

PRELIMINARY PHASE II GEO-ENVIRONMENTAL REPORT FOR A PROPOSED REDEVELOPMENT AT THE KELTRUCK AND WESTERMANS INTERNATIONAL SITE, GROBY, LEICESTERSHIRE



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Revision 1 (October 2024): updated site layout plan

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1. Introduction

- 1.1 It is proposed to redevelop the Keltruck Distribution, Westermans International and former Quinto Crane premises to the south of the A50 to the northwest of Groby, Leicestershire. The proposals show the development to comprise the partial demolition of the existing structures leaving a refurbished building in the south and a new building in the northwest of the site. A preliminary layout plan is included within the appendix. A new access road is also proposed to the east and south of the site.
- 1.2 GIP have been commissioned to carry out a Phase II geo-environmental investigation consisting of the sinking of windowless sample boreholes in order to assess the prevailing geology and assess the contaminative status of the underlying strata. This report contains a description of the site, anticipated geology and strata encountered. A preliminary environmental risk assessment is provided which includes comments on the potential for contamination to affect Controlled Waters and Human Health (future users). Six ground gas monitoring visits have been undertaken over a three-month period.
- 1.3 Petroleum hydrocarbon contamination has been recorded in soils and groundwater in the north of the site in the area of a former 50,000L fuel tank. It is recommended further site works are undertaken once access is available, in particular around areas of fuel tanks and interceptor chambers, and where buildings are to be removed, to further assess the contamination beneath the site. This report, therefore, should be considered preliminary.
- 1.4 A Phase I Desk Study has been carried out for the site by Brown Fisher Environmental, report reference 236613CLR and dated 23rd October 2024. This Phase II report should be read in conjunction with the Phase I report.
- 1.5 In addition to this geo-environmental investigation, a number of handheld DCP tests have been undertaken along the route of the new access road. The results are included in the appendix as a preliminary guide to CBR values.
- 1.6 We are confident that the conclusions drawn from the findings of this investigation are appropriate for the proposed development. However, we cannot guarantee that they would be accepted by regulatory authorities without question. It is recommended that the report is submitted and approval gained from such bodies prior to the undertaking of detailed design, construction work or other irreversible processes.

2. The Site

- 2.1 The area of the proposed development occupies a roughly square shaped parcel of land approximately 1.1 hectares in size in the south of A50 to the northwest of Groby in Leicestershire. National Grid Reference 451570, 307810 denotes the approximate centre of the site. Photographs of the site are included below:

Figure 1: Looking southwest at the Keltruck premises



Figure 2: Looking southwest at the Quinto Crane premises



Figure 3: Looking south across the western portion of the site



Figure 4: Looking east at part of the proposed new roadway area



Figure 5: Looking inside a workshop



Figure 6: Looking southeast at part of the proposed new roadway area



Figure 7: Looking north at former 50,000L fuel tank area in north of the site



Figure 8: Google Earth imagery from 2006 showing the 50,000L fuel tank



Figure 9: Looking at fuel tank on the roof at western end of building



Figure 10: Looking inside Westermans premises

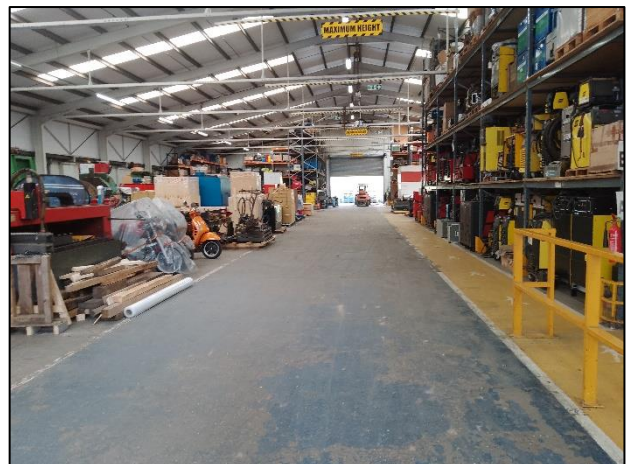


Figure 11: Looking northeast from southwest corner of site, fuel tank on roof



Figure 12: Looking east across the southern portion of the site



Figure 13: Looking north along eastern site boundary



Figure 14: Looking northwest from southeastern corner at proposed road location



Figure 15: Looking northeast from southeastern corner at proposed road location



- 2.2 At the time of the site investigation, the site was predominantly level at surface and occupied by the commercial/depot buildings. Concrete hardstanding, generally in poor condition with many areas of cracking, covered the majority of the yard area, with some areas of hardcore. A cutting into the hillslope to the south and east of the site outside the fencing has been made, separated from the main portion of the site by a ditch, possibly in preparation for the proposed roadway. Some evidence of slope instability was visible in the slope, and a manhole chamber has been left 1-2m proud out of the ground.
- 2.3 A concrete pad was present in the north of the site, understood from the Phase I report to have previously held an above ground 50,000L fuel tank, as visible on historical Google Earth aerial photography. A petrol interceptor chamber was located nearby (as detailed in the Phase I report). Another fuel tank was present on the roof of the western end of the building, and on the eastern end was a fuel filling point.
- 2.4 The buildings on site were in use as servicing and maintenance facilities for HGV and welding equipment, and until recently also for the storing and servicing of cranes. No obvious surface staining was visible. Some waste materials were present in the west, south and east of the site. The topography of the wider area rises upwards to the east and south, with surface water features present to the west and north. A small tributary not recorded on the mapping leads from the north of the A50 road bounding the north of the site towards the Slate Brook, which flows westwards past the site.

3. Phase I Report

3.1 Phase I Land Contamination Assessment Report, Brown Fisher Environmental – Reports 4 Planning (October 2023)

- 3.1.1 The Client has supplied a Phase I Desk Study for GIP's information to aid the Phase II report, the Executive Summary of which is reproduced below. It is recommended that the full Phase I report is read in conjunction with this Phase II report, and the below is included here as a brief summary. GIP hold no liability for the accuracy of the information in the report.

"Reports4Planning has been instructed to undertake a Phase I Land Contamination Assessment of an existing industrial site at Unit 2, Midland Distribution Centre, Markfield Road, Groby, Leicestershire, LE6 0FS. It is proposed to extensively redevelop the site, with the demolition of existing buildings, refurbishment of an existing building and the erection of workshop buildings with ancillary offices, welfare, parking access areas.

The historical evidence indicates that the subject site supported open undeveloped agricultural until the middle part of the twentieth century, at which time a warehouse was constructed on it. The site was used as a food depot and then a depot prior to the mid 1980's when its permitted use was changed to light industrial. The site is currently used for the servicing and maintenance of HGVs (Keltruck Ltd) and for the servicing of welding equipment (Westermans International Ltd). Although no obvious current sources of significant environmental concern were apparent, this long-term use of the site, involving the storage and use of various fuels and other chemicals, creates the potential (through spillage, leakage etc) for infiltration of potentially contaminative materials into the subsurface.

Historical activities in the site's vicinity have largely been of a relatively benign nature. However, Groby Old Quarry extended to approximately 110m of the site to the east. There is some evidence that this area was subsequently filled with industrial and household waste materials under licence by Groby Parish Council. The potential on-site migration of mobile contaminants (ground gas and groundwater) cannot therefore be discounted.

