)	0.50		
			Samp No	2	Type	B
			ID	ESGH1003-11201101270000000058		
			Spec Ref			



Soil description	Brown clayey very sandy GRAVEL with high cobble content		
Test method	BS 1377:part 4:1990: clause 3.5, 4.5 kg rammer in a 1 litre mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	32	%	
Material < 37.5mm > 20mm	13	%	
Particle density	2.65	assumed	
Remarks	'X' sample tested at clients request		

Derived Parameters +

Maximum dry density, Mg/m3

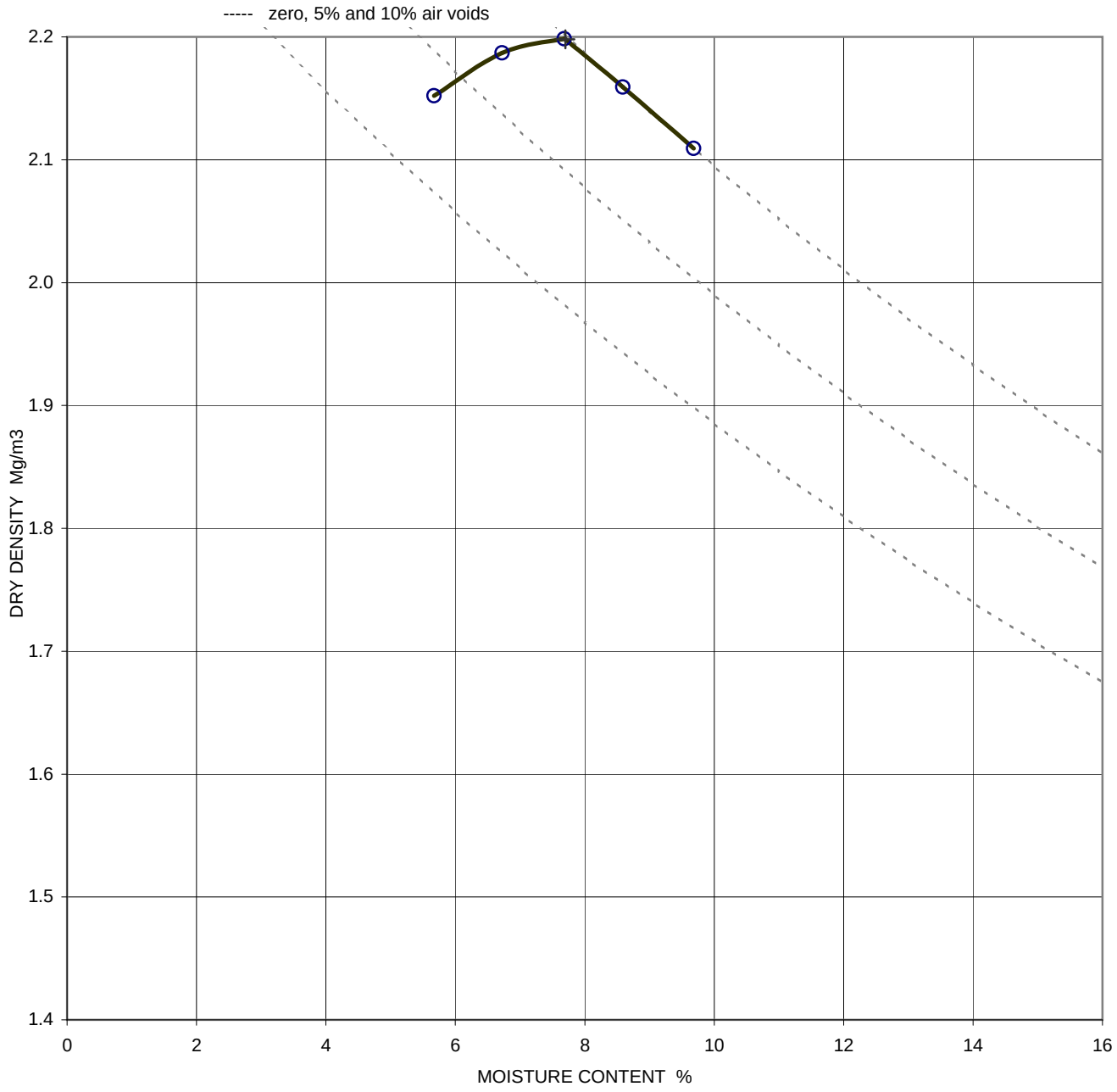
2.18

Optimum moisture content, %

9.3

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Project No	H1003-11	Sample Details:	Hole No	TP7		
Project Name	Machynys Mound Machynys		Depth (m BGL)	0.30		
			Samp No	2	Type	B
			ID	ESGH1003-11201101270000000069		
			Spec Ref			



Soil description	Brown grey clayey very sandy GRAVEL with low cobble content		
Test method	BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	7	%	
Material < 37.5mm > 20mm	23	%	
Particle density	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3

2.20

Optimum moisture content, %

7.7

TEST REPORT
SOIL SAMPLE ANALYSIS

Report No. EFS/111553 (Ver. 1)

Soil Mechanics
Unit 15
Crosby Yard
Bridgend
Mid Glamorgan
CF31 1JZ

Site: Machyny's Mound

The 13 samples described in this report were logged for analysis by Scientifics on 28-Feb-2011. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 11-Mar-2011

The following tables are contained in this report:

On behalf of
Scientifics :
Andrew Timms Operations Manager

Date of Issue: 11-Mar-2011

Tests marked '^' have been subcontracted to another laboratory.

Scientifics accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

	Units :	%	g/l															
	Method Codes :	WSLM40	WSLM42															
	Method Reporting Limits :	0.1	0.01															
Laboratory ID Number CL/	**Client Sample Description**	**Organic Mat % BS1377**	**Sulphate (W) BS1377**															
1107364	BH1 1.2-1.7		0.06															
1107374	BH1 3.0-3.5	2.33																
1107365	BH1 5.6-6.1		0.06															
1107366	BH2 1.2-1.7		<0.01															
1107367	TP1 1.0-1.3		0.05															
1107368	TP4 0.3-0.6		0.06															
1107369	TP5 0.5-0.8		<0.01															
1107375	TP5 3.3-3.6	1.70																
1107370	TP6 1.4-1.7		<0.01															
1107371	TP7 2.4-2.7		<0.01															
1107372	TP8 0.8-1.2		<0.01															
1107376	TP8 2.7-3.0	1.98																
1107373	TP9 0.5-0.8		<0.01															

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Client Name **Soil Mechanics**

Contact Mr A Henry

Machyny's Mound

Soils Sample Analysis

Date Printed	11-Mar-11
Report Number	**EFS/111553**
Table Number	**1**

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	WSLM40	Air Dried	Acid Dichromate oxidation of the sample followed by Titrimetric analysis of the extract
Soil	WSLM42	Air Dried	Determination of Water Soluble Sulphate in soil using Hydrochloric Acid digestion followed by gravimetric analysis

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on an air dried basis
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile
CR Denotes Crocidolite
AM Denotes Amosite
NAIIS No Asbestos Identified in Sample

Symbol Reference

^ Sub-contracted analysis. Note: The accreditation status is that assigned by the subcontract laboratory.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined
N.Det Not detected
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

END OF REPORT

Where individual results are flagged see report notes for status.

ENCLOSURE D

GEOENVIRONMENTAL LABORATORY TEST RESULTS

TES Report	EFS/110798M(Ver .2)
	EFS/111308M
	EXR/116037
	EXR/116502
	EXR/116731

TEST REPORT
SOIL SAMPLE ANALYSIS

1252

Report No. EFS/110798M (Ver. 2)

Soil Mechanics
Unit 15
Crosby Yard
Bridgend
Mid Glamorgan
CF31 1JZ

Site: Machyny's Mound

The 15 samples described in this report were logged for analysis by Scientifics on 04-Feb-2011. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 28-Feb-2011

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS or MCERTS accredited
Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by Scientifics.

The following tables are contained in this report:

On behalf of
Scientifics :
Andrew Timms Operations Manager

Date of Issue: 28-Feb-2011

Accreditation Codes: **N** (Not Accredited), **U** (UKAS), **UM** (UKAS & MCERTS)
Tests marked '^' have been subcontracted to another laboratory.
(NVM) - denotes the sample matrix is dissimilar to matrices upon which the MCERTS validation was based, and is therefore not accredited for MCERTS.
All results are reported on a dry weight basis at 105^{o}C unless otherwise stated. (except QC samples)
Scientifics accepts no responsibility for any sampling not carried out by our personnel.

Units :		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :		ICPACIDS	ICPBOR	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPSOIL	ICPSOIL	ICPWSS	PAHMSUS
Method Reporting Limits :		20	0.5	0.3	0.2	1.2	1.6	0.7	0.5	2	0.5	0.6	16	1	0.1	10	0.08
Accreditation Code:		UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	U	UM	N	UM	UM	
Laboratory ID Number CL/	**Client Sample Description**	**SO4-- (acid sol)**	**Boron (H20 Soluble)**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**	**Selenium (MS)**	**Vanadium (MS)**	**Zinc (MS)**	**Barium.**	**Beryllium.**	**SO4-- (H2O sol) mg/l**	**PAH by MS.16(0.08)**
1103738	TP1 D 5 1.00	1560	0.9	24	0.68	82.5	124.6	221	<0.5	31	0.8	79.2	213.4	356	1.26	262	
1103739	TP1 D 8 3.00	1120	1.1	24.4	0.73	355.1	105.7	115	0.61	32.1	0.6	1020	302.5	380	0.86	214	
1103740	TP2 D 2 0.20	916	<0.5	54.2	1.5	24.1	157.8	198.2	<0.5	27.3	1.2	34	446.9	173	0.83	73	Req
1103741	TP3 D 4 1.00	164	0.5	13.7	<0.2	18	15.6	14.6	<0.5	15.2	0.6	22.9	57.3	36.4	0.57	23	Req
1103742	TP4 D 1 0.20	623	0.9	11.1	0.21	16.7	28	29	<0.5	17	<0.5	18.4	83.5	65.1	0.59	255	
1103743	TP4 D 7 2.00	512	0.8	20.5	1.1	26.9	55.3	109.3	<0.5	27.2	0.6	25.1	286.2	131	0.8	107	
1103744	TP4 D 9 3.00	502	0.5	8.4	<0.21	16.2	17.5	21.5	<0.5	24.8	0.7	16.2	95.7	40	0.85	279	Req
1103745	TP5 D 3 0.60	572	0.7	11	<0.21	17.2	27.4	31.3	<0.5	19.8	<0.5	19.4	84.7	64.3	0.58	223	
1103746	TP5 D 6 2.00	2090	3	116.8	1.01	25.4	158	125.1	<0.49	50.9	1.1	55.5	515.9	414	1.59	412	Req
1103747	TP6 D 6 1.50	786	1	40.9	0.68	41	200	127.6	<0.50	64.4	0.6	39	239	216	0.89	210	
1103748	TP7 D 6 2.00	467	<0.6	17.4	0.24	22.9	45	37.6	<0.6	23.6	<0.6	30.6	80.6	115	0.91	289	
1103749	TP8 D 2 0.50	1920	1	27.7	1.6	34.1	442	181.8	<0.50	40.6	0.6	36.4	939.9	329	0.9	316	
1103750	TP8 D 6 2.00	1200	0.7	39.5	0.62	24.6	147.2	577.7	<0.5	49.1	1.2	54.8	562.3	850	2.32	378	Req
1103751	TP9 D 6 1.50	1380	2.3	26.9	0.67	32.8	259.1	110.6	<0.54	36.3	0.7	41.6	254	199	1.27	417	
1103752	TP10 D 1 0.30	406	<0.5	14.8	<0.21	15.5	37.3	68.8	<0.5	20.2	0.6	17.8	110.9	73.2	0.73	70	Req

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Client Name **Soil Mechanics**

Contact Mr A Henry

Machyny's Mound

Soils Sample Analysis

Date Printed	28-Feb-11
Report Number	**EFS/110798M**
Table Number	**1**

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105ºC where appr opriate, in accordance with the MCERTS standard.

Units :		pH Units	mg/kg	mg/kg		%	mg/kg	ug/kg	mg/kg	ug/kg	ug/kg	mg/kg		mg/kg	% M/M		
Method Codes :		PHSOIL	SFAPI	SFAPI	Sub02a	TMSS	TPHUSSI	VOCHSAS	GROHSA	PCBUSECDAR	PCBUSECDAR	SFAS	Sub08	SVOCMSUS	WSLM59		
Method Reporting Limits :			0.5	0.5		0.2	10.0	1	0.1			0.5		0.2-10.0	0.01		
Accreditation Code:		UM	UM	UM	U	U						N			N		
Laboratory ID Number CL/	**Client Sample Description**	**pH units (AR)**	**Cyanide(Free) (AR)**	**Cyanide(Total) (AR)**	**^Asbestos Screen**	**Tot.Moisture @ 105C**	**TPH by GCFID (AR/Si)**	**VOC + TICs HSA-MS**	**GRO (AA)**	**PCB-12 Congeners(AR)**	**PCB-7 Congeners(AR)**	**Sulphide as S (AR)**	**^Dioxins & Furans AD**	**SVOC + TICs (AR)**	**Total Organic Carbon**		
1103738	TP1 D 5 1.00	8.7	<0.6	<0.6	NAIIS	14.4	Req	Req	Req	Req	Req	<0.6	Req	Req	2.599		
1103739	TP1 D 8 3.00	8.9	<0.6	<0.6	NAIIS	10.8	Req	Req	Req			<0.6		Req	5.05		
1103740	TP2 D 2 0.20	5.9	<0.7	<0.7	NAIIS	29.9	Req		Req			1.9			11.79		
1103741	TP3 D 4 1.00	7.9	<0.6	<0.6	NAIIS	15.3	Req		Req			<0.6			0.732		
1103742	TP4 D 1 0.20	8.7	<0.6	<0.6	NAIIS	11.7	Req	Req	Req	Req	Req	<0.6	Req	Req	1.816		
1103743	TP4 D 7 2.00	8.6	<0.5	<0.5	CH	8.2	Req	Req	Req			<0.5		Req	3.91		
1103744	TP4 D 9 3.00	8.0	<0.6	<0.6	NAIIS	13.6	Req		Req			20.9			0.868		
1103745	TP5 D 3 0.60	8.6	<0.6	<0.6	NAIIS	11.6	Req	Req	Req			0.7		Req	1.826		
1103746	TP5 D 6 2.00	8.4	<0.6	<0.6	NAIIS	17.7	Req		Req			<0.6			20.8		
1103747	TP6 D 6 1.50	7.9	<0.6	<0.6	CH	17.8	Req	Req	Req			1.1		Req	8.67		
1103748	TP7 D 6 2.00	8.0	<0.6	<0.6	NAIIS	20.4	Req	Req	Req			<0.6		Req	4.78		
1103749	TP8 D 2 0.50	8.8	<0.6	<0.6	CH	14.1	Req	Req	Req			<0.6		Req	8.65		
1103750	TP8 D 6 2.00	8.2	<0.7	<0.7	NAIIS	32.5	Req		Req			31.4			18.3		
1103751	TP9 D 6 1.50	6.2	<0.8	<0.8	NAIIS	35.2	Req	Req	Req	Req	Req	12.7	Req	Req	7.01		
1103752	TP10 D 1 0.30	7.7	<0.6	<0.6	NAIIS	15.0	Req		Req			<0.6			2.234		

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Client Name **Soil Mechanics**

Contact Mr A Henry

Machyny's Mound

Soils Sample Analysis

Date Printed	28-Feb-11
Report Number	**EFS/110798M**
Table Number	**1**

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105ºC where appr opriate, in accordance with the MCERTS standard.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP2 D 2 0.20	**Job Number:**	S11_0798M
LIMS ID Number:	CL1103740	**Date Booked in:**	04-Feb-11
QC Batch Number:	110226	**Date Extracted:**	09-Feb-11
Quantitation File:	Initial Calibration	**Date Analysed:**	11-Feb-11
Directory:	911PAH.MS14\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

Accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Naphthalene	91-20-3	-	< 0.11	-	**UM**
Acenaphthylene	208-96-8	-	< 0.11	-	U
Acenaphthene	83-32-9	-	< 0.11	-	UM
Fluorene	86-73-7	-	< 0.11	-	UM
Phenanthrene	85-01-8	5.79	0.20	95	UM
Anthracene	120-12-7	-	< 0.11	-	U
Fluoranthene	206-44-0	7.14	0.33	77	UM
Pyrene	129-00-0	7.43	0.23	87	UM
Benzo[a]anthracene	56-55-3	9.12	0.19	87	UM
Chrysene	218-01-9	9.17	0.24	90	UM
Benzo[b]fluoranthene	205-99-2	10.66	0.30	90	UM
Benzo[k]fluoranthene	207-08-9	-	< 0.11	-	UM
Benzo[a]pyrene	50-32-8	11.09	0.16	91	UM
Indeno[1,2,3-cd]pyrene	193-39-5	12.48	0.10	64	UM
Dibenzo[a,h]anthracene	53-70-3	-	< 0.11	-	UM
Benzo[g,h,i]perylene	191-24-2	12.78	0.10	77	UM
Total (USEPA16) PAHs	-	-	< 2.72	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	106
Acenaphthene-d10	112
Phenanthrene-d10	130
Chrysene-d12	140
Perylene-d12	132

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	81
Terphenyl-d14	95

Concentrations are reported on a dry weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP3 D 4 1.00	**Job Number:**	S11_0798M
LIMS ID Number:	CL1103741	**Date Booked in:**	04-Feb-11
QC Batch Number:	110226	**Date Extracted:**	09-Feb-11
Quantitation File:	Initial Calibration	**Date Analysed:**	11-Feb-11
Directory:	911PAH.MS14\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

Accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Naphthalene	91-20-3	-	< 0.09	-	**UM**
Acenaphthylene	208-96-8	-	< 0.09	-	U
Acenaphthene	83-32-9	-	< 0.09	-	UM
Fluorene	86-73-7	-	< 0.09	-	UM
Phenanthrene	85-01-8	-	< 0.09	-	UM
Anthracene	120-12-7	-	< 0.09	-	U
Fluoranthene	206-44-0	-	< 0.09	-	UM
Pyrene	129-00-0	-	< 0.09	-	UM
Benzo[a]anthracene	56-55-3	-	< 0.09	-	UM
Chrysene	218-01-9	-	< 0.09	-	UM
Benzo[b]fluoranthene	205-99-2	-	< 0.09	-	UM
Benzo[k]fluoranthene	207-08-9	-	< 0.09	-	UM
Benzo[a]pyrene	50-32-8	-	< 0.09	-	UM
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.09	-	UM
Dibenzo[a,h]anthracene	53-70-3	-	< 0.09	-	UM
Benzo[g,h,i]perylene	191-24-2	-	< 0.09	-	UM
Total (USEPA16) PAHs	-	-	< 1.51	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	112
Acenaphthene-d10	115
Phenanthrene-d10	135
Chrysene-d12	146
Perylene-d12	135

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	82
Terphenyl-d14	97

Concentrations are reported on a dry weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP4 D 9 3.00	**Job Number:**	S11_0798M
LIMS ID Number:	CL1103744	**Date Booked in:**	04-Feb-11
QC Batch Number:	110261	**Date Extracted:**	11-Feb-11
Quantitation File:	Initial Calibration	**Date Analysed:**	12-Feb-11
Directory:	111PAH.MS20\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

Accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Naphthalene	91-20-3	-	< 0.09	-	**UM**
Acenaphthylene	208-96-8	4.63	0.10	M	U
Acenaphthene	83-32-9	4.76	0.31	62	UM
Fluorene	86-73-7	5.17	0.27	M	UM
Phenanthrene	85-01-8	6.08	0.28	89	UM
Anthracene	120-12-7	-	< 0.09	-	U
Fluoranthene	206-44-0	-	< 0.09	-	UM
Pyrene	129-00-0	-	< 0.09	-	UM
Benzo[a]anthracene	56-55-3	-	< 0.09	-	UM
Chrysene	218-01-9	-	< 0.09	-	UM
Benzo[b]fluoranthene	205-99-2	-	< 0.09	-	UM
Benzo[k]fluoranthene	207-08-9	-	< 0.09	-	UM
Benzo[a]pyrene	50-32-8	-	< 0.09	-	UM
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.09	-	UM
Dibenzo[a,h]anthracene	53-70-3	-	< 0.09	-	UM
Benzo[g,h,i]perylene	191-24-2	-	< 0.09	-	UM
Total (USEPA16) PAHs	-	-	< 2.10	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	104
Acenaphthene-d10	109
Phenanthrene-d10	113
Chrysene-d12	120
Perylene-d12	117

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	83
Terphenyl-d14	91

Concentrations are reported on a dry weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP5 D 6 2.00	**Job Number:**	S11_0798M
LIMS ID Number:	CL1103746	**Date Booked in:**	04-Feb-11
QC Batch Number:	110261	**Date Extracted:**	11-Feb-11
Quantitation File:	Initial Calibration	**Date Analysed:**	12-Feb-11
Directory:	111PAH.MS20\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

Accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Naphthalene	91-20-3	-	< 0.10	-	**UM**
Acenaphthylene	208-96-8	-	< 0.10	-	U
Acenaphthene	83-32-9	-	< 0.10	-	UM
Fluorene	86-73-7	-	< 0.10	-	UM
Phenanthrene	85-01-8	6.08	0.20	99	UM
Anthracene	120-12-7	-	< 0.10	-	U
Fluoranthene	206-44-0	7.50	0.43	96	UM
Pyrene	129-00-0	7.80	0.35	97	UM
Benzo[a]anthracene	56-55-3	9.52	0.27	91	UM
Chrysene	218-01-9	9.57	0.30	96	UM
Benzo[b]fluoranthene	205-99-2	11.07	0.51	97	UM
Benzo[k]fluoranthene	207-08-9	11.11	0.18	97	UM
Benzo[a]pyrene	50-32-8	11.51	0.28	99	UM
Indeno[1,2,3-cd]pyrene	193-39-5	12.92	0.35	94	UM
Dibenzo[a,h]anthracene	53-70-3	-	< 0.10	-	UM
Benzo[g,h,i]perylene	191-24-2	13.28	0.32	99	UM
Total (USEPA16) PAHs	-	-	< 3.82	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	105
Acenaphthene-d10	104
Phenanthrene-d10	103
Chrysene-d12	107
Perylene-d12	105

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	94
Terphenyl-d14	97

Concentrations are reported on a dry weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP8 D 6 2.00	**Job Number:**	S11_0798M
LIMS ID Number:	CL1103750	**Date Booked in:**	04-Feb-11
QC Batch Number:	110261	**Date Extracted:**	11-Feb-11
Quantitation File:	Initial Calibration	**Date Analysed:**	12-Feb-11
Directory:	111PAH.MS20\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

Accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Naphthalene	91-20-3	-	< 0.12	-	**UM**
Acenaphthylene	208-96-8	-	< 0.12	-	U
Acenaphthene	83-32-9	-	< 0.12	-	UM
Fluorene	86-73-7	-	< 0.12	-	UM
Phenanthrene	85-01-8	6.08	0.90	100	UM
Anthracene	120-12-7	6.14	0.21	96	U
Fluoranthene	206-44-0	7.50	1.08	97	UM
Pyrene	129-00-0	7.80	0.84	96	UM
Benzo[a]anthracene	56-55-3	9.52	0.47	95	UM
Chrysene	218-01-9	9.57	0.49	97	UM
Benzo[b]fluoranthene	205-99-2	11.07	0.46	96	UM
Benzo[k]fluoranthene	207-08-9	11.11	0.18	95	UM
Benzo[a]pyrene	50-32-8	11.51	0.33	98	UM
Indeno[1,2,3-cd]pyrene	193-39-5	12.92	0.19	100	UM
Dibenzo[a,h]anthracene	53-70-3	-	< 0.12	-	UM
Benzo[g,h,i]perylene	191-24-2	13.27	0.18	96	UM
Total (USEPA16) PAHs	-	-	< 5.91	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	102
Acenaphthene-d10	108
Phenanthrene-d10	101
Chrysene-d12	105
Perylene-d12	103

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	92
Terphenyl-d14	100

Concentrations are reported on a dry weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP10 D 1 0.30	**Job Number:**	S11_0798M
LIMS ID Number:	CL1103752	**Date Booked in:**	04-Feb-11
QC Batch Number:	110261	**Date Extracted:**	11-Feb-11
Quantitation File:	Initial Calibration	**Date Analysed:**	12-Feb-11
Directory:	111PAH.MS20\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

Accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Naphthalene	91-20-3	-	< 0.09	-	**UM**
Acenaphthylene	208-96-8	-	< 0.09	-	U
Acenaphthene	83-32-9	-	< 0.09	-	UM
Fluorene	86-73-7	-	< 0.09	-	UM
Phenanthrene	85-01-8	-	< 0.09	-	UM
Anthracene	120-12-7	-	< 0.09	-	U
Fluoranthene	206-44-0	-	< 0.09	-	UM
Pyrene	129-00-0	-	< 0.09	-	UM
Benzo[a]anthracene	56-55-3	-	< 0.09	-	UM
Chrysene	218-01-9	-	< 0.09	-	UM
Benzo[b]fluoranthene	205-99-2	-	< 0.09	-	UM
Benzo[k]fluoranthene	207-08-9	-	< 0.09	-	UM
Benzo[a]pyrene	50-32-8	-	< 0.09	-	UM
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.09	-	UM
Dibenzo[a,h]anthracene	53-70-3	-	< 0.09	-	UM
Benzo[g,h,i]perylene	191-24-2	-	< 0.09	-	UM
Total (USEPA16) PAHs	-	-	< 1.51	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	104
Acenaphthene-d10	103
Phenanthrene-d10	105
Chrysene-d12	98
Perylene-d12	91

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	94
Terphenyl-d14	93

Concentrations are reported on a dry weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polychlorinated Biphenyls (congeners)

Customer and Site Details:	Soil Mechanics: Machyny's Mound	**Matrix:**	SOIL
Job Number:	S11_0798M	**Date Booked in:**	04-Feb-11
QC Batch Number:	110301	**Date Extracted:**	17-Feb-11
Directory:	0217PCB.GC8	**Date Analysed:**	17-Feb-11
Method:	Ultrasonic		
Accreditation code:	N		

			Concentration, (µg/kg)						
	Sample ID	**Customer ID**	**PCB28**	**PCB52**	**PCB101**	**PCB118**	**PCB153**	**PCB138**	**PCB180**
*	CL1103738	TP1 D 5 1.00	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
*	CL1103742	TP4 D 1 0.20	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1
*	CL1103751	TP9 D 6 1.50	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where approp riate, in accordance with the MCERTS standard.

Polychlorinated Biphenyls (congeners)

Customer and Site Details: Soil Mechanics: Machyny's Mound
Job Number: S11_0798M
QC Batch Number: 110301
Directory: 0217PCB.GC8
Method: Ultrasonic
Accreditation code: N

Matrix: Soil
Date Booked in: 04-Feb-11
Date Extracted: 17-Feb-11
Date Analysed: 17-Feb-11

		Concentration, (µg/kg)											
Sample ID	**Customer ID**	**PCB 81**	**PCB 77**	**PCB 123**	**PCB 118**	**PCB 114**	**PCB 105**	**PCB 126**	**PCB 167**	**PCB 156**	**PCB 157**	**PCB 169**	**PCB 189**
* CL1103738	TP1 D 5 1.00	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
* CL1103742	TP4 D 1 0.20	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1
* CL1103751	TP9 D 6 1.50	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

Semi-Volatile Organic Compounds

Accredited?: No

Customer and Site Details:	Soil Mechanics: Machyny's Mound			**Matrix:**	Soil	**QC Batch Number:**	269
Sample Details:	TP1 D 5 1.00	**Date Booked in:**	04-Feb-11	**Ext Method:**	Ultrasonic	**Multiplier:**	0.2
LIMS ID Number:	CL1103738	**Date Extracted:**	13-Feb-11	**Operator:**	SO/DMB	**Dilution Factor:**	1
Job Number:	S11_0798M	**Date Analysed:**	14-Feb-11	**Directory/Quant File:**	14SVOC.GC11\ 0214_CCC2.D	**GPC (Y/N)**	N

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Phenol	108-95-2	-	< 2.0	-	N
bis(2-Chloroethyl)ether	111-44-4	-	< 0.6	-	N
2-Chlorophenol	95-57-8	-	< 2.0	-	N
1,3-Dichlorobenzene	541-73-1	-	< 0.6	-	N
1,4-Dichlorobenzene	106-46-7	-	< 0.6	-	N
Benzyl alcohol	100-51-6	-	< 0.6	-	N
1,2-Dichlorobenzene	95-50-1	-	< 0.6	-	N
2-Methylphenol	95-48-7	-	< 0.6	-	N
bis(2-Chloroisopropyl)ether	108-60-1	-	< 0.6	-	N
Hexachloroethane	67-72-1	-	< 0.6	-	N
N-Nitroso-di-n-propylamine	621-64-7	-	< 0.6	-	N
3- & 4-Methylphenol	108-39-4/106-44-5	-	< 2.0	-	N
Nitrobenzene	98-95-3	-	< 0.6	-	N
Isophorone	78-59-1	-	< 0.6	-	N
2-Nitrophenol	88-75-5	-	< 2.0	-	N
2,4-Dimethylphenol	105-67-9	-	< 2.0	-	N
Benzoic Acid	65-85-0 *	-	< 12.0	-	N
bis(2-Chloroethoxy)methane	111-91-1	-	< 0.6	-	N
2,4-Dichlorophenol	120-83-2	-	< 2.0	-	N
1,2,4-Trichlorobenzene	120-82-1	-	< 0.6	-	N
Naphthalene	91-20-3	-	< 0.2	-	N
4-Chlorophenol	106-48-9	-	< 2.0	-	N
4-Chloroaniline	106-47-8 *	-	< 0.6	-	N
Hexachlorobutadiene	87-68-3	-	< 0.6	-	N
4-Chloro-3-methylphenol	59-50-7	-	< 0.6	-	N
2-Methylnaphthalene	91-57-6	-	< 0.2	-	N
1-Methylnaphthalene	90-12-0	-	< 0.2	-	N
Hexachlorocyclopentadiene	77-47-4 *	-	< 0.6	-	N
2,4,6-Trichlorophenol	88-06-2	-	< 2.0	-	N
2,4,5-Trichlorophenol	95-95-4	-	< 2.0	-	N
2-Chloronaphthalene	91-58-7	-	< 0.2	-	N
Biphenyl	92-52-4	-	< 0.2	-	N
Diphenyl ether	101-84-8	-	< 0.2	-	N
2-Nitroaniline	88-74-4	-	< 0.6	-	N
Acenaphthylene	208-96-8	-	< 0.2	-	N
Dimethylphthalate	131-11-3	-	< 0.6	-	N
2,6-Dinitrotoluene	606-20-2	-	< 0.6	-	N
Acenaphthene	83-32-9	-	< 0.2	-	N
3-Nitroaniline	99-09-2	-	< 0.6	-	N

Target Compounds	CAS #	R.T.	Concentration mg/kg	% Fit	Accr. code
2,4-Dinitrophenol	51-28-5 *	-	< 1.0	-	N
Dibenzofuran	132-64-9	-	< 0.6	-	N
4-Nitrophenol	100-02-7	-	< 6.0	-	N
2,4-Dinitrotoluene	121-14-2	-	< 0.6	-	N
Fluorene	86-73-7	-	< 0.2	-	N
Diethylphthalate	84-66-2	-	< 0.6	-	N
4-Chlorophenyl-phenylether	7005-72-3	-	< 0.6	-	N
4,6-Dinitro-2-methylphenol	534-52-1	-	< 6.0	-	N
4-Nitroaniline	100-01-6	-	< 0.6	-	N
N-Nitrosodiphenylamine	86-30-6 *	-	< 0.6	-	N
4-Bromophenyl-phenylether	101-55-3	-	< 0.6	-	N
Hexachlorobenzene	118-74-1	-	< 0.6	-	N
Pentachlorophenol	87-86-5	-	< 6.0	-	N
Phenanthrene	85-01-8	10.70	0.5	100	N
Anthracene	120-12-7	-	< 0.2	-	N
Di-n-butylphthalate	84-74-2	-	< 0.6	-	N
Fluoranthene	206-44-0	12.52	0.5	96	N
Pyrene	129-00-0	12.86	0.4	94	N
Butylbenzylphthalate	85-68-7	-	< 0.6	-	N
Benzo[a]anthracene	56-55-3	-	< 0.2	-	N
Chrysene	218-01-9	-	< 0.2	-	N
3,3'-Dichlorobenzidine	91-94-1	-	< 2.0	-	N
bis(2-Ethylhexyl)phthalate	117-81-7	-	< 0.6	-	N
Di-n-octylphthalate	117-84-0	-	< 0.2	-	N
Benzo[b]fluoranthene	205-99-2	16.37	0.2	73	N
Benzo[k]fluoranthene	207-08-9	-	< 0.2	-	N
Benzo[a]pyrene	50-32-8	-	< 0.2	-	N
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.2	-	N
Dibenzo[a,h]anthracene	53-70-3	-	< 0.2	-	N
Benzo[g,h,i]perylene	191-24-2	-	< 0.2	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	88
Naphthalene-d8	87
Acenaphthene-d10	90
Phenanthrene-d10	91
Chrysene-d12	88
Perylene-d12	85

Surrogates	% Rec
2-Fluorophenol	106
Phenol-d5	107
Nitrobenzene-d5	99
2-Fluorobiphenyl	100
2,4,6-Tribromophenol	98
Terphenyl-d14	107

This analysis was conducted on an 'As Recieved' basis.

Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Semi-Volatile Organic Compounds

Accredited?: No

Customer and Site Details:	Soil Mechanics: Machyny's Mound			**Matrix:**	Soil	**QC Batch Number:**	269
Sample Details:	TP1 D 8 3.00	**Date Booked in:**	04-Feb-11	**Ext Method:**	Ultrasonic	**Multiplier:**	0.2
LIMS ID Number:	CL1103739	**Date Extracted:**	13-Feb-11	**Operator:**	SO/DMB	**Dilution Factor:**	1
Job Number:	S11_0798M	**Date Analysed:**	14-Feb-11	**Directory/Quant File:**	14SVOC.GC11\ 0214_CCC2.D	**GPC (Y/N)**	N

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Phenol	108-95-2	-	< 2.0	-	N
bis(2-Chloroethyl)ether	111-44-4	-	< 0.6	-	N
2-Chlorophenol	95-57-8	-	< 2.0	-	N
1,3-Dichlorobenzene	541-73-1	-	< 0.6	-	N
1,4-Dichlorobenzene	106-46-7	-	< 0.6	-	N
Benzyl alcohol	100-51-6	-	< 0.6	-	N
1,2-Dichlorobenzene	95-50-1	-	< 0.6	-	N
2-Methylphenol	95-48-7	-	< 0.6	-	N
bis(2-Chloroisopropyl)ether	108-60-1	-	< 0.6	-	N
Hexachloroethane	67-72-1	-	< 0.6	-	N
N-Nitroso-di-n-propylamine	621-64-7	-	< 0.6	-	N
3- & 4-Methylphenol	108-39-4/106-44-5	-	< 2.0	-	N
Nitrobenzene	98-95-3	-	< 0.6	-	N
Isophorone	78-59-1	-	< 0.6	-	N
2-Nitrophenol	88-75-5	-	< 2.0	-	N
2,4-Dimethylphenol	105-67-9	-	< 2.0	-	N
Benzoic Acid	65-85-0 *	-	< 11.0	-	N
bis(2-Chloroethoxy)methane	111-91-1	-	< 0.6	-	N
2,4-Dichlorophenol	120-83-2	-	< 2.0	-	N
1,2,4-Trichlorobenzene	120-82-1	-	< 0.6	-	N
Naphthalene	91-20-3	6.72	0.3	97	N
4-Chlorophenol	106-48-9	-	< 2.0	-	N
4-Chloroaniline	106-47-8 *	-	< 0.6	-	N
Hexachlorobutadiene	87-68-3	-	< 0.6	-	N
4-Chloro-3-methylphenol	59-50-7	-	< 0.6	-	N
2-Methylnaphthalene	91-57-6	7.43	0.4	98	N
1-Methylnaphthalene	90-12-0	7.54	0.3	96	N
Hexachlorocyclopentadiene	77-47-4 *	-	< 0.6	-	N
2,4,6-Trichlorophenol	88-06-2	-	< 2.0	-	N
2,4,5-Trichlorophenol	95-95-4	-	< 2.0	-	N
2-Chloronaphthalene	91-58-7	-	< 0.2	-	N
Biphenyl	92-52-4	-	< 0.2	-	N
Diphenyl ether	101-84-8	-	< 0.2	-	N
2-Nitroaniline	88-74-4	-	< 0.6	-	N
Acenaphthylene	208-96-8	8.46	0.7	98	N
Dimethylphthalate	131-11-3	-	< 0.6	-	N
2,6-Dinitrotoluene	606-20-2	-	< 0.6	-	N
Acenaphthene	83-32-9	8.67	0.3	90	N
3-Nitroaniline	99-09-2	-	< 0.6	-	N

Target Compounds	CAS #	R.T.	Concentration mg/kg	% Fit	Accr. code
2,4-Dinitrophenol	51-28-5 *	-	< 1.0	-	N
Dibenzofuran	132-64-9	-	< 0.6	-	N
4-Nitrophenol	100-02-7	-	< 6.0	-	N
2,4-Dinitrotoluene	121-14-2	-	< 0.6	-	N
Fluorene	86-73-7	9.35	0.7	92	N
Diethylphthalate	84-66-2	-	< 0.6	-	N
4-Chlorophenyl-phenylether	7005-72-3	-	< 0.6	-	N
4,6-Dinitro-2-methylphenol	534-52-1	-	< 6.0	-	N
4-Nitroaniline	100-01-6	-	< 0.6	-	N
N-Nitrosodiphenylamine	86-30-6 *	-	< 0.6	-	N
4-Bromophenyl-phenylether	101-55-3	-	< 0.6	-	N
Hexachlorobenzene	118-74-1	-	< 0.6	-	N
Pentachlorophenol	87-86-5	-	< 6.0	-	N
Phenanthrene	85-01-8	10.71	6.8	100	N
Anthracene	120-12-7	10.78	1.6	94	N
Di-n-butylphthalate	84-74-2	-	< 0.6	-	N
Fluoranthene	206-44-0	12.54	12.0	95	N
Pyrene	129-00-0	12.88	9.1	94	N
Butylbenzylphthalate	85-68-7	-	< 0.6	-	N
Benzo[a]anthracene	56-55-3	14.78	4.0	94	N
Chrysene	218-01-9	14.84	4.6	94	N
3,3'-Dichlorobenzidine	91-94-1	-	< 2.0	-	N
bis(2-Ethylhexyl)phthalate	117-81-7	-	< 0.6	-	N
Di-n-octylphthalate	117-84-0	-	< 0.2	-	N
Benzo[b]fluoranthene	205-99-2	16.39	4.7	74	N
Benzo[k]fluoranthene	207-08-9	16.42	1.8	70	N
Benzo[a]pyrene	50-32-8	16.83	3.9	98	N
Indeno[1,2,3-cd]pyrene	193-39-5	18.22	2.4	89	N
Dibenzo[a,h]anthracene	53-70-3	18.24	0.6	90	N
Benzo[g,h,i]perylene	191-24-2	18.53	2.1	96	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	85
Naphthalene-d8	86
Acenaphthene-d10	87
Phenanthrene-d10	89
Chrysene-d12	82
Perylene-d12	80

Surrogates	% Rec
2-Fluorophenol	102
Phenol-d5	101
Nitrobenzene-d5	95
2-Fluorobiphenyl	99
2,4,6-Tribromophenol	97
Terphenyl-d14	104

This analysis was conducted on an 'As Recieved' basis.

Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Semi-Volatile Organic Compounds

Accredited?: No

Customer and Site Details:	Soil Mechanics: Machyny's Mound			**Matrix:**	Soil	**QC Batch Number:**	269
Sample Details:	TP4 D 1 0.20	**Date Booked in:**	04-Feb-11	**Ext Method:**	Ultrasonic	**Multiplier:**	0.2
LIMS ID Number:	CL1103742	**Date Extracted:**	13-Feb-11	**Operator:**	SO/DMB	**Dilution Factor:**	1
Job Number:	S11_0798M	**Date Analysed:**	14-Feb-11	**Directory/Quant File:**	14SVOC.GC11\ 0214_CCC2.D	**GPC (Y/N)**	N

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Phenol	108-95-2	-	< 2.0	-	N
bis(2-Chloroethyl)ether	111-44-4	-	< 0.6	-	N
2-Chlorophenol	95-57-8	-	< 2.0	-	N
1,3-Dichlorobenzene	541-73-1	-	< 0.6	-	N
1,4-Dichlorobenzene	106-46-7	-	< 0.6	-	N
Benzyl alcohol	100-51-6	-	< 0.6	-	N
1,2-Dichlorobenzene	95-50-1	-	< 0.6	-	N
2-Methylphenol	95-48-7	-	< 0.6	-	N
bis(2-Chloroisopropyl)ether	108-60-1	-	< 0.6	-	N
Hexachloroethane	67-72-1	-	< 0.6	-	N
N-Nitroso-di-n-propylamine	621-64-7	-	< 0.6	-	N
3- & 4-Methylphenol	108-39-4/106-44-5	-	< 2.0	-	N
Nitrobenzene	98-95-3	-	< 0.6	-	N
Isophorone	78-59-1	-	< 0.6	-	N
2-Nitrophenol	88-75-5	-	< 2.0	-	N
2,4-Dimethylphenol	105-67-9	-	< 2.0	-	N
Benzoic Acid	65-85-0 *	-	< 11.0	-	N
bis(2-Chloroethoxy)methane	111-91-1	-	< 0.6	-	N
2,4-Dichlorophenol	120-83-2	-	< 2.0	-	N
1,2,4-Trichlorobenzene	120-82-1	-	< 0.6	-	N
Naphthalene	91-20-3	-	< 0.2	-	N
4-Chlorophenol	106-48-9	-	< 2.0	-	N
4-Chloroaniline	106-47-8 *	-	< 0.6	-	N
Hexachlorobutadiene	87-68-3	-	< 0.6	-	N
4-Chloro-3-methylphenol	59-50-7	-	< 0.6	-	N
2-Methylnaphthalene	91-57-6	-	< 0.2	-	N
1-Methylnaphthalene	90-12-0	-	< 0.2	-	N
Hexachlorocyclopentadiene	77-47-4 *	-	< 0.6	-	N
2,4,6-Trichlorophenol	88-06-2	-	< 2.0	-	N
2,4,5-Trichlorophenol	95-95-4	-	< 2.0	-	N
2-Chloronaphthalene	91-58-7	-	< 0.2	-	N
Biphenyl	92-52-4	-	< 0.2	-	N
Diphenyl ether	101-84-8	-	< 0.2	-	N
2-Nitroaniline	88-74-4	-	< 0.6	-	N
Acenaphthylene	208-96-8	-	< 0.2	-	N
Dimethylphthalate	131-11-3	-	< 0.6	-	N
2,6-Dinitrotoluene	606-20-2	-	< 0.6	-	N
Acenaphthene	83-32-9	-	< 0.2	-	N
3-Nitroaniline	99-09-2	-	< 0.6	-	N

Target Compounds	CAS #	R.T.	Concentration mg/kg	% Fit	Accr. code
2,4-Dinitrophenol	51-28-5 *	-	< 1.0	-	N
Dibenzofuran	132-64-9	-	< 0.6	-	N
4-Nitrophenol	100-02-7	-	< 6.0	-	N
2,4-Dinitrotoluene	121-14-2	-	< 0.6	-	N
Fluorene	86-73-7	-	< 0.2	-	N
Diethylphthalate	84-66-2	-	< 0.6	-	N
4-Chlorophenyl-phenylether	7005-72-3	-	< 0.6	-	N
4,6-Dinitro-2-methylphenol	534-52-1	-	< 6.0	-	N
4-Nitroaniline	100-01-6	-	< 0.6	-	N
N-Nitrosodiphenylamine	86-30-6 *	-	< 0.6	-	N
4-Bromophenyl-phenylether	101-55-3	-	< 0.6	-	N
Hexachlorobenzene	118-74-1	-	< 0.6	-	N
Pentachlorophenol	87-86-5	-	< 6.0	-	N
Phenanthrene	85-01-8	-	< 0.2	-	N
Anthracene	120-12-7	-	< 0.2	-	N
Di-n-butylphthalate	84-74-2	-	< 0.6	-	N
Fluoranthene	206-44-0	-	< 0.2	-	N
Pyrene	129-00-0	-	< 0.2	-	N
Butylbenzylphthalate	85-68-7	-	< 0.6	-	N
Benzo[a]anthracene	56-55-3	-	< 0.2	-	N
Chrysene	218-01-9	-	< 0.2	-	N
3,3'-Dichlorobenzidine	91-94-1	-	< 2.0	-	N
bis(2-Ethylhexyl)phthalate	117-81-7	-	< 0.6	-	N
Di-n-octylphthalate	117-84-0	-	< 0.2	-	N
Benzo[b]fluoranthene	205-99-2	-	< 0.2	-	N
Benzo[k]fluoranthene	207-08-9	-	< 0.2	-	N
Benzo[a]pyrene	50-32-8	-	< 0.2	-	N
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.2	-	N
Dibenzo[a,h]anthracene	53-70-3	-	< 0.2	-	N
Benzo[g,h,i]perylene	191-24-2	-	< 0.2	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	87
Naphthalene-d8	87
Acenaphthene-d10	89
Phenanthrene-d10	92
Chrysene-d12	89
Perylene-d12	82

Surrogates	% Rec
2-Fluorophenol	100
Phenol-d5	101
Nitrobenzene-d5	92
2-Fluorobiphenyl	95
2,4,6-Tribromophenol	92
Terphenyl-d14	103

This analysis was conducted on an 'As Recieved' basis.

Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Semi-Volatile Organic Compounds

Accredited?: No

Customer and Site Details:	Soil Mechanics: Machyny's Mound			**Matrix:**	Soil	**QC Batch Number:**	269
Sample Details:	TP4 D 7 2.00	**Date Booked in:**	04-Feb-11	**Ext Method:**	Ultrasonic	**Multiplier:**	0.2
LIMS ID Number:	CL1103743	**Date Extracted:**	13-Feb-11	**Operator:**	SO/DMB	**Dilution Factor:**	1
Job Number:	S11_0798M	**Date Analysed:**	14-Feb-11	**Directory/Quant File:**	14SVOC.GC11\ 0214_CCC2.D	**GPC (Y/N)**	N

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Phenol	108-95-2	-	< 2.0	-	N
bis(2-Chloroethyl)ether	111-44-4	-	< 0.5	-	N
2-Chlorophenol	95-57-8	-	< 2.0	-	N
1,3-Dichlorobenzene	541-73-1	-	< 0.5	-	N
1,4-Dichlorobenzene	106-46-7	-	< 0.5	-	N
Benzyl alcohol	100-51-6	-	< 0.5	-	N
1,2-Dichlorobenzene	95-50-1	-	< 0.5	-	N
2-Methylphenol	95-48-7	-	< 0.5	-	N
bis(2-Chloroisopropyl)ether	108-60-1	-	< 0.5	-	N
Hexachloroethane	67-72-1	-	< 0.5	-	N
N-Nitroso-di-n-propylamine	621-64-7	-	< 0.5	-	N
3- & 4-Methylphenol	108-39-4/106-44-5	-	< 2.0	-	N
Nitrobenzene	98-95-3	-	< 0.5	-	N
Isophorone	78-59-1	-	< 0.5	-	N
2-Nitrophenol	88-75-5	-	< 2.0	-	N
2,4-Dimethylphenol	105-67-9	-	< 2.0	-	N
Benzoic Acid	65-85-0 *	-	< 11.0	-	N
bis(2-Chloroethoxy)methane	111-91-1	-	< 0.5	-	N
2,4-Dichlorophenol	120-83-2	-	< 2.0	-	N
1,2,4-Trichlorobenzene	120-82-1	-	< 0.5	-	N
Naphthalene	91-20-3	-	< 0.2	-	N
4-Chlorophenol	106-48-9	-	< 2.0	-	N
4-Chloroaniline	106-47-8 *	-	< 0.5	-	N
Hexachlorobutadiene	87-68-3	-	< 0.5	-	N
4-Chloro-3-methylphenol	59-50-7	-	< 0.5	-	N
2-Methylnaphthalene	91-57-6	-	< 0.2	-	N
1-Methylnaphthalene	90-12-0	-	< 0.2	-	N
Hexachlorocyclopentadiene	77-47-4 *	-	< 0.5	-	N
2,4,6-Trichlorophenol	88-06-2	-	< 2.0	-	N
2,4,5-Trichlorophenol	95-95-4	-	< 2.0	-	N
2-Chloronaphthalene	91-58-7	-	< 0.2	-	N
Biphenyl	92-52-4	-	< 0.2	-	N
Diphenyl ether	101-84-8	-	< 0.2	-	N
2-Nitroaniline	88-74-4	-	< 0.5	-	N
Acenaphthylene	208-96-8	-	< 0.2	-	N
Dimethylphthalate	131-11-3	-	< 0.5	-	N
2,6-Dinitrotoluene	606-20-2	-	< 0.5	-	N
Acenaphthene	83-32-9	-	< 0.2	-	N
3-Nitroaniline	99-09-2	-	< 0.5	-	N

Target Compounds	CAS #	R.T.	Concentration mg/kg	% Fit	Accr. code
2,4-Dinitrophenol	51-28-5 *	-	< 1.0	-	N
Dibenzofuran	132-64-9	-	< 0.5	-	N
4-Nitrophenol	100-02-7	-	< 5.0	-	N
2,4-Dinitrotoluene	121-14-2	-	< 0.5	-	N
Fluorene	86-73-7	-	< 0.2	-	N
Diethylphthalate	84-66-2	-	< 0.5	-	N
4-Chlorophenyl-phenylether	7005-72-3	-	< 0.5	-	N
4,6-Dinitro-2-methylphenol	534-52-1	-	< 5.0	-	N
4-Nitroaniline	100-01-6	-	< 0.5	-	N
N-Nitrosodiphenylamine	86-30-6 *	-	< 0.5	-	N
4-Bromophenyl-phenylether	101-55-3	-	< 0.5	-	N
Hexachlorobenzene	118-74-1	-	< 0.5	-	N
Pentachlorophenol	87-86-5	-	< 5.0	-	N
Phenanthrene	85-01-8	-	< 0.2	-	N
Anthracene	120-12-7	-	< 0.2	-	N
Di-n-butylphthalate	84-74-2	-	< 0.5	-	N
Fluoranthene	206-44-0	12.52	0.4	96	N
Pyrene	129-00-0	12.86	0.4	95	N
Butylbenzylphthalate	85-68-7	-	< 0.5	-	N
Benzo[a]anthracene	56-55-3	14.77	0.2	81	N
Chrysene	218-01-9	14.82	0.3	71	N
3,3'-Dichlorobenzidine	91-94-1	-	< 2.0	-	N
bis(2-Ethylhexyl)phthalate	117-81-7	-	< 0.5	-	N
Di-n-octylphthalate	117-84-0	-	< 0.2	-	N
Benzo[b]fluoranthene	205-99-2	16.37	0.3	74	N
Benzo[k]fluoranthene	207-08-9	-	< 0.2	-	N
Benzo[a]pyrene	50-32-8	16.81	0.3	96	N
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.2	-	N
Dibenzo[a,h]anthracene	53-70-3	-	< 0.2	-	N
Benzo[g,h,i]perylene	191-24-2	-	< 0.2	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	90
Naphthalene-d8	91
Acenaphthene-d10	95
Phenanthrene-d10	97
Chrysene-d12	96
Perylene-d12	91

Surrogates	% Rec
2-Fluorophenol	103
Phenol-d5	103
Nitrobenzene-d5	94
2-Fluorobiphenyl	95
2,4,6-Tribromophenol	92
Terphenyl-d14	102

This analysis was conducted on an 'As Recieved' basis.

Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Semi-Volatile Organic Compounds

Accredited?: No

Customer and Site Details:	Soil Mechanics: Machyny's Mound			**Matrix:**	Soil	**QC Batch Number:**	269
Sample Details:	TP5 D 3 0.60	**Date Booked in:**	04-Feb-11	**Ext Method:**	Ultrasonic	**Multiplier:**	0.2
LIMS ID Number:	CL1103745	**Date Extracted:**	13-Feb-11	**Operator:**	SO/DMB	**Dilution Factor:**	1
Job Number:	S11_0798M	**Date Analysed:**	14-Feb-11	**Directory/Quant File:**	14SVOC.GC11\ 0214_CCC2.D	**GPC (Y/N)**	N

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Phenol	108-95-2	-	< 2.0	-	N
bis(2-Chloroethyl)ether	111-44-4	-	< 0.6	-	N
2-Chlorophenol	95-57-8	-	< 2.0	-	N
1,3-Dichlorobenzene	541-73-1	-	< 0.6	-	N
1,4-Dichlorobenzene	106-46-7	-	< 0.6	-	N
Benzyl alcohol	100-51-6	-	< 0.6	-	N
1,2-Dichlorobenzene	95-50-1	-	< 0.6	-	N
2-Methylphenol	95-48-7	-	< 0.6	-	N
bis(2-Chloroisopropyl)ether	108-60-1	-	< 0.6	-	N
Hexachloroethane	67-72-1	-	< 0.6	-	N
N-Nitroso-di-n-propylamine	621-64-7	-	< 0.6	-	N
3- & 4-Methylphenol	108-39-4/106-44-5	-	< 2.0	-	N
Nitrobenzene	98-95-3	-	< 0.6	-	N
Isophorone	78-59-1	-	< 0.6	-	N
2-Nitrophenol	88-75-5	-	< 2.0	-	N
2,4-Dimethylphenol	105-67-9	-	< 2.0	-	N
Benzoic Acid	65-85-0 *	-	< 11.0	-	N
bis(2-Chloroethoxy)methane	111-91-1	-	< 0.6	-	N
2,4-Dichlorophenol	120-83-2	-	< 2.0	-	N
1,2,4-Trichlorobenzene	120-82-1	-	< 0.6	-	N
Naphthalene	91-20-3	-	< 0.2	-	N
4-Chlorophenol	106-48-9	-	< 2.0	-	N
4-Chloroaniline	106-47-8 *	-	< 0.6	-	N
Hexachlorobutadiene	87-68-3	-	< 0.6	-	N
4-Chloro-3-methylphenol	59-50-7	-	< 0.6	-	N
2-Methylnaphthalene	91-57-6	-	< 0.2	-	N
1-Methylnaphthalene	90-12-0	-	< 0.2	-	N
Hexachlorocyclopentadiene	77-47-4 *	-	< 0.6	-	N
2,4,6-Trichlorophenol	88-06-2	-	< 2.0	-	N
2,4,5-Trichlorophenol	95-95-4	-	< 2.0	-	N
2-Chloronaphthalene	91-58-7	-	< 0.2	-	N
Biphenyl	92-52-4	-	< 0.2	-	N
Diphenyl ether	101-84-8	-	< 0.2	-	N
2-Nitroaniline	88-74-4	-	< 0.6	-	N
Acenaphthylene	208-96-8	-	< 0.2	-	N
Dimethylphthalate	131-11-3	-	< 0.6	-	N
2,6-Dinitrotoluene	606-20-2	-	< 0.6	-	N
Acenaphthene	83-32-9	-	< 0.2	-	N
3-Nitroaniline	99-09-2	-	< 0.6	-	N

Target Compounds	CAS #	R.T.	Concentration mg/kg	% Fit	Accr. code
2,4-Dinitrophenol	51-28-5 *	-	< 1.0	-	N
Dibenzofuran	132-64-9	-	< 0.6	-	N
4-Nitrophenol	100-02-7	-	< 6.0	-	N
2,4-Dinitrotoluene	121-14-2	-	< 0.6	-	N
Fluorene	86-73-7	-	< 0.2	-	N
Diethylphthalate	84-66-2	-	< 0.6	-	N
4-Chlorophenyl-phenylether	7005-72-3	-	< 0.6	-	N
4,6-Dinitro-2-methylphenol	534-52-1	-	< 6.0	-	N
4-Nitroaniline	100-01-6	-	< 0.6	-	N
N-Nitrosodiphenylamine	86-30-6 *	-	< 0.6	-	N
4-Bromophenyl-phenylether	101-55-3	-	< 0.6	-	N
Hexachlorobenzene	118-74-1	-	< 0.6	-	N
Pentachlorophenol	87-86-5	-	< 6.0	-	N
Phenanthrene	85-01-8	-	< 0.2	-	N
Anthracene	120-12-7	-	< 0.2	-	N
Di-n-butylphthalate	84-74-2	-	< 0.6	-	N
Fluoranthene	206-44-0	-	< 0.2	-	N
Pyrene	129-00-0	-	< 0.2	-	N
Butylbenzylphthalate	85-68-7	-	< 0.6	-	N
Benzo[a]anthracene	56-55-3	-	< 0.2	-	N
Chrysene	218-01-9	-	< 0.2	-	N
3,3'-Dichlorobenzidine	91-94-1	-	< 2.0	-	N
bis(2-Ethylhexyl)phthalate	117-81-7	-	< 0.6	-	N
Di-n-octylphthalate	117-84-0	-	< 0.2	-	N
Benzo[b]fluoranthene	205-99-2	16.37	0.2	74	N
Benzo[k]fluoranthene	207-08-9	-	< 0.2	-	N
Benzo[a]pyrene	50-32-8	-	< 0.2	-	N
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.2	-	N
Dibenzo[a,h]anthracene	53-70-3	-	< 0.2	-	N
Benzo[g,h,i]perylene	191-24-2	-	< 0.2	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	87
Naphthalene-d8	87
Acenaphthene-d10	89
Phenanthrene-d10	92
Chrysene-d12	91
Perylene-d12	87

Surrogates	% Rec
2-Fluorophenol	105
Phenol-d5	104
Nitrobenzene-d5	95
2-Fluorobiphenyl	98
2,4,6-Tribromophenol	93
Terphenyl-d14	104

This analysis was conducted on an 'As Recieved' basis.

Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Semi-Volatile Organic Compounds

Accredited?: No

Customer and Site Details:	Soil Mechanics: Machyny's Mound			**Matrix:**	Soil	**QC Batch Number:**	269
Sample Details:	TP6 D 6 1.50	**Date Booked in:**	04-Feb-11	**Ext Method:**	Ultrasonic	**Multiplier:**	0.2
LIMS ID Number:	CL1103747	**Date Extracted:**	13-Feb-11	**Operator:**	SO/DMB	**Dilution Factor:**	1
Job Number:	S11_0798M	**Date Analysed:**	14-Feb-11	**Directory/Quant File:**	14SVOC.GC11\ 0214_CCC2.D	**GPC (Y/N)**	N

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Phenol	108-95-2	-	< 2.0	-	N
bis(2-Chloroethyl)ether	111-44-4	-	< 0.6	-	N
2-Chlorophenol	95-57-8	-	< 2.0	-	N
1,3-Dichlorobenzene	541-73-1	-	< 0.6	-	N
1,4-Dichlorobenzene	106-46-7	-	< 0.6	-	N
Benzyl alcohol	100-51-6	-	< 0.6	-	N
1,2-Dichlorobenzene	95-50-1	-	< 0.6	-	N
2-Methylphenol	95-48-7	-	< 0.6	-	N
bis(2-Chloroisopropyl)ether	108-60-1	-	< 0.6	-	N
Hexachloroethane	67-72-1	-	< 0.6	-	N
N-Nitroso-di-n-propylamine	621-64-7	-	< 0.6	-	N
3- & 4-Methylphenol	108-39-4/106-44-5	-	< 2.0	-	N
Nitrobenzene	98-95-3	-	< 0.6	-	N
Isophorone	78-59-1	-	< 0.6	-	N
2-Nitrophenol	88-75-5	-	< 2.0	-	N
2,4-Dimethylphenol	105-67-9	-	< 2.0	-	N
Benzoic Acid	65-85-0 *	-	< 12.0	-	N
bis(2-Chloroethoxy)methane	111-91-1	-	< 0.6	-	N
2,4-Dichlorophenol	120-83-2	-	< 2.0	-	N
1,2,4-Trichlorobenzene	120-82-1	-	< 0.6	-	N
Naphthalene	91-20-3	-	< 0.2	-	N
4-Chlorophenol	106-48-9	-	< 2.0	-	N
4-Chloroaniline	106-47-8 *	-	< 0.6	-	N
Hexachlorobutadiene	87-68-3	-	< 0.6	-	N
4-Chloro-3-methylphenol	59-50-7	-	< 0.6	-	N
2-Methylnaphthalene	91-57-6	-	< 0.2	-	N
1-Methylnaphthalene	90-12-0	-	< 0.2	-	N
Hexachlorocyclopentadiene	77-47-4 *	-	< 0.6	-	N
2,4,6-Trichlorophenol	88-06-2	-	< 2.0	-	N
2,4,5-Trichlorophenol	95-95-4	-	< 2.0	-	N
2-Chloronaphthalene	91-58-7	-	< 0.2	-	N
Biphenyl	92-52-4	-	< 0.2	-	N
Diphenyl ether	101-84-8	-	< 0.2	-	N
2-Nitroaniline	88-74-4	-	< 0.6	-	N
Acenaphthylene	208-96-8	-	< 0.2	-	N
Dimethylphthalate	131-11-3	-	< 0.6	-	N
2,6-Dinitrotoluene	606-20-2	-	< 0.6	-	N
Acenaphthene	83-32-9	-	< 0.2	-	N
3-Nitroaniline	99-09-2	-	< 0.6	-	N

Target Compounds	CAS #	R.T.	Concentration mg/kg	% Fit	Accr. code
2,4-Dinitrophenol	51-28-5 *	-	< 1.0	-	N
Dibenzofuran	132-64-9	-	< 0.6	-	N
4-Nitrophenol	100-02-7	-	< 6.0	-	N
2,4-Dinitrotoluene	121-14-2	-	< 0.6	-	N
Fluorene	86-73-7	-	< 0.2	-	N
Diethylphthalate	84-66-2	-	< 0.6	-	N
4-Chlorophenyl-phenylether	7005-72-3	-	< 0.6	-	N
4,6-Dinitro-2-methylphenol	534-52-1	-	< 6.0	-	N
4-Nitroaniline	100-01-6	-	< 0.6	-	N
N-Nitrosodiphenylamine	86-30-6 *	-	< 0.6	-	N
4-Bromophenyl-phenylether	101-55-3	-	< 0.6	-	N
Hexachlorobenzene	118-74-1	-	< 0.6	-	N
Pentachlorophenol	87-86-5	-	< 6.0	-	N
Phenanthrene	85-01-8	10.71	1.7	99	N
Anthracene	120-12-7	10.79	0.6	98	N
Di-n-butylphthalate	84-74-2	-	< 0.6	-	N
Fluoranthene	206-44-0	12.53	5.5	95	N
Pyrene	129-00-0	12.87	4.0	95	N
Butylbenzylphthalate	85-68-7	-	< 0.6	-	N
Benzo[a]anthracene	56-55-3	14.78	2.7	76	N
Chrysene	218-01-9	14.84	1.7	79	N
3,3'-Dichlorobenzidine	91-94-1	-	< 2.0	-	N
bis(2-Ethylhexyl)phthalate	117-81-7	-	< 0.6	-	N
Di-n-octylphthalate	117-84-0	-	< 0.2	-	N
Benzo[b]fluoranthene	205-99-2	16.39	4.0	75	N
Benzo[k]fluoranthene	207-08-9	16.42	1.0	70	N
Benzo[a]pyrene	50-32-8	16.83	2.3	94	N
Indeno[1,2,3-cd]pyrene	193-39-5	18.22	1.8	90	N
Dibenzo[a,h]anthracene	53-70-3	18.24	0.4	93	N
Benzo[g,h,i]perylene	191-24-2	18.53	1.3	98	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	91
Naphthalene-d8	94
Acenaphthene-d10	95
Phenanthrene-d10	99
Chrysene-d12	98
Perylene-d12	95

Surrogates	% Rec
2-Fluorophenol	107
Phenol-d5	105
Nitrobenzene-d5	96
2-Fluorobiphenyl	99
2,4,6-Tribromophenol	97
Terphenyl-d14	103

This analysis was conducted on an 'As Recieved' basis.

Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Semi-Volatile Organic Compounds

Accredited?: No

Customer and Site Details:	Soil Mechanics: Machyny's Mound			**Matrix:**	Soil	**QC Batch Number:**	269
Sample Details:	TP7 D 6 2.00	**Date Booked in:**	04-Feb-11	**Ext Method:**	Ultrasonic	**Multiplier:**	0.2
LIMS ID Number:	CL1103748	**Date Extracted:**	13-Feb-11	**Operator:**	SO/DMB	**Dilution Factor:**	1
Job Number:	S11_0798M	**Date Analysed:**	14-Feb-11	**Directory/Quant File:**	14SVOC.GC11\ 0214_CCC2.D	**GPC (Y/N)**	N

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Phenol	108-95-2	-	< 3.0	-	N
bis(2-Chloroethyl)ether	111-44-4	-	< 0.6	-	N
2-Chlorophenol	95-57-8	-	< 3.0	-	N
1,3-Dichlorobenzene	541-73-1	-	< 0.6	-	N
1,4-Dichlorobenzene	106-46-7	-	< 0.6	-	N
Benzyl alcohol	100-51-6	-	< 0.6	-	N
1,2-Dichlorobenzene	95-50-1	-	< 0.6	-	N
2-Methylphenol	95-48-7	-	< 0.6	-	N
bis(2-Chloroisopropyl)ether	108-60-1	-	< 0.6	-	N
Hexachloroethane	67-72-1	-	< 0.6	-	N
N-Nitroso-di-n-propylamine	621-64-7	-	< 0.6	-	N
3- & 4-Methylphenol	108-39-4/106-44-5	-	< 3.0	-	N
Nitrobenzene	98-95-3	-	< 0.6	-	N
Isophorone	78-59-1	-	< 0.6	-	N
2-Nitrophenol	88-75-5	-	< 3.0	-	N
2,4-Dimethylphenol	105-67-9	-	< 3.0	-	N
Benzoic Acid	65-85-0 *	-	< 13.0	-	N
bis(2-Chloroethoxy)methane	111-91-1	-	< 0.6	-	N
2,4-Dichlorophenol	120-83-2	-	< 3.0	-	N
1,2,4-Trichlorobenzene	120-82-1	-	< 0.6	-	N
Naphthalene	91-20-3	-	< 0.3	-	N
4-Chlorophenol	106-48-9	-	< 3.0	-	N
4-Chloroaniline	106-47-8 *	-	< 0.6	-	N
Hexachlorobutadiene	87-68-3	-	< 0.6	-	N
4-Chloro-3-methylphenol	59-50-7	-	< 0.6	-	N
2-Methylnaphthalene	91-57-6	-	< 0.3	-	N
1-Methylnaphthalene	90-12-0	-	< 0.3	-	N
Hexachlorocyclopentadiene	77-47-4 *	-	< 0.6	-	N
2,4,6-Trichlorophenol	88-06-2	-	< 3.0	-	N
2,4,5-Trichlorophenol	95-95-4	-	< 3.0	-	N
2-Chloronaphthalene	91-58-7	-	< 0.3	-	N
Biphenyl	92-52-4	-	< 0.3	-	N
Diphenyl ether	101-84-8	-	< 0.3	-	N
2-Nitroaniline	88-74-4	-	< 0.6	-	N
Acenaphthylene	208-96-8	-	< 0.3	-	N
Dimethylphthalate	131-11-3	-	< 0.6	-	N
2,6-Dinitrotoluene	606-20-2	-	< 0.6	-	N
Acenaphthene	83-32-9	-	< 0.3	-	N
3-Nitroaniline	99-09-2	-	< 0.6	-	N

Target Compounds	CAS #	R.T.	Concentration mg/kg	% Fit	Accr. code
2,4-Dinitrophenol	51-28-5 *	-	< 1.0	-	N
Dibenzofuran	132-64-9	-	< 0.6	-	N
4-Nitrophenol	100-02-7	-	< 6.0	-	N
2,4-Dinitrotoluene	121-14-2	-	< 0.6	-	N
Fluorene	86-73-7	-	< 0.3	-	N
Diethylphthalate	84-66-2	-	< 0.6	-	N
4-Chlorophenyl-phenylether	7005-72-3	-	< 0.6	-	N
4,6-Dinitro-2-methylphenol	534-52-1	-	< 6.0	-	N
4-Nitroaniline	100-01-6	-	< 0.6	-	N
N-Nitrosodiphenylamine	86-30-6 *	-	< 0.6	-	N
4-Bromophenyl-phenylether	101-55-3	-	< 0.6	-	N
Hexachlorobenzene	118-74-1	-	< 0.6	-	N
Pentachlorophenol	87-86-5	-	< 6.0	-	N
Phenanthrene	85-01-8	10.71	0.6	99	N
Anthracene	120-12-7	10.78	0.4	98	N
Di-n-butylphthalate	84-74-2	-	< 0.6	-	N
Fluoranthene	206-44-0	12.54	9.3	96	N
Pyrene	129-00-0	12.88	7.9	96	N
Butylbenzylphthalate	85-68-7	-	< 0.6	-	N
Benzo[a]anthracene	56-55-3	14.78	4.0	87	N
Chrysene	218-01-9	14.84	2.4	89	N
3,3'-Dichlorobenzidine	91-94-1	-	< 3.0	-	N
bis(2-Ethylhexyl)phthalate	117-81-7	-	< 0.6	-	N
Di-n-octylphthalate	117-84-0	-	< 0.3	-	N
Benzo[b]fluoranthene	205-99-2	16.39	5.2	74	N
Benzo[k]fluoranthene	207-08-9	16.43	1.9	70	N
Benzo[a]pyrene	50-32-8	16.83	3.5	95	N
Indeno[1,2,3-cd]pyrene	193-39-5	18.22	2.6	89	N
Dibenzo[a,h]anthracene	53-70-3	18.24	0.6	94	N
Benzo[g,h,i]perylene	191-24-2	18.53	2.0	95	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	90
Naphthalene-d8	91
Acenaphthene-d10	93
Phenanthrene-d10	98
Chrysene-d12	101
Perylene-d12	100

Surrogates	% Rec
2-Fluorophenol	104
Phenol-d5	101
Nitrobenzene-d5	94
2-Fluorobiphenyl	95
2,4,6-Tribromophenol	89
Terphenyl-d14	98

This analysis was conducted on an 'As Recieved' basis.

Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Semi-Volatile Organic Compounds

Accredited?: No

Customer and Site Details:	Soil Mechanics: Machyny's Mound			**Matrix:**	Soil	**QC Batch Number:**	269
Sample Details:	TP8 D 2 0.50	**Date Booked in:**	04-Feb-11	**Ext Method:**	Ultrasonic	**Multiplier:**	2
LIMS ID Number:	CL1103749	**Date Extracted:**	13-Feb-11	**Operator:**	SO/DMB	**Dilution Factor:**	10
Job Number:	S11_0798M	**Date Analysed:**	16-Feb-11	**Directory/Quant File:**	15SVOC.GC11\ 0215_CCC2.D	**GPC (Y/N)**	N

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Phenol	108-95-2	-	< 23.0	-	N
bis(2-Chloroethyl)ether	111-44-4	-	< 6.0	-	N
2-Chlorophenol	95-57-8	-	< 23.0	-	N
1,3-Dichlorobenzene	541-73-1	-	< 6.0	-	N
1,4-Dichlorobenzene	106-46-7	-	< 6.0	-	N
Benzyl alcohol	100-51-6	-	< 6.0	-	N
1,2-Dichlorobenzene	95-50-1	-	< 6.0	-	N
2-Methylphenol	95-48-7	-	< 6.0	-	N
bis(2-Chloroisopropyl)ether	108-60-1	-	< 6.0	-	N
Hexachloroethane	67-72-1	-	< 6.0	-	N
N-Nitroso-di-n-propylamine	621-64-7	-	< 6.0	-	N
3- & 4-Methylphenol	108-39-4/106-44-5	-	< 23.0	-	N
Nitrobenzene	98-95-3	-	< 6.0	-	N
Isophorone	78-59-1	-	< 6.0	-	N
2-Nitrophenol	88-75-5	-	< 23.0	-	N
2,4-Dimethylphenol	105-67-9	-	< 23.0	-	N
Benzoic Acid	65-85-0 *	-	< 117.0	-	N
bis(2-Chloroethoxy)methane	111-91-1	-	< 6.0	-	N
2,4-Dichlorophenol	120-83-2	-	< 23.0	-	N
1,2,4-Trichlorobenzene	120-82-1	-	< 6.0	-	N
Naphthalene	91-20-3	-	< 2.0	-	N
4-Chlorophenol	106-48-9	-	< 23.0	-	N
4-Chloroaniline	106-47-8 *	-	< 6.0	-	N
Hexachlorobutadiene	87-68-3	-	< 6.0	-	N
4-Chloro-3-methylphenol	59-50-7	-	< 6.0	-	N
2-Methylnaphthalene	91-57-6	-	< 2.0	-	N
1-Methylnaphthalene	90-12-0	-	< 2.0	-	N
Hexachlorocyclopentadiene	77-47-4 *	-	< 6.0	-	N
2,4,6-Trichlorophenol	88-06-2	-	< 23.0	-	N
2,4,5-Trichlorophenol	95-95-4	-	< 23.0	-	N
2-Chloronaphthalene	91-58-7	-	< 2.0	-	N
Biphenyl	92-52-4	-	< 2.0	-	N
Diphenyl ether	101-84-8	-	< 2.0	-	N
2-Nitroaniline	88-74-4	-	< 6.0	-	N
Acenaphthylene	208-96-8	-	< 2.0	-	N
Dimethylphthalate	131-11-3	-	< 6.0	-	N
2,6-Dinitrotoluene	606-20-2	-	< 6.0	-	N
Acenaphthene	83-32-9	-	< 2.0	-	N
3-Nitroaniline	99-09-2	-	< 6.0	-	N

Target Compounds	CAS #	R.T.	Concentration mg/kg	% Fit	Accr. code
2,4-Dinitrophenol	51-28-5 *	-	< 12.0	-	N
Dibenzofuran	132-64-9	-	< 6.0	-	N
4-Nitrophenol	100-02-7	-	< 58.0	-	N
2,4-Dinitrotoluene	121-14-2	-	< 6.0	-	N
Fluorene	86-73-7	-	< 2.0	-	N
Diethylphthalate	84-66-2	-	< 6.0	-	N
4-Chlorophenyl-phenylether	7005-72-3	-	< 6.0	-	N
4,6-Dinitro-2-methylphenol	534-52-1	-	< 58.0	-	N
4-Nitroaniline	100-01-6	-	< 6.0	-	N
N-Nitrosodiphenylamine	86-30-6 *	-	< 6.0	-	N
4-Bromophenyl-phenylether	101-55-3	-	< 6.0	-	N
Hexachlorobenzene	118-74-1	-	< 6.0	-	N
Pentachlorophenol	87-86-5	-	< 58.0	-	N
Phenanthrene	85-01-8	10.65	9.0	99	N
Anthracene	120-12-7	-	< 2.0	-	N
Di-n-butylphthalate	84-74-2	-	< 6.0	-	N
Fluoranthene	206-44-0	12.45	13.4	96	N
Pyrene	129-00-0	12.80	9.5	92	N
Butylbenzylphthalate	85-68-7	-	< 6.0	-	N
Benzo[a]anthracene	56-55-3	14.70	7.4	66	N
Chrysene	218-01-9	14.76	6.7	62	N
3,3'-Dichlorobenzidine	91-94-1	-	< 23.0	-	N
bis(2-Ethylhexyl)phthalate	117-81-7	-	< 6.0	-	N
Di-n-octylphthalate	117-84-0	-	< 2.0	-	N
Benzo[b]fluoranthene	205-99-2	16.30	9.0	73	N
Benzo[k]fluoranthene	207-08-9	16.34	3.4	69	N
Benzo[a]pyrene	50-32-8	16.74	6.1	97	N
Indeno[1,2,3-cd]pyrene	193-39-5	18.13	4.0	97	N
Dibenzo[a,h]anthracene	53-70-3	-	< 2.0	-	N
Benzo[g,h,i]perylene	191-24-2	18.44	4.0	91	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	80
Naphthalene-d8	80
Acenaphthene-d10	81
Phenanthrene-d10	83
Chrysene-d12	83
Perylene-d12	88

Surrogates	% Rec
2-Fluorophenol	96
Phenol-d5	93
Nitrobenzene-d5	89
2-Fluorobiphenyl	97
2,4,6-Tribromophenol	83
Terphenyl-d14	103

This analysis was conducted on an 'As Recieved' basis.

Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Semi-Volatile Organic Compounds

Accredited?: No

Customer and Site Details:	Soil Mechanics: Machyny's Mound			**Matrix:**	Soil	**QC Batch Number:**	269
Sample Details:	TP9 D 6 1.50	**Date Booked in:**	04-Feb-11	**Ext Method:**	Ultrasonic	**Multiplier:**	0.2
LIMS ID Number:	CL1103751	**Date Extracted:**	13-Feb-11	**Operator:**	SO/DMB	**Dilution Factor:**	1
Job Number:	S11_0798M	**Date Analysed:**	14-Feb-11	**Directory/Quant File:**	14SVOC.GC11\ 0214_CCC2.D	**GPC (Y/N)**	N

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Phenol	108-95-2	-	< 3.0	-	N
bis(2-Chloroethyl)ether	111-44-4	-	< 0.8	-	N
2-Chlorophenol	95-57-8	-	< 3.0	-	N
1,3-Dichlorobenzene	541-73-1	-	< 0.8	-	N
1,4-Dichlorobenzene	106-46-7	-	< 0.8	-	N
Benzyl alcohol	100-51-6	-	< 0.8	-	N
1,2-Dichlorobenzene	95-50-1	-	< 0.8	-	N
2-Methylphenol	95-48-7	-	< 0.8	-	N
bis(2-Chloroisopropyl)ether	108-60-1	-	< 0.8	-	N
Hexachloroethane	67-72-1	-	< 0.8	-	N
N-Nitroso-di-n-propylamine	621-64-7	-	< 0.8	-	N
3- & 4-Methylphenol	108-39-4/106-44-5	-	< 3.0	-	N
Nitrobenzene	98-95-3	-	< 0.8	-	N
Isophorone	78-59-1	-	< 0.8	-	N
2-Nitrophenol	88-75-5	-	< 3.0	-	N
2,4-Dimethylphenol	105-67-9	-	< 3.0	-	N
Benzoic Acid	65-85-0 *	-	< 15.0	-	N
bis(2-Chloroethoxy)methane	111-91-1	-	< 0.8	-	N
2,4-Dichlorophenol	120-83-2	-	< 3.0	-	N
1,2,4-Trichlorobenzene	120-82-1	-	< 0.8	-	N
Naphthalene	91-20-3	-	< 0.3	-	N
4-Chlorophenol	106-48-9	-	< 3.0	-	N
4-Chloroaniline	106-47-8 *	-	< 0.8	-	N
Hexachlorobutadiene	87-68-3	-	< 0.8	-	N
4-Chloro-3-methylphenol	59-50-7	-	< 0.8	-	N
2-Methylnaphthalene	91-57-6	-	< 0.3	-	N
1-Methylnaphthalene	90-12-0	-	< 0.3	-	N
Hexachlorocyclopentadiene	77-47-4 *	-	< 0.8	-	N
2,4,6-Trichlorophenol	88-06-2	-	< 3.0	-	N
2,4,5-Trichlorophenol	95-95-4	-	< 3.0	-	N
2-Chloronaphthalene	91-58-7	-	< 0.3	-	N
Biphenyl	92-52-4	-	< 0.3	-	N
Diphenyl ether	101-84-8	-	< 0.3	-	N
2-Nitroaniline	88-74-4	-	< 0.8	-	N
Acenaphthylene	208-96-8	-	< 0.3	-	N
Dimethylphthalate	131-11-3	-	< 0.8	-	N
2,6-Dinitrotoluene	606-20-2	-	< 0.8	-	N
Acenaphthene	83-32-9	-	< 0.3	-	N
3-Nitroaniline	99-09-2	-	< 0.8	-	N

Target Compounds	CAS #	R.T.	Concentration mg/kg	% Fit	Accr. code
2,4-Dinitrophenol	51-28-5 *	-	< 2.0	-	N
Dibenzofuran	132-64-9	-	< 0.8	-	N
4-Nitrophenol	100-02-7	-	< 8.0	-	N
2,4-Dinitrotoluene	121-14-2	-	< 0.8	-	N
Fluorene	86-73-7	-	< 0.3	-	N
Diethylphthalate	84-66-2	-	< 0.8	-	N
4-Chlorophenyl-phenylether	7005-72-3	-	< 0.8	-	N
4,6-Dinitro-2-methylphenol	534-52-1	-	< 8.0	-	N
4-Nitroaniline	100-01-6	-	< 0.8	-	N
N-Nitrosodiphenylamine	86-30-6 *	-	< 0.8	-	N
4-Bromophenyl-phenylether	101-55-3	-	< 0.8	-	N
Hexachlorobenzene	118-74-1	-	< 0.8	-	N
Pentachlorophenol	87-86-5	-	< 8.0	-	N
Phenanthrene	85-01-8	-	< 0.3	-	N
Anthracene	120-12-7	-	< 0.3	-	N
Di-n-butylphthalate	84-74-2	-	< 0.8	-	N
Fluoranthene	206-44-0	12.52	0.5	97	N
Pyrene	129-00-0	12.87	0.3	94	N
Butylbenzylphthalate	85-68-7	-	< 0.8	-	N
Benzo[a]anthracene	56-55-3	-	< 0.3	-	N
Chrysene	218-01-9	-	< 0.3	-	N
3,3'-Dichlorobenzidine	91-94-1	-	< 3.0	-	N
bis(2-Ethylhexyl)phthalate	117-81-7	-	< 0.8	-	N
Di-n-octylphthalate	117-84-0	-	< 0.3	-	N
Benzo[b]fluoranthene	205-99-2	16.38	0.3	74	N
Benzo[k]fluoranthene	207-08-9	-	< 0.3	-	N
Benzo[a]pyrene	50-32-8	-	< 0.3	-	N
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.3	-	N
Dibenzo[a,h]anthracene	53-70-3	-	< 0.3	-	N
Benzo[g,h,i]perylene	191-24-2	-	< 0.3	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	85
Naphthalene-d8	84
Acenaphthene-d10	87
Phenanthrene-d10	93
Chrysene-d12	98
Perylene-d12	98

Surrogates	% Rec
2-Fluorophenol	100
Phenol-d5	98
Nitrobenzene-d5	92
2-Fluorobiphenyl	85
2,4,6-Tribromophenol	90
Terphenyl-d14	83

This analysis was conducted on an 'As Recieved' basis.

Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

SVOC (TICs)

Accredited?:No

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP1 D 5 1.00	**Job Number:**	S11_0798
LIMS ID Number:	CL1103738		
		Multiplier:	0.2
Date Booked in:	04-Feb-11	**Dilution Factor:**	1
Date Extracted:	13-Feb-11	**GPC (Y/N):**	N
Date Analysed:	14-Feb-11	**Matrix:**	Soil
QC Batch Number:	269	**Method:**	Ultrasonic
Directory/Quant File:	14SVOC.GC11\ 0214_CCC2.D	**Operator:**	SO/DMB

Tentatively Identified Compounds	CAS #	R.T.	mg/kg	% Fit	Accr. code
1-Tricosene	018835-32-0	20.28	1.110	70	N
9-Octadecenamide, (Z)-	000301-02-0	14.07	0.524	93	N

The compounds listed above have been tentatively identified by a computer based library search.
Compounds identified in the sample are not reported if they also occur in the method blank.
The % fit is an indication of the reliability of the compound assignment.
Due to the similarity between mass spectra of some isomeric compounds assignments may not be correct.
Other compounds may also be present but identification was not possible.
Concentrations are semi-quantitative, assume a response factor of 1 and use the nearest internal standard.
Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

SVOC (TICs)

Accredited?:No

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP1 D 8 3.00	**Job Number:**	S11_0798
LIMS ID Number:	CL1103739		
		Multiplier:	0.2
Date Booked in:	04-Feb-11	**Dilution Factor:**	1
Date Extracted:	13-Feb-11	**GPC (Y/N):**	N
Date Analysed:	14-Feb-11	**Matrix:**	Soil
QC Batch Number:	269	**Method:**	Ultrasonic
Directory/Quant File:	14SVOC.GC11\ 0214_CCC2.D	**Operator:**	SO/DMB

Tentatively Identified Compounds	CAS #	R.T.	mg/kg	% Fit	Accr. code
Benzo[b]triphenylene	000215-58-7	18.40	0.951	86	N
13H-Dibenzo[a,h]fluorene	000239-85-0	17.11	0.908	55	N
Dibenzo[def,mno]chrysene	000191-26-4	18.69	0.870	96	N
Unidentified pak	-	18.01	0.727	-	N
Benzo[e]pyrene	000192-97-2	16.52	0.689	99	N
3-Chloro-11H-pyrido[3',2'-4,5]pyrrolo[3,2-c]quinoline	1000212-59-4	16.17	0.648	58	N
Thiazole, 4-(4-methylphenyl)-2-phenylamino-	093020-56-5	16.99	0.639	50	N
Unidentified pak	-	17.47	0.620	-	N
4H-Cyclopenta[def]phenanthrene	000203-64-5	11.60	0.592	95	N
Benz[j]aceanthrylene, 3-methyl-	003343-10-0	17.26	0.539	78	N
.beta.-iso-Methyl ionone	1000285-40-2	17.64	0.480	64	N
1,2:3,4-Dibenzopyrene	000191-30-0	20.75	0.471	91	N
Pyrrolo[3,2-f]quinolin-9-one, 1,2,3,5,6,7-hexamethyl-3,6-dihyd	1000302-73-3	16.66	0.461	53	N
Dibenzopyrene	-	20.13	0.421	98	N
Anthracene, 1-methyl-	000610-48-0	11.48	0.401	94	N
2-Phenylnaphthalene	035465-71-5	11.92	0.388	95	N
Dibenzo(a,c)fluoren-13-one	063041-47-4	17.73	0.369	87	N
Dibenzopyrene	-	20.02	0.363	99	N

The compounds listed above have been tentatively identified by a computer based library search.
Compounds identified in the sample are not reported if they also occur in the method blank.
The % fit is an indication of the reliability of the compound assignment.
Due to the similarity between mass spectra of some isomeric compounds assignments may not be correct.
Other compounds may also be present but identification was not possible.
Concentrations are semi-quantitative, assume a response factor of 1 and use the nearest internal standard.
Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

SVOC (TICs)

Accredited?:No

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP4 D 1 0.20	**Job Number:**	S11_0798
LIMS ID Number:	CL1103742		
		Multiplier:	0.2
Date Booked in:	04-Feb-11	**Dilution Factor:**	1
Date Extracted:	13-Feb-11	**GPC (Y/N):**	N
Date Analysed:	14-Feb-11	**Matrix:**	Soil
QC Batch Number:	269	**Method:**	Ultrasonic
Directory/Quant File:	14SVOC.GC11\ 0214_CCC2.D	**Operator:**	SO/DMB

Tentatively Identified Compounds	CAS #	R.T.	mg/kg	% Fit	Accr. code
Acenaphtho[1,2-j]fluoranthene	000193-21-5	18.82	0.660	95	N
26-Hydroxycholesterol	013095-61-9	18.71	0.479	53	N
Tetradecanamide	000638-58-4	14.07	0.477	72	N
Rubicene-	000197-61-5	17.71	0.350	70	N
Unidentified peak	-	18.94	0.344	-	N

The compounds listed above have been tentatively identified by a computer based library search.
Compounds identified in the sample are not reported if they also occur in the method blank.
The % fit is an indication of the reliability of the compound assignment.
Due to the similarity between mass spectra of some isomeric compounds assignments may not be correct.
Other compounds may also be present but identification was not possible.
Concentrations are semi-quantitative, assume a response factor of 1 and use the nearest internal standard.
Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

SVOC (TICs)

Accredited?:No

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP4 D 7 2.00	**Job Number:**	S11_0798
LIMS ID Number:	CL1103743		
		Multiplier:	0.2
Date Booked in:	04-Feb-11	**Dilution Factor:**	1
Date Extracted:	13-Feb-11	**GPC (Y/N):**	N
Date Analysed:	14-Feb-11	**Matrix:**	Soil
QC Batch Number:	269	**Method:**	Ultrasonic
Directory/Quant File:	14SVOC.GC11\ 0214_CCC2.D	**Operator:**	SO/DMB

Tentatively Identified Compounds	CAS #	R.T.	mg/kg	% Fit	Accr. code
Benzo[a]coronene	000190-70-5	21.24	0.511	58	N
9-Octadecenamide, (Z)-	000301-02-0	14.07	0.448	86	N

The compounds listed above have been tentatively identified by a computer based library search.
Compounds identified in the sample are not reported if they also occur in the method blank.
The % fit is an indication of the reliability of the compound assignment.
Due to the similarity between mass spectra of some isomeric compounds assignments may not be correct.
Other compounds may also be present but identification was not possible.
Concentrations are semi-quantitative, assume a response factor of 1 and use the nearest internal standard.
Concentrations are reported on a dry weight basis.

SVOC (TICs)

Accredited?:No

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP5 D 3 0.60	**Job Number:**	S11_0798
LIMS ID Number:	CL1103745		
		Multiplier:	0.2
Date Booked in:	04-Feb-11	**Dilution Factor:**	1
Date Extracted:	13-Feb-11	**GPC (Y/N):**	N
Date Analysed:	14-Feb-11	**Matrix:**	Soil
QC Batch Number:	269	**Method:**	Ultrasonic
Directory/Quant File:	14SVOC.GC11\ 0214_CCC2.D	**Operator:**	SO/DMB

Tentatively Identified Compounds	CAS #	R.T.	mg/kg	% Fit	Accr. code
9-Octadecenamide, (Z)-	000301-02-0	14.07	0.608	90	N

The compounds listed above have been tentatively identified by a computer based library search.
Compounds identified in the sample are not reported if they also occur in the method blank.
The % fit is an indication of the reliability of the compound assignment.
Due to the similarity between mass spectra of some isomeric compounds assignments may not be correct.
Other compounds may also be present but identification was not possible.
Concentrations are semi-quantitative, assume a response factor of 1 and use the nearest internal standard.
Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

SVOC (TICs)

Accredited?:No

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP6 D 6 1.50	**Job Number:**	S11_0798
LIMS ID Number:	CL1103747		
		Multiplier:	0.2
Date Booked in:	04-Feb-11	**Dilution Factor:**	1
Date Extracted:	13-Feb-11	**GPC (Y/N):**	N
Date Analysed:	14-Feb-11	**Matrix:**	Soil
QC Batch Number:	269	**Method:**	Ultrasonic
Directory/Quant File:	14SVOC.GC11\ 0214_CCC2.D	**Operator:**	SO/DMB

Tentatively Identified Compounds	CAS #	R.T.	mg/kg	% Fit	Accr. code
Perylene	000198-55-0	16.75	1.025	99	N
4H-Cyclopenta[def]phenanthrene	000203-64-5	11.60	0.727	94	N
Benzo[e]pyrene	000192-97-2	16.52	0.673	99	N
1-Methyl-1-hydridotetrachlorocyclotriphosphazene	068351-74-6	18.40	0.559	87	N
Unidentified peak	-	18.94	0.498	-	N
3,4:8,9-Dibenzopyrene	000189-64-0	20.13	0.461	95	N
Dibenzo[def,mno]chrysene	000191-26-4	18.69	0.448	95	N
Coronene	000191-07-1	20.74	0.435	91	N
11H-Indeno[2,1-a]phenanthrene	000220-97-3	17.14	0.416	89	N
3,4:9,10-Dibenzopyrene	000189-55-9	20.02	0.371	98	N

The compounds listed above have been tentatively identified by a computer based library search.
Compounds identified in the sample are not reported if they also occur in the method blank.
The % fit is an indication of the reliability of the compound assignment.
Due to the similarity between mass spectra of some isomeric compounds assignments may not be correct.
Other compounds may also be present but identification was not possible.
Concentrations are semi-quantitative, assume a response factor of 1 and use the nearest internal standard.
Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

SVOC (TICs)

Accredited?:No

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP7 D 6 2.00	**Job Number:**	S11_0798
LIMS ID Number:	CL1103748		
		Multiplier:	0.2
Date Booked in:	04-Feb-11	**Dilution Factor:**	1
Date Extracted:	13-Feb-11	**GPC (Y/N):**	N
Date Analysed:	14-Feb-11	**Matrix:**	Soil
QC Batch Number:	269	**Method:**	Ultrasonic
Directory/Quant File:	14SVOC.GC11\ 0214_CCC2.D	**Operator:**	SO/DMB

Tentatively Identified Compounds	CAS #	R.T.	mg/kg	% Fit	Accr. code
Perylene	000198-55-0	16.75	1.401	94	N
Benzo[b]triphenylene	000215-58-7	18.36	1.096	97	N
Dibenzo[def,mno]chrysene	000191-26-4	18.10	0.712	87	N
4H-Cyclopenta[def]phenanthrene	000203-64-5	11.60	0.634	94	N
Benzo[e]pyrene	000192-97-2	16.52	0.602	99	N
Dibenzopyrene	-	20.13	0.568	98	N
Coronene	000191-07-1	20.76	0.556	95	N
Dibenzopyrene	-	20.02	0.464	99	N
Unidentified peak	-	17.99	0.426	-	N

The compounds listed above have been tentatively identified by a computer based library search.
Compounds identified in the sample are not reported if they also occur in the method blank.
The % fit is an indication of the reliability of the compound assignment.
Due to the similarity between mass spectra of some isomeric compounds assignments may not be correct.
Other compounds may also be present but identification was not possible.
Concentrations are semi-quantitative, assume a response factor of 1 and use the nearest internal standard.
Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

SVOC (TICs)

Accredited?:No

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP8 D 2 0.50	**Job Number:**	S11_0798
LIMS ID Number:	CL1103749		
		Multiplier:	2
Date Booked in:	04-Feb-11	**Dilution Factor:**	10
Date Extracted:	13-Feb-11	**GPC (Y/N):**	N
Date Analysed:	16-Feb-11	**Matrix:**	Soil
QC Batch Number:	269	**Method:**	Ultrasonic
Directory/Quant File:	15SVOC.GC11\ 0215_CCC2.D	**Operator:**	SO/DMB

Tentatively Identified Compounds	CAS #	R.T.	mg/kg	% Fit	Accr. code
Benzo[b]chrysene	000214-17-5	18.32	6.086	78	N
Unidentified peak	-	18.71	5.003	-	N
.beta.-iso-Methyl ionone	1000285-40-2	17.94	3.579	70	N

The compounds listed above have been tentatively identified by a computer based library search.
Compounds identified in the sample are not reported if they also occur in the method blank.
The % fit is an indication of the reliability of the compound assignment.
Due to the similarity between mass spectra of some isomeric compounds assignments may not be correct.
Other compounds may also be present but identification was not possible.
Concentrations are semi-quantitative, assume a response factor of 1 and use the nearest internal standard.
Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

SVOC (TICs)

Accredited?:No

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	TP9 D 6 1.50	**Job Number:**	S11_0798
LIMS ID Number:	CL1103751		
		Multiplier:	0.2
Date Booked in:	04-Feb-11	**Dilution Factor:**	1
Date Extracted:	13-Feb-11	**GPC (Y/N):**	N
Date Analysed:	14-Feb-11	**Matrix:**	Soil
QC Batch Number:	269	**Method:**	Ultrasonic
Directory/Quant File:	14SVOC.GC11\ 0214_CCC2.D	**Operator:**	SO/DMB

Tentatively Identified Compounds	CAS #	R.T.	mg/kg	% Fit	Accr. code
Nor.alpha.(H)-hopane	-	18.01	1.687	72	N
Unidentified peak	-	18.44	1.464	-	N
Nor.alpha.(H)-hopane	-	17.65	1.399	78	N
Unidentified peak	-	17.08	1.053	-	N
Unidentified peak	-	17.54	1.026	-	N
Unidentified peak	-	17.35	1.025	-	N
Unidentified peak	-	17.29	0.989	-	N
9-Octadecenamide, (Z)-	000301-02-0	14.08	0.919	91	N
16-Deoxokryptogenin	1000253-58-9	19.22	0.918	70	N
Unidentified peak	-	17.16	0.884	-	N
Unidentified peak	-	18.64	0.789	-	N
Stigmastane	000601-58-1	16.70	0.773	60	N
Unidentified peak	-	17.87	0.733	-	N
Unidentified peak	-	17.73	0.723	-	N
Unidentified peak	-	16.51	0.707	-	N
Unidentified peak	-	16.16	0.692	-	N
Unidentified peak	-	17.81	0.677	-	N
Anthracene, 9-dodecyltetradecahydro-	055401-75-7	18.79	0.619	53	N
Azulene, 1,4-dimethyl-7-(1-methylethyl)-	000489-84-9	19.57	0.585	70	N
Unidentified peak	-	18.97	0.582	-	N

The compounds listed above have been tentatively identified by a computer based library search.
Compounds identified in the sample are not reported if they also occur in the method blank.
The % fit is an indication of the reliability of the compound assignment.
Due to the similarity between mass spectra of some isomeric compounds assignments may not be correct.
Other compounds may also be present but identification was not possible.
Concentrations are semi-quantitative, assume a response factor of 1 and use the nearest internal standard.
Concentrations are reported on a dry weight basis.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

Gasoline Range Organics
(BTEX and Aliphatic Carbon Ranges)

Customer and Site Details: Soil Mechanics : Machyny's Mound
Job Number: S11_0798
Directory: D:\TES\DATA\Y2011\0211HSA_GC12\021111A 2011-02-11 13-06-35\150B4301.D
Method: Headspace GCFID
Accreditation Code: N

Matrix: Soil
Date Booked in: 04-Feb-11
Date extracted: 15-Feb-11
Date Analysed: 12-Feb-11, 02:4

			Concentration, (mg/kg) - as dry weight.					Aliphatics				
	Sample ID	Client ID	Benzene	Toluene	Ethyl benzene	m/p-Xylene	o-Xylene	C5 - C6	>C6 - C7	>C7 - C8	>C8 - C10	Total GRO
*	CL1103738	TP1 D 5 1.00	<0.012	<0.012	<0.012	<0.012	<0.012	<0.2	<0.2	<0.2	<0.2	<0.2
*	CL1103739	TP1 D 8 3.00	<0.011	<0.011	<0.011	<0.011	<0.011	<0.2	<0.2	<0.2	<0.2	<0.2
*	CL1103740	TP2 D 2 0.20	<0.036	<0.036	<0.036	<0.036	<0.036	<0.7	<0.7	<0.7	<0.7	<0.7
*	CL1103741	TP3 D 4 1.00	<0.012	<0.012	<0.012	<0.012	<0.012	<0.2	<0.2	<0.2	<0.2	<0.2
*	CL1103742	TP4 D 1 0.20	<0.011	<0.011	<0.011	<0.011	<0.011	<0.2	<0.2	<0.2	<0.2	<0.2
*	CL1103743	TP4 D 7 2.00	<0.011	<0.011	<0.011	<0.011	<0.011	<0.2	<0.2	<0.2	<0.2	<0.2
*	CL1103744	TP4 D 9 3.00	<0.012	<0.012	0.032	0.128	0.045	<0.2	<0.2	<0.2	4.1	4.3
*	CL1103745	TP5 D 3 0.60	<0.011	<0.011	<0.011	<0.011	<0.011	<0.2	<0.2	<0.2	1.5	1.6
*	CL1103746	TP5 D 6 2.00	<0.012	<0.012	<0.012	<0.012	<0.012	<0.2	<0.2	<0.2	<0.2	<0.2
*	CL1103747	TP6 D 6 1.50	<0.012	<0.012	<0.012	<0.012	<0.012	<0.2	<0.2	<0.2	<0.2	<0.2
*	CL1103748	TP7 D 6 2.00	<0.013	<0.013	<0.013	<0.013	<0.013	<0.3	<0.3	<0.3	<0.3	<0.3
*	CL1103749	TP8 D 2 0.50	<0.012	<0.012	<0.012	<0.012	<0.012	<0.2	<0.2	<0.2	<0.2	<0.2
*	CL1103750	TP8 D 6 2.00	<0.037	<0.037	<0.037	<0.037	<0.037	<0.7	<0.7	<0.7	<0.7	<0.7
*	CL1103751	TP9 D 6 1.50	<0.039	<0.039	<0.039	<0.039	<0.039	<0.8	<0.8	<0.8	<0.8	<0.8
*	CL1103752	TP10 D 1 0.30	<0.012	<0.012	<0.012	<0.012	<0.012	<0.2	<0.2	<0.2	<0.2	<0.2

Note: Benzene elutes between C6 and C7, toluene elutes between C7 and C8, ethyl benzene and the xylenes elute between C8 and C9.
Each BTEX compund is deducted from the appropriate band to give the aliphatic fractions, however aromatic compounds may still be contributing to these fractions

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

ALIPHATIC / AROMATIC FRACTION BY GC/FID

Customer and Site Details: Soil Mechanics : Machyny's Mound
Job Number: S11_0798
QC Batch Number: 110226
Directory: D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\055B6501.D
Method: Ultra Sonic

Separation: Silica gel
Eluents: Hexane, DCM

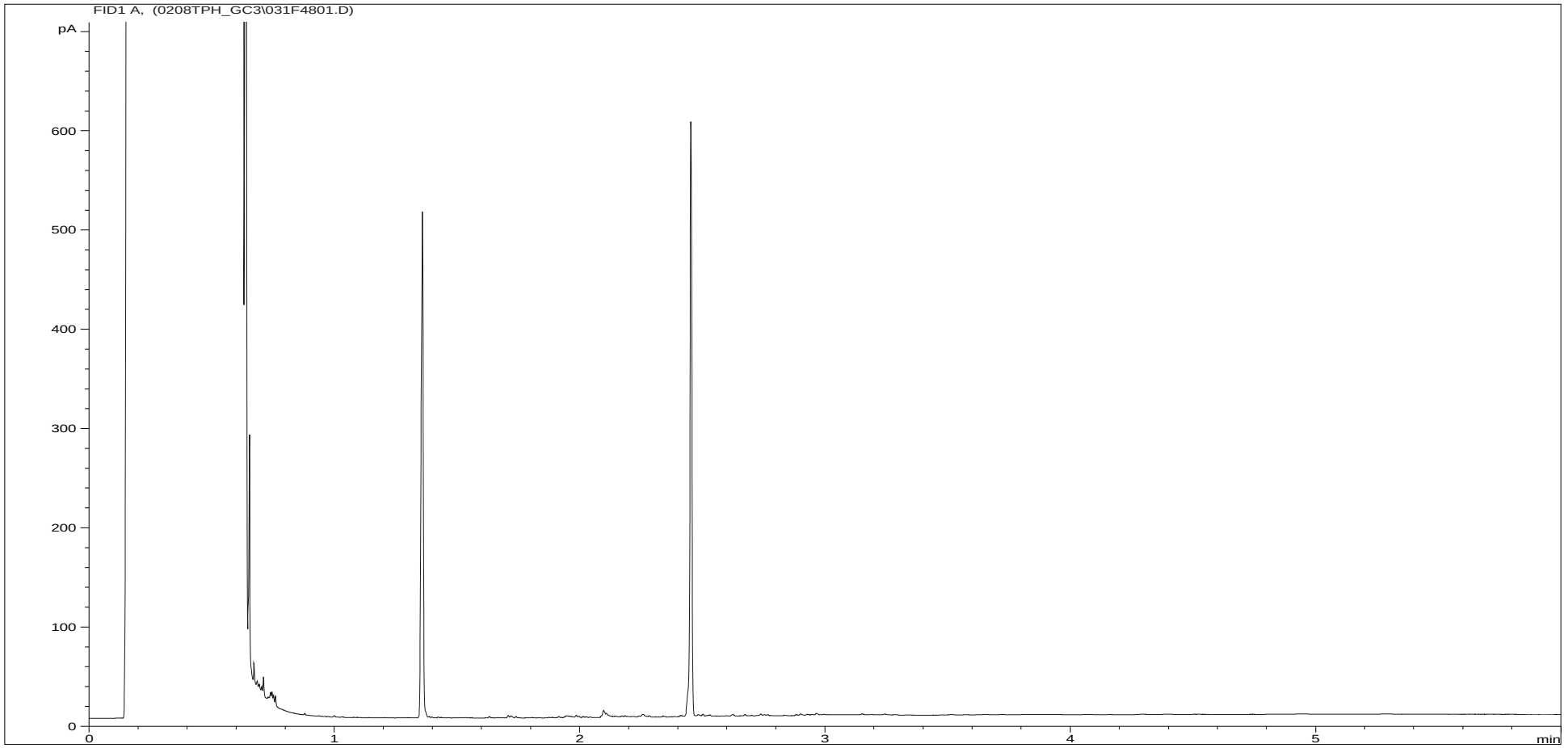
Matrix: Soil
Date Booked in 04-Feb-11
Date Extracted 08-Feb-11
Date Analysed: 08-Feb-11

This sample data is not accredited.

		Concentration, (mg/kg) - as dry weight.											
		>C8 - C10		>C10 - C12		>C12 - C16		>C16 - C21		>C21 - C35		>C8 - C40	
Sample ID	**Client ID**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**
CL1103738	TP1 D 5 1.00	<5	<5	<5	<5	<5	<5	<5	<5	11.4	19.4	<23	28
CL1103739	TP1 D 8 3.00	<4	<4	<4	<4	<4	<4	<4	9.34	25	48.3	31.4	64.1
CL1103740	TP2 D 2 0.20	<6	<6	<6	<6	<6	<6	<6	<6	<12.50	23.7	<29	31.8
CL1103741	TP3 D 4 1.00	<5	<5	<5	<5	<5	<5	<5	<5	<10.34	<10.34	<24	<24
CL1103742	TP4 D 1 0.20	<5	<5	<5	<5	<5	<5	<5	<5	18.6	17.9	25.4	24.3
CL1103743	TP4 D 7 2.00	<4	<4	<4	<4	<4	<4	4.37	<4	15	11.5	22.5	<22
CL1103744	TP4 D 9 3.00	7.6	<5	110	5.65	921	235	789	429	179	146	2010	817
CL1103745	TP5 D 3 0.60	<5	<5	<5	<5	<5	<5	<5	<5	14.9	15.5	<23	23
CL1103746	TP5 D 6 2.00	<5	<5	<5	<5	<5	<5	<5	5.2	11.2	31.8	<24	42.2
CL1103747	TP6 D 6 1.50	<5	<5	<5	<5	<5	<5	12.4	24.8	65.2	168	93.8	215
CL1103748	TP7 D 6 2.00	<5	<5	<5	<5	7.4	18	15.6	110.7	67.2	440	100.4	597
CL1103749	TP8 D 2 0.50	<5	<5	<5	<5	5.48	<5	29.4	10.9	140	84	192	111.9
CL1103750	TP8 D 6 2.00	<6	<6	<6	<6	<6	<6	8.39	<6	58.2	26.1	93.8	37
CL1103751	TP9 D 6 1.50	<6	<6	<6	<6	<6	6.6	8.55	10.86	92.1	101.5	122.1	144
CL1103752	TP10 D 1 0.30	<5	<5	<5	<5	<5	<5	<5	4.78	12.1	12.2	<24	<24

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

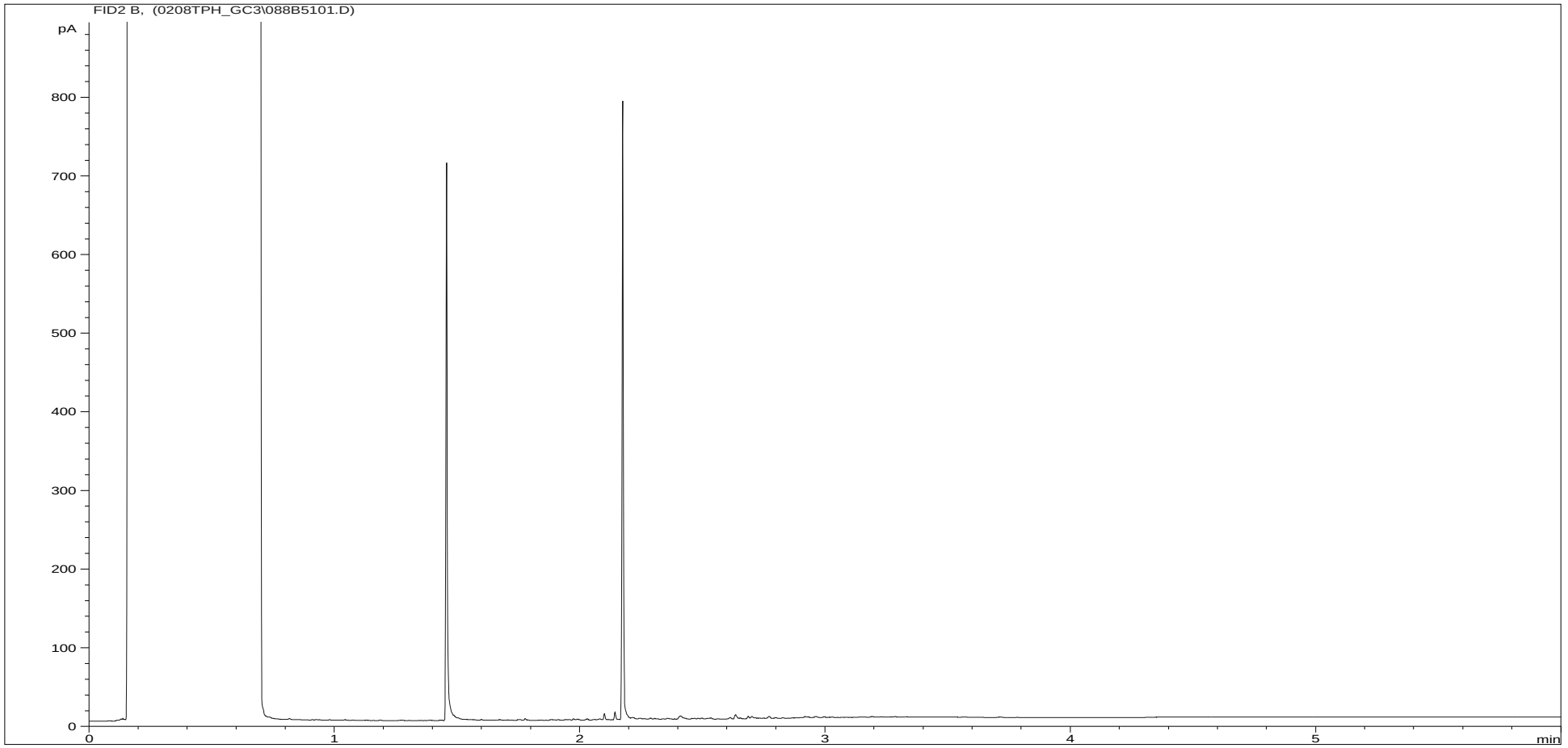
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103738ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP1 D 5 1.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\031F4801.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

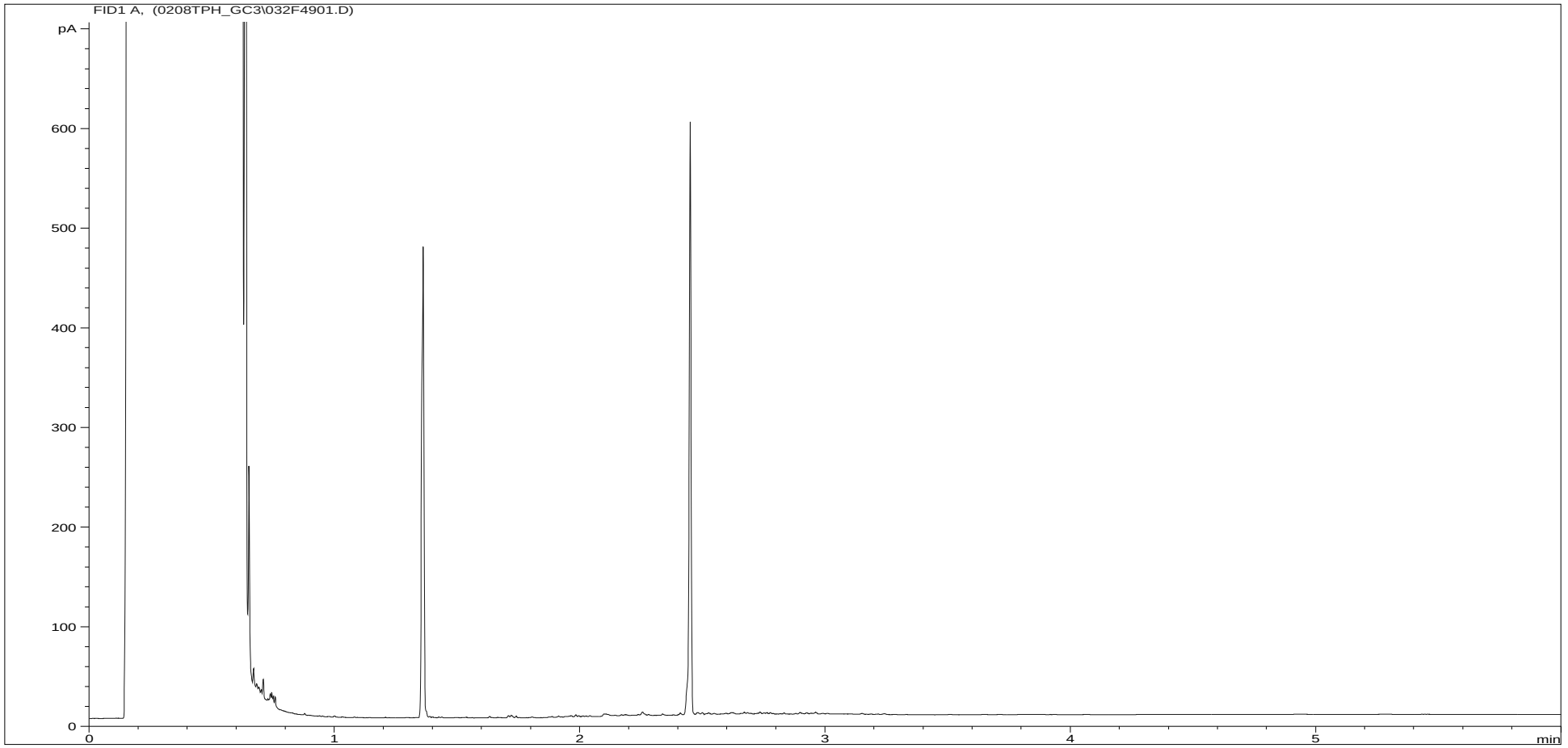
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103738ARO	**Job Number:**	S11_0798M
Multiplier:	11.4	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP1 D 5 1.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\088B5101.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

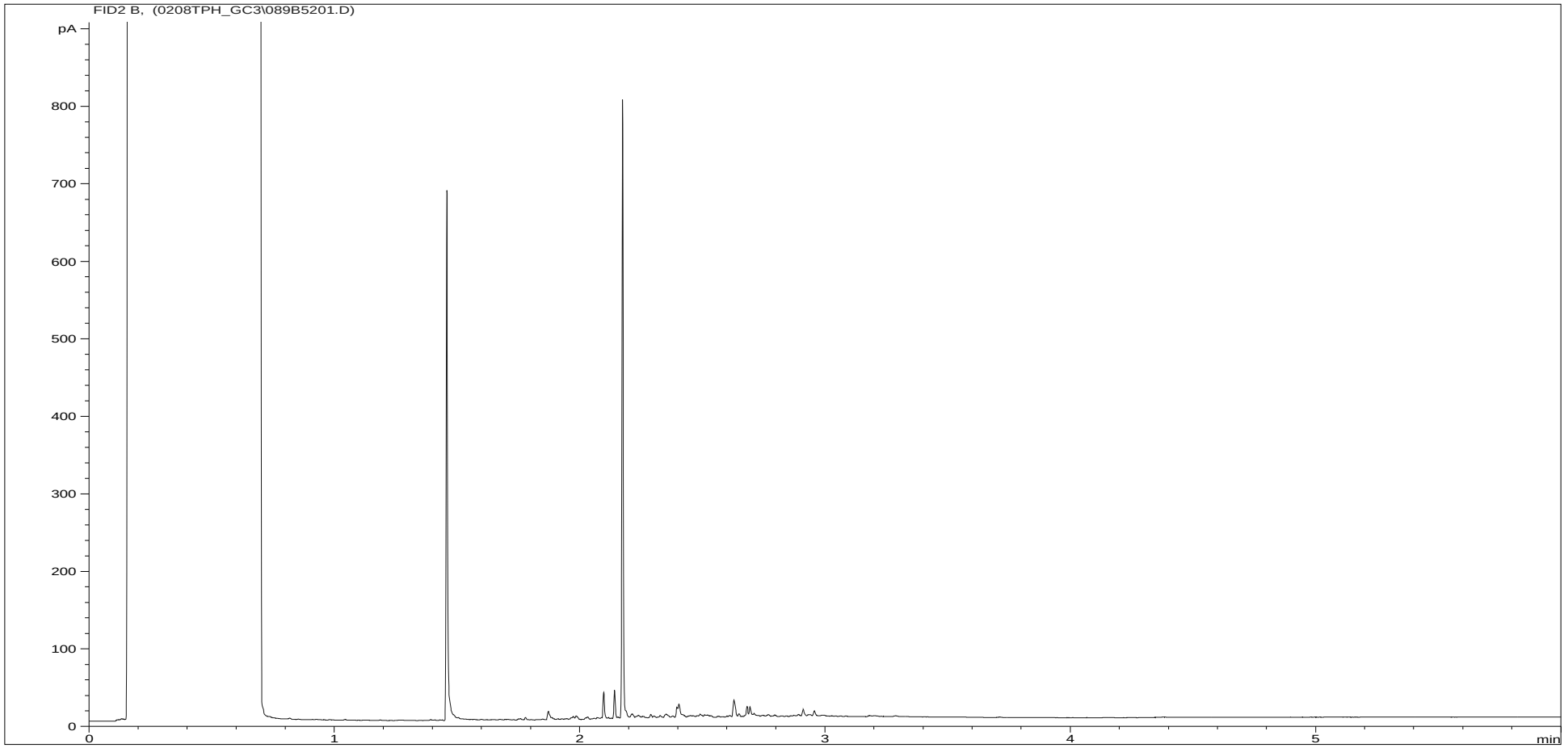
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103739ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP1 D 8 3.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\032F4901.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