Potential areas of concern identified during this assessment are therefore:

- *PAC 1: Potential subsurface contamination from previous industrial use of the site involving storage and use of organic/inorganic substances - fuels, lubricants, solvents, acids, alkalis etc;*
- *PAC 2: Former above ground storage of hydrocarbons in north central area;*
- *PAC 3: Potential on-site ground gas and groundwater migration from nearby filled former quarry.*

The underlying bedrock geology comprises strata of the Edwalton member - mudstone, classified as a secondary B aquifer. The Slate Brook flows approximately 20m north of the site. Alluvial deposits may extend onto the north eastern corner of the site and perched groundwater sitting at the base of any Made Ground and above the mudstone may be present. As such, the site setting is considered to be of moderate environmental sensitivity.

Potentially contaminative activities are associated with the current or former uses of the site and its immediate surroundings. The conceptual model of the site demonstrates that potential pollutant linkages exist and represent a risk to human health and to the natural environment.

On the basis of this Phase I Land Contamination Assessment, intrusive investigation of the site is now considered necessary to further investigate the soil, groundwater and ground gas environments beneath the site. The investigation should focus on the northern part of the site and quantify actual risks associated with each of the identified potential areas of concern. Further generic or detailed risk assessment based on the results of this analysis will follow. Should pollutant linkages be confirmed as unacceptable, then a remediation strategy will be formulated and remedial actions validated.

(Brown Fisher Environmental, 2023)

4. Fieldwork

4.1 General Comments

- 4.1.1 The prevailing ground conditions were determined with a series of windowless sample boreholes. All the exploratory holes were undertaken, where appropriate, in accordance with BS 5930:2015+A1:2020. Full engineer verified logs are included in the appendix.
- 4.1.2 The following table is a summary of the investigation positions and the rationale behind their positions and how the information has been used.

Investigation Type	Number of Positions	ID	Rationale Behind Investigation Positions
Windowless Sampler Boreholes	8	WS1 – 8	- Investigate the underlying soils to profile the made ground depth for soil chemical analysis. - Geological interpretation of the site. - Targeting areas of fuel tanks or filling points (WS1 and WS3) - Installation of ground gas and groundwater monitoring standpipes (WS1, WS2 and WS3)
Dynamic Cone Penetrometer Testing	6	DCP1 – 6	Provide provisional CBR values along the proposed roadway (results included within the appendix)

5. Laboratory Testing

- 5.1 The following contamination laboratory tests were undertaken by i2 Analytical and the results are appended:

SOILS	
Test Description	Number of Tests
Metals and non-Metals (Arsenic, Cadmium, Hexavalent Chromium, Copper, Nickel, Zinc, Vanadium, Lead, Mercury, Selenium, Cyanide & Phenol (mono))	5
Polycyclic Aromatic Hydrocarbons (PAHs): (EPA16 PAHs: Acenaphthene, Acenaphthylene, Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Benzo(k)fluoranthene, Benzo(ghi)perylene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Naphthalene, Phenanthrene and Pyrene)	5
Petroleum Hydrocarbons: Total Petroleum Hydrocarbons Criteria Working Group	7
Asbestos ID	5
Asbestos Quantification	2
WATER	
Test Description	Number of Tests
Metals and non-Metals (Arsenic, Cadmium, Hexavalent Chromium, Copper, Nickel, Zinc, Vanadium, Lead, Mercury, Selenium, Cyanide & Phenol (mono))	10
Polycyclic Aromatic Hydrocarbons (PAHs): (EPA16 PAHs: Acenaphthene, Acenaphthylene, Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Benzo(k)fluoranthene, Benzo(ghi)perylene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Naphthalene, Phenanthrene and Pyrene)	10
Petroleum Hydrocarbons: Total Petroleum Hydrocarbons Criteria Working Group	10

6. Ground Conditions

6.1 Recorded Ground Conditions

- 6.1.1 The available published geological information indicates the majority of the site to be underlain by the Edwalton Member of the Triassic Period, described as *'mudstone and siltstone, red-brown and greenish grey, with beds of indurated, variably dolomitic siltstone and very fine-grained sandstone common in the lower half; finely disseminated gypsum common in upper half'*.
- 6.1.2 An outcrop of South Charnwood Diorites of the Ediacaran Period is located just to the east of the site, described as *'grey to pink, medium- to coarse-grained granophyric diorite with a distinctive "mottled" appearance caused by the clumping together of dark grey ferromagnesian minerals (mainly hornblende and chlorite) and grey-green hypidiomorphic plagioclase crystals. Both components are surrounded by a pink to grey granophyric mesostasis. The texture coarsens in places, but true pegmatites are rarely developed; green-grey aplite sheets cross the diorite in some quarries'*.

- 6.1.3 Superficial deposits are shown to the north as Alluvium, typically comprising silty clay with some sand, gravel and peat.

6.2 Encountered Ground Conditions

- 6.2.1 For full details of the strata encountered reference should be made to the appended logs, however, the salient features of the engineering geology can be summarised as follows.
- 6.2.2 **Made Ground** – encountered beneath the hardstanding at surface to depths of between 0.25m (WS4) and 1.20m (WS1) as silty or clayey sandy gravel and gravelly sandy clay containing gravel and occasionally cobble sized fragments of hardcore, ash, brick, burnt shale, mudstone and sandstone. The made ground was not fully penetrated in WS5 and WS6 due to water ingress in the service avoidance hand pits and the boreholes were abandoned. A ‘moderate sulphurous odour’ was noted in the made ground in WS5.
- 6.2.3 **Superficial Deposits** – encountered beneath the made ground as silty gravelly clay, sandy gravelly clay and sandy clay containing gravel sized fragments of mudstone, quartz, quartzite, carbonaceous mudstone and coal. Hand shear vanes in the cohesive horizons were recorded between 14kPa and 98kPa, indicating very soft to stiff ground conditions.
- 6.2.4 **Edwalton Member** – encountered beneath the superficial soils as firm to very stiff clay and sandy clay with mudstone lithorelicts to the base of the boreholes.
- 6.2.5 **Groundwater** – was encountered at 0.20m and 3.45m in WS1, 1.50m in WS2, 2.50m in WS3, 3.45m in WS4, 0.75m in WS5, 0.60m in WS6, 3.45m and 5.00m in WS7 and 1.45m in WS8. During the monitoring period, groundwater has been recorded as standing in the standpipes at depths of between 1.00m and 1.77m in WS1, between 1.60m and 2.05m in WS2 and between 1.24m and 1.74m in WS3.
- 6.2.6 **Petroleum Hydrocarbon Contamination**
- 6.2.7 Petroleum hydrocarbon staining and slight and moderate odours were noted throughout WS1, sunk near the former large above ground fuel tank and below ground interceptor chamber, with PID readings ranging from 6.5ppm to 69ppm. Environmental samples were taken for testing.