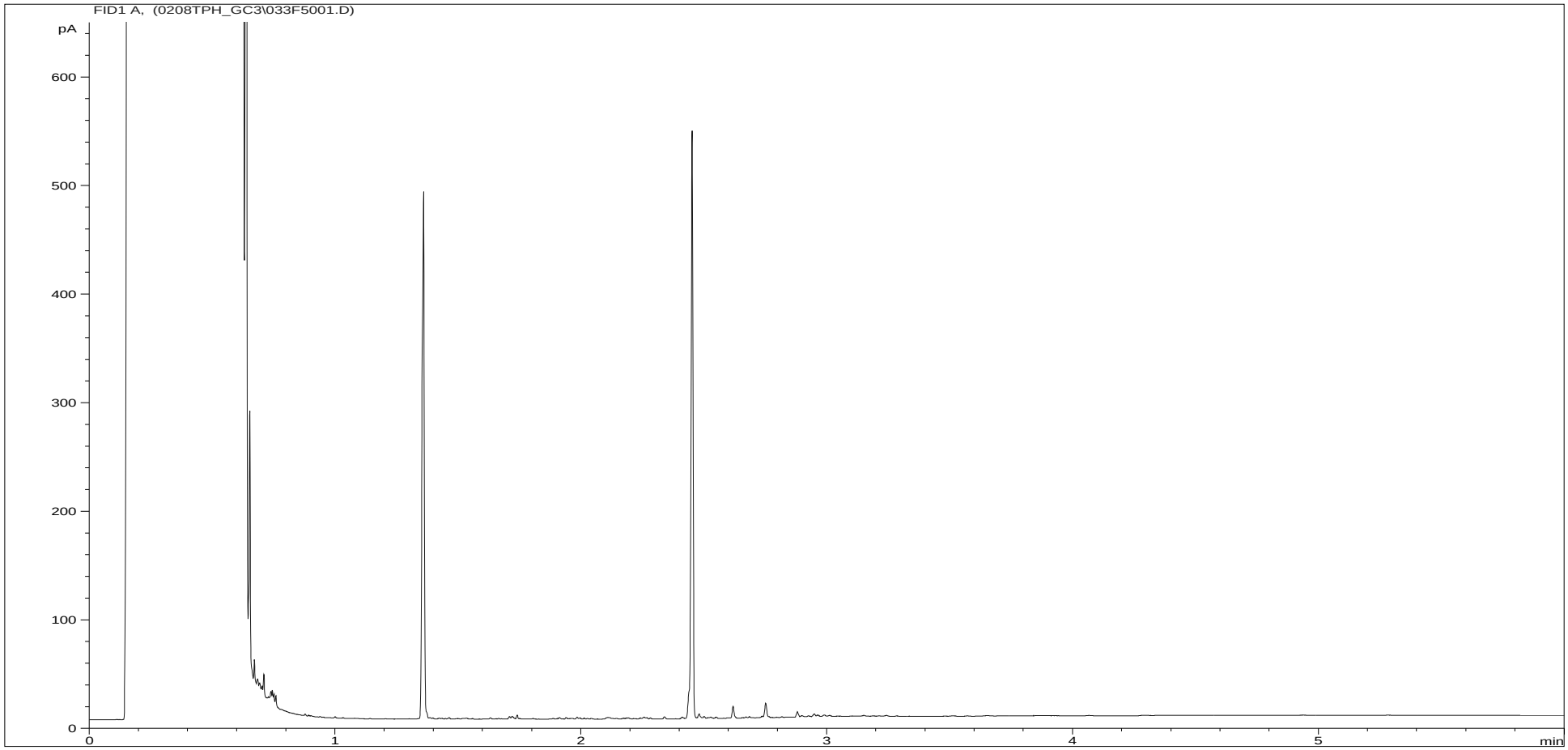
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103739ARO	**Job Number:**	S11_0798M
Multiplier:	11.4	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP1 D 8 3.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\089B5201.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

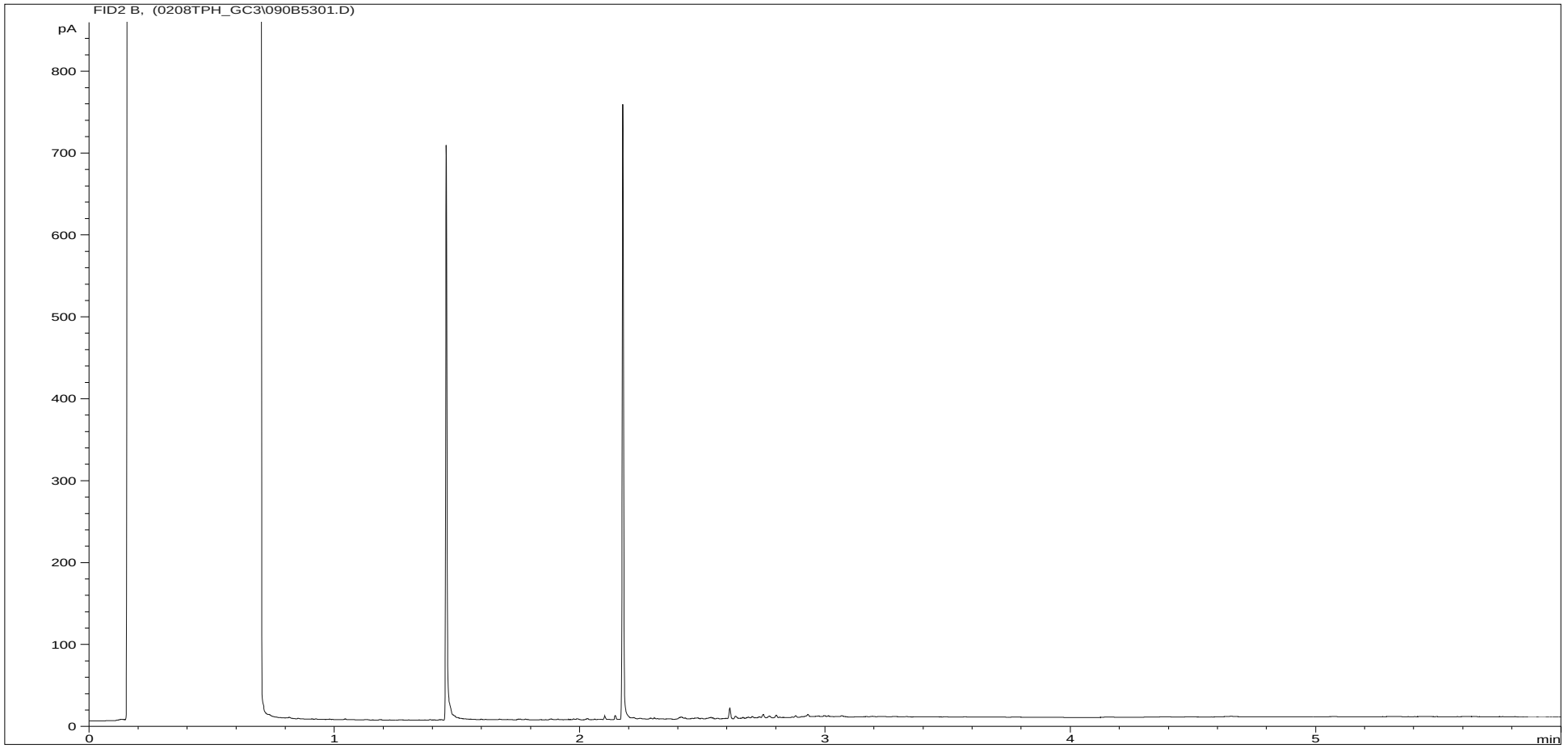
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103740ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP2 D 2 0.20
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\033F5001.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

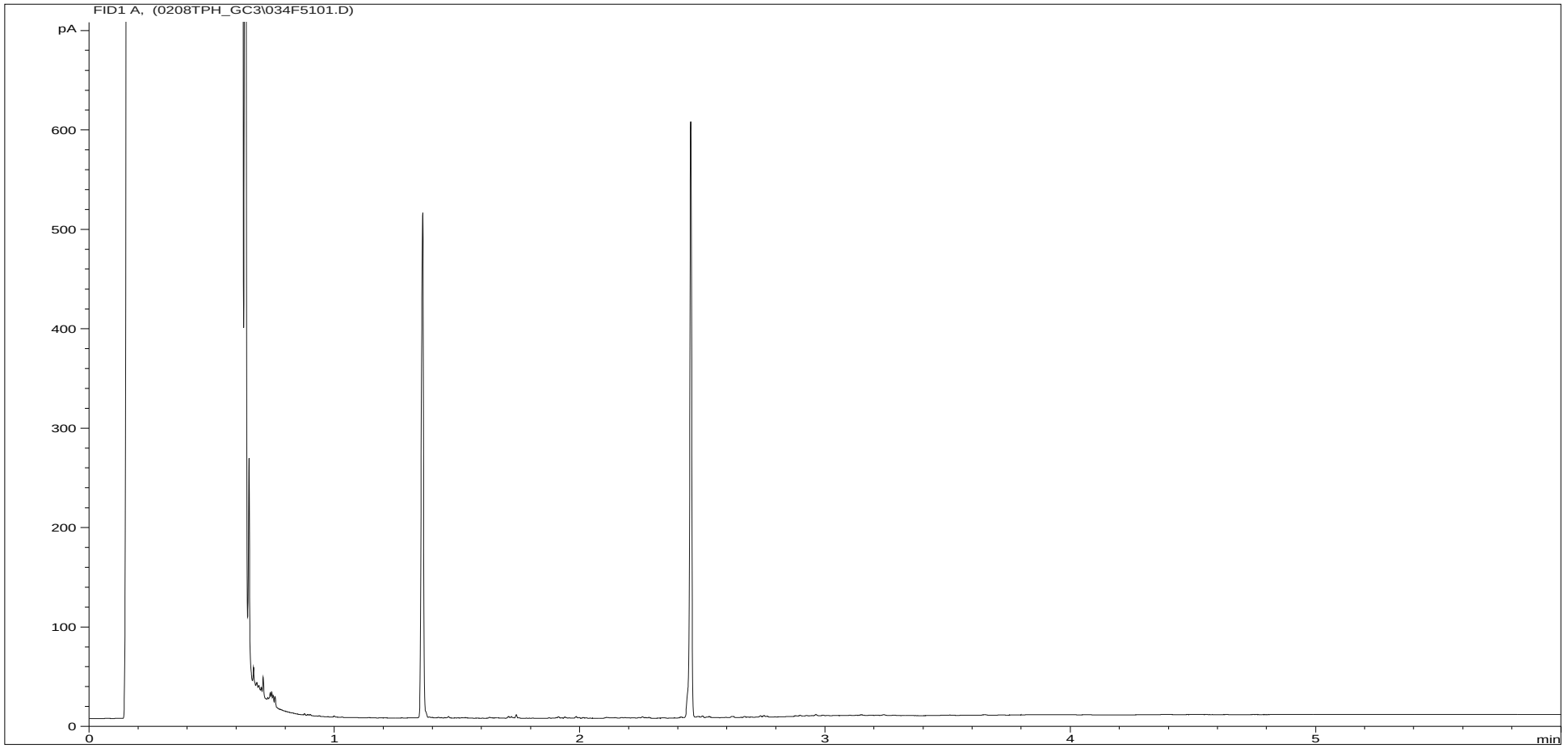
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103740ARO	**Job Number:**	S11_0798M
Multiplier:	11.4	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP2 D 2 0.20
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\090B5301.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

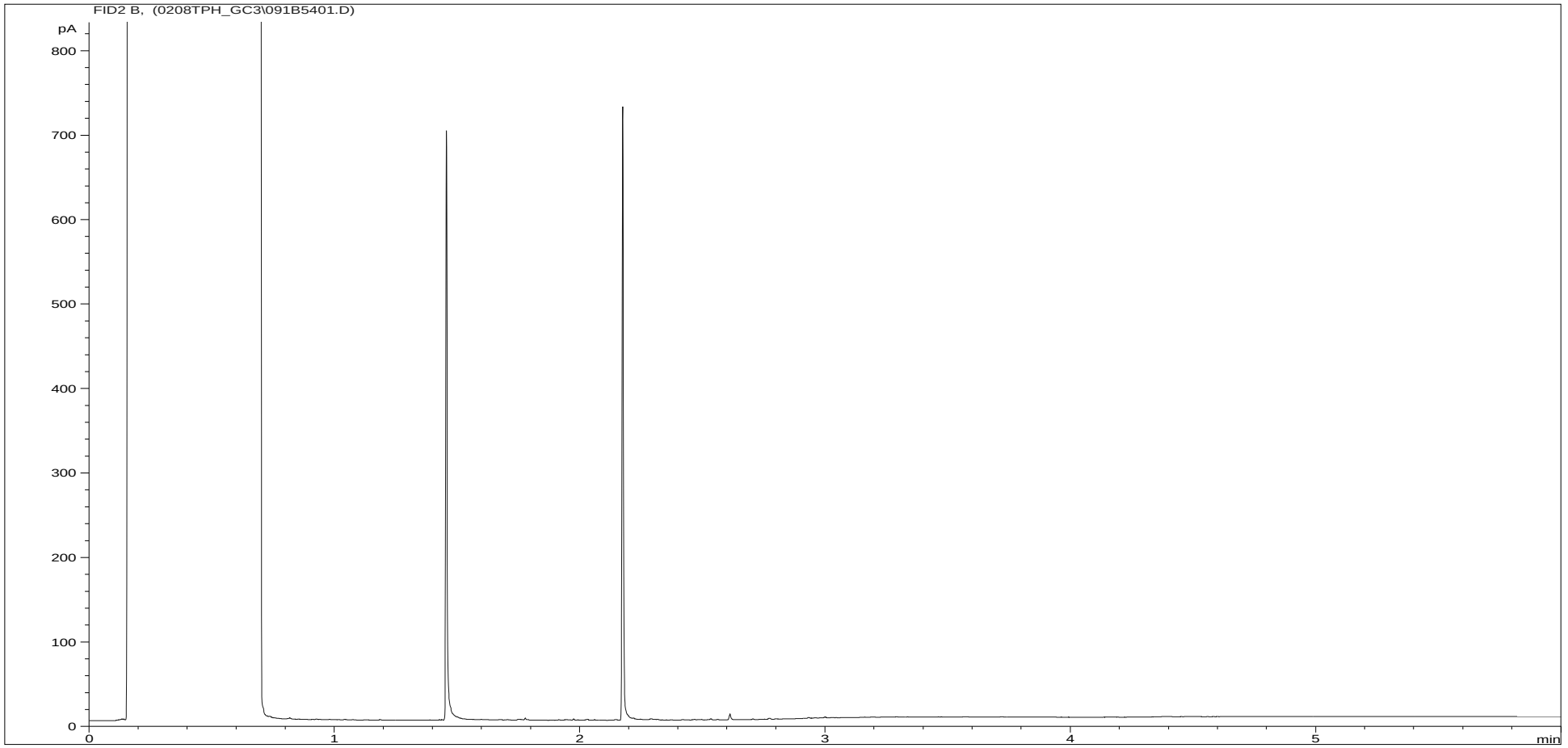
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103741ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP3 D 4 1.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\034F5101.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

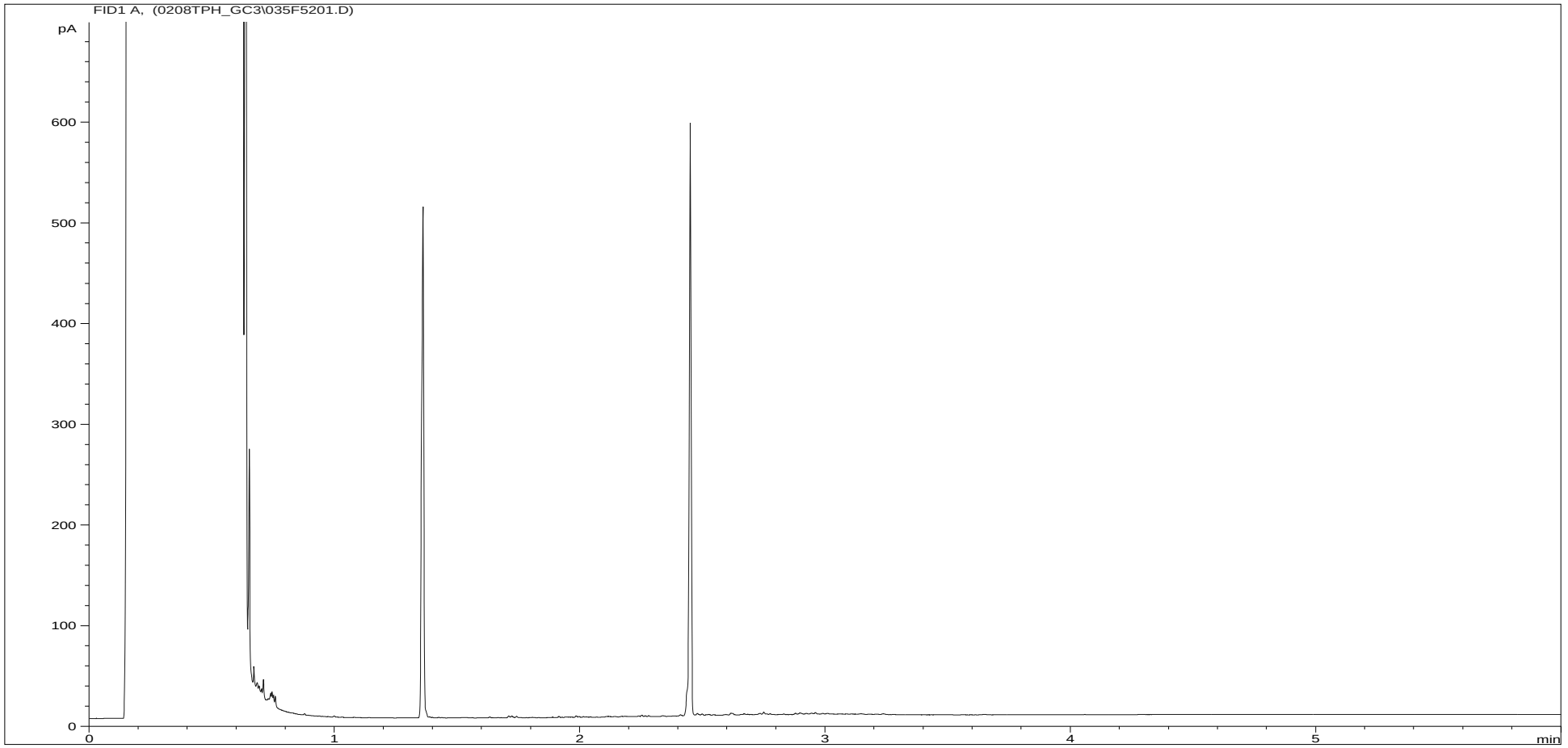
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103741ARO	**Job Number:**	S11_0798M
Multiplier:	11.78	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP3 D 4 1.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\091B5401.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

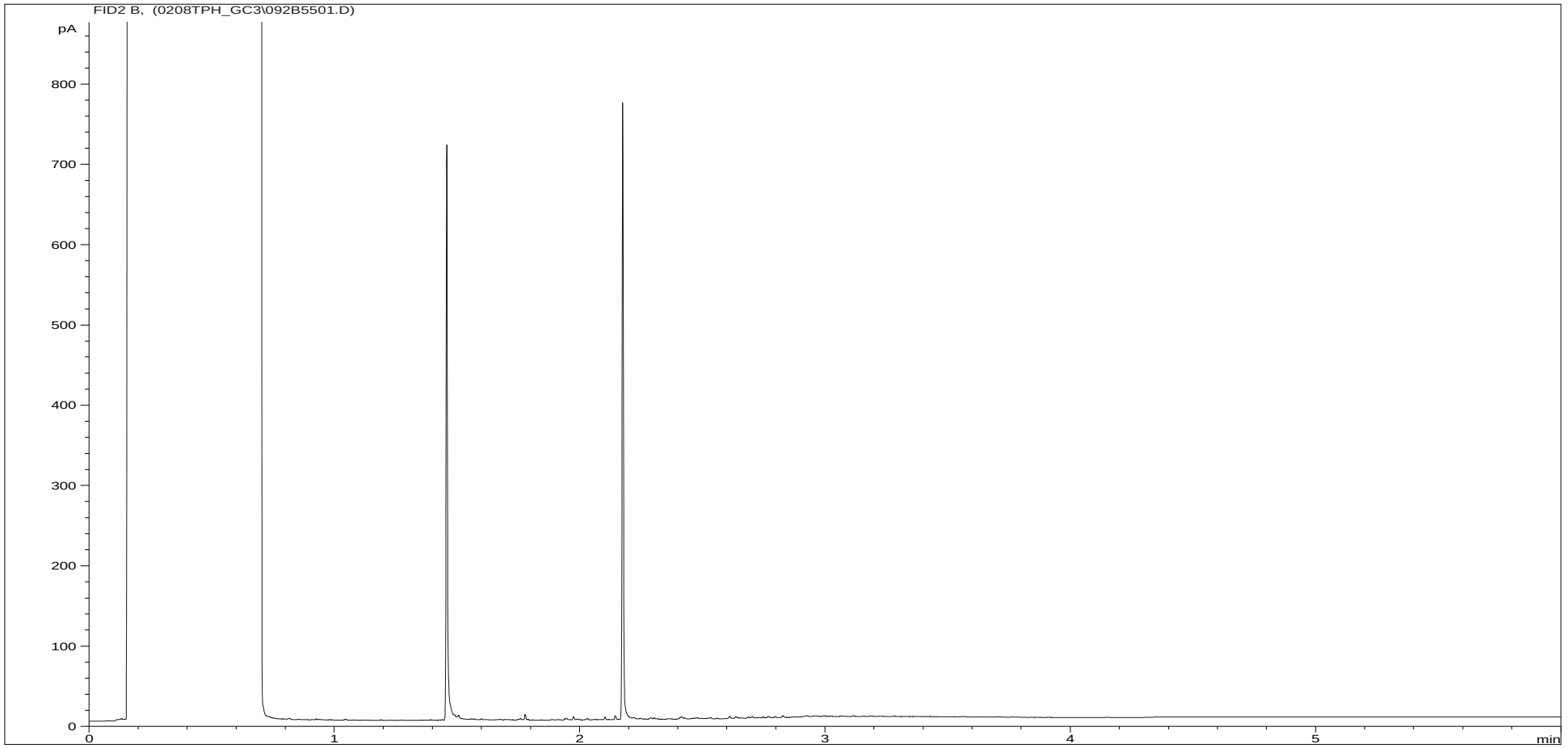
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103742ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP4 D 1 0.20
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\035F5201.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

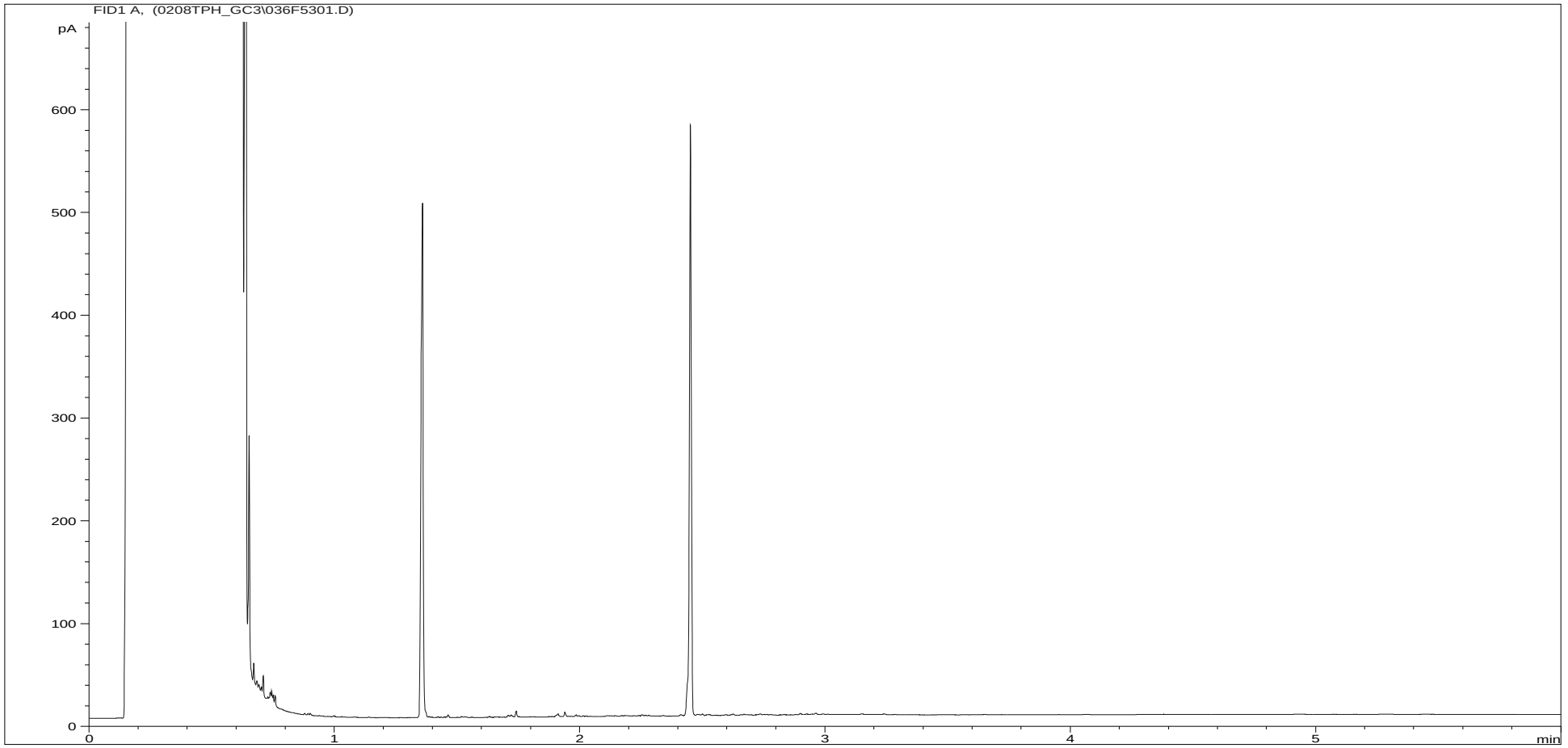
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103742ARO	**Job Number:**	S11_0798M
Multiplier:	11.78	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP4 D 1 0.20
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\092B5501.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

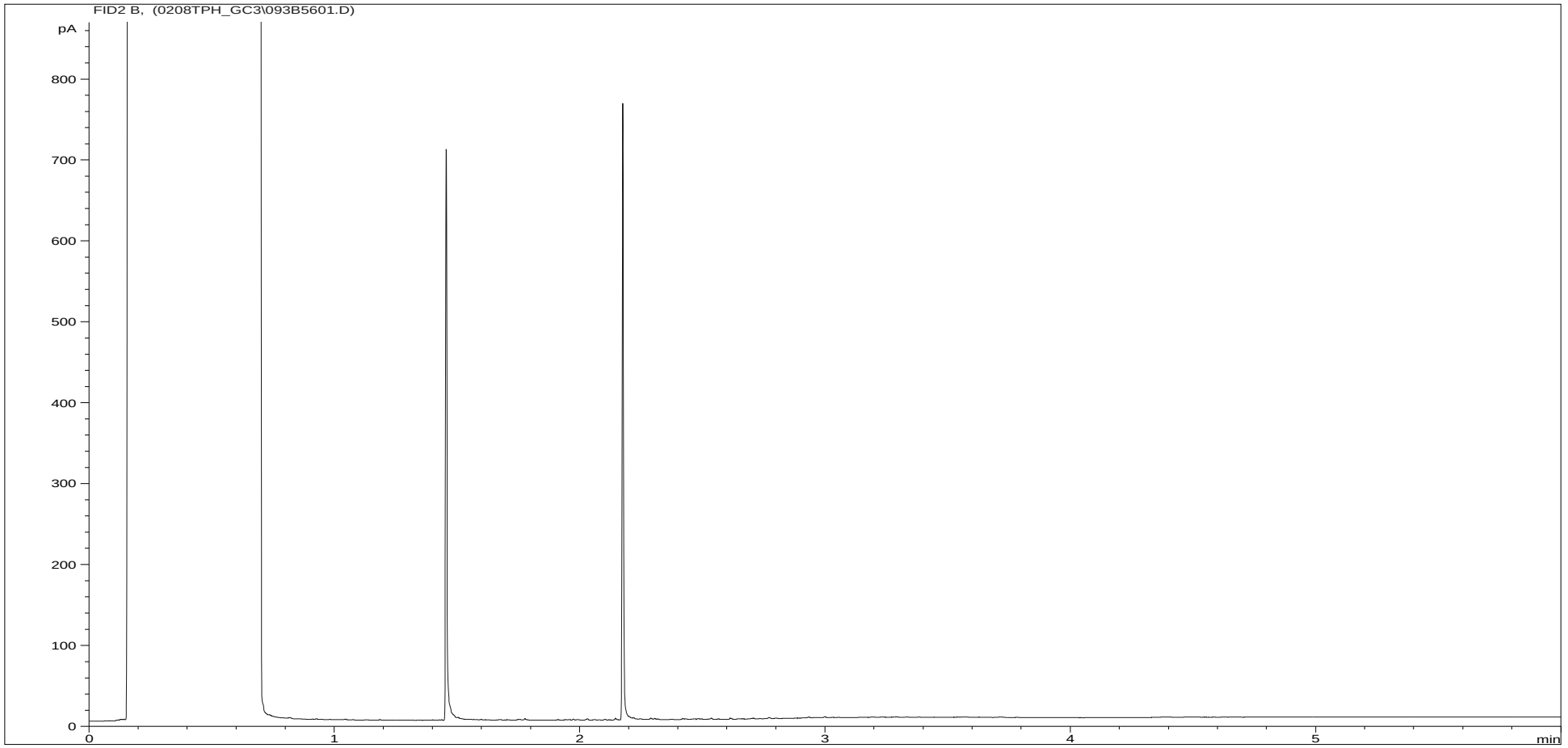
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103743ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP4 D 7 2.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\036F5301.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

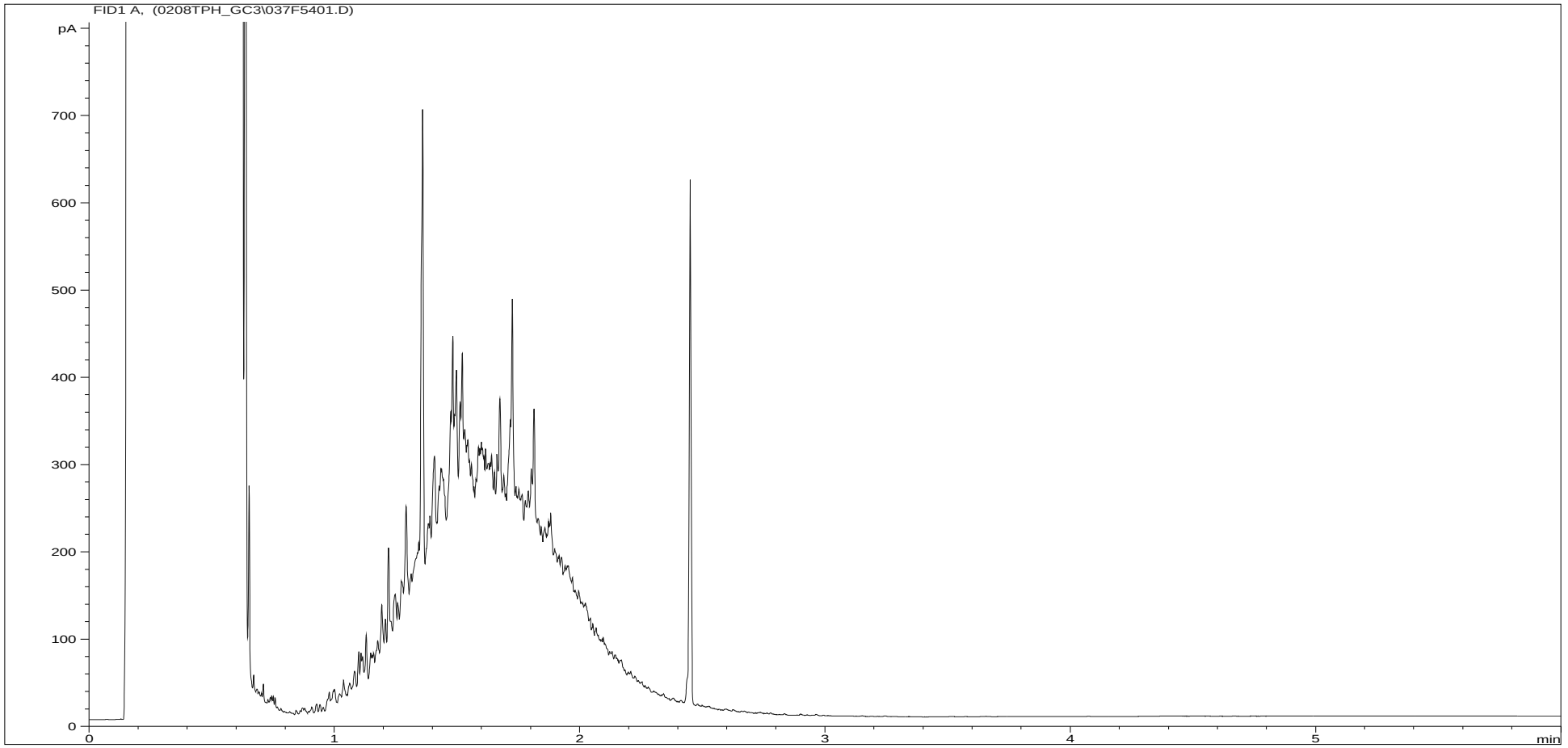
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103743ARO	**Job Number:**	S11_0798M
Multiplier:	11.4	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP4 D 7 2.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\093B5601.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

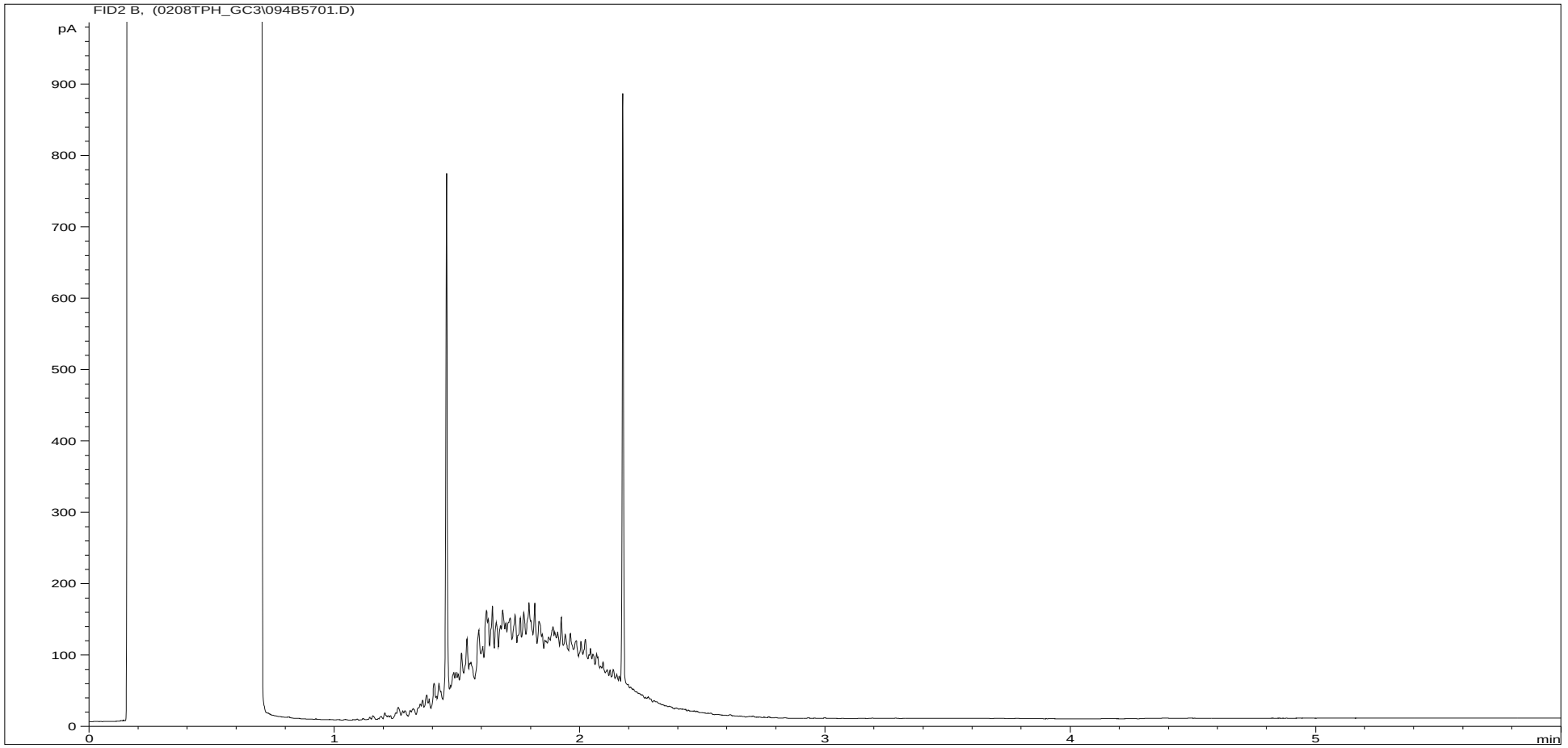
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103744ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP4 D 9 3.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\037F5401.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

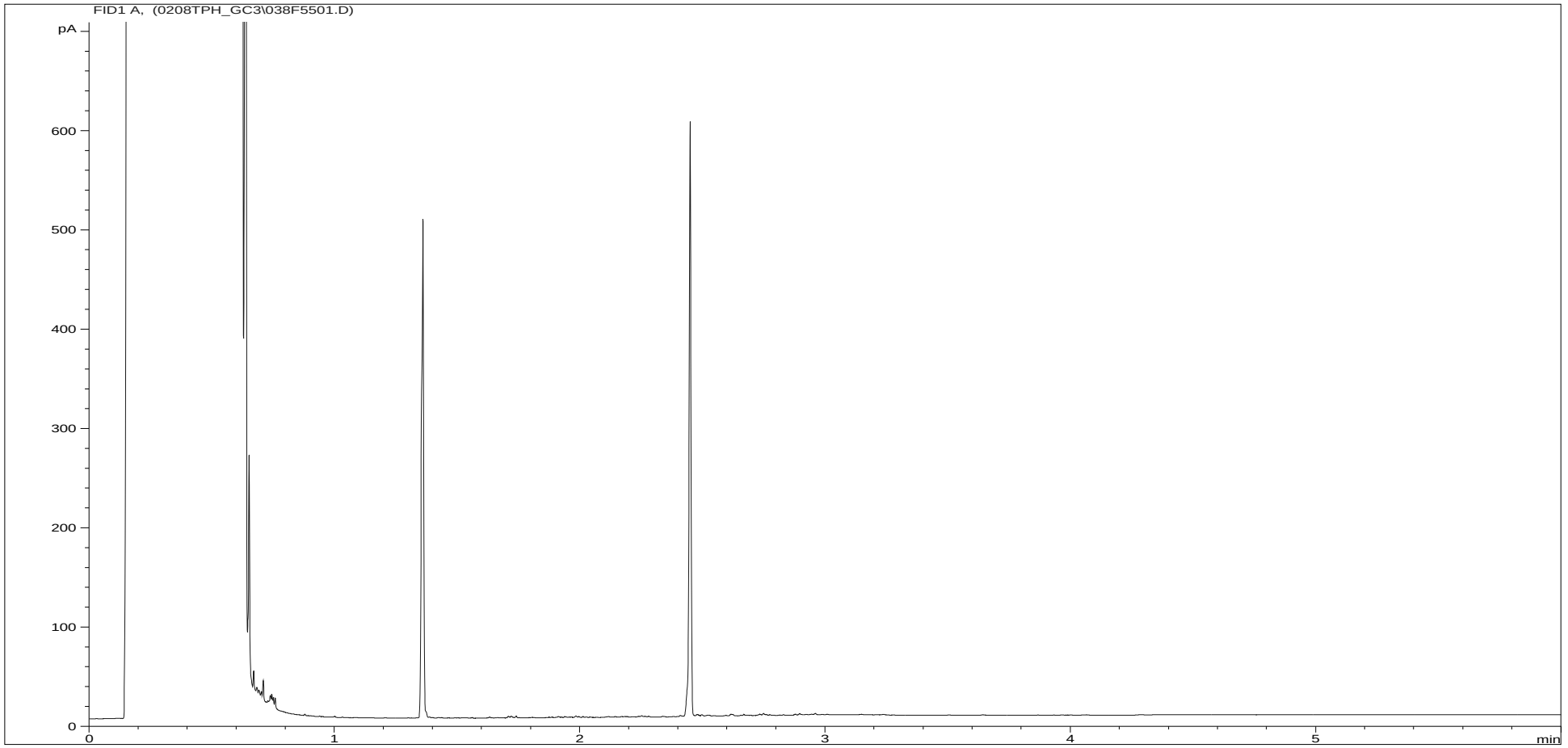
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103744ARO	**Job Number:**	S11_0798M
Multiplier:	11.78	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP4 D 9 3.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\094B5701.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

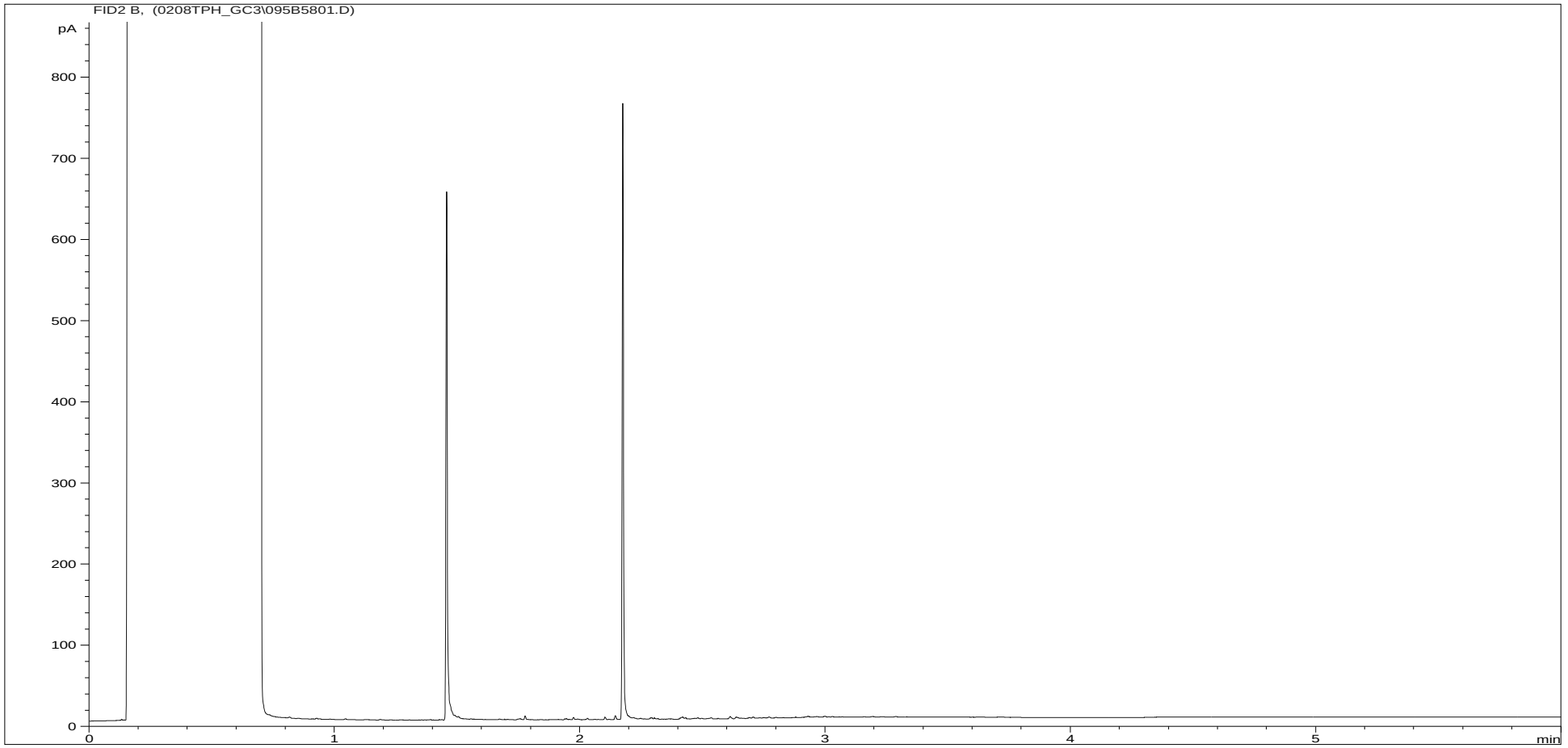
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103745ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP5 D 3 0.60
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\038F5501.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

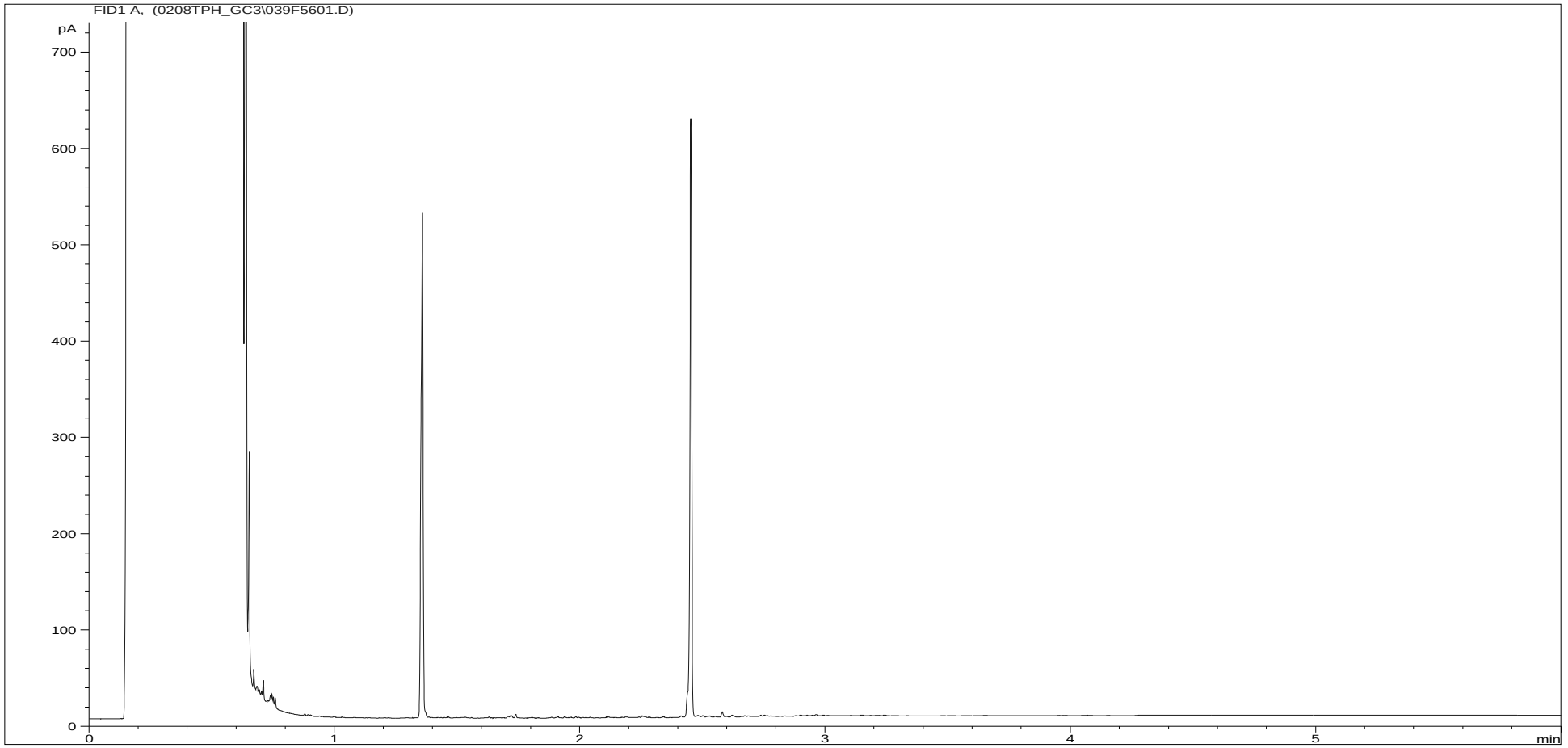
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103745ARO	**Job Number:**	S11_0798M
Multiplier:	11.4	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP5 D 3 0.60
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\095B5801.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

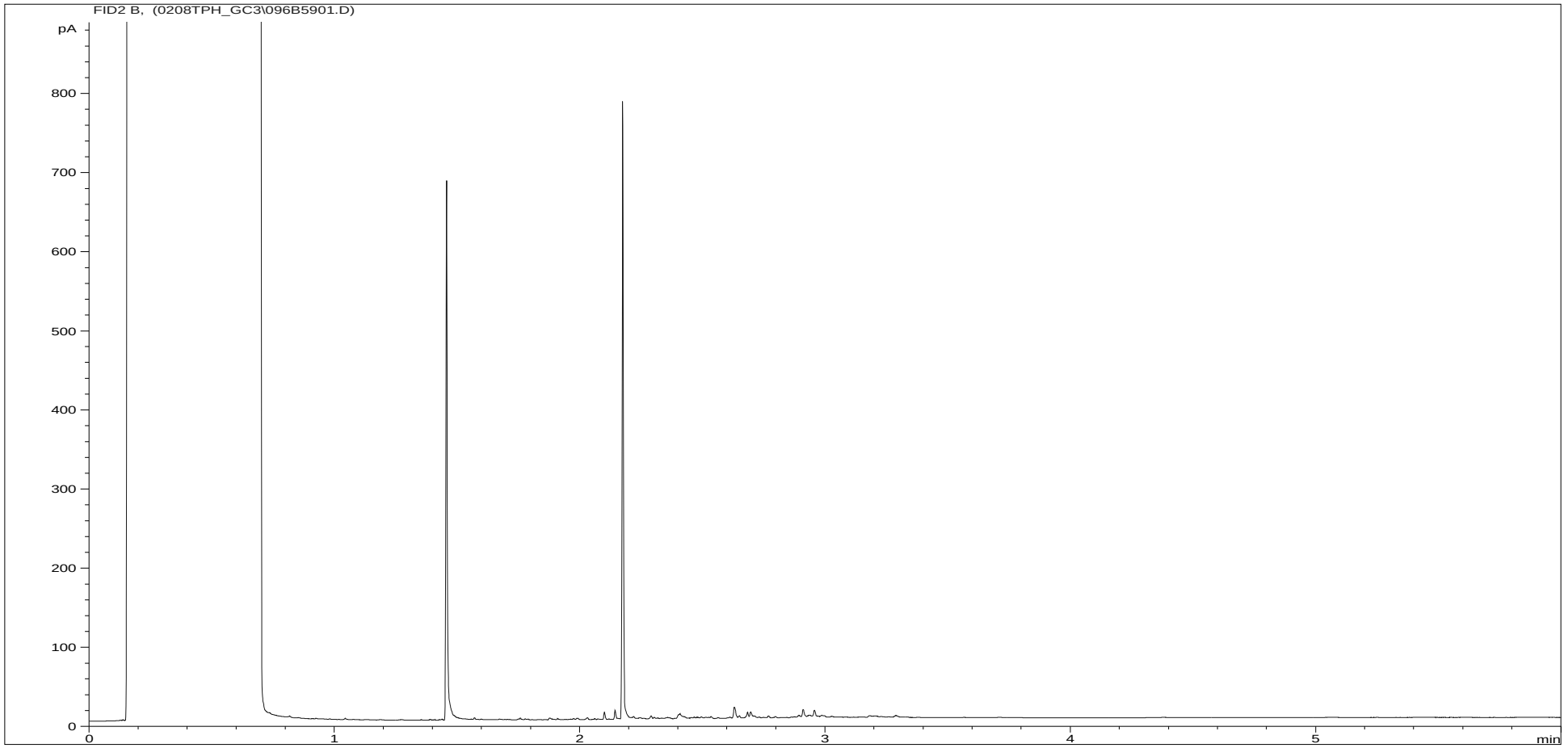
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103746ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP5 D 6 2.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\039F5601.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

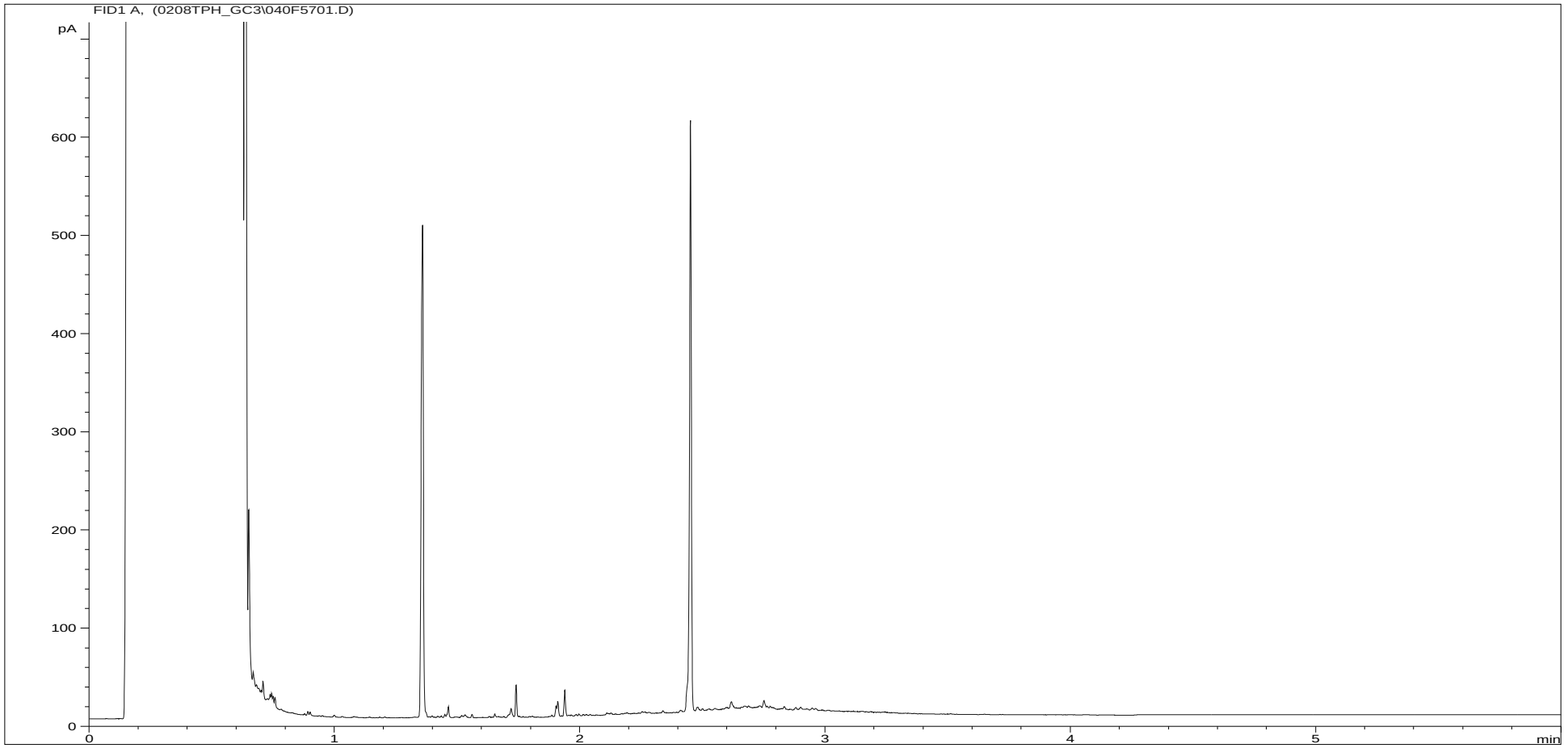
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103746ARO	**Job Number:**	S11_0798M
Multiplier:	11.78	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP5 D 6 2.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\096B5901.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

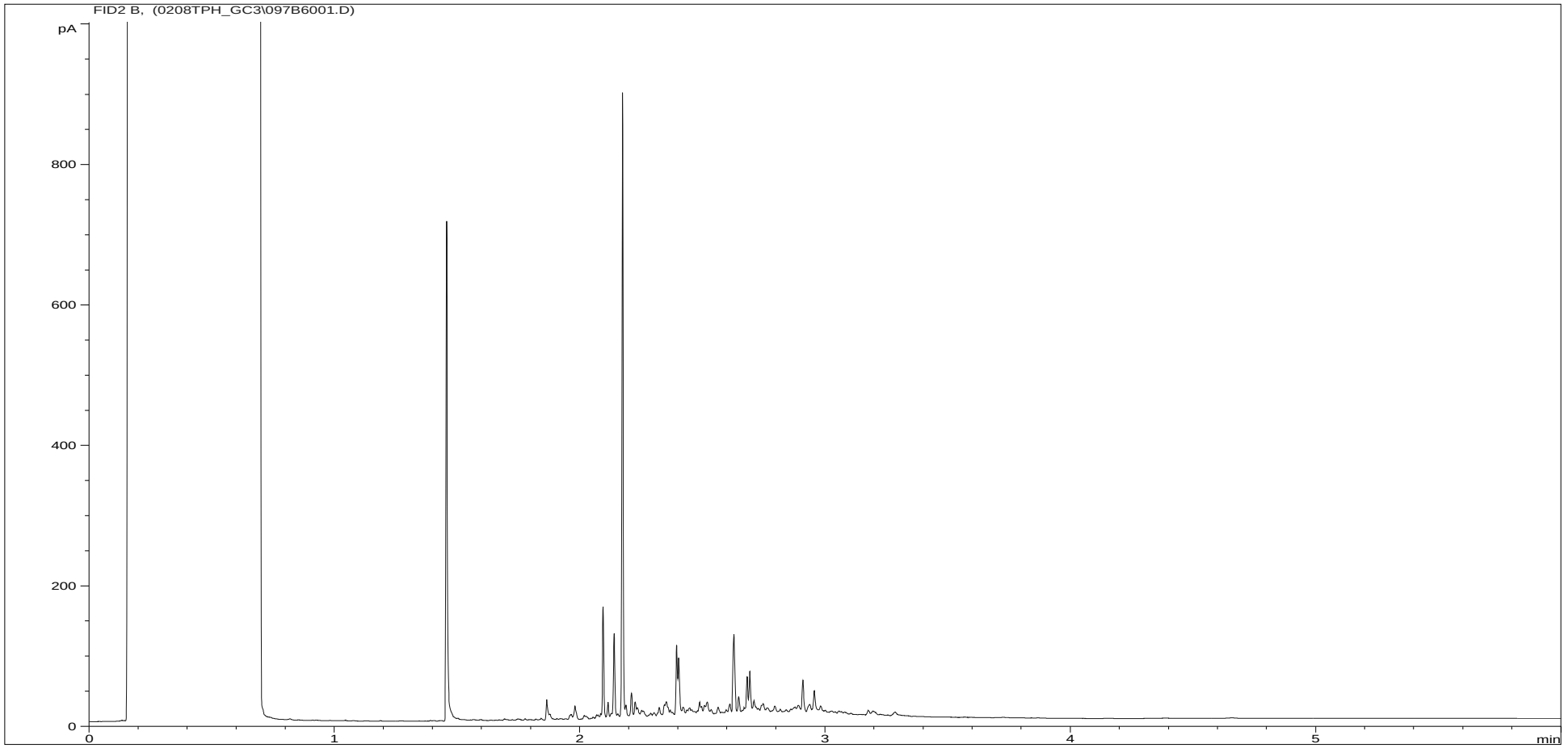
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103747ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP6 D 6 1.50
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\040F5701.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

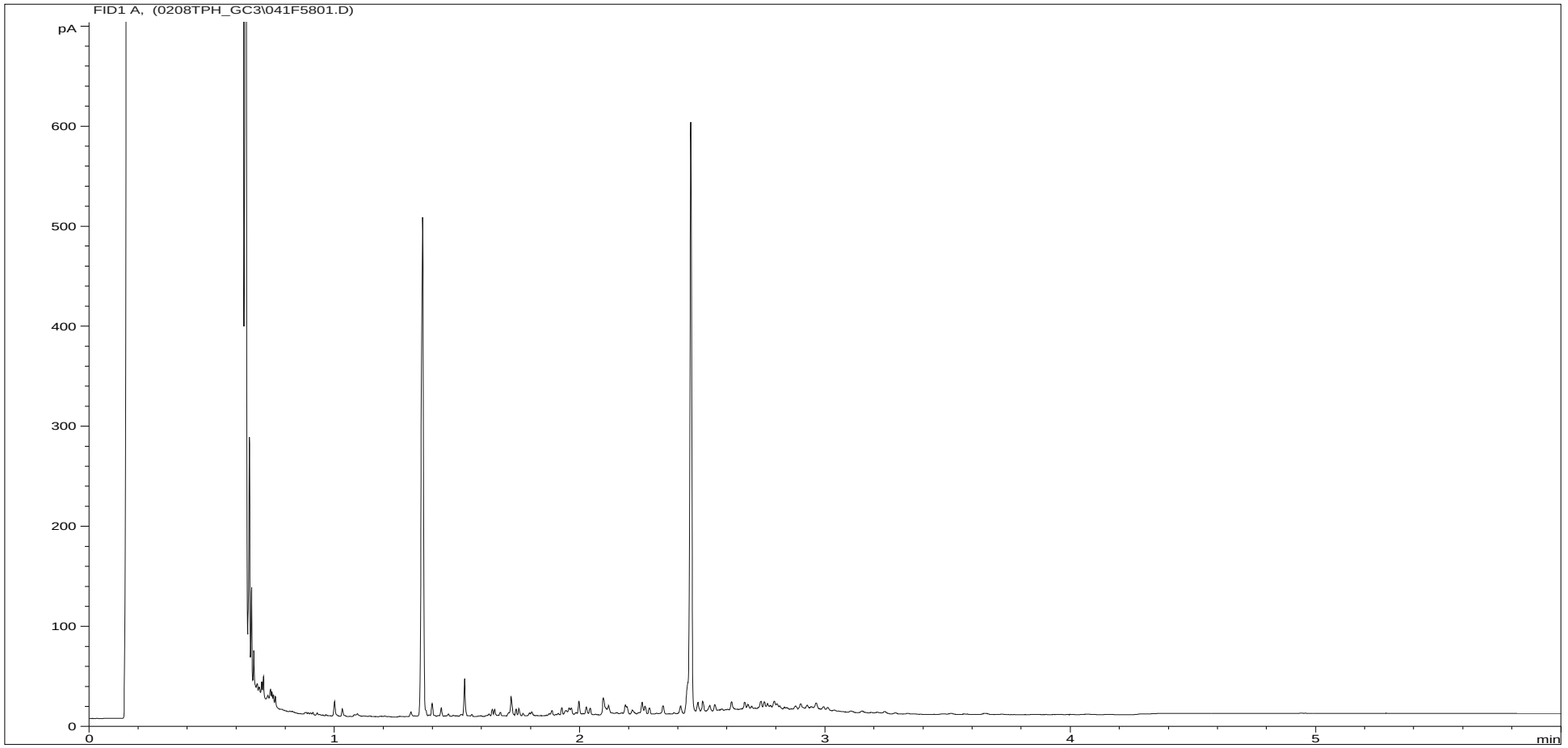
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103747ARO	**Job Number:**	S11_0798M
Multiplier:	11.4	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP6 D 6 1.50
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\097B6001.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

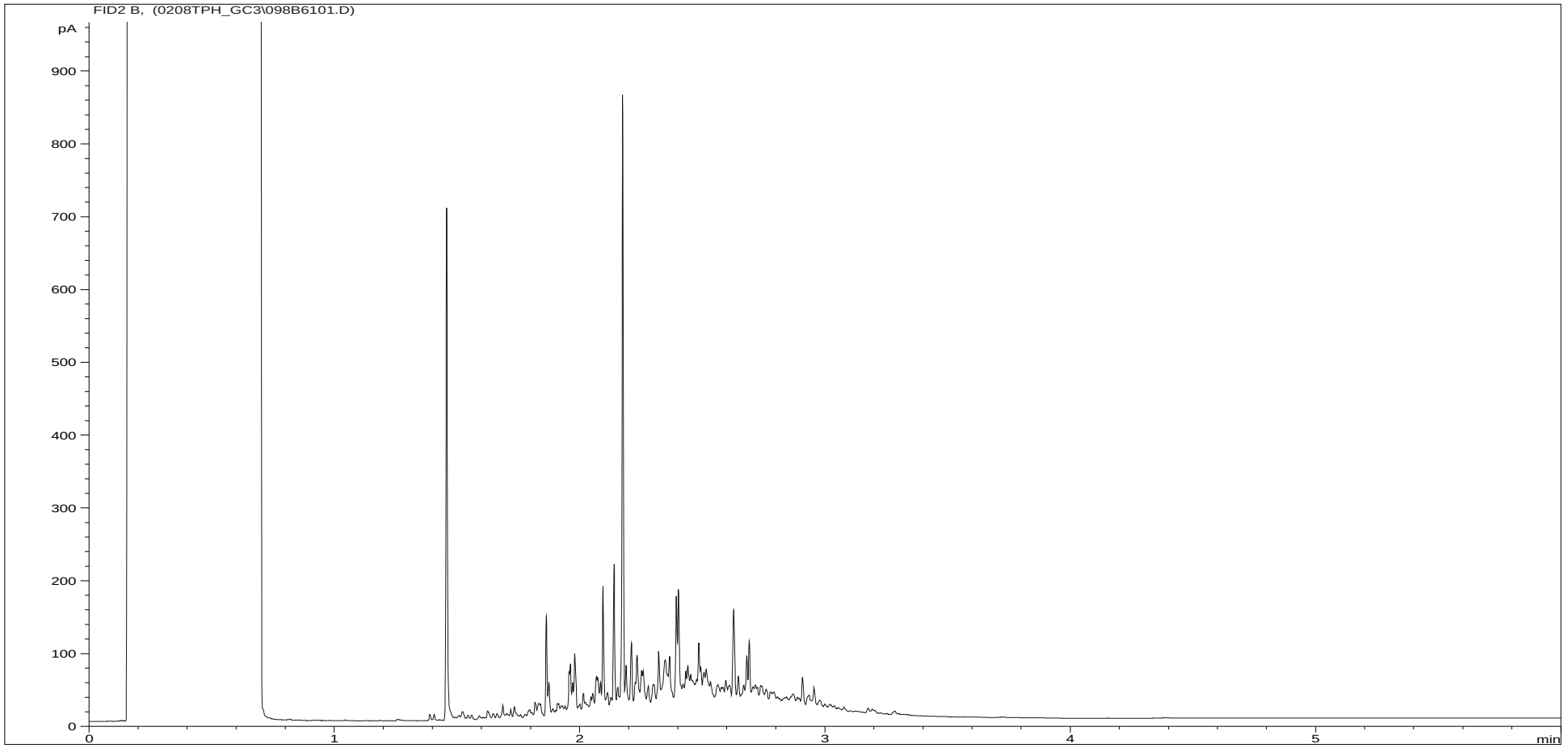
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103748ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP7 D 6 2.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\041F5801.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

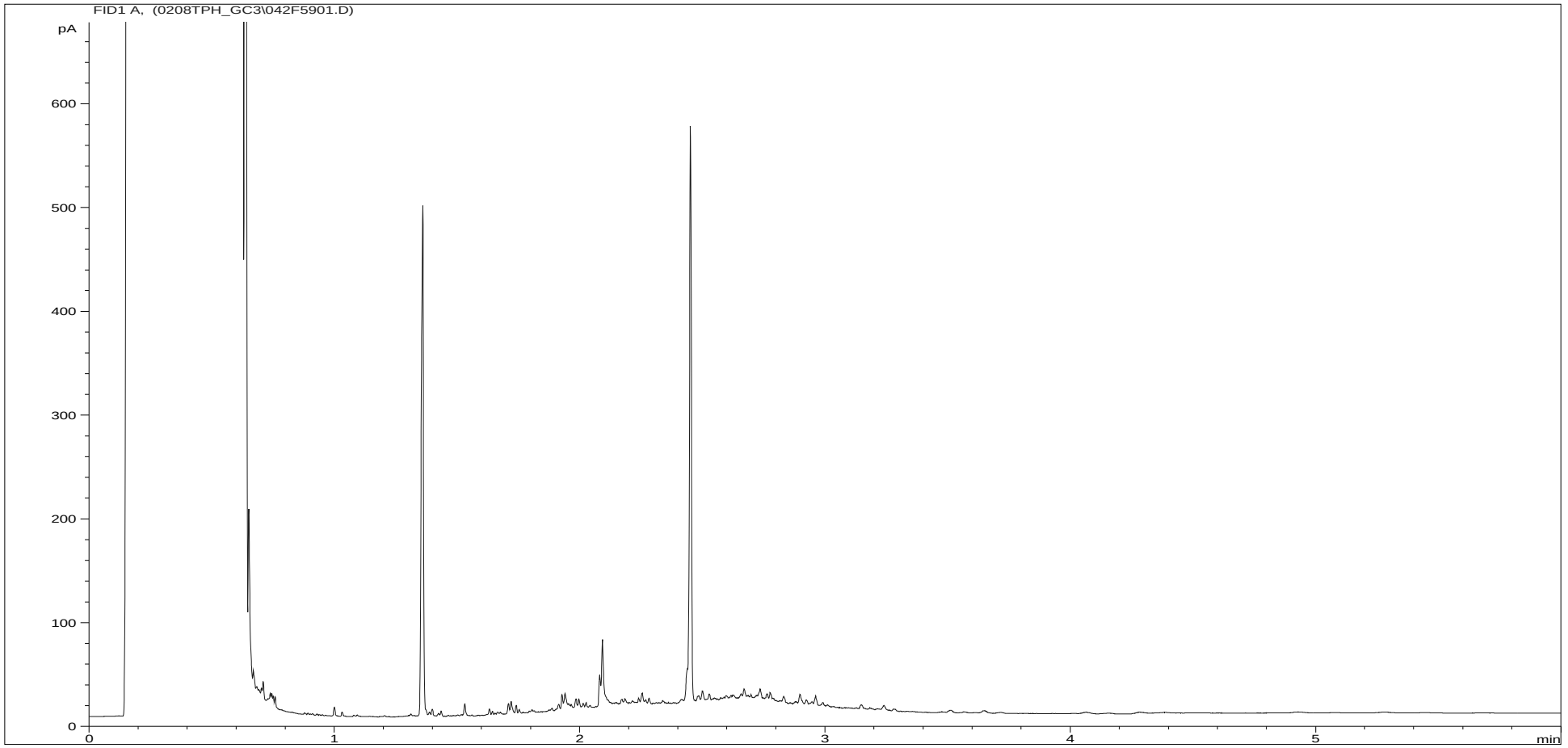
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103748ARO	**Job Number:**	S11_0798M
Multiplier:	11.78	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP7 D 6 2.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\098B6101.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

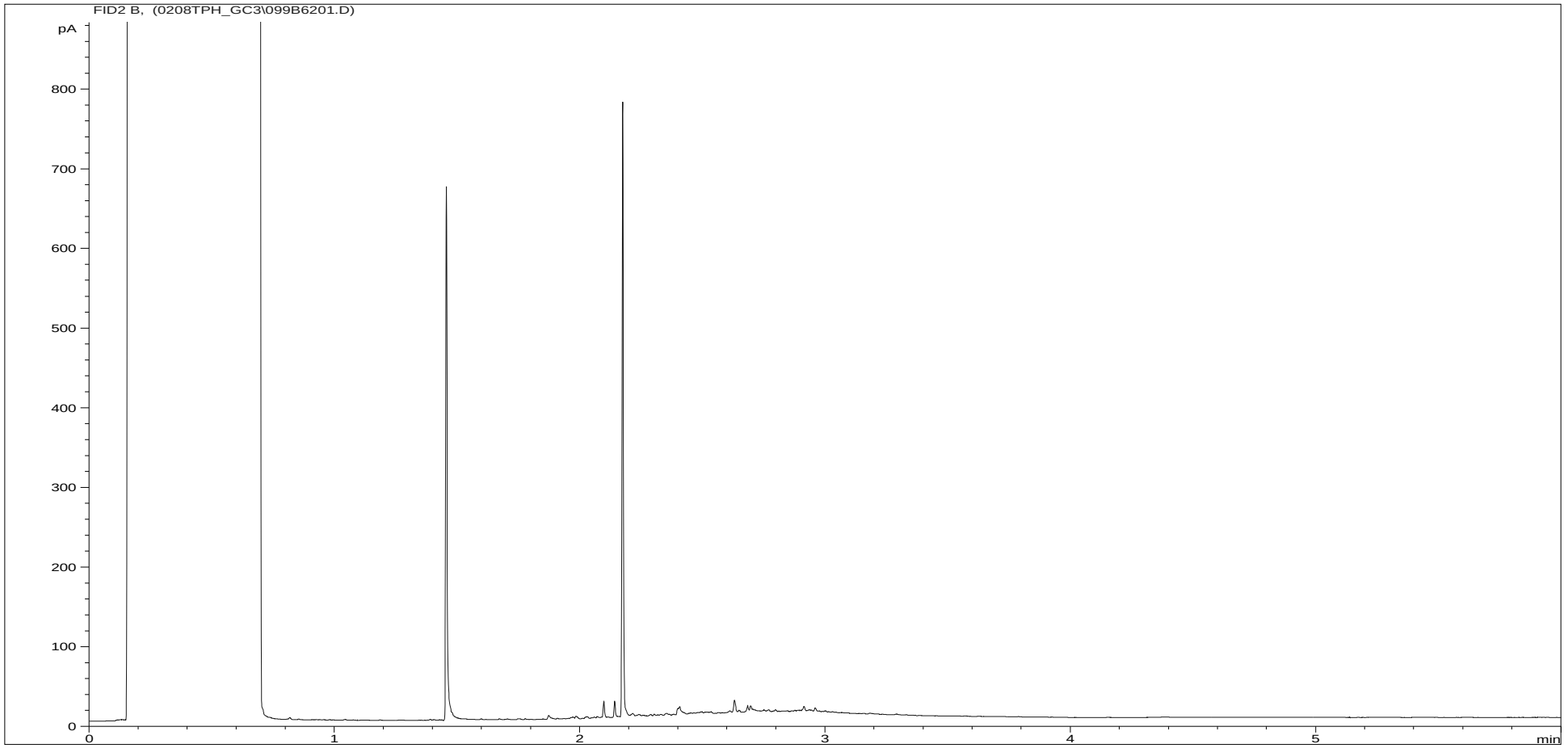
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103749ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP8 D 2 0.50
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\042F5901.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

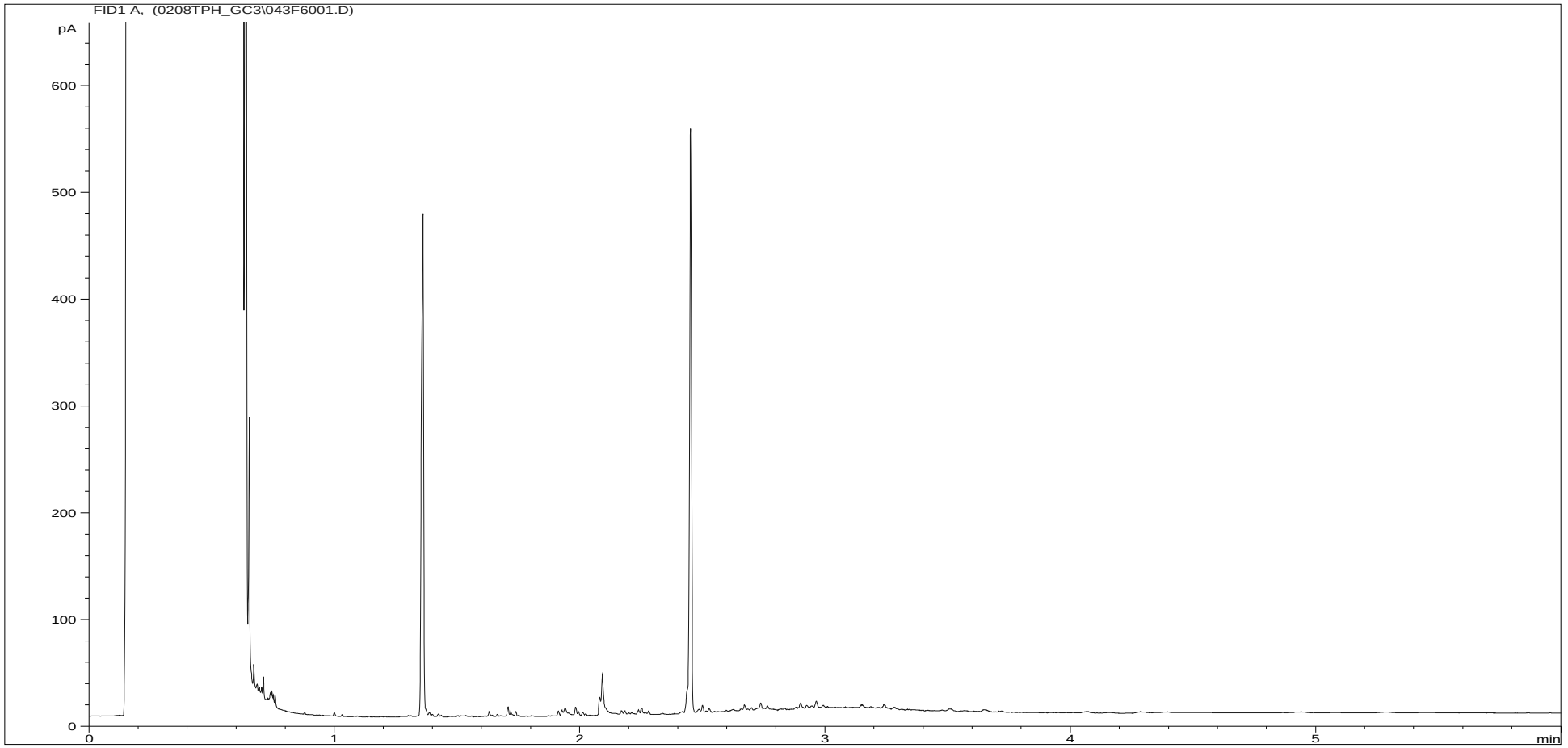
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103749ARO	**Job Number:**	S11_0798M
Multiplier:	11.78	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP8 D 2 0.50
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\099B6201.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