7. Comments and Recommendations: Assessment of Contamination

7.1 Updated Conceptual Site Model

- 7.1.1 In accordance with Environment Agency (EA) document LCRM 'Land Contamination Risk Management' the information from the Phase I Desk Study and site investigation have been used to generate a risk assessment. The purpose of this is to confirm and modify the initial conceptual site model to establish whether there are any potentially unacceptable risks present and determine the action required to provide any further information to refine the model.

7.2 Potential Contaminants of Concern

- 7.2.1 The contamination testing has included a range of common contaminants in accordance with the Conceptual Site Model, including the following:

- Arsenic
- Cadmium
- Chromium (hexavalent)
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Vanadium
- Zinc
- Cyanide
- Phenols
- Polycyclic Aromatic Hydrocarbons (PAHs, speciated)
- Petroleum Hydrocarbons
- BTEX
- MTBE
- Asbestos Fibres

7.3 Contamination Analyses

- 7.3.1 In order to assess the potential for contamination, samples of the near surface soils were forwarded to i2 Analytical for analysis for a range of contaminants in accordance with the Conceptual Site Model. The samples tested appeared to be representative of the soils present upon the site.
- 7.3.2 Further works around the former 50,000L fuel tank and petroleum interceptor chamber in the north of the site is recommended to delineate the potential contamination in this area due to the proximity of the surface water features adjacent to the site.

- 7.3.3 It should be appreciated that there remains the potential for unidentified areas of contamination to exist. Suspect areas as may be identified in the future would have to be further investigated / assessed. Risk assessment work has its limitations and uncertainties ranging from those introduced by the type and quality of the data, analytical methods through to the model chosen.

7.4 Assessment of Risk to Human Health

- 7.4.1 The CLEA (Contaminated Land Exposure Assessment) model combines information on the toxicity of soil contaminants with estimates of potential exposure by adults and children living, working and / or playing on land affected by contamination over long periods of time. By comparing predicted exposure with health criteria values on tolerable or acceptable contaminant intakes the model can be used to generate Critical Concentrations (Cc).
- 7.4.2 Generic Cc have been used as a screening process adopting Soil Screening Values (SSVs) produced by Atkins Consultants and available from the ATRISKsoil web site have been used. In this instance, values for 'Commercial' with 6% soil organic matter are considered to be the most appropriate for the nature of the proposed end usage. Where "non-detects" were recorded in the sample data they have been replaced by the relevant method detection limit.
- 7.4.3 The results of the analyses are included within the appendix together with the CLEA sheets. The results of the testing showed all contaminants were either below the critical concentrations or the method limit of detection.
- 7.4.4 Elevated bands of petroleum hydrocarbons were recorded in WS1 and to some extent in WS2, however, these fall below the threshold levels for a Commercial End Usage.
- 7.4.5 Asbestos fibres were recorded in the form of loose chrysotile fibres at a concentration of <0.001% in WS1 from 0.00m to 0.65m and in WS8 from 0.00m to 0.60m.

7.5 Preliminary Assessment of Risk to Controlled Waters

- 7.5.1 As a preliminary assessment of the risk to controlled waters, two rounds of testing have been undertaken on water samples obtained from the borehole standpipes and from the Slate Brook to the north of the site. Prior to the sampling visits, the wells were developed.

- 7.5.2 Oily odours were noted during the well development of all three boreholes, with an oily sheen noted in WS1 and WS2. No odours or oil were noted during the sampling of the surface water course to the north of the site. An oily sheen and odour was noted during the first sampling visit to WS1, with a 'faint organic odour' and 'tiny amount of sheen' noted on the second visit. An interface meter was also used to measure whether any free phase product was present. No free product was found on the two sampling visits. The records of the well development and sampling visits are included in the appendix.
- 7.5.3 The water samples have been submitted for a range of testing as included within the appendix. The results can be compared against an appropriate Environmental Quality Standard (EQS), which given the setting of the site can be the Freshwater Environmental Quality Standard (FEQS). In the absence of a UK EQS for Freshwater, the values adopted via the Water Supply (Water Quality) Regulations and World Health Organisation Guidelines for Drinking Water Quality can be utilized.
- 7.5.4 All of the determinants tested for were found at concentrations either below the relevant threshold values or below the method limit of detection, with the exception of some petroleum hydrocarbons and PAHs in WS1, as shown in the table below. The threshold level for petroleum hydrocarbons is 10µg/l. There is no applicable threshold level for either individual or total PAHs, however, a threshold level for a total four PAHs is 0.1µg/l.

Borehole		WS1	WS1
Date Sampled	Unit	27/06/2024	02/07/2024
Aliphatic >EC10 - EC12	µg/l	20	< 10
Aliphatic >EC12 - EC16	µg/l	330	< 10
Aliphatic >EC16 - EC21	µg/l	550	< 10
Aliphatic >EC21 - EC35	µg/l	280	< 10
Total Aliphatic >EC5 - EC35	µg/l	1200	< 10
Aromatic >EC10 - EC12	µg/l	52	64
Aromatic >EC12 - EC16	µg/l	250	260
Aromatic >EC16 - EC21	µg/l	230	200
Aromatic >EC21 - EC35	µg/l	40	< 10
Total Aromatic >EC5 - EC35	µg/l	580	530
Total EPA-16 PAHs	µg/l	4.36	4.05

7.6 Modified Conceptual Site Model

- The ground is characterised by a mantling of made ground up to 1.20m deep onto superficial and residual soils.
- The site appears to have been farmland prior to the construction of a warehouse in the mid twentieth century. A food depot and then a depot followed, with the site changing to light industrial usage by the 1980s.
- The site is currently in use for servicing and maintenance of HGVs and welding equipment.
- Offsite, Groby Old Quarry extended to approximately 110m to the east of the site which appears to have been infilled with industrial and household waste.
- An above ground 50,000L petroleum tank is understood to have been historically located in the north of the site, along with a buried interceptor chamber.
- Petroleum hydrocarbon contamination was found in both the soils and the groundwater in WS1, with some oily sheens and odours noted during the water sampling.
- Asbestos fibres were recorded in two shallow soil samples.
- A refurbishment and partial demolition of the existing building and construction of a new building is proposed for the site.