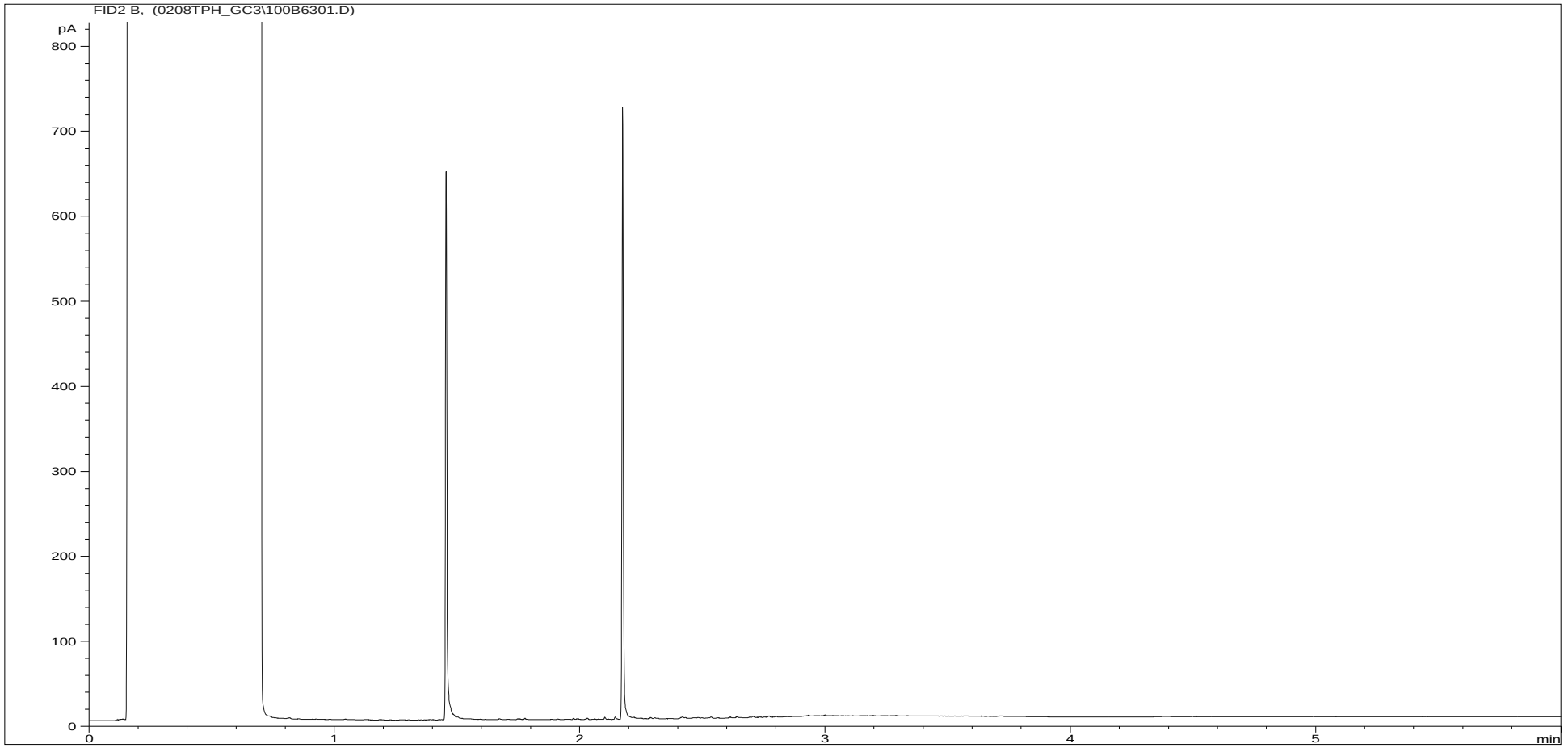
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103750ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP8 D 6 2.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\043F6001.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

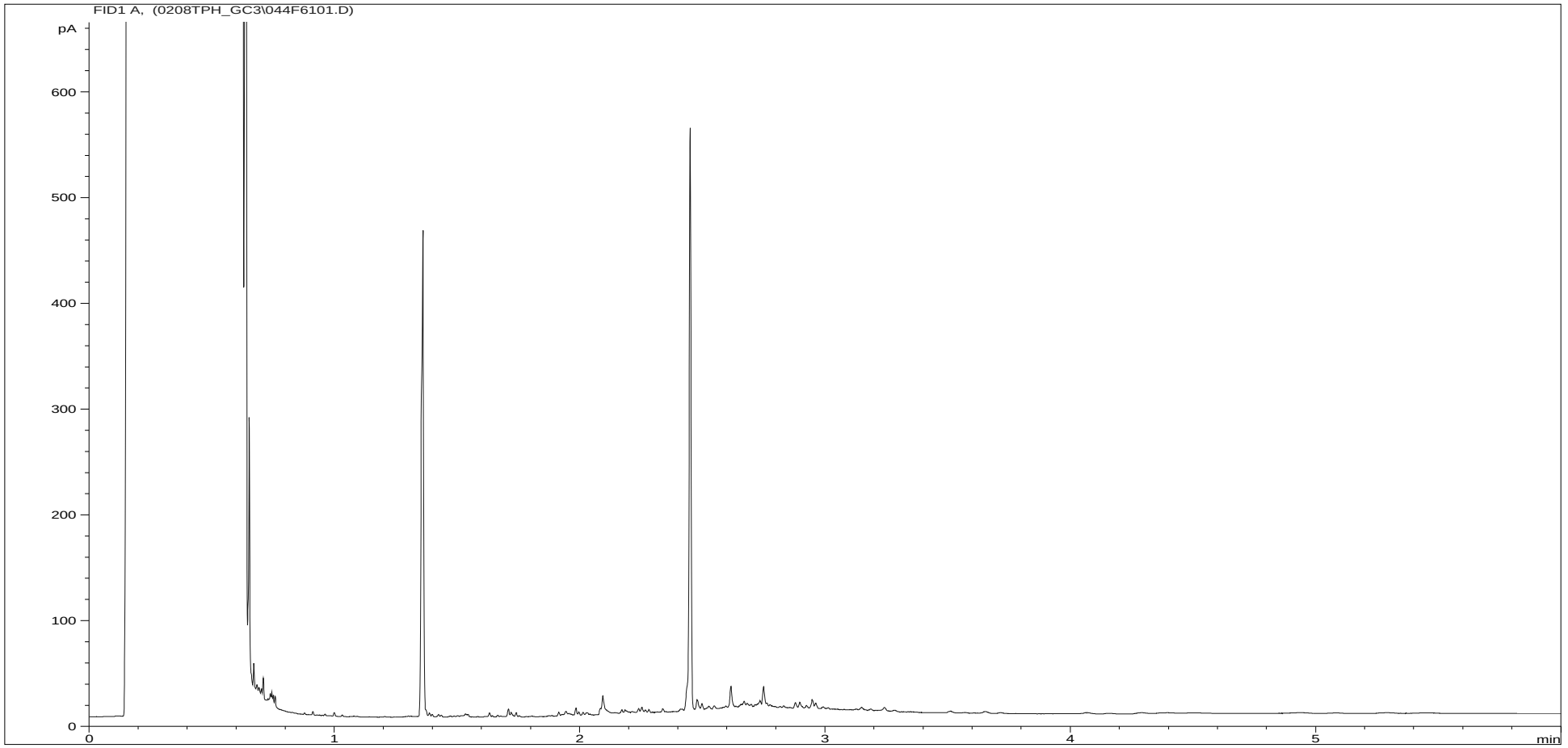
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103750ARO	**Job Number:**	S11_0798M
Multiplier:	11.78	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP8 D 6 2.00
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\100B6301.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

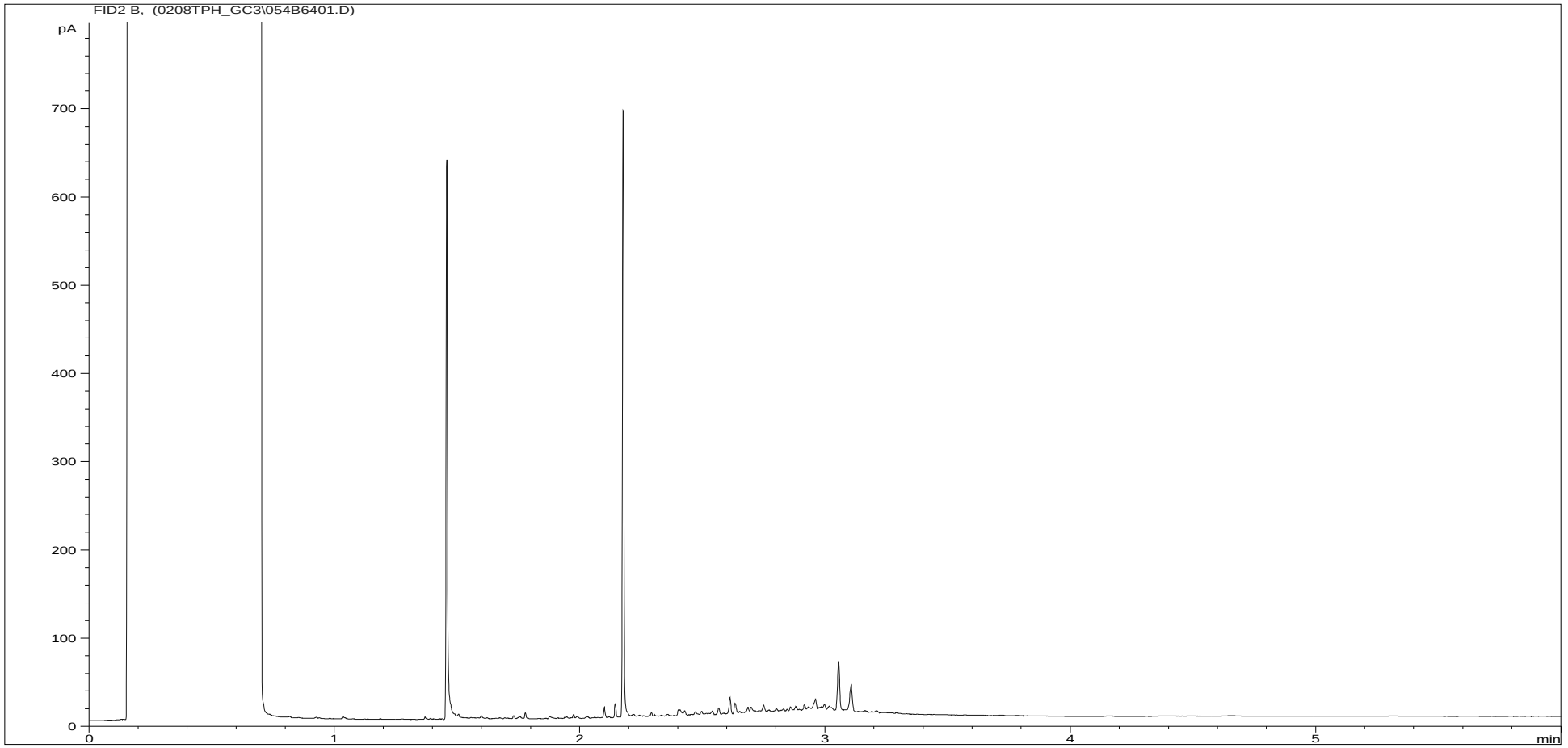
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103751ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP9 D 6 1.50
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\044F6101.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

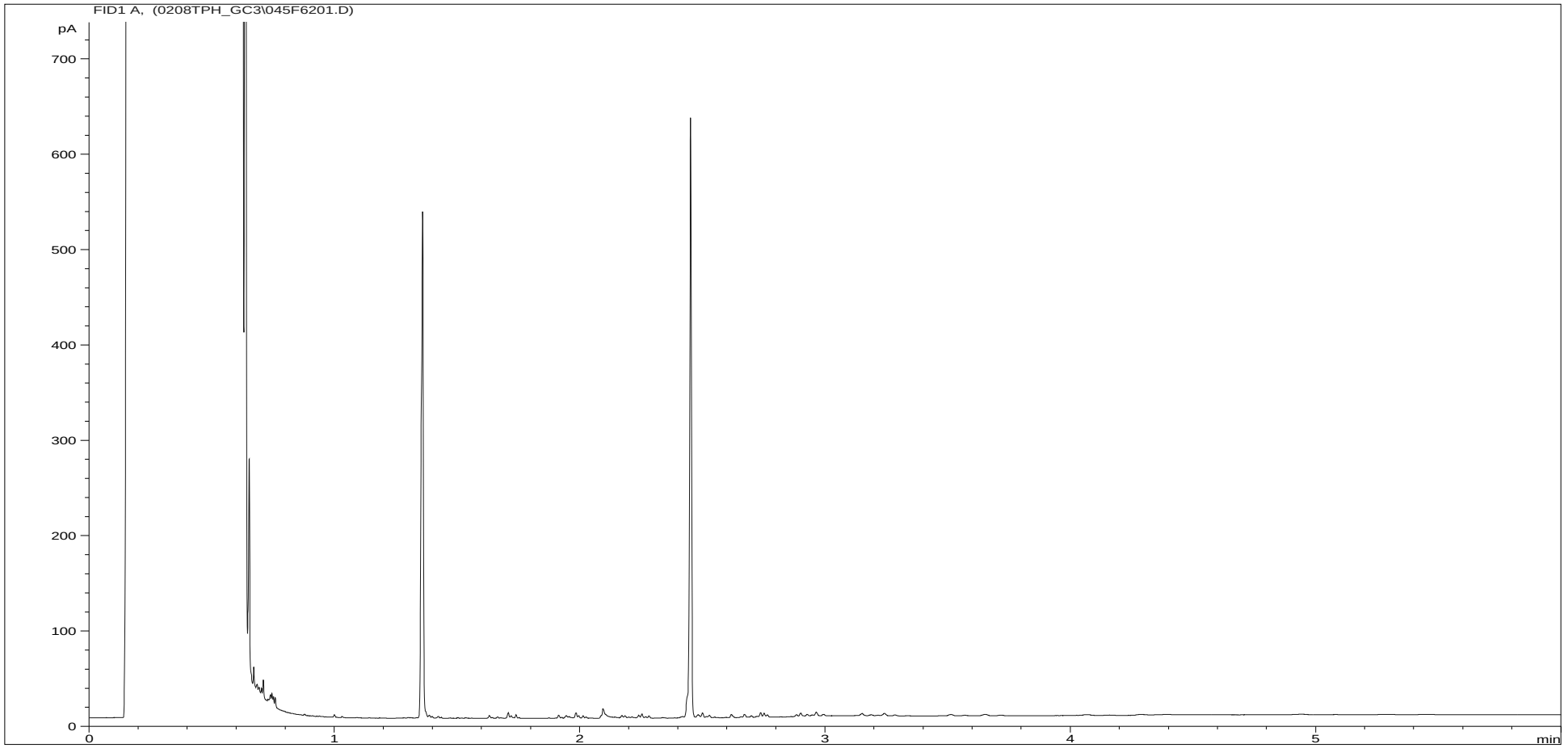
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103751ARO	**Job Number:**	S11_0798M
Multiplier:	11.78	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP9 D 6 1.50
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\054B6401.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

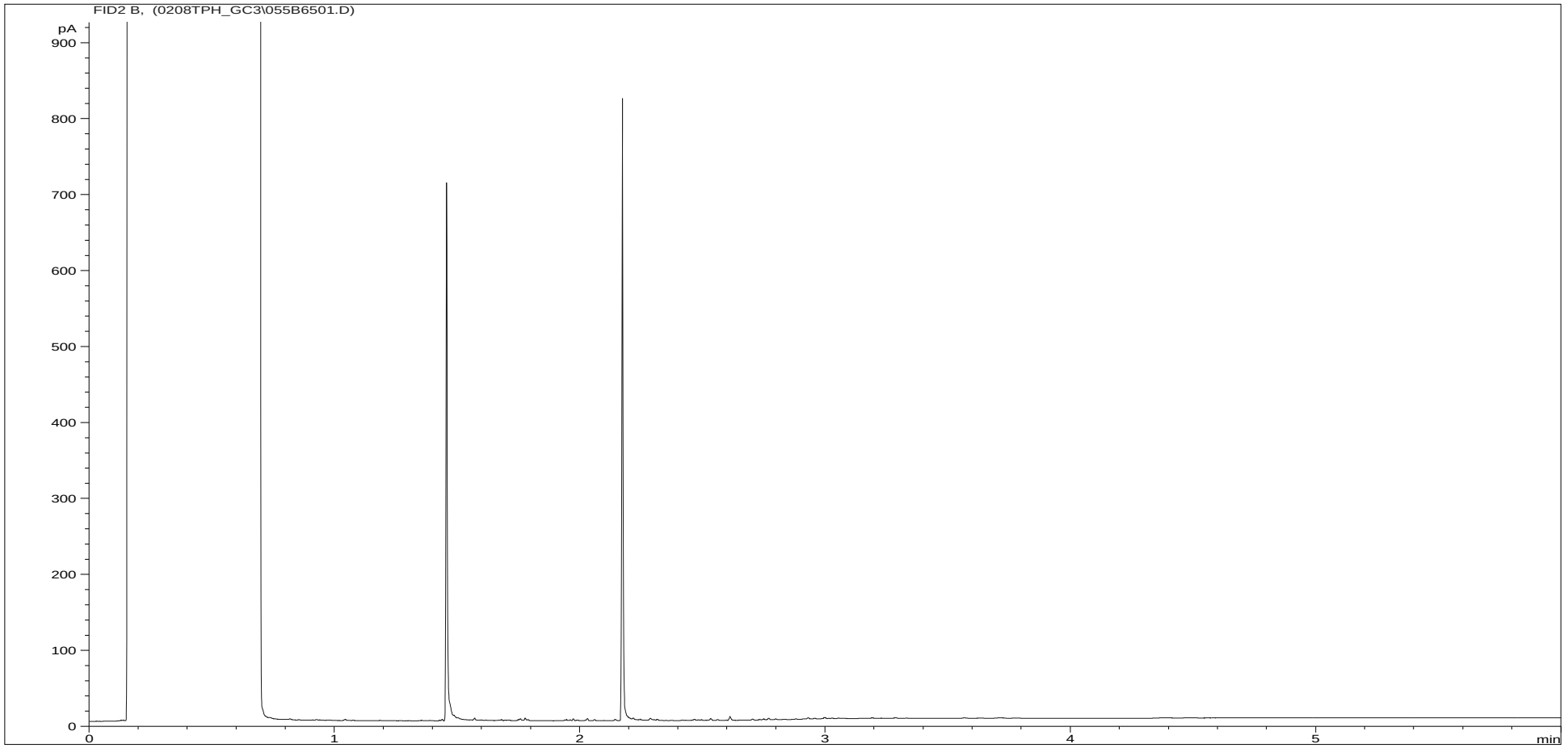
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1103752ALI	**Job Number:**	S11_0798M
Multiplier:	15.2	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP10 D 1 0.30
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\045F6201.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1103752ARO	**Job Number:**	S11_0798M
Multiplier:	11.4	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	TP10 D 1 0.30
Acquisition Date/Time:	08-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0208TPH_GC3\055B6501.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details:	Soil Mechanics: Machyny's Mound	**Directory/Quant file:**	211VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	TP1 D 5 1.00	**Date Booked in:**	04-Feb-11	**Method:**	Headspace
LIMS ID Number:	CL1103738	**Date Analysed:**	11-Feb-11	**Multiplier:**	1
Job Number:	S11_0798M	**Operator:**	TP	**Position:**	13

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48*	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 2	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	-	< 1	-	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.66	6	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.80	2	M	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5*	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 **	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	-	< 6	-	N
1,2,3-Trichlorobenzene	87-61-6 **	-	4	-	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.15	93	Dibromofluoromethane	106
1,4-Difluorobenzene	4.49	93	Toluene-d8	97
Chlorobenzene-d5	5.60	84		
Bromofluorobenzene	5.99	72		
1,4-Dichlorobenzene-d4	6.40	60		
Naphthalene-D8	7.28	25		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details:	Soil Mechanics: Machyny's Mound	**Directory/Quant file:**	211VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	TP1 D 8 3.00	**Date Booked in:**	04-Feb-11	**Method:**	Headspace
LIMS ID Number:	CL1103739	**Date Analysed:**	11-Feb-11	**Multiplier:**	1
Job Number:	S11_0798M	**Operator:**	TP	**Position:**	14

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48*	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 2	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.34	4	M	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.61	1	M	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.09	6	M	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	5.30	4	M	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	5.62	4	M	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.66	11	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.80	6	M	UM
Styrene	100-42-5	5.81	2	M	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5*	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.10	2	M	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.24	2	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	6.41	1	M	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	6.55	1	M	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 **	7.17	17	M	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	7.29	21	M	N
1,2,3-Trichlorobenzene	87-61-6 **	7.42	14	M	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.15	68	Dibromofluoromethane	122
1,4-Difluorobenzene	4.49	61	Toluene-d8	96
Chlorobenzene-d5	5.60	43		
Bromofluorobenzene	6.00	29		
1,4-Dichlorobenzene-d4	6.40	19		
Naphthalene-D8	7.28	4		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Soil Mechanics: Machyny's Mound
Sample Details: TP4 D 1 0.20
LIMS ID Number: CL1103742
Job Number: S11_0798M

Directory/Quant file: 211VOC_MS19\ Initial Calibration
Date Booked in: 04-Feb-11
Date Analysed: 11-Feb-11
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 15

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48*	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 2	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.34	1	M	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	-	< 1	-	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 3	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	5.62	2	M	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.66	8	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.80	3	M	UM
Styrene	100-42-5	5.81	2	M	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5*	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.24	1	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	6.41	1	M	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 **	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	-	< 6	-	N
1,2,3-Trichlorobenzene	87-61-6 **	-	3	-	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.15	88	Dibromofluoromethane	108
1,4-Difluorobenzene	4.50	87	Toluene-d8	95
Chlorobenzene-d5	5.60	72		
Bromofluorobenzene	5.99	56		
1,4-Dichlorobenzene-d4	6.40	47		
Naphthalene-D8	7.28	19		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details:	Soil Mechanics: Machyny's Mound	**Directory/Quant file:**	211VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	TP4 D 7 2.00	**Date Booked in:**	04-Feb-11	**Method:**	Headspace
LIMS ID Number:	CL1103743	**Date Analysed:**	11-Feb-11	**Multiplier:**	1
Job Number:	S11_0798M	**Operator:**	TP	**Position:**	16

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48*	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 2	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	4.17	4	M	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.34	2	M	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.61	1	M	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.09	7	M	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	5.30	3	M	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	5.62	3	M	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.66	10	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.81	4	M	UM
Styrene	100-42-5	5.81	2	M	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5*	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.24	2	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	6.41	1	M	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 **	7.16	7	M	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	7.29	12	M	N
1,2,3-Trichlorobenzene	87-61-6 **	7.42	7	M	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.15	76	Dibromofluoromethane	115
1,4-Difluorobenzene	4.49	76	Toluene-d8	93
Chlorobenzene-d5	5.60	55		
Bromofluorobenzene	5.99	37		
1,4-Dichlorobenzene-d4	6.40	25		
Naphthalene-D8	7.28	7		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details:	Soil Mechanics: Machyny's Mound	**Directory/Quant file:**	211VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	TP5 D 3 0.60	**Date Booked in:**	04-Feb-11	**Method:**	Headspace
LIMS ID Number:	CL1103745	**Date Analysed:**	11-Feb-11	**Multiplier:**	1
Job Number:	S11_0798M	**Operator:**	TP	**Position:**	17

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48*	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 2	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.61	1	M	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 3	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.66	5	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.80	2	M	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5*	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	6.41	1	M	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 **	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	-	< 6	-	N
1,2,3-Trichlorobenzene	87-61-6 **	-	3	-	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.15	82	Dibromofluoromethane	113
1,4-Difluorobenzene	4.50	83	Toluene-d8	92
Chlorobenzene-d5	5.60	65		
Bromofluorobenzene	6.00	48		
1,4-Dichlorobenzene-d4	6.40	34		
Naphthalene-D8	7.28	16		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Soil Mechanics: Machyny's Mound
Sample Details: TP6 D 6 1.50
LIMS ID Number: CL1103747
Job Number: S11_0798M

Directory/Quant file: 211VOC_MS19\ Initial Calibration
Date Booked in: 04-Feb-11
Date Analysed: 11-Feb-11
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 18

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48*	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 2	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.34	2	M	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	-	< 1	-	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.09	9	M	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	5.62	4	M	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.66	10	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.80	5	M	UM
Styrene	100-42-5	5.81	2	M	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5*	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.10	1	M	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.24	2	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	6.40	1	M	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 **	7.17	7	M	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	7.29	12	M	N
1,2,3-Trichlorobenzene	87-61-6 **	7.42	7	M	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %
Pentafluorobenzene	4.15	76
1,4-Difluorobenzene	4.49	72
Chlorobenzene-d5	5.60	48
Bromofluorobenzene	5.99	33
1,4-Dichlorobenzene-d4	6.40	24
Naphthalene-D8	7.28	7

Surrogates	% Rec
Dibromofluoromethane	107
Toluene-d8	92

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Soil Mechanics: Machyny's Mound
Sample Details: TP7 D 6 2.00
LIMS ID Number: CL1103748
Job Number: S11_0798M

Directory/Quant file: 211VOC_MS19\ Initial Calibration
Date Booked in: 04-Feb-11
Date Analysed: 11-Feb-11
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 19

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 3	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48*	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 3	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	-	< 1	-	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 3	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.66	6	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.80	3	M	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5*	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 **	7.16	5	M	N
Hexachlorobutadiene	87-68-3 **	-	< 3	-	N
Naphthalene	91-20-3 **	-	< 6	-	N
1,2,3-Trichlorobenzene	87-61-6 **	7.42	6	M	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.15	78	Dibromofluoromethane	107
1,4-Difluorobenzene	4.50	71	Toluene-d8	92
Chlorobenzene-d5	5.60	50		
Bromofluorobenzene	5.99	35		
1,4-Dichlorobenzene-d4	6.40	24		
Naphthalene-D8	7.28	9		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Soil Mechanics: Machyny's Mound
Sample Details: TP8 D 2 0.50
LIMS ID Number: CL1103749
Job Number: S11_0798M

Directory/Quant file: 211VOC_MS19\ Initial Calibration
Date Booked in: 04-Feb-11
Date Analysed: 11-Feb-11
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 20

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48*	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 2	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.34	4	M	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.61	207	98	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.09	6	M	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	5.30	4	M	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	5.62	4	M	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.66	12	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.80	6	M	UM
Styrene	100-42-5	5.81	2	M	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5*	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.24	1	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 **	7.17	12	M	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	7.29	14	M	N
1,2,3-Trichlorobenzene	87-61-6 **	7.42	7	M	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.15	66	Dibromofluoromethane	117
1,4-Difluorobenzene	4.49	64	Toluene-d8	88
Chlorobenzene-d5	5.60	38		
Bromofluorobenzene	5.99	24		
1,4-Dichlorobenzene-d4	6.40	14		
Naphthalene-D8	7.28	4		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details:	Soil Mechanics: Machyny's Mound	**Directory/Quant file:**	211VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	TP9 D 6 1.50	**Date Booked in:**	04-Feb-11	**Method:**	Headspace
LIMS ID Number:	CL1103751	**Date Analysed:**	11-Feb-11	**Multiplier:**	1
Job Number:	S11_0798M	**Operator:**	TP	**Position:**	21

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 2	-	N
Chloromethane	74-87-3 *	-	< 5	-	N
Vinyl Chloride	75-01-4	-	< 2	-	UM
Bromomethane	74-83-9	-	< 2	-	UM
Chloroethane	75-00-3	-	< 3	-	UM
Trichlorofluoromethane	75-69-4	-	< 2	-	UM
1,1-Dichloroethene	75-35-48*	-	< 2	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 2	-	UM
1,1-Dichloroethane	75-34-3	-	< 2	-	UM
MTBE	1634-04-4	-	< 2	-	UM
2,2-Dichloropropane	594-20-7	-	< 2	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 3	-	UM
Bromochloromethane	74-97-5	-	< 2	-	UM
Chloroform	67-66-3	-	< 2	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 2	-	UM
Carbon Tetrachloride	56-23-5	-	< 2	-	UM
1,1-Dichloropropene	563-58-6	-	< 2	-	UM
Benzene	71-43-2	4.34	3	M	UM
1,2-Dichloroethane	107-06-2	-	< 2	-	UM
Trichloroethene	79-01-6	4.61	2	M	UM
1,2-Dichloropropane	78-87-5	-	< 2	-	UM
Dibromomethane	74-95-3	-	< 2	-	UM
Bromodichloromethane	75-27-4	-	< 2	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 2	-	UM
Toluene	108-88-3	5.09	15	M	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 2	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 2	-	UM
Tetrachloroethene	127-18-4	-	< 5	-	UM
1,3-Dichloropropane	142-28-9	-	< 2	-	UM
Dibromochloromethane	124-48-1	-	< 2	-	UM
1,2-Dibromoethane	106-93-4	-	< 2	-	UM
Chlorobenzene	108-90-7	-	< 2	-	UM
Ethylbenzene	100-41-4	5.62	9	M	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 2	-	UM
m and p-Xylene	108-38-3/106-42-3	5.65	23	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.80	11	M	UM
Styrene	100-42-5	5.81	3	M	UM
Bromoform	75-25-2	-	< 2	-	UM
iso-Propylbenzene	98-82-8	-	< 2	-	UM
1,1,2,2-Tetrachloroethane	79-34-5*	-	< 2	-	N
Propylbenzene	103-65-1	-	< 2	-	UM
Bromobenzene	108-86-1	-	< 2	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 2	-	UM
2-Chlorotoluene	95-49-8	-	< 2	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.10	3	M	UM
4-Chlorotoluene	106-43-4	-	< 2	-	UM
tert-Butylbenzene	98-06-6	-	< 2	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.24	5	M	UM
sec-Butylbenzene	135-98-8	-	< 2	-	UM
p-Isopropyltoluene	99-87-6	6.33	8	M	UM
1,3-Dichlorobenzene	541-73-1	-	< 2	-	UM
1,4-Dichlorobenzene	106-46-7	6.40	2	M	UM
n-Butylbenzene	104-51-8 *	-	< 2	-	N
1,2-Dichlorobenzene	95-50-1	-	< 2	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 2	-	UM
1,2,4-Trichlorobenzene	120-82-1 **	7.17	12	M	N
Hexachlorobutadiene	87-68-3 **	-	< 3	-	N
Naphthalene	91-20-3 **	7.29	25	M	N
1,2,3-Trichlorobenzene	87-61-6 **	7.42	9	M	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.15	71	Dibromofluoromethane	115
1,4-Difluorobenzene	4.49	65	Toluene-d8	91
Chlorobenzene-d5	5.60	41		
Bromofluorobenzene	6.00	27		
1,4-Dichlorobenzene-d4	6.40	17		
Naphthalene-D8	7.28	5		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Dioxins

Customer and Site Details : Soil Mechanics - Machyny's Mound
Report Number : **S110798**
Report Date : 23/02/2011

Matrix (level) : Soil
Units : ng/kg

This sample data is not accredited.

Scientifics Lab ID Number	Client Reference	Date Sampled	2378 Tetra CDD	12378 Penta CDD	123478 Hexa CDD	123678 Hexa CDD	123789 Hexa CDD	1234678 Hepta CDD	OCDD Octa CDD	Total 2378-Dioxins					
CL/1103738	TP1 D 5 1.00		0.41	2	2.4	5	2.5	81	262	353					
CL/1103742	TP4 D 1 0.20		<0.02	<0.5	1.7	1.5	2.1	18	274	294					
CL/1103751	TP9 D 6 1.50		2.4	8	16	12	9.4	130	369	542					

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

Dioxins

Customer and Site Details : Soil Mechanics - Machyny's Mound
Report Number : **S110798**
Report Date : 23/02/2011

Matrix (level) : Soil
Units : ng/kg

This sample data is not accredited.

Scientifics Lab ID Number	Client Reference	Date Sampled	2378 Tetra CDD	12378 Penta CDD	123478 Hexa CDD	123678 Hexa CDD	123789 Hexa CDD	1234678 Hepta CDD	OCDD Octa CDD	Total 2378-Dioxins					
CL/1103738	TP1 D 5 1.00		0.41	2	2.4	5	2.5	80	260	350					
CL/1103742	TP4 D 1 0.20		<0.02	<0.5	1.7	1.5	2.1	18	270	290					
CL/1103751	TP9 D 6 1.50		2.2	7	15	11	8.7	120	340	500					

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

ESG Asbestos Limited

Certificate of Analysis for Asbestos in Soils

UKAS TESTING
1089

ASBESTOS ANALYSIS RESULTS - SOIL ANALYSIS

Client:	Scientifics Environmental Chemistry	Page 1 of 1
Address:	Etwall House, Bretby Business Park, Ashby Road, Burton upon Trent	Report No:ANO-0488-810
For the attention of :	Soil Mechanics	Report Date:15/02/11
Site Address:	Machyny's Mound	Project Number:S110798

SAMPLE NUMBER	SAMPLE DATE	SAMPLE LOCATION	Sample Type	DEPTH (M)	TEST DATE	% asbestos by dry weight**	ASBESTOS FIBRE TYPES IDENTIFIED
CL/1103738		TP1 1.0			15/02/2011	Screen Only	No Asbestos Identified in Sample
CL/1103739		TP1 3.0			15/02/2011	Screen Only	No Asbestos Identified in Sample
CL/1103740		TP2 0.2			15/02/2011	Screen Only	No Asbestos Identified in Sample
CL/1103741		TP3 1.0			15/02/2011	Screen Only	No Asbestos Identified in Sample
CL/1103742		TP4 0.2			15/02/2011	Screen Only	No Asbestos Identified in Sample
CL/1103743		TP4 2.0			15/02/2011	Screen & ID	Chrysotile
CL/1103744		TP4 3.0			15/02/2011	Screen Only	No Asbestos Identified in Sample
CL/1103745		TP5 0.6			15/02/2011	Screen Only	No Asbestos Identified in Sample
CL/1103746		TP5 2.0			15/02/2011	Screen Only	No Asbestos Identified in Sample
CL/1103747		TP6 1.5			15/02/2011	Screen & ID	Chrysotile
CL/1103748		TP7 2.0			15/02/2011	Screen Only	No Asbestos Identified in Sample
CL/1103749		TP8 0.5			15/02/2011	Screen & ID	Chrysotile
CL/1103750		TP8 2.0			15/02/2011	Screen Only	No Asbestos Identified in Sample
CL/1103751		TP9 1.5			15/02/2011	Screen Only	No Asbestos Identified in Sample
CL/1103752		TP10 0.3			15/02/2011	Screen Only	No Asbestos Identified in Sample

*Sampling carried out by client ** Detection limit advised by client

The sample analysis for the above results was carried out using the procedures detailed in ESG Asbestos Limited in house method (SCI-ASB-020) based on HSE document MDHS 90 - Asbestos Contaminated Land - Draft 5 - November 1997 (withdrawn). Fibre identific

Key

NADIS = No Asbestos Detected in Sample

Authorised Signatory:

Name: Kate Lovatt

Position: System Support & Quality Manager

Where individual results are flagged see report notes for status.

Additional Report Notes

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
VOCHSAS	CL/1103739	Low internal responses, repeat of samples confim this, suggesting sample matrix to be the probable cause.
VOCHSAS	CL/1103742	Low internal responses, repeat of samples confim this, suggesting sample matrix to be the probable cause.
VOCHSAS	CL/1103743	Low internal responses, repeat of samples confim this, suggesting sample matrix to be the probable cause.
VOCHSAS	CL/1103745	Low internal responses, repeat of samples confim this, suggesting sample matrix to be the probable cause.
VOCHSAS	CL/1103747	Low internal responses, repeat of samples confim this, suggesting sample matrix to be the probable cause.
VOCHSAS	CL/1103748	Low internal responses, repeat of samples confim this, suggesting sample matrix to be the probable cause.
VOCHSAS	CL/1103749	Low internal responses, repeat of samples confim this, suggesting sample matrix to be the probable cause.
VOCHSAS	CL/1103751	Low internal responses, repeat of samples confim this, suggesting sample matrix to be the probable cause.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace GCFID
Soil	ICPACIDS	Air Dried	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPBOR	Air Dried	Determination of Boron in soil samples by hot water extraction followed by ICPOES detection
Soil	ICPMSS	Air Dried	Determination of Metals in soil samples by aqua regia digestion followed by ICPMS
Soil	ICPSOIL	Air Dried	Determination of Metals in soil samples by aqua regia digestion followed by ICPOES detection
Soil	ICPWSS	Air Dried	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	PAHMSUS	As Received	Determination of Polycyclic Aromatic Hydrocarbons (PAH) by hexane/acetone extraction followed by GCMS detection
Soil	PCBUSECDAR	As Received	Determination of Polychlorinated Biphenyl (PCB) congeners/aroclors by hexane/acetone extraction followed by GCECD detection
Soil	PHSOIL	As Received	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.
Soil	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Soil	SFAS	As Received	Segmented flow analysis with colorimetric detection
Soil	Subcon*	*	Contact Laboratory for details of the methodology used by the sub-contractor.
Soil	SVOCMSUS	As Received	Determination of Semi Volatile Organic Compounds in soil samples by hexane / acetone extraction followed by GCMS detection
Soil	TMSS	As Received	Determination of the Total Moisture content at 105ºC by loss on oven drying gravimetric analysis
Soil	TPHUSSI	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection including quantitation of Aromatic and Aliphatic fractions.
Soil	VOCHSAS	As Received	Determination of Volatile Organic Compounds (VOC) by Headspace GCMS
Soil	WSLM59	Air Dried	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on an air dried basis
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile
CR Denotes Crocidolite
AM Denotes Amosite
NAIIS No Asbestos Identified in Sample

Symbol Reference

^ Sub-contracted analysis. Note: The accreditation status is that assigned by the subcontract laboratory.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined
N.Det Not detected
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

END OF REPORT

Sample Descriptions

Client : Soil Mechanics

Site : Machyny's Mound

Report Number : S11_0798M

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1103738	TP1 D 5 1.00	Brown MADE GROUND
CL/1103739	TP1 D 8 3.00	Grey Gravel SILT
CL/1103740	TP2 D 2 0.20	Grey Gravel SILT
CL/1103741	TP3 D 4 1.00	Brown Stone SILT
CL/1103742	TP4 D 1 0.20	Grey Stone SILT
CL/1103743	TP4 D 7 2.00	Grey Stone SILT
CL/1103744	TP4 D 9 3.00	Grey Stone SILT
CL/1103745	TP5 D 3 0.60	Grey Stone SILT
CL/1103746	TP5 D 6 2.00	Grey MADE GROUND
CL/1103747	TP6 D 6 1.50	Grey Gravel SILT
CL/1103748	TP7 D 6 2.00	Grey Stone SILT
CL/1103749	TP8 D 2 0.50	Grey MADE GROUND
CL/1103750	TP8 D 6 2.00	Grey Stone SILT
CL/1103751	TP9 D 6 1.50	Grey Stone SILT Rootlets
CL/1103752	TP10 D 1 0.30	Brown Stone SILT

END OF REPORT

TEST REPORT
SOIL SAMPLE ANALYSIS

1252

Report No. EFS/111308M (Ver. 1)

Soil Mechanics
Unit 15
Crosby Yard
Bridgend
Mid Glamorgan
CF31 1JZ

Site: Machyny's Mound

The 3 samples described in this report were logged for analysis by Scientifics on 21-Feb-2011. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 02-Mar-2011

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS or MCERTS accredited
Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by Scientifics.

The following tables are contained in this report:

On behalf of
Scientifics :
Andrew Timms Operations Manager

Date of Issue: 02-Mar-2011

Accreditation Codes: **N** (Not Accredited), **U** (UKAS), **UM** (UKAS & MCERTS)
Tests marked '^' have been subcontracted to another laboratory.
(NVM) - denotes the sample matrix is dissimilar to matrices upon which the MCERTS validation was based, and is therefore not accredited for MCERTS.
All results are reported on a dry weight basis at 105^{o}C unless otherwise stated. (except QC samples)
Scientifics accepts no responsibility for any sampling not carried out by our personnel.

Units :		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :		ICPACIDS	ICPBOR	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPSOIL	ICPSOIL	ICPWSS	PAHMSUS
Method Reporting Limits :		20	0.5	0.3	0.2	1.2	1.6	0.7	0.5	2	0.5	0.6	16	1	0.1	10	0.08
Accreditation Code:		UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	U	UM	N	UM	UM	
Laboratory ID Number CL/	**Client Sample Description**	**SO4-- (acid sol)**	**Boron (H20 Soluble)**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**	**Selenium (MS)**	**Vanadium (MS)**	**Zinc (MS)**	**Barium.**	**Beryllium.**	**SO4-- (H2O sol) mg/l**	**PAH by MS.16(0.08)**
1106341	BH1 D 2 0.30	327	0.8	11.3	0.3	21	32.5	57	<0.5	20.6	<0.5	24	134.5	129	0.73	88	Req
1106342	BH1 D 6 1.20	940	1.2	25.7	0.55	17	106.8	28.6	<0.6	41.5	0.9	32.9	195.8	355	1.3	310	Req
1106343	BH2 D 7 2.00	889	0.9	34.3	0.53	210.9	123.3	2390	<0.54	22.7	<0.5	300	171.5	346	0.78	354	Req

scientifics

Bretby Business Park, Ashby Road

Burton-on-Trent, Staffordshire, DE15 0YZ

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Client Name **Soil Mechanics**

Contact Mr A Henry

Machyny's Mound

Soils Sample Analysis

Date Printed	02-Mar-11
Report Number	**EFS/111308M**
Table Number	**1**

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appr opriate, in accordance with the MCERTS standard.

Units :		pH Units	mg/kg	mg/kg		%	mg/kg	mg/kg	mg/kg	% M/M								
Method Codes :		PHSOIL	SFAPI	SFAPI	Sub02a	TMSS	TPHUSSI	GROHSA	SFAS	WSLM59								
Method Reporting Limits :			0.5	0.5		0.2	10.0	0.1	0.5	0.01								
Accreditation Code:		UM	UM	UM	U	U			N	N								
Laboratory ID Number CL/	**Client Sample Description**	**pH units (AR)**	**Cyanide(Free) (AR)**	**Cyanide(Total) (AR)**	**^Asbestos Screen**	**Tot.Moisture @ 105C**	**TPH by GCFID (AR/Si)**	**GRO (AA)**	**Sulphide as S (AR)**	**Total Organic Carbon**								
1106341	BH1 D 2 0.30	8.6	<0.6	<0.6	CH	13.7	Req	Req	<0.6	1.779								
1106342	BH1 D 6 1.20	8.1	<0.7	<0.7	CH	28.6	Req	Req	<0.7	>31								
1106343	BH2 D 7 2.00	8.3	<0.7	<0.7	CH	18.2	Req	Req	<0.7	0.832								

scientifics

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Client Name **Soil Mechanics**

Contact Mr A Henry

Machyny's Mound

Soils Sample Analysis

Date Printed	02-Mar-11
Report Number	**EFS/111308M**
Table Number	**1**

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105ºC where appr opriate, in accordance with the MCERTS standard.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	BH1 D 2 0.30	**Job Number:**	S11_1308M
LIMS ID Number:	CL1106341	**Date Booked in:**	21-Feb-11
QC Batch Number:	110368	**Date Extracted:**	24-Feb-11
Quantitation File:	Initial Calibration	**Date Analysed:**	24-Feb-11
Directory:	411PAH.MS14\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

Accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Naphthalene	91-20-3	-	< 0.09	-	**UM**
Acenaphthylene	208-96-8	-	< 0.09	-	U
Acenaphthene	83-32-9	-	< 0.09	-	UM
Fluorene	86-73-7	-	< 0.09	-	UM
Phenanthrene	85-01-8	5.85	0.13	98	UM
Anthracene	120-12-7	-	< 0.09	-	U
Fluoranthene	206-44-0	7.21	0.28	89	UM
Pyrene	129-00-0	7.50	0.22	83	UM
Benzo[a]anthracene	56-55-3	9.19	0.21	95	UM
Chrysene	218-01-9	9.24	0.22	98	UM
Benzo[b]fluoranthene	205-99-2	10.72	0.28	92	UM
Benzo[k]fluoranthene	207-08-9	-	< 0.09	-	UM
Benzo[a]pyrene	50-32-8	11.15	0.17	94	UM
Indeno[1,2,3-cd]pyrene	193-39-5	12.53	0.15	85	UM
Dibenzo[a,h]anthracene	53-70-3	-	< 0.09	-	UM
Benzo[g,h,i]perylene	191-24-2	12.84	0.14	92	UM
Total (USEPA16) PAHs	-	-	< 2.44	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	94
Acenaphthene-d10	91
Phenanthrene-d10	94
Chrysene-d12	100
Perylene-d12	107

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	89
Terphenyl-d14	91

Concentrations are reported on a dry weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	BH1 D 6 1.20	**Job Number:**	S11_1308M
LIMS ID Number:	CL1106342	**Date Booked in:**	21-Feb-11
QC Batch Number:	110368	**Date Extracted:**	24-Feb-11
Quantitation File:	Initial Calibration	**Date Analysed:**	24-Feb-11
Directory:	411PAH.MS14\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

Accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Naphthalene	91-20-3	3.41	0.13	86	**UM**
Acenaphthylene	208-96-8	-	< 0.11	-	U
Acenaphthene	83-32-9	-	< 0.11	-	UM
Fluorene	86-73-7	-	< 0.11	-	UM
Phenanthrene	85-01-8	5.85	0.31	99	UM
Anthracene	120-12-7	-	< 0.11	-	U
Fluoranthene	206-44-0	7.21	0.15	66	UM
Pyrene	129-00-0	7.50	0.13	60	UM
Benzo[a]anthracene	56-55-3	-	< 0.11	-	UM
Chrysene	218-01-9	9.24	0.13	92	UM
Benzo[b]fluoranthene	205-99-2	10.72	0.18	94	UM
Benzo[k]fluoranthene	207-08-9	-	< 0.11	-	UM
Benzo[a]pyrene	50-32-8	11.15	0.11	99	UM
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.11	-	UM
Dibenzo[a,h]anthracene	53-70-3	-	< 0.11	-	UM
Benzo[g,h,i]perylene	191-24-2	12.84	0.11	90	UM
Total (USEPA16) PAHs	-	-	< 2.14	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	98
Acenaphthene-d10	93
Phenanthrene-d10	95
Chrysene-d12	103
Perylene-d12	114

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	86
Terphenyl-d14	85

Concentrations are reported on a dry weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	Soil Mechanics: Machyny's Mound		
Sample Details:	BH2 D 7 2.00	**Job Number:**	S11_1308M
LIMS ID Number:	CL1106343	**Date Booked in:**	21-Feb-11
QC Batch Number:	110368	**Date Extracted:**	24-Feb-11
Quantitation File:	Initial Calibration	**Date Analysed:**	25-Feb-11
Directory:	411PAH.MS14\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

Accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Naphthalene	91-20-3	-	< 0.11	-	**UM**
Acenaphthylene	208-96-8	-	< 0.11	-	U
Acenaphthene	83-32-9	4.59	0.18	95	UM
Fluorene	86-73-7	4.98	0.13	94	UM
Phenanthrene	85-01-8	5.85	1.60	99	UM
Anthracene	120-12-7	5.90	0.41	98	U
Fluoranthene	206-44-0	7.21	3.90	91	UM
Pyrene	129-00-0	7.50	2.86	88	UM
Benzo[a]anthracene	56-55-3	9.19	2.20	96	UM
Chrysene	218-01-9	9.24	2.17	99	UM
Benzo[b]fluoranthene	205-99-2	10.72	2.79	98	UM
Benzo[k]fluoranthene	207-08-9	10.76	0.87	96	UM
Benzo[a]pyrene	50-32-8	11.15	1.89	96	UM
Indeno[1,2,3-cd]pyrene	193-39-5	12.52	1.43	89	UM
Dibenzo[a,h]anthracene	53-70-3	12.56	0.35	93	UM
Benzo[g,h,i]perylene	191-24-2	12.84	1.16	90	UM
Total (USEPA16) PAHs	-	-	< 22.17	-	N

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	92
Acenaphthene-d10	89
Phenanthrene-d10	90
Chrysene-d12	96
Perylene-d12	104

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	90
Terphenyl-d14	91

Concentrations are reported on a dry weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Gasoline Range Organics
(BTEX and Aliphatic Carbon Ranges)

Customer and Site Details: Soil Mechanics : Machyny's Mound
Job Number: S11_1308
Directory: D:\TES\DATA\Y2011\0224HSA_GC12\022411B 2011-02-24 12-56-52\125B1601.D
Method: Headspace GCFID
Accreditation Code: N

Matrix: Soil
Date Booked in: 21-Feb-11
Date extracted: 24-Feb-11
Date Analysed: 24-Feb-11, 21:2

			Concentration, (mg/kg) - as dry weight.					Aliphatics				
	Sample ID	Client ID	Benzene	Toluene	Ethyl benzene	m/p-Xylene	o-Xylene	C5 - C6	>C6 - C7	>C7 - C8	>C8 - C10	Total GRO
*	CL1106341	BH1 D 2 0.30	<0.012	<0.012	<0.012	<0.012	<0.012	<0.2	<0.2	<0.2	<0.2	<0.2
*	CL1106342	BH1 D 6 1.20	<0.014	<0.014	<0.014	<0.014	<0.014	<0.3	<0.3	<0.3	<0.3	<0.3
*	CL1106343	BH2 D 7 2.00	<0.014	<0.014	<0.014	<0.014	<0.014	<0.3	<0.3	<0.3	<0.3	<0.3

Note: Benzene elutes between C6 and C7, toluene elutes between C7 and C8, ethyl benzene and the xylenes elute between C8 and C9.
Each BTEX compund is deducted from the appropriate band to give the aliphatic fractions, however aromatic compounds may still be contributing to these fractions

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

ALIPHATIC / AROMATIC FRACTION BY GC/FID

Customer and Site Details: Soil Mechanics : Machyny's Mound
Job Number: S11_1308
QC Batch Number: 110368
Directory: D:\TES\DATA\Y2011\FEB2011\0225TPH_GC3\023F2201.D
Method: Ultra Sonic

Separation: Silica gel
Eluents: Hexane, DCM

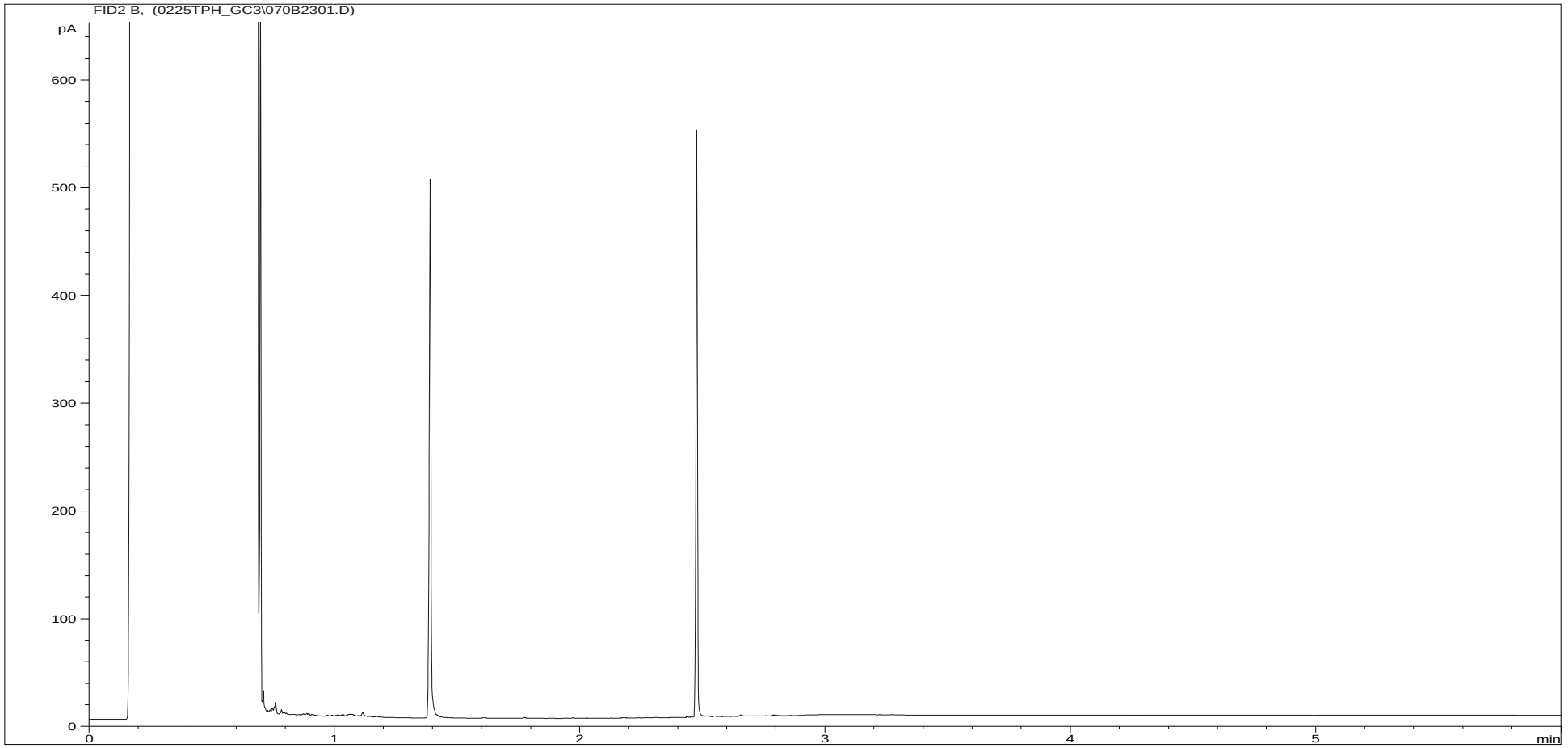
Matrix: Soil
Date Booked in 21-Feb-11
Date Extracted 24-Feb-11
Date Analysed: 25-Feb-11

This sample data is not accredited.

		Concentration, (mg/kg) - as dry weight.											
		>C8 - C10		>C10 - C12		>C12 - C16		>C16 - C21		>C21 - C35		>C8 - C40	
Sample ID	**Client ID**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**
CL1106341	BH1 D 2 0.30	<5	<5	<5	<5	<5	<5	<5	<5	12.3	13.8	<23	<23
CL1106342	BH1 D 6 1.20	<6	<6	<6	<6	<6	<6	<6	<6	18.9	30.4	37.5	54.8
CL1106343	BH2 D 7 2.00	<6	<6	<6	<6	<6	<6	<6	16	16.5	87.7	<28	122

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

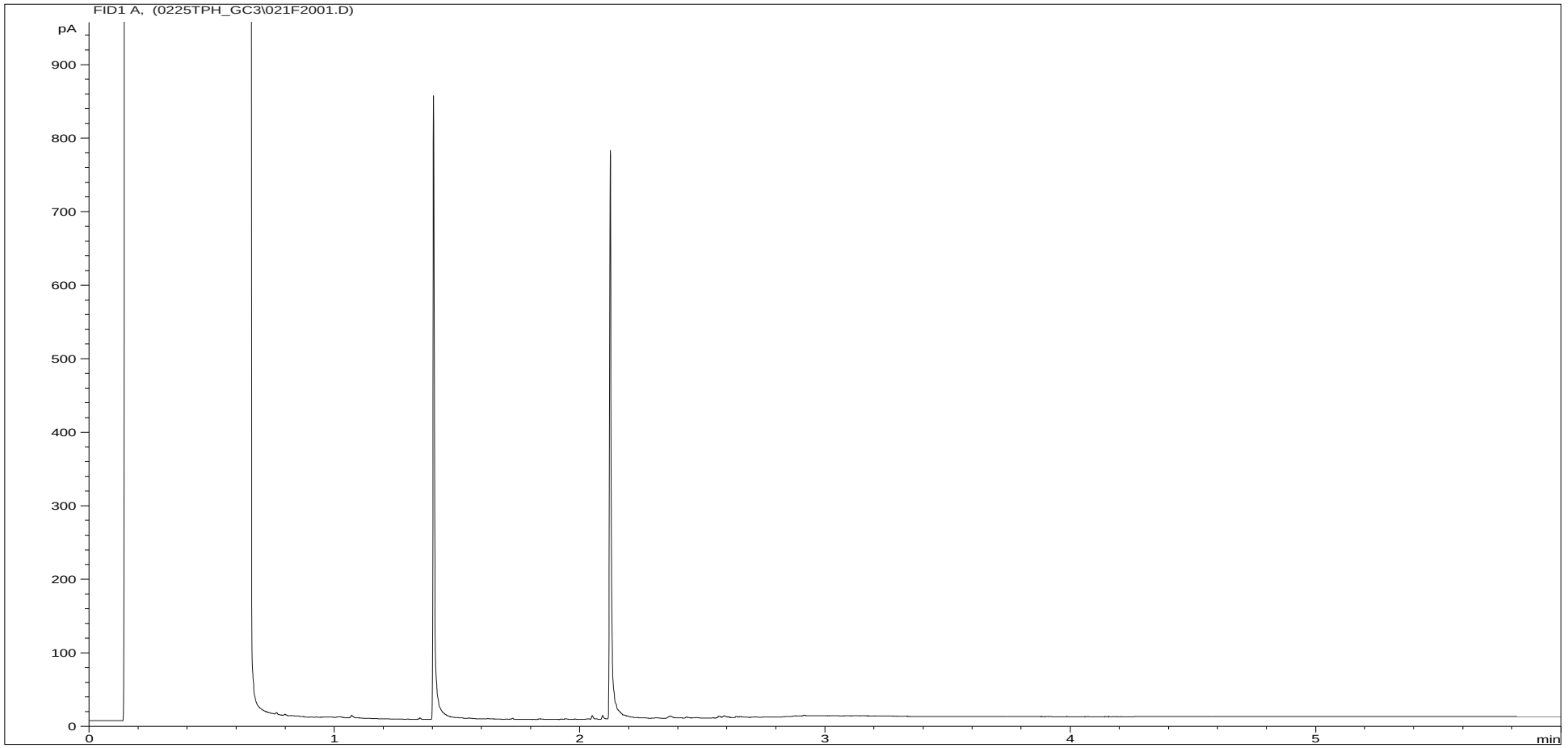
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1106341ALI	**Job Number:**	S11_1308M
Multiplier:	14.82	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	BH1 D 2 0.30
Acquisition Date/Time:	25-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0225TPH_GC3\070B2301.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

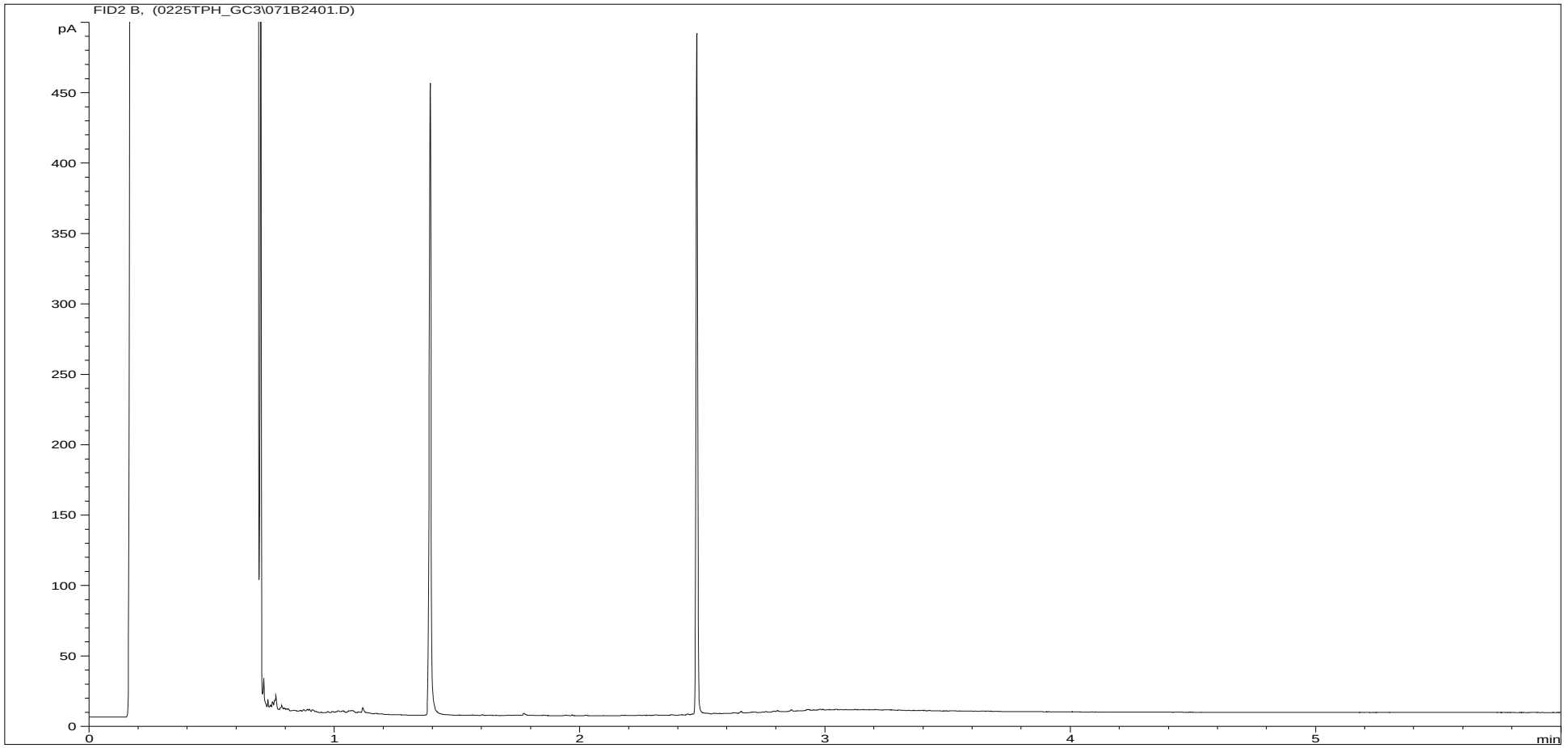
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1106341ARO	**Job Number:**	S11_1308M
Multiplier:	11.78	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	BH1 D 2 0.30
Acquisition Date/Time:	25-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0225TPH_GC3\021F2001.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

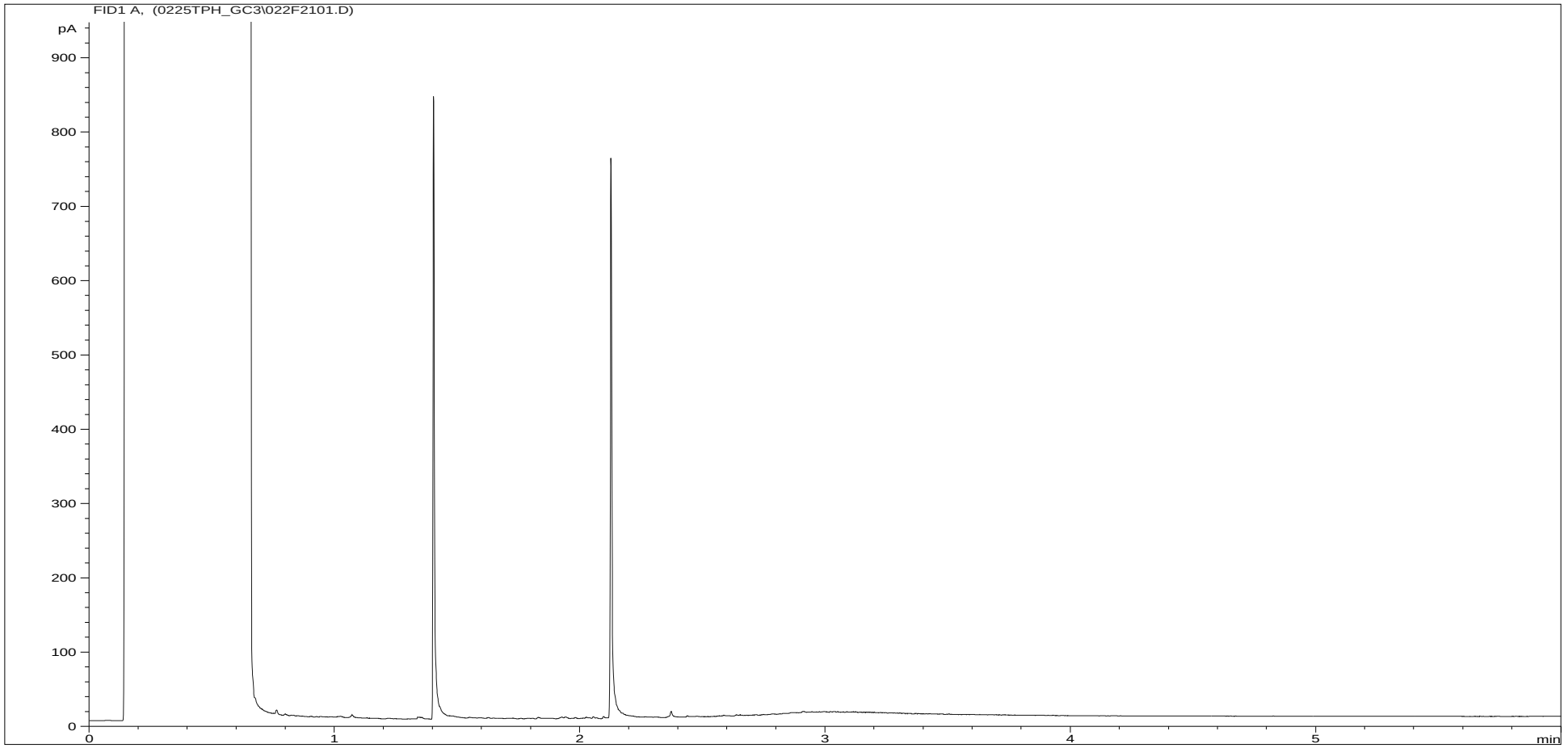
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1106342ALI	**Job Number:**	S11_1308M
Multiplier:	14.82	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	BH1 D 6 1.20
Acquisition Date/Time:	25-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0225TPH_GC3\071B2401.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

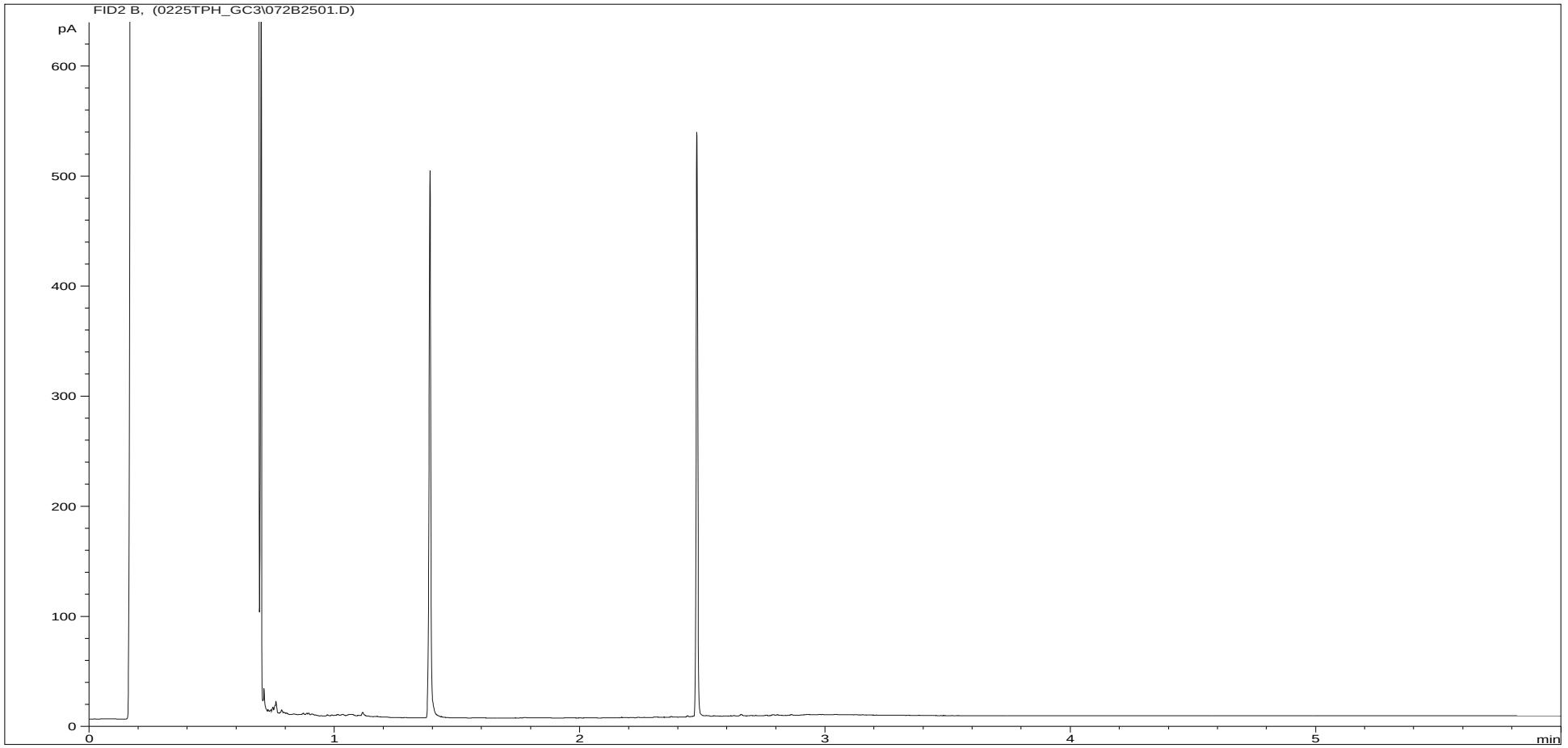
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1106342ARO	**Job Number:**	S11_1308M
Multiplier:	11.4	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	BH1 D 6 1.20
Acquisition Date/Time:	25-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0225TPH_GC3\022F2101.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

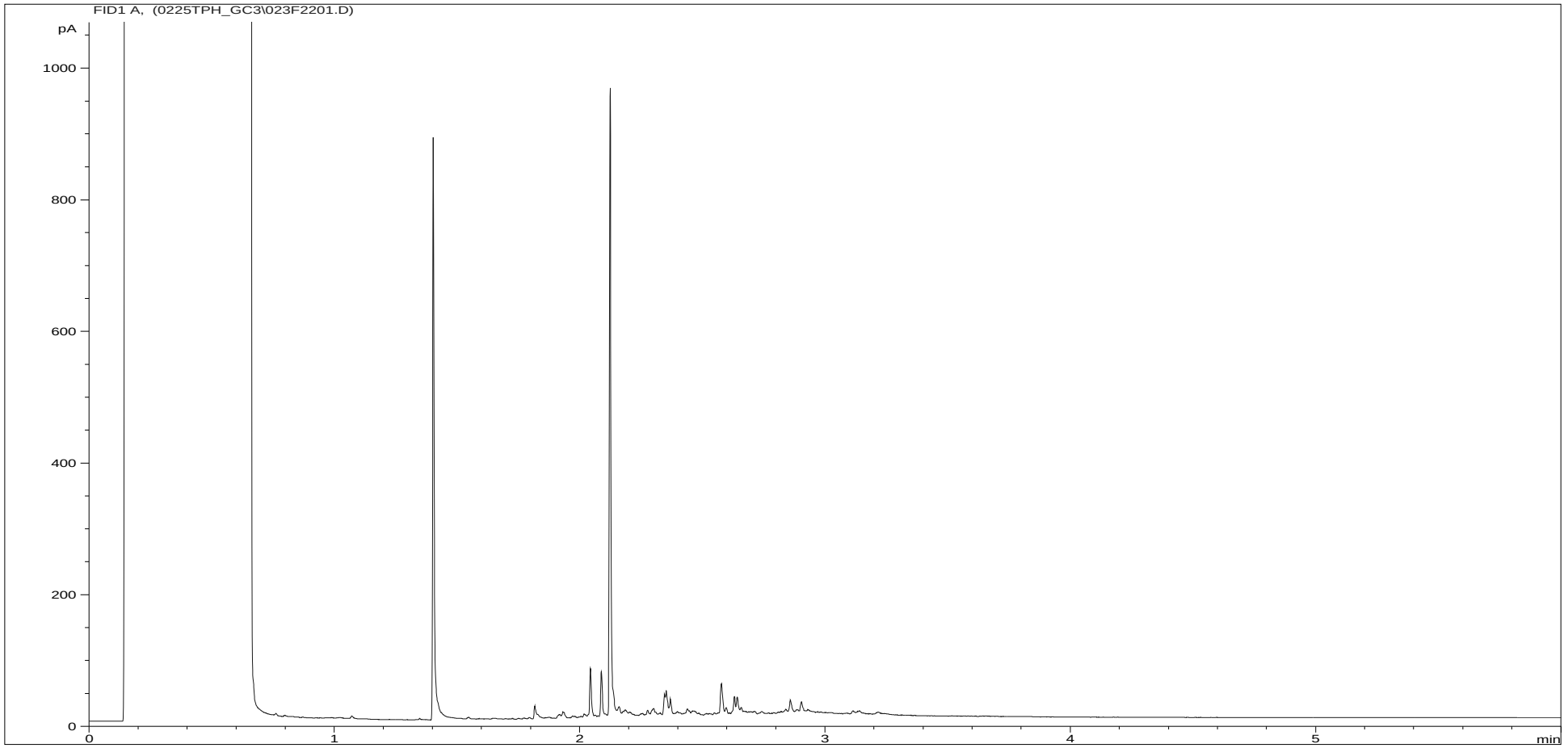
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1106343ALI	**Job Number:**	S11_1308M
Multiplier:	14.04	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	BH2 D 7 2.00
Acquisition Date/Time:	25-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0225TPH_GC3\072B2501.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1106343ARO	**Job Number:**	S11_1308M
Multiplier:	10.44	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machyny's Mound
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	BH2 D 7 2.00
Acquisition Date/Time:	25-Feb-11		
Datafile:	D:\TES\DATA\Y2011\FEB2011\0225TPH_GC3\023F2201.D		

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appr opriate, in accordance with the MCERTS standard.

ESG Asbestos Limited

Certificate of Analysis for Asbestos in Soils

1089

ASBESTOS ANALYSIS RESULTS - SOIL ANALYSIS

Client:	Scientifics Environmental Chemistry	Page 1 of 1
Address:	Etwall House, Bretby Business Park, Ashby Road, Burton upon Trent	Report No:ANO-0488-895
For the attention of :	Soil Mechanics	Report Date:01/03/2011
Site Address:	Machyny's Mound	Project Number:S111308

SAMPLE NUMBER	SAMPLE DATE	SAMPLE LOCATION	Sample Type	DEPTH (M)	TEST DATE	% asbestos by dry weight**	ASBESTOS FIBRE TYPES IDENTIFIED
CL/1106341		BH1 0.3			01/03/2011	Screen & ID	Chrysotile
CL/1106342		BH1 1.2			01/03/2011	Screen & ID	Chrysotile
CL/1106343		BH2 2.0			01/03/2011	Screen & ID	Chrysotile

*Sampling carried out by client ** Detection limit advised by client

The sample analysis for the above results was carried out using the procedures detailed in ESG Asbestos Limited in house method (SCI-ASB-020) based on HSE document MDHS 90 - Asbestos Contaminated Land - Draft 5 - November 1997 (withdrawn). Fibre identific

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace GCFID
Soil	ICPACIDS	Air Dried	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPBOR	Air Dried	Determination of Boron in soil samples by hot water extraction followed by ICPOES detection
Soil	ICPMSS	Air Dried	Determination of Metals in soil samples by aqua regia digestion followed by ICPMS
Soil	ICPSOIL	Air Dried	Determination of Metals in soil samples by aqua regia digestion followed by ICPOES detection
Soil	ICPWSS	Air Dried	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	PAHMSUS	As Received	Determination of Polycyclic Aromatic Hydrocarbons (PAH) by hexane/acetone extraction followed by GCMS detection
Soil	PHSOIL	As Received	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.
Soil	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Soil	SFAS	As Received	Segmented flow analysis with colorimetric detection
Soil	Subcon*	*	Contact Laboratory for details of the methodology used by the sub-contractor.
Soil	TMSS	As Received	Determination of the Total Moisture content at 105ºC by loss on oven drying gravimetric analysis
Soil	TPHUSSI	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection including quantitation of Aromatic and Aliphatic fractions.
Soil	WSLM59	Air Dried	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on an air dried basis
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile
CR Denotes Crocidolite
AM Denotes Amosite
NAIIS No Asbestos Identified in Sample

Symbol Reference

^ Sub-contracted analysis. Note: The accreditation status is that assigned by the subcontract laboratory.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined
N.Det Not detected
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

END OF REPORT

Sample Descriptions

Client : Soil Mechanics

Site : Machyny's Mound

Report Number : S11_1308M

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1106341	BH1 D 2 0.30	Grey Gravel SILT
CL/1106342	BH1 D 6 1.20	Grey Gravel SILT
CL/1106343	BH2 D 7 2.00	Grey Gravel SILT

END OF REPORT

TEST REPORT
LEACHATE SAMPLE ANALYSIS

UKAS TESTING
1252

Report No. EXR/116037 (Ver. 1)

Soil Mechanics
Unit 15
Crosby Yard
Wildmill
Bridgend
Mid Glamorgan
CF31 1JZ

Site: Machyny's Mound

The 6 samples described in this report were logged for analysis by Scientifics on 10-Feb-2011. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 16-Feb-2011

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited
Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by Scientifics.