Modified Conceptual Site Model

Potential Source	Pathway / Pollution Linkage	Receptor	Modified Risk Rating	Rationale - Based on Site History, Walkover and the Ground Investigation Information
Contaminated Soils or Shallow Groundwater	Ingestion of soil/dust and groundwater.	Future Occupiers	LOW TO MODERATE	- The site appears to have been farmland prior to the construction of the depot, later in use as light industrial units and the current HGV and welding equipment servicing and maintenance premises. - Up to 1.20m of made ground has been recorded. - Petroleum hydrocarbon contamination has been noted in the north of the site, with asbestos fibres present in the north and south of the site. - Good working practices and appropriate Health and Safety planning would reduce the risk to Construction Workers, in particular with regards asbestos fibres. - An asbestos risk assessment will need to be prepared in accordance with CAR 2012 (Control of Asbestos Regulations) and in place prior to the commencement of any further enabling works or remediation of the site. - Good housekeeping during development works (e.g. suppression of dust with water, covering of spoil mounds, bunding of leakages/surface water runoff) would reduce the risk of spreading unrecorded contaminated soils/water or generating dust to Off Site Receptors.
	Dermal contact with soil and groundwater.	Construction Workers	LOW TO MODERATE	
	Inhalation of vapour. Inhalation of soil dust.	Off Site Receptors	LOW	
Contaminated Soils or Shallow Groundwater	Impact on groundwater from: - soil contamination - leachate - migration on/off site - through preferential pathways	Groundwater beneath the site Groundwater off site	MODERATE	- The site is underlain by a Secondary B Aquifer. The site is not within a Source Protection Zone. No groundwater abstraction licenses are located within 1km. - The Slate Brook is present to the north of the site, which lies within a SSSI. - There appears to be a former landfill site 110m to the east of the site. - Petroleum hydrocarbon contamination has been recorded in the groundwater in the north of the site, possibly due to the historical presence of a 50,000L above ground fuel tank and below ground interceptor chamber in this area. - Any new surface water drainage installed as part of the proposed works will be appropriately designed and managed. Buried concrete structures should be constructed to a suitable ACEC class of concrete to withstand potentially aggressive ground conditions to avoid deterioration over its lifespan and prevent leakages.
Contaminated Soils	Impact on surface waters from soil contamination.	Surface water features	MODERATE	- There are surface water features adjacent to the site to the north and west. - Petroleum hydrocarbon contamination has been recorded in the soils and groundwater in the north of the site, however, no elevated readings were present in the surface water samples obtained from the Slate Brook. - Any new surface water drainage installed as part of the proposed development will be appropriately designed and managed. Buried concrete structures should be constructed to a suitable ACEC class of concrete to withstand potentially aggressive ground conditions to avoid deterioration over its lifespan and prevent leakages.

Ground Gas	Migration and accumulation of ground gas in internal spaces.	Future users of the buildings	MODERATE	• Up to 1.20m of made ground has been recorded, with petroleum hydrocarbon contamination recorded. • An infilled quarry 110m to the east of the site is a former landfill site. • Some VOCs have been recorded on the PID meter during gas monitoring (<7.3ppm). • Elevated methane has been recorded in WS1, along with two visits recording carbon dioxide above 5% in WS1. • Protective measures may be required in the construction of new buildings, in particular in smaller, more enclosed rooms such as offices, kitchens and toilet facilities within the larger industrial buildings to protect Human Health, as discussed in Section 8 below. • Further monitoring is recommended following completion of any remedial works in the area of the former fuel tank and interceptor chamber.
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7.7 Preliminary Recommendations for Remediation - Assessment of Risk to Human Health

Petroleum Hydrocarbons

- 7.7.1 Whilst the levels of petroleum hydrocarbon contamination within soils in WS1 fall below the threshold levels for a commercial end usage, their presence cannot be completely discounted for both the protection of Human Health and the potential risk to Controlled Waters. Whilst surface hardstanding and floor slabs would break the physical contact with the soils for End Users, vapour migration is still a possibility into the proposed building, which will be discussed in Section 8 below.
- 7.7.2 It would be beneficial to undertake a series of additional exploratory holes in this area to delineate the extent of petroleum hydrocarbon contamination to aid the formation of a more detailed remedial strategy. If time constraints do not allow for more detailed site investigation and monitoring, an alternative solution could be as part of the redevelopment works to remove the petroleum interceptor chamber, associated pipework and any heavily contaminated soils. It is cautioned that without more knowledge of the spread of the contamination first, that the removal excavations may extend further than predicted which could have knock on implications on the redevelopment works. The proximity to the northern site boundary may require some impacted soils to remain, however, by removing a potentially ongoing source of contamination from the site this would offer some site betterment.
- 7.7.3 As will be required in accordance with a Health and Safety Plan which should be prepared for the project, personnel involved in site development works should observe a high standard of personal hygiene. For example, gloves, boots and overalls should be worn and washing facilities should be provided. In addition, should excavations be undertaken into petroleum hydrocarbon contaminated soils, the Plan will be required to ensure construction workers exposure to the soils, groundwater and vapours is managed appropriately.
- 7.7.4 If any unexpected contamination is observed elsewhere during the site works, the works should be paused, the contamination recorded and reference made to an appropriately experienced engineer to assess the risk the contamination poses and agree a remedial solution.

Asbestos

7.7.5 In view of the presence of asbestos fibres recorded in the samples of the made ground, measures will be required in order to control the risks to workers involved with the construction. This should be addressed for the current site preparation works and during future construction. This may involve the wetting down of soils and wearing of disposable overalls / appropriate masks. Additional measures could also include the following:

- Background air monitoring around the periphery of the work area
- Periodic personal air monitoring of operatives involved in the work
- Provision for cover/ sheeting of excavations when work is not underway
- Asbestos awareness training of personnel involved
- A specified system of work/ methodology for actions to be taken when suspected asbestos containing material is encountered

7.7.6 An asbestos risk assessment will need to be prepared in accordance with CAR 2012 (Control of Asbestos Regulations) and in place prior to the commencement of any further enabling works or remediation of the site.

7.8 Preliminary Recommendations for Remediation - Assessment of Risk to Controlled Waters

7.8.1 It is the remit of the Environment Agency to protect 'Controlled Waters', which includes groundwater and surface waters. The Agency are also statutory consultees in the planning process.

7.8.2 In view of the geological and hydrological setting of the site (up to 1.20m of made ground, presence of shallow groundwater, underlying geology designated as Secondary B Aquifer, nearby surface water features, petroleum hydrocarbon impacted soils and groundwater) the potential risk that the site poses to Controlled Waters can be considered as 'moderate'. As discussed above, if the interceptor chamber, pipework and heavily contaminated soils are removed in the area of WS1, then a potential ongoing source of groundwater contamination will be removed from site, offering some site betterment.

7.8.3 Considering the past history of the site and findings of the contamination testing of the shallow soils and groundwater, it is possible that the Environment Agency could require further sampling and testing to determine the extent of the risk that the site poses to Controlled Waters. This may include carrying out a Detailed Quantitative Risk Assessment (DQRA).

7.9 Disposal of Excavated Material

- 7.9.1 If excavated materials are to be removed for disposal off site, in accordance with the Landfill Directive (England and Wales) Regulations 2002 there are three main categories; Inert, Non-Hazardous and Hazardous Waste. Each category is defined by individual parameters which govern the types of waste accepted for classification. It is recommended that samples are tested for Waste Acceptance Criteria. It should be noted that individual landfill sites will have the final decision regarding the acceptance of the waste for disposal. As such the chemical testing results should be provided to the landfill operator for their specific interpretation in relation to their licences.

8. Ground Gases

8.1 General Comments

- 8.1.1 Ground atmosphere monitoring standpipes were installed in WS1, WS2 and WS3 to permit the recording of gas concentrations. Monitoring has been undertaken over a three-month period and the results are appended, together with details of the barometric pressure and borehole water level at the time of each visit.

8.2 Environmental Setting

- 8.2.1 The site was historically farmland prior to the construction of the Depot and later in use as light industrial, with the current site usage as servicing and maintenance of HGVs and welding equipment. A 50,000L fuel tank was historically present in the north of the site, and another fuel tank is present on the roof of the building. An interceptor chamber is present next in the north of the site. A former landfill site is present 110m to the east. Up to 1.20m of made ground was recorded in the boreholes. Petroleum hydrocarbon contamination is present in the north of the site in both soils and groundwater. PID readings of the contaminated soils in WS1 ranged from 6.5ppm up to 69ppm.

8.3 In Situ Gas Concentrations

- 8.3.1 The results of the gas monitoring visits can be summarised in the table below. In accordance with CIRIA Report C665 and British Standards Institution BS8485:2015 (modified in 2019), Gas Screening Values (GSVs) have been calculated for Methane and Carbon Dioxide by multiplying the steady flow rate by the gas concentrations. PID readings during the monitoring period were all below 7.3ppm.

Standpipe	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	H ₂ S (ppm)	CO (ppm)	Steady Gas Flow (l/hr)	Peak Gas Flow (l/hr)	Gas Screening Values (GSV, l/hr)	
								CH ₄	CO ₂
WS1	4.2 – 16.6	2.2 – 7.1	0 – 17.6	0	0 (1*)	<0.5	<0.5	0.083	0.036
WS2	0	1.0 – 4.1	7.3 – 16.0	0	0	<0.5 (-8.7*)	<0.5 (-14* and 62.5*)	0	0.021
WS3	0	0.1 – 3.8	14.2 – 20.0	0	0 (10*)	<0.5	<0.5 (-8.9* and 6.3*)	0	0.019

** bracketed values recorded on one occasion*

8.4 Discussion of Results

- 8.4.1 The results have shown that gas flow rates are generally low (<0.5l/hr) and concentrations of hydrogen sulphide are below detectable limits. Elevated levels of methane and carbon dioxide have been recorded in WS1. Where petroleum hydrocarbons are present in soils and groundwater, some interference with the methane readings can occur, and the concentration of methane should be checked using alternative methods (such as ground gas sampling and testing in a laboratory) during supplementary works.
- 8.4.2 In accordance with BS8485:2015/2019, the current conditions would suggest a 'Characteristic Gas Situation' of '2' defined as a 'low' hazard potential could be applied to the site, therefore some protective measures will be required in the new building to be constructed.
- 8.4.3 Minimum gas protection scores from a combination of two or more protective measures are required (Table 4 and Section 7.2 of BS8485), with the score dependant on structure type (see Table 3 of BS8485). With the presence of petroleum hydrocarbons in the north of the site, it is recommended that the protective measures include a gas proof membrane that is resistant to petroleum hydrocarbon vapours. This requirement may not be required if the impacted soils, interceptor chamber and associated pipework are removed from site, and should be reviewed following any further works.
- 8.4.4 The gas measures must be installed correctly and verified independently by a suitably qualified person for the buildings to be approved by the Local Authority and Building Control. For example, failure to install a gas membrane correctly and get it independently inspected, tested and verified would result in the membrane scoring 0 instead of 2 points in the point score system.

FOR AND ON BEHALF OF

GIP LIMITED



K. C. Davis BSc (Hons), FGS.

SENIOR ENGINEERING GEOLOGIST

Author Contact Details: kate.davis@gipuk.com



A. McHugh BSc, MSc, C.Geol., FGS.

TECHNICAL DIRECTOR

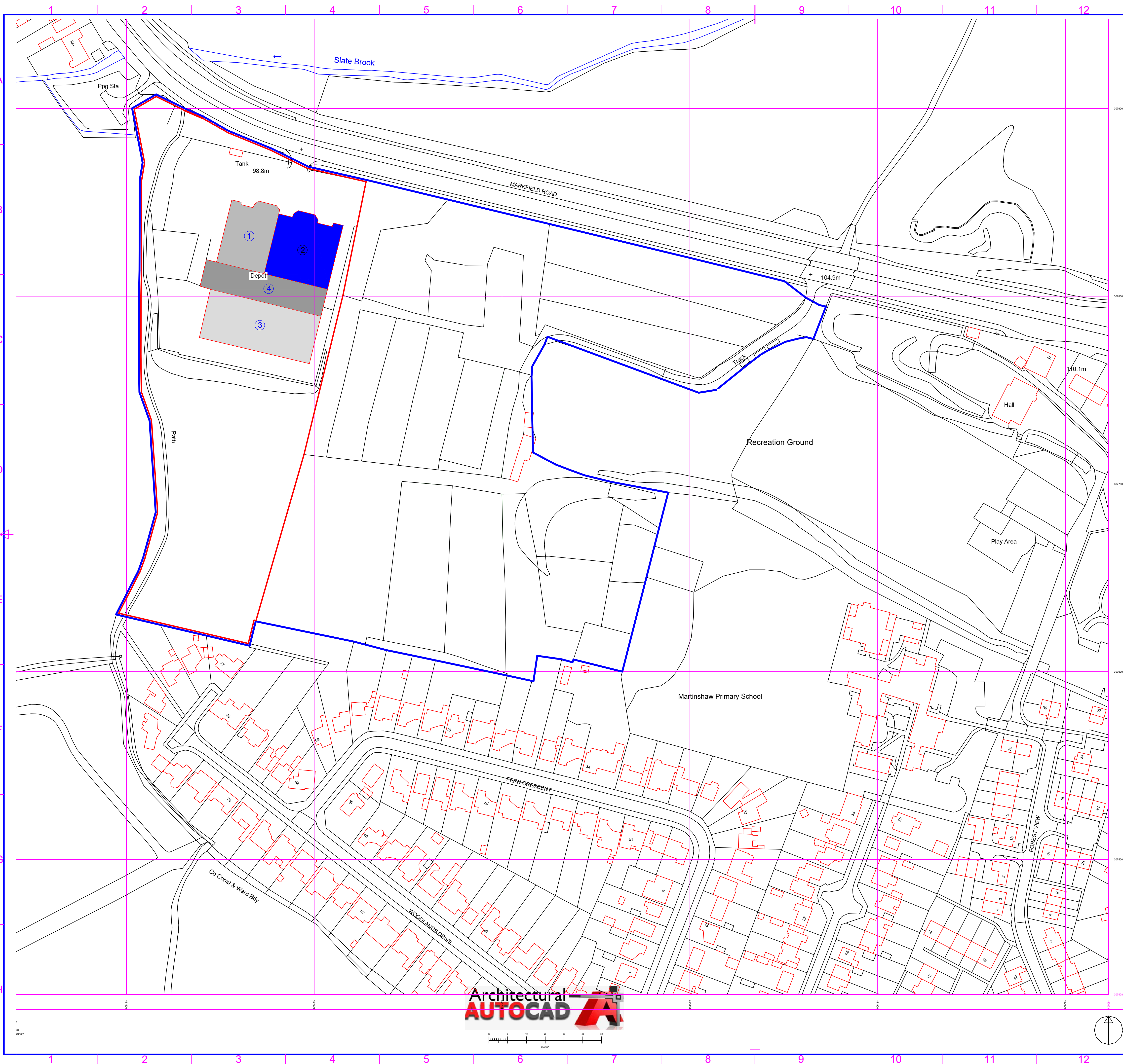


J. P. Hughes BSc, MSc, C Geol, FGS, C Sci, Eur. Geol.

CONSULTING ENGINEERING GEOLOGIST

APPENDIX A





NOTES:

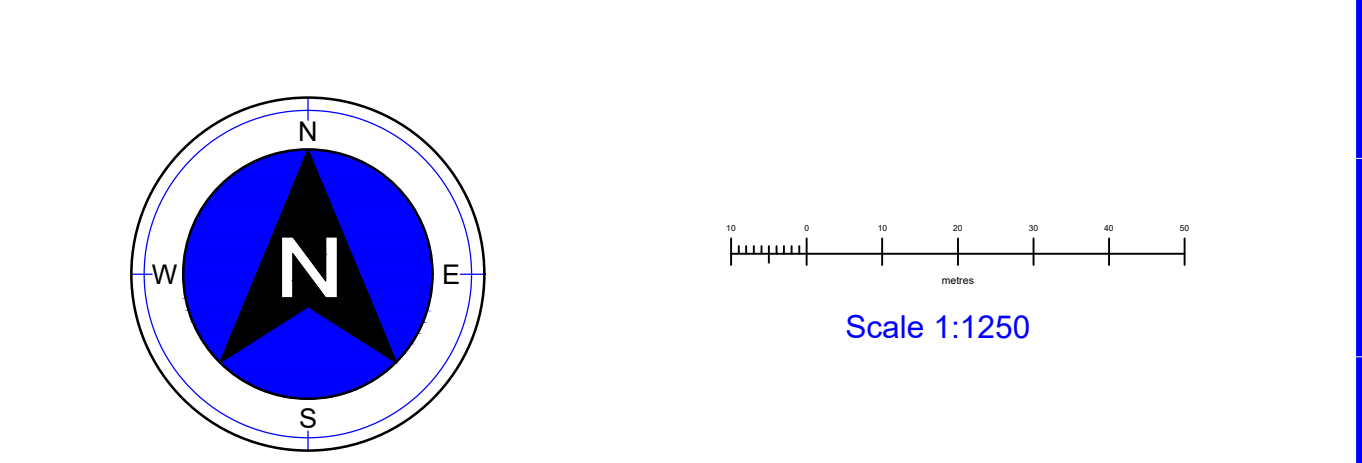
THE COPYRIGHT OF THIS DRAWING REMAINS VESTED WITH A.T.C. DESIGN AND BUILD LTD AND THE DRAWING MAY NOT BE REPRODUCED WITHOUT THE WRITTEN APPROVAL OF A.T.C. DESIGN AND BUILD LTD.

THIS DRAWING HAS BEEN PREPARED TO A RECOGNISED SCALE AND CONSENT IS GRANTED TO LOCAL AUTHORITY DEPARTMENTS OF TOWN PLANNING AND BUILDING CONTROL FOR THE DRAWING TO BE SCALED WHERE REQUIRED.

CONTRACTORS IN GENERAL ARE REQUESTED NOT TO SCALE CRITICAL DIMENSIONS AND ARE INSTRUCTED TO REFER TO A.T.C. DESIGN AND BUILD LTD FOR SPECIFIC DIMENSIONS BEFORE WORK COMMENCES

Serial number: 192003

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Notes:

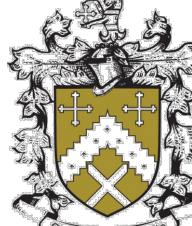
Applicants Site Boundary

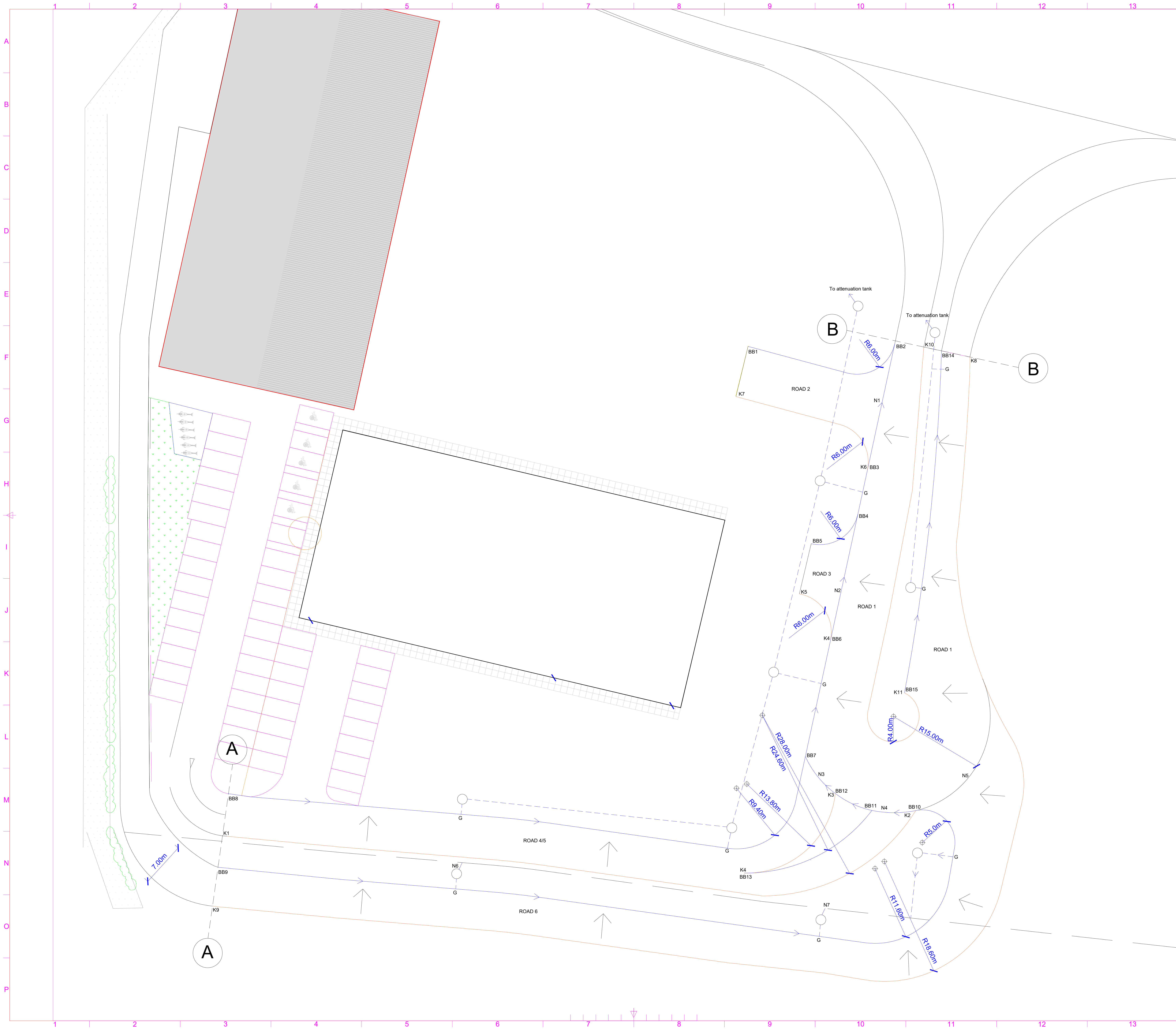
Land in Ownership of Applicant

- ① Existing Premises occupied by Quanto Cranes Ltd
- ② Existing Premises occupied by Keltruck Ltd
- ③ Existing Premises occupied by Westernmans International Ltd
- ④ Vacant

Revision (a):
Boundaries Defined

Applicant: Kelproperties Ltd		Proposal: Redevelopment of Site Located at Markfield Road	
Location: Keltruck Limited Markfield Road Groby Leicestershire LE6 0FS		Drawing Title: Location Plan as Existing showing Total Land Ownership	
Drawn by: Alan Crossley	Date: November 2020		

A.T.C. Design and Build Ltd., Design and Build Consultants		Scales: 1:1250 at A1	
 The Design Studios, Lower Drayton, Brimfield, Ludlow, Shropshire SY8 4NX		Job No. ATC.1110	
		Drg No. ATC.1110.01a	
Mobile: 07917 855766		Status: Planning Application:	
Email: ATCDandB@gmail.com			



NOTES:

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THIS DRAWING HAS BEEN PREPARED TO A RECOGNISED SCALE AND CONSENT IS GRANTED TO LOCAL AUTHORITY DEPARTMENTS OF TOWN PLANNING AND BUILDING CONTROL FOR THE DRAWING TO BE SCALED WHERE REQUIRED.

CONTRACTORS IN GENERAL ARE REQUESTED NOT TO SCALE CRITICAL DIMENSIONS AND ARE INSTRUCTED TO REFER TO A.T.C. DESIGN AND BUILD LTD FOR SPECIFIC DIMENSIONS BEFORE WORK COMMENCES.

GENERAL NOTES

This Block Plan illustrates the Proposed Development. It also shows the proposed drainage diversion. At other existing drainage remains as existing.

The development boundary is outlined in GREEN.

The existing foul water drain that will have a part of it subject to a diversion, is coloured BROWN.

The length of foul drain that is to be diverted is coloured RED.

The Manhole Schedule

Existing Manhole: Our Drawing Ref: FW101 Proposed New Manhole: Our Drawing Ref: FW 102

Depth to invert: 4570mm Depth to invert: 4600mm

From Existing Ground Level From Existing Ground Level

Length of drain:

FW 101 to FW 102 49 metres Gradient 1 in 65

FW 102 to Pump Station Wall 20 metres Gradient 1 in 65

The existing manhole is depicted by the Reference FW 101. It will be a 1500mm diameter.

The Proposed New Manhole is depicted by the Reference FW 102. It will be 1500mm diameter.

Please refer to the Manhole Construction Detail.

The new length of drain will be 255mm diameter in VC to match the existing.

Please read in Conjunction with Drawing Number: ATC 1188.70

Please read in Conjunction with Drawing Number: ATC 1188.72

D400 Heavy Duty Ductile Iro Cover and frame to FW1, FW2 and FW3

Key:

Beany block kerb drainage total length;392m

Standard precast concrete kerb total length;401m

Direction of cross fall.

Notes

Beany Block Kerb Drainage

The installation of the Beany Drainage Kerb System is to be strictly in accordance with the Design and Installation guide as issued by the manufacturer.

(Specific Notes and Requirements)

BB1 to BB2

Total length of Beany Kerb = 25.5metres.

This includes a quarter circle of four radius.

At point BB2 where the radius meets the straight, there is to be a junction to allow the length BB2 to BB3 to join the straight section. The length BB2 to BB3 will be completed with a cover plate and cast iron top with holes.

BB2 to BB3

Total length of Beany = 20 metres. This section will have a base unit with cover plate and cast iron cover with holes. This will allow the drainage to be continuous under the carriageway.

Where this section joins the straight a junction unit will be required.

BB3 to BB4

Total length of Beany = 7 metres.

At point BB3 where the radius of the standard kerb meets the straight of the Beany, there is to be a junction to allow the length BB2 to BB3 to join the straight section.

BB4 to BB5

Total length of Beany = 9.5 metres.

This incorporates a quarter circle of radius ten

At point BB4 where the radius of the Beany meets the straight, there is to be a junction to allow the length BB4 to BB5 to join the straight section.

BB4 to BB6

Total length of Beany = 20 metres.

This section will have a base unit with cover plate and cast iron cover with holes. This will allow the drainage to be continuous under the carriageway.

At point BB6 where the radius of the standard kerb meets the straight of the Beany, there is to be a junction to allow the length BB6 to BB7 to join the straight section.

BB6 to BB7

Total length of Beany = 38.5 metres.

At Point BB7 where the length BB22 to BB7 meet, there will be a junction required to allow the length BB22 to BB7 which is an under-carriageway section, to join to the Beany Kerb.

BB7 to BB8

Total length of Beany = 99 metres. This will incorporate a section of radius 5.40 metres. The length of the curved section of four radius will be 2.2metres. Please note that this curved length is included within the overall length indicated.

BB7 to BB12

Total length of Beany = 7.5 metres.

This section will have a base unit with cover plate and cast iron cover with holes. This will allow the drainage to be continuous under the carriageway.

BB12 to BB13

Total length of Beany = 6.3 metres.

At point BB12 and at point BB13, a junction will be required to allow a continuous flow under the carriageway where the straight meets the under-carriageway sections.

BB13 to BB15

Total length of Beany = 7.2 metres.

At point BB13 and at point BB15, a junction will be required to allow a continuous flow under the carriageway where the straight meets the under-carriageway sections.

BB15 to BB16

Total length of Beany = 132 metres.

This overall length includes two curved sections, as follows:

length of radius of 3.60m = 16 metres

length of radius of 5.00m = 9.6 metres

Please note that these curved lengths are included within the overall length indicated.

BB16 to BB17

Total length of Beany = 2.3 metres.

This section is all curved to a radius of 24.40m

A junction will be required at point BB17 to allow the flow to be continuous.

BB17 to BB18

Total length of Beany = 53 metres.

A junction will be required between the Beany Kerb and the standard precast concrete kerb at this point.

Standard Road Kerbs

K1 to K2

Total length of kerb = 111 metres.

This overall length includes a curved section of 28.00m radius. The actual curved section measures 28.00metres and is included in the overall length given.

A junction will be made between the Standard precast concrete kerb and the Beany Block Kerb at point K2/BB12.

K2 to K4

Total length of kerb = 20 metres.

This overall length is a curved section.

A junction will be made between the Standard precast concrete kerb and the Beany Block Kerb at point K2/BB12.

A junction will be made between the Standard precast concrete kerb and the Beany Block Kerb at point K4/BB13.

K3 to K4

Total length of kerb = 9.6 metres.

This overall length is a curved section of a quarter circle at 6.0m radius.

A junction will be made between the Standard precast concrete kerb and the Beany Block Kerb at point K4/BB13.

K6 to K7

Total length of kerb = 26 metres.

This overall length includes a curved section of a quarter circle at 6.0m radius. This length will cover measures 26 metres. The curved section is included in the overall length.

A junction will be made between the Standard precast concrete kerb and the Beany Block Kerb at point K6/BB15.

K10 to K11

Total length of kerb = 75 metres.

This overall length includes a curved section of a part circle at 4.0m radius. This length of curve measures 28 metres. The curved section is included in the overall length.

A junction will be made between the Standard precast concrete kerb and the Beany Block Kerb at point K11/BB15.

K8 to K9

Total length of kerb = 215 metres.

This overall length includes a curved section of a part circle at 18.00m radius. This length of curve measures 20 metres. This curved section is included in the overall length.

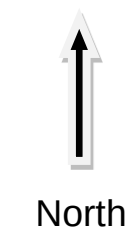
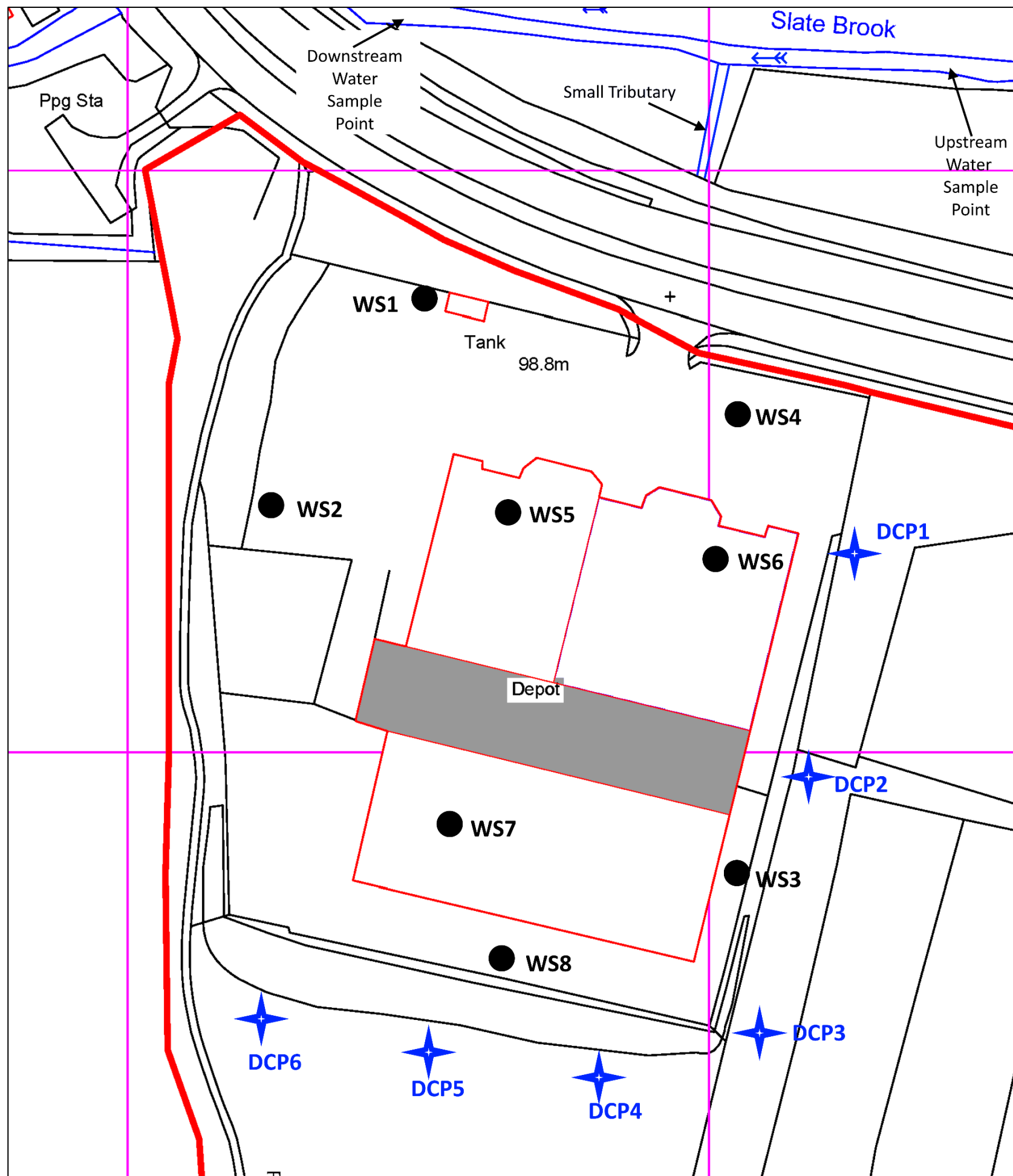
General Notes

The Beany Block will pass under the carriageway at this junction, and will be covered with a cast iron cover finished level with the surface of the carriageway.

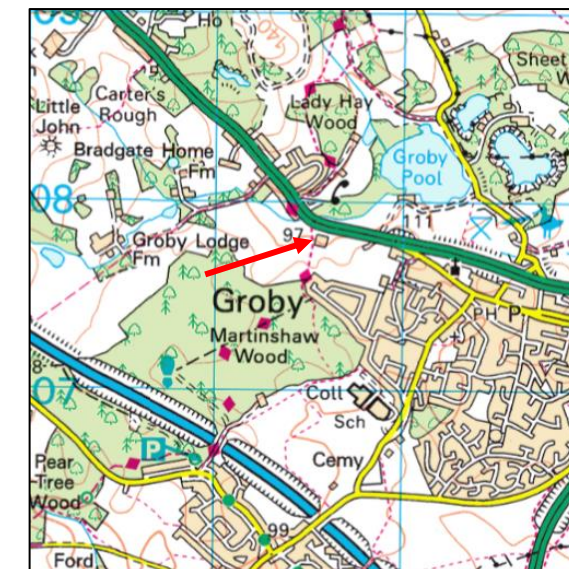
White dotted thermoplastic road lines will mark the junction.

Full to be connected to the existing surface water drain via a collar.

Applicant: Kelproperties Ltd		Proposal: Extensions & Refurbishments	
Location: Midland Distribution Centre Marksfield Road Leicester LE6 0FS		Drawing Title: GENERAL ARRANGEMENT SHOWING KERB DETAILS	
Drawn by: GW	Date: July 2024		
A.T.C. Design and Build Ltd., Design and Build Consultants		Scale: 1:200 at AO	
The Design Studios, Lower Drayton, Brimfield, Ludlow, Shropshire SY8 4NX		Job No. ATC 1120	
		Dwg No. ATC 1120.107(b)	
Mobile: 01584 711286	Status:	Planning Application:	
Email: ATCDandB@gmail.com			



Site Location



Key

- = Windowless Sample Borehole
- ★ = DCP Test



Building 62, Third Avenue, The Pensnett Estate,
Kingswinford, West Midlands, DY6 7XT
Tel: 01902 459558 Email: info@gipuk.com
Website: www.gipuk.com

Title: Ground Investigation at Keltruck, Groby
Plan Detailing Existing Site Layout & Approximate
Exploratory Hole Locations.

Client: ATC Design and Build Ltd

Scale: Not to Scale

Date: August 2024

Contract: 33155

Drg: 1

All positions are approximate as shown

APPENDIX B





Building 62, Third Avenue
The Pensnett Estate
Kingswinford