The following tables are contained in this report:

On behalf of
Scientifics :
Andrew Timms Operations Manager

Date of Issue: 16-Feb-2011

Tests marked '^' have been subcontracted to another laboratory.

Scientifics accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units :		mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l			
Method Codes :		ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	SFAPI	ICPWATVAR			
Method Reporting Limits :		0.001	0.001	0.0001	0.001	0.001	0.002	0.001	0.0001	0.001	0.001	0.001	0.05	0.01			
UKAS Accredited :		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no			
Laboratory ID Number EX/	**Client Sample Description**	**Nickel as Ni (Dissolved)**	**Chromium as Cr (Dissolved)**	**Cadmium as Cd (Dissolved)**	**Copper as Cu (Dissolved)**	**Lead as Pb (Dissolved)**	**Zinc as Zn (Dissolved)**	**Arsenic as As (Dissolved)**	**Mercury as Hg (Dissolved)**	**Selenium as Se (Dissolved)**	**Molybdenum as Mo (Dissolved)**	**Antimony as Sb (Dissolved)**	**Phenol Index as C6H5OH**	**Barium as Ba (Dissolved) a**			
1105020	TP1 D 5 1.00	0.011	0.002	0.0001	0.022	<0.001	0.123	0.003	0.0001	0.003	0.095	0.005	<0.05	0.21			
1105021	TP4 D 1 0.20	0.002	0.005	<0.0001	0.023	0.002	0.217	0.004	<0.0001	0.001	0.035	0.003	<0.05	0.6			
1105022	TP5 D 3 0.60	0.003	0.003	<0.0001	0.017	<0.001	0.11	0.002	<0.0001	0.001	0.031	0.003	<0.05	0.27			
1105023	TP7 D 6 2.00	0.002	0.004	<0.0001	0.016	<0.001	0.114	0.003	<0.0001	0.002	0.025	0.004	<0.05	0.69			
1105024	TP8 D 2 0.50	0.003	0.01	<0.0001	0.057	<0.001	0.011	0.008	0.0005	0.003	0.1	0.005	<0.05	0.38			
1105025	TP9 D 6 1.50	0.009	0.005	0.0002	0.033	0.005	0.487	0.008	<0.0001	0.002	0.035	0.005	<0.05	0.48			

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Client Name **Soil Mechanics**

Contact Mr A Henry

Machyny's Mound

Leachate Sample Analysis

Date Printed	16-Feb-11
Report Number	**EXR/116037**
Table Number	**1**

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	SFAPI	As Received	Determination of Total Phenols by segmented flow analysis with colorimetric detection

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on an air dried basis
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile
CR Denotes Crocidolite
AM Denotes Amosite
NAIIS No Asbestos Identified in Sample

Symbol Reference

^ Sub-contracted analysis. Note: The accreditation status is that assigned by the subcontract laboratory.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined
N.Det Not detected
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

END OF REPORT

Where individual results are flagged see report notes for status.

TEST REPORT
LEACHATE SAMPLE ANALYSIS

1252

Report No. EXR/116502 (Ver. 1)

Soil Mechanics
Unit 15
Crosby Yard
Wildmill
Bridgend
Mid Glamorgan
CF31 1JZ

Site: Machyny's Mound

The 1 sample described in this report were logged for analysis by Scientifics on 23-Feb-2011. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 01-Mar-2011

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited
Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by Scientifics.

The following tables are contained in this report:

On behalf of
Scientifics :
Andrew Timms Operations Manager

Date of Issue: 01-Mar-2011

Tests marked '^' have been subcontracted to another laboratory.

Scientifics accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units :		mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l				
Method Codes :		ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	SFAPI	ICPWATVAR				
Method Reporting Limits :		0.001	0.001	0.0001	0.001	0.001	0.001	0.0001	0.001	0.001	0.001	0.05	0.01				
UKAS Accredited :		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no				
Laboratory ID Number EX/	**Client Sample Description**	**Nickel as Ni (Dissolved)**	**Chromium as Cr (Dissolved)**	**Cadmium as Cd (Dissolved)**	**Copper as Cu (Dissolved)**	**Lead as Pb (Dissolved)**	**Arsenic as As (Dissolved)**	**Mercury as Hg (Dissolved)**	**Selenium as Se (Dissolved)**	**Molybdenum as Mo (Dissolved)**	**Antimony as Sb (Dissolved)**	**Phenol Index as C6H5OH**	**Barium as Ba (Dissolved) a**				
1106649	BH1 D 2 0.30	0.002	0.004	0.0001	0.012	0.001	0.003	<0.0001	0.001	0.022	0.003	0.06	0.8				

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Client Name	**Soil Mechanics**
Contact	Mr A Henry

Machyny's Mound

Leachate Sample Analysis

Date Printed	01-Mar-11
Report Number	**EXR/116502**
Table Number	**1**

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	SFAPI	As Received	Determination of Total Phenols by segmented flow analysis with colorimetric detection

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on an air dried basis
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile
CR Denotes Crocidolite
AM Denotes Amosite
NAIIS No Asbestos Identified in Sample

Symbol Reference

^ Sub-contracted analysis. Note: The accreditation status is that assigned by the subcontract laboratory.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined
N.Det Not detected
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

END OF REPORT

Where individual results are flagged see report notes for status.

TEST REPORT
WATER SAMPLE ANALYSIS

UKAS TESTING
1252

Report No. EXR/116731 (Ver. 1)

Soil Mechanics
Unit 15
Crosby Yard
Wildmill
Bridgend
Mid Glamorgan
CF31 1JZ

Site: Machynys Mound

The 1 sample described in this report were logged for analysis by Scientifics on 02-Mar-2011. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 14-Mar-2011

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited
Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by Scientifics.

The following tables are contained in this report:

On behalf of
Scientifics :
Andrew Timms Operations Manager

Date of Issue: 14-Mar-2011

Tests marked '^' have been subcontracted to another laboratory.

Scientifics accepts no responsibility for any sampling not carried out by our personnel.

Units :				mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Method Codes :			WSLM3	KONENS	ICPWATVAR	ICPMSW	ICPMSW	ICPMSW	PAHMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPWATVAR	ICPMSW	ICPMSW	KONENS	SFAPI
Method Reporting Limits :				1	3.0	0.001	0.001	0.0001	0.01	0.001	0.001	0.002	0.001	0.01	0.0001	0.001	0.01	0.02
UKAS Accredited :			yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Laboratory ID Number EX/	**Client Sample Description**	**Sample Date**	**pH units**	**Chloride as Cl w**	**Total Sulphur as SO4 (Dissolved) a**	**Nickel as Ni (Dissolved)**	**Chromium as Cr (Dissolved)**	**Cadmium as Cd (Dissolved)**	**PAH MS-SIM (16)**	**Copper as Cu (Dissolved)**	**Lead as Pb (Dissolved)**	**Zinc as Zn (Dissolved)**	**Arsenic as As (Dissolved)**	**Boron as B (Dissolved) a**	**Mercury as Hg (Dissolved)**	**Selenium as Se (Dissolved)**	**Ammoniacal Nitrogen as N**	**Cyanide (Total) as CN**
1107769	BH1 EW 1 2.50	24-Feb-11	7.6	323	221	0.003	0.004	<0.0001	Req	0.002	<0.001	0.003	0.002	0.4	<0.0001	0.008	0.4	<0.02

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Client Name **Soil Mechanics**

Contact Mr A Henry

Machynys Mound

Water Sample Analysis

Date Printed	14-Mar-11
Report Number	**EXR/116731**
Table Number	**1**

Where individual results are flagged see report notes for status.

		Units :	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l							
		Method Codes :	TPHFID-Si	SVOCSW	VOCHSAW	PCBAROEC	GROHSA	PHEHPLC	PHEHPLC	PHEHPLC	PHEHPLC							
		Method Reporting Limits :	0.01	0.002	1	0.0005	0.1	0.0005	0.0005	0.0005	0.0005							
		UKAS Accredited :	yes	yes	yes	no	no	no	no	no	no							
Laboratory ID Number EX/	**Client Sample Description**	**Sample Date**	**TPH GC (AA)**	**SVOC + TICS**	**Volatile Organic Compounds**	**PCB - ARO**	**GRO-HSA (AA)**	**Phenol**	**Cresols**	**Dimethylphenols**	**Trimethylphenols**							
1107769	BH1 EW 1 2.50	**24-Feb-11**	Req	Req	Req	<0.0005	Req	<0.0005	<0.0005	<0.0005	<0.0005							

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Client Name **Soil Mechanics**

Contact Mr A Henry

Machynys Mound

Water Sample Analysis

Date Printed	14-Mar-11
Report Number	**EXR/116731**
Table Number	**1**

Where individual results are flagged see report notes for status.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	Soil Mechanics: Machynys Mound		
Sample Details:	BH1 EW 1 2.50	**Job Number:**	W11_6731
LIMS ID Number:	EX1107769	**Date Booked in:**	02-Mar-11
QC Batch Number:	0197	**Date Extracted:**	11-Mar-11
Quantitation File:	Initial Calibration	**Date Analysed:**	13-Mar-11
Directory:	0313PAH.MS4\	**Matrix:**	Water
Dilution:	1.0	**Ext Method:**	Sep. Funnel

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration ug/l	% Fit
Naphthalene	91-20-3	3.13	0.017	M
Acenaphthylene	208-96-8	-	< 0.010	-
Acenaphthene	83-32-9	-	< 0.010	-
Fluorene	86-73-7	-	< 0.010	-
Phenanthrene	85-01-8	5.50	0.023	M
Anthracene	120-12-7	-	< 0.010	-
Fluoranthene	206-44-0	6.82	0.024	M
Pyrene	129-00-0	7.10	0.022	M
Benzo[a]anthracene	56-55-3	8.77	0.025	M
Chrysene	218-01-9	8.82	0.013	M
Benzo[b]fluoranthene	205-99-2	10.30	0.021	M
Benzo[k]fluoranthene	207-08-9	-	< 0.010	-
Benzo[a]pyrene	50-32-8	10.72	0.015	M
Indeno[1,2,3-cd]pyrene	193-39-5	12.10	0.010	M
Dibenzo[a,h]anthracene	53-70-3	-	< 0.010	-
Benzo[g,h,i]perylene	191-24-2	12.39	0.010	M
Total (USEPA16) PAHs	-	-	< 0.240	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	123
Acenaphthene-d10	125
Phenanthrene-d10	141
Chrysene-d12	146
Perylene-d12	155

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	58
Terphenyl-d14	63

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Semi-Volatile Organic Compounds

UKAS accredited?: No

Customer and Site Details:	Soil Mechanics: Machynys Mound			**Matrix:**	Water	**QC Batch Number:**	461
Sample Details:	BH1 EW 1 2.50	**Date Booked in:**	02-Mar-11	**Ext Method:**	Sep. Funnel	**Multiplier:**	0.006
LIMS ID Number:	EX1107769	**Date Extracted:**	08-Mar-11	**Operator:**	SO/DMB	**Dilution Factor:**	3
Job Number:	W11_6731	**Date Analysed:**	08-Mar-11	**Directory/Quant File:**	08SVOC.GC11\ 0308_CCC2.D	**GPC (Y/N)**	N

Target Compounds	CAS #	R.T. (min)	Concentration mg/l	% Fit
Phenol	108-95-2	-	< 0.024	-
bis(2-Chloroethyl)ether	111-44-4	-	< 0.006	-
2-Chlorophenol	95-57-8	-	< 0.024	-
1,3-Dichlorobenzene	541-73-1	-	< 0.006	-
1,4-Dichlorobenzene	106-46-7	-	< 0.006	-
Benzyl alcohol	100-51-6	-	< 0.006	-
1,2-Dichlorobenzene	95-50-1	-	< 0.006	-
2-Methylphenol	95-48-7	-	< 0.006	-
bis(2-Chloroisopropyl)ether	108-60-1	-	< 0.006	-
Hexachloroethane	67-72-1	-	< 0.006	-
N-Nitroso-di-n-propylamine	621-64-7	-	< 0.006	-
3- & 4-Methylphenol	108-39-4/106-44-5	-	< 0.024	-
Nitrobenzene	98-95-3	-	< 0.006	-
Isophorone	78-59-1	-	< 0.006	-
2-Nitrophenol	88-75-5	-	< 0.024	-
2,4-Dimethylphenol	105-67-9	-	< 0.024	-
Benzoic Acid	65-85-0 *	-	< 0.120	-
bis(2-Chloroethoxy)methane	111-91-1	-	< 0.006	-
2,4-Dichlorophenol	120-83-2	-	< 0.024	-
1,2,4-Trichlorobenzene	120-82-1	-	< 0.006	-
Naphthalene	91-20-3	-	< 0.002	-
4-Chlorophenol	106-48-9	-	< 0.024	-
4-Chloroaniline	106-47-8 *	-	< 0.006	-
Hexachlorobutadiene	87-68-3	-	< 0.006	-
4-Chloro-3-methylphenol	59-50-7	-	< 0.006	-
2-Methylnaphthalene	91-57-6	-	< 0.002	-
1-Methylnaphthalene	90-12-0	-	< 0.002	-
Hexachlorocyclopentadiene	77-47-4 *	-	< 0.006	-
2,4,6-Trichlorophenol	88-06-2	-	< 0.024	-
2,4,5-Trichlorophenol	95-95-4	-	< 0.024	-
2-Chloronaphthalene	91-58-7	-	< 0.002	-
Biphenyl	92-52-4	-	< 0.002	-
Diphenyl ether	101-84-8	-	< 0.002	-
2-Nitroaniline	88-74-4	-	< 0.006	-
Acenaphthylene	208-96-8	-	< 0.002	-
Dimethylphthalate	131-11-3	-	< 0.006	-
2,6-Dinitrotoluene	606-20-2	-	< 0.006	-
Acenaphthene	83-32-9	-	< 0.002	-
3-Nitroaniline	99-09-2	-	< 0.006	-

Target Compounds	CAS #	R.T.	Concentration mg/l	% Fit
2,4-Dinitrophenol	51-28-5 *	-	< 0.012	-
Dibenzofuran	132-64-9	-	< 0.006	-
4-Nitrophenol	100-02-7	-	< 0.060	-
2,4-Dinitrotoluene	121-14-2	-	< 0.006	-
Fluorene	86-73-7	-	< 0.002	-
Diethylphthalate	84-66-2	-	< 0.006	-
4-Chlorophenyl-phenylether	7005-72-3	-	< 0.006	-
4,6-Dinitro-2-methylphenol	534-52-1	-	< 0.060	-
4-Nitroaniline	100-01-6	-	< 0.006	-
N-Nitrosodiphenylamine	86-30-6 *	-	< 0.006	-
4-Bromophenyl-phenylether	101-55-3	-	< 0.006	-
Hexachlorobenzene	118-74-1	-	< 0.006	-
Pentachlorophenol	87-86-5	-	< 0.060	-
Phenanthrene	85-01-8	-	< 0.002	-
Anthracene	120-12-7	-	< 0.002	-
Di-n-butylphthalate	84-74-2	-	< 0.006	-
Fluoranthene	206-44-0	-	< 0.002	-
Pyrene	129-00-0	-	< 0.002	-
Butylbenzylphthalate	85-68-7	-	< 0.006	-
Benzo[a]anthracene	56-55-3	-	< 0.002	-
Chrysene	218-01-9	-	< 0.002	-
3,3'-Dichlorobenzidine	91-94-1	-	< 0.024	-
bis(2-Ethylhexyl)phthalate	117-81-7	-	< 0.006	-
Di-n-octylphthalate	117-84-0	-	< 0.002	-
Benzo[b]fluoranthene	205-99-2	-	< 0.002	-
Benzo[k]fluoranthene	207-08-9	-	< 0.002	-
Benzo[a]pyrene	50-32-8	-	< 0.002	-
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.002	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.002	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.002	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	80
Naphthalene-d8	82
Acenaphthene-d10	82
Phenanthrene-d10	82
Chrysene-d12	73
Perylene-d12	71

Surrogates	% Rec
2-Fluorophenol	54
Phenol-d5	40
Nitrobenzene-d5	116
2-Fluorobiphenyl	118
2,4,6-Tribromophenol	82
Terphenyl-d14	122

Compounds marked with a * are reported not UKAS.

Concentrations are reported on a wet weight basis.

"M" denotes that % fit has been manually interpreted

Where individual results are flagged see report notes for status.

SVOC (TICs)

UKAS accredited?:No

Customer and Site Details:	Soil Mechanics: Machynys Mound		
Sample Details:	BH1 EW 1 2.50	**Job Number:**	W11_6731
LIMS ID Number:	EX1107769		
		Multiplier:	0.006
Date Booked in:	02-Mar-11	**Dilution Factor:**	3
Date Extracted:	08-Mar-11	**GPC (Y/N):**	N
Date Analysed:	08-Mar-11	**Matrix:**	Water
QC Batch Number:	461	**Method:**	Sep. Funnel
Directory/Quant File:	08SVOC.GC11\ 0308_CCC2.D	**Operator:**	SO/DMB

Tentatively Identified Compounds	CAS #	R.T.	Concentration mg/l	% Fit
Unidentified Peak	-	3.19	0.030	-

The compounds listed above have been tentatively identified by a computer based library search.
Compounds identified in the sample are not reported if they also occur in the method blank.
The % fit is an indication of the reliability of the compound assignment.
Due to the similarity between mass spectra of some isomeric compounds assignments may not be correct.
Other compounds may also be present but identification was not possible.
Concentrations are semi-quantitative, assume a response factor of 1 and use the nearest internal standard.

Gasoline Range Organics
(BTEX and Aliphatic Carbon Ranges)

Customer and Site Details: Soil Mechanics : Machynys Mound
Job Number: W11_6731
Directory: D:\TES\DATA\Y2011\0310AHSA_GC12\031011B 2011-03-11 13-57-10\135B3501.D
Method: Headspace GCFID

Matrix: Water
Date Booked in: 02-Mar-11
Date extracted: 11-Mar-11
Date Analysed: 12-Mar-11, 00:4

*** Sample data with an asterisk are not UKAS accredited.**

		Concentration, (mg/l)					Aliphatics				
Sample ID	Client ID	Benzene	Toluene	Ethyl benzene	m/p-Xylene	o-Xylene	C5 - C6	>C6 - C7	>C7 - C8	>C8 - C10	Total GRO
* EX1107769	BH1 EW 1 2.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.1	<0.1	<0.1	<0.1	<0.1

Note: Benzene elutes between C6 and C7, toluene elutes between C7 and C8, ethyl benzene and the xylenes elute between C8 and C9.
Each BTEX compund is deducted from the appropriate band to give the aliphatic fractions, however aromatic compounds may still be contributing to these fractions

Where individual results are flagged see report notes for status.

ALIPHATIC / AROMATIC FRACTION BY GC/FID

Customer and Site Details: Soil Mechanics : Machynys Mound
Job Number: W11_6731
QC Batch Number: 110197
Directory: D:\TES\DATA\Y2011\031011\031011A 2011-03-11 08-42-45\070B0501.D
Method: Separating Funnel

Separation: Silica gel
Eluents: Hexane, DCM

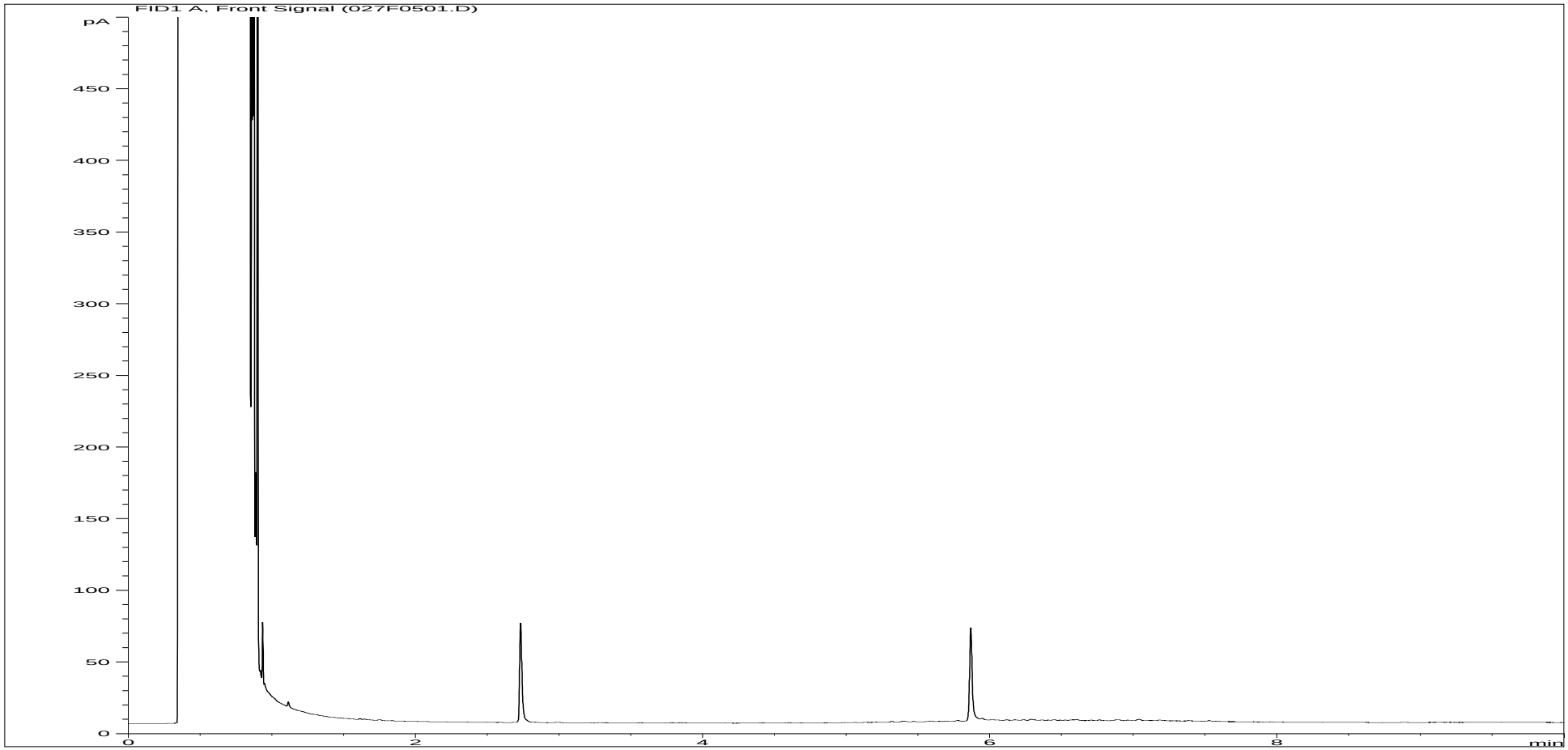
Matrix: Water
Date Booked in 02-Mar-11
Date Extracted 09-Mar-11
Date Analysed 11-Mar-11, 09:53:43

*** This sample data is not UKAS accredited.**

		Concentration, (mg/l)											
		>C8 - C10		>C10 - C12		>C12 - C16		>C16 - C21		>C21 - C35		>C8 - C40	
Sample ID	**Client ID**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**
EX1107769	BH1 EW 1 2.50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.044	<0.01	0.069	<0.01

Where individual results are flagged see report notes for status.

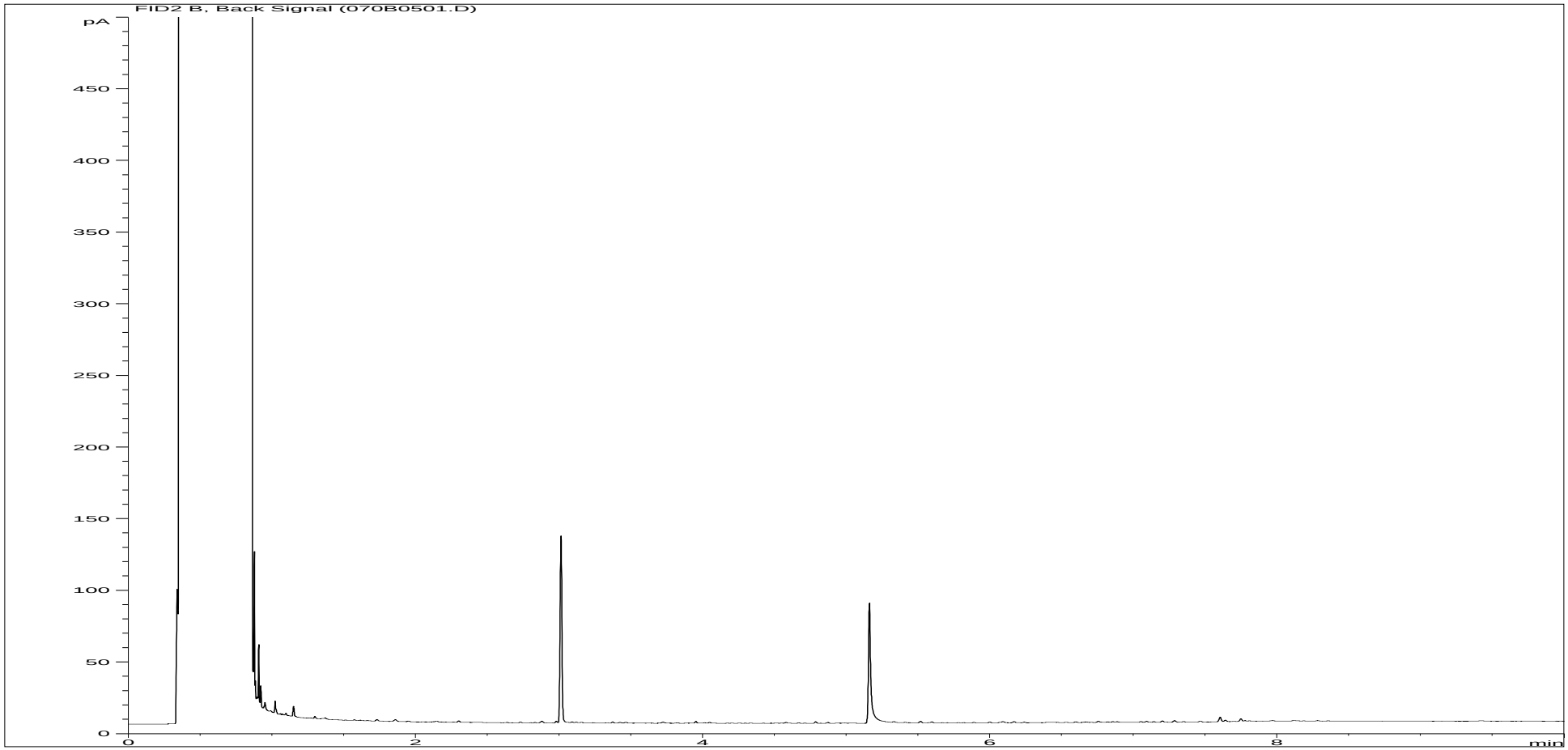
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	EX1107769ALI	**Job Number:**	W11_6731
Multiplier:	0.019	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machynys Mound
Acquisition Method:	TPH_RUNF.M	**Client Sample Ref:**	BH1 EW 1 2.50
Acquisition Date/Time:	11-Mar-11, 09:53:43		
Datafile:	D:\TES\DATA\Y2011\031011\031011A 2011-03-11 08-42-45\027F0501.D		

Where individual results are flagged see report notes for status.

Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	EX1107769ARO	**Job Number:**	W11_6731
Multiplier:	0.015	**Client:**	Soil Mechanics
Dilution:	1	**Site:**	Machynys Mound
Acquisition Method:	TPH_RUNF.M	**Client Sample Ref:**	BH1 EW 1 2.50
Acquisition Date/Time:	11-Mar-11, 09:53:43		
Datafile:	D:\TES\DATA\Y2011\031011\031011A 2011-03-11 08-42-45\070B0501.D		

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Soil Mechanics: Machynys Mound	**Directory/Quant file:**	0310VOC.MS8\ Initial Calibration	**Matrix:**	Water
Sample Details:	BH1 EW 1 2.50	**Date Booked in:**	02-Mar-11	**Method:**	Headspace
LIMS ID Number:	EX1107769	**Date Analysed:**	10-Mar-11	**Multiplier:**	1
Job Number:	W11_6731	**Operator:**	PR	**Position:**	14

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 1	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 5	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6	-	< 5	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6 *	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8 *	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.42	86	Dibromofluoromethane	114
1,4-Difluorobenzene	3.78	85	Toluene-d8	99
Chlorobenzene-d5	4.92	81	Bromofluorobenzene	98
1,4-Dichlorobenzene-d4	5.72	76		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

TICs by HSA-GCMS

UKAS accredited?: No

Customer and Site Details:	Soil Mechanics: Machynys Mound		**Date Booked in:**	02-Mar-11
Sample Details:	BH1 EW 1 2.50		**Date Analysed:**	10-Mar-11
LIMS ID Number:	EX1107769		**Matrix:**	Water
Job Number:	W11_6731		**Ext Method:**	Headspace
Directory/Quant file:	0310VOC.MS8\	Initial Calibration	**Dilution:**	1
Operator:	PR		**Position:**	14

Tentatively Identified Compounds	CAS No	R.T. (min.)	Concentration µg/l	% Fit
Acetone	67-64-1		<5	

The compounds listed above have been tentatively identified by a computer based library search.
Compounds identified in the sample are not reported if they also occur in the method blank.
The % fit is an indication of the reliability of the compound assignment.
Due to the similarity between mass spectra of some isomeric compounds, assignments may not be correct.
Other compounds may also be present but identification was not possible.
Concentrations are semi-quantitative, assume a response factor of 1 and use the nearest internal standard.
Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace FID
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	PAHMSW	As Received	Determination of PolyAromatic Hydrocarbons in water by pentane extraction GCMS quantitation
Water	PCBAROEC	As Received	Determination of Polychlorinated Biphenyl (PCB) aroclors by pentane extraction followed by GCECD detection
Water	PHEHPLC	As Received	Determination of Total Phenol by HPLC
Water	SFAPI	As Received	Determination of Total Phenols by segmented flow analysis with colorimetric detection
Water	SVOCSW	As Received	Determination of Semi Volatile Organic Compounds (SVOC) by DCM extraction followed by GCMS detection
Water	TPHFID-Si	As Received	Determination of speciated pentane extractable hydrocarbons in water by GCFID
Water	VOCHSAW	As Received	Determination of Volatile Organics Compounds or Gasoline Range Hydrocarbons (GRO) by Headspace GCMS
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on an air dried basis
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile
CR Denotes Crocidolite
AM Denotes Amosite
NAIIS No Asbestos Identified in Sample

Symbol Reference

^ Sub-contracted analysis. Note: The accreditation status is that assigned by the subcontract laboratory.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined
N.Det Not detected
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

END OF REPORT

Where individual results are flagged see report notes for status.

ENCLOSURE E

PHOTOGRAPHS

Trial Pit Photographs

Soil Mechanics

Trial Pit 1

Notes:			Figure
	Project	Machynys Mound, Machynys	**E1**
	Project No.	H1003-11	
	Carried out for	Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 1

Notes:			Figure
	Project	Machynys Mound, Machynys	**E2**
	Project No.	H1003-11	
	Carried out for	Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 2

Notes:		
	Project Machynys Mound, Machynys	**Figure**
	Project No. H1003-11	**E3**
	Carried out for Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 2

Notes:			Figure
	Project	Machynys Mound, Machynys	**E4**
	Project No.	H1003-11	
	Carried out for	Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 3

Notes:		
	Project Machynys Mound, Machynys	**Figure**
	Project No. H1003-11	**E5**
	Carried out for Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 3

Notes:			Figure
	Project	Machynys Mound, Machynys	**E6**
	Project No.	H1003-11	
	Carried out for	Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 4

Notes:		
	Project Machynys Mound, Machynys	**Figure**
	Project No. H1003-11	**E7**
	Carried out for Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 4

Notes:			Figure
	Project	Machynys Mound, Machynys	**E8**
	Project No.	H1003-11	
	Carried out for	Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 5

Notes:			
	Project	Machynys Mound, Machynys	**Figure**
	Project No.	H1003-11	**E9**
	Carried out for	Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 5

Notes:			Figure
	Project	Machynys Mound, Machynys	**E10**
	Project No.	H1003-11	
	Carried out for	Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 6

Notes:		
	Project	Machynys Mound, Machynys
	Project No.	H1003-11
	Carried out for	Carmarthenshire County Council
		Figure E11

Trial Pit Photographs

Soil Mechanics

Trial Pit 6

Notes:		
	Project Machynys Mound, Machynys	**Figure**
	Project No. H1003-11	**E12**
	Carried out for Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 7

Notes:		
	Project Machynys Mound, Machynys	**Figure**
	Project No. H1003-11	**E13**
	Carried out for Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 7

Notes:		
	Project Machynys Mound, Machynys	**Figure**
	Project No. H1003-11	**E14**
	Carried out for Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 8

Notes:		
	Project Machynys Mound, Machynys	**Figure**
	Project No. H1003-11	**E15**
	Carried out for Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 8

Notes:			
	Project	Machynys Mound, Machynys	**Figure**
	Project No.	H1003-11	**E16**
	Carried out for	Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 9

Notes:		
	Project Machynys Mound, Machynys	**Figure**
	Project No. H1003-11	**E17**
	Carried out for Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 9

Notes:			
	Project	Machynys Mound, Machynys	**Figure**
	Project No.	H1003-11	**E18**
	Carried out for	Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 10

Notes:		
	Project Machynys Mound, Machynys	**Figure**
	Project No. H1003-11	**E19**
	Carried out for Carmarthenshire County Council	

Trial Pit Photographs

Soil Mechanics

Trial Pit 10

Notes:			Figure
	Project	Machynys Mound, Machynys	**E20**
	Project No.	H1003-11	
	Carried out for	Carmarthenshire County Council	

ENCLOSURE F

DRAWINGS

Site Location Plan

Soil Mechanics

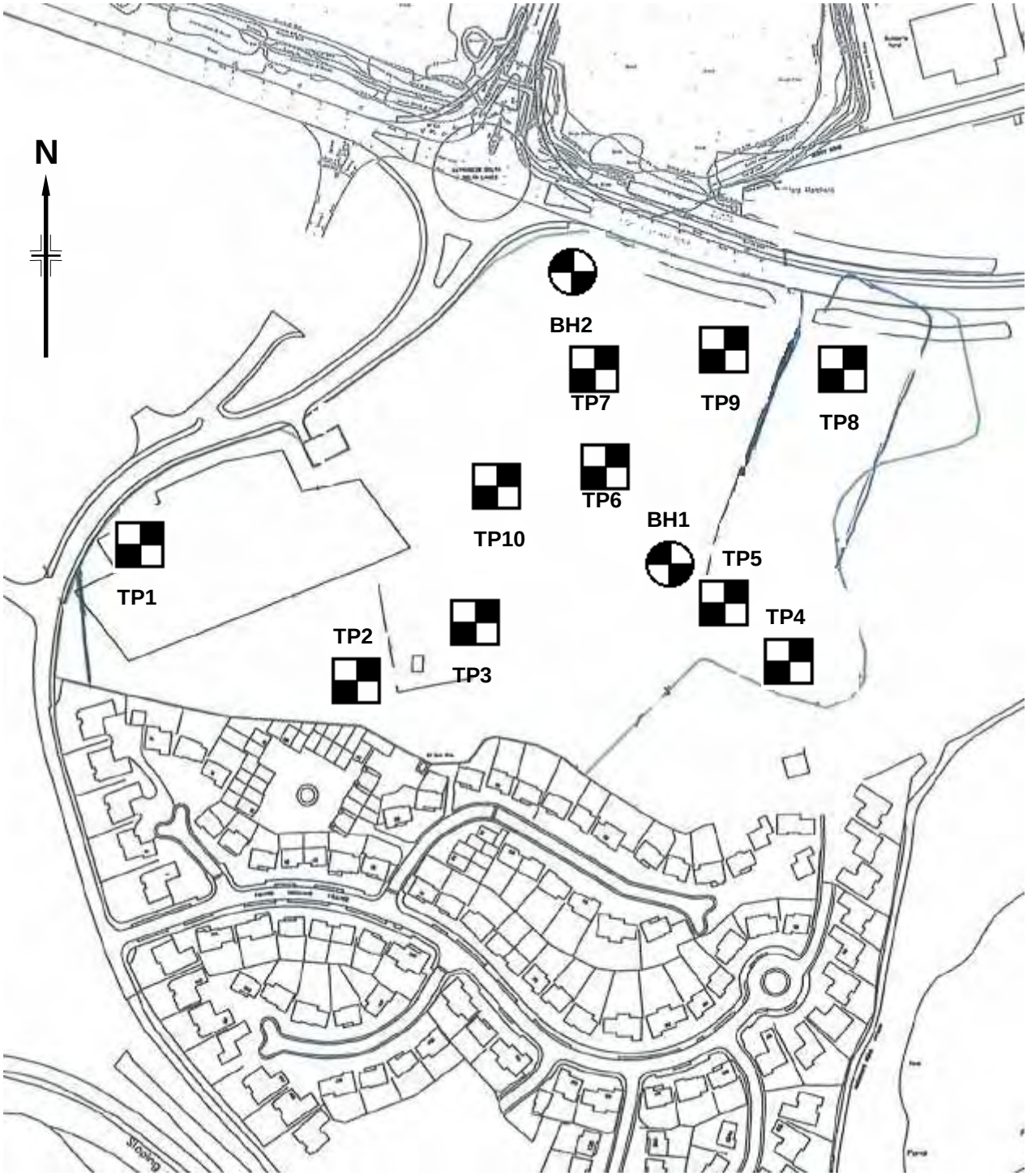
N

THE SITE

Notes: Scale 1:50 000	**Project**	**Machynys Mound, Machynys**	**Figure**
	Project No.	**H1003-11**	**F1**
	Carried out for	**Carmarthenshire County Council**	

Exploratory Hole Location Plan

Soil Mechanics



Key

Borehole

Trial Pit

Notes: Not to scale	Project	Machynys Mound, Machynys	Figure
	Project No.	H1003-11	F2
	Carried out for	Carmarthenshire County Council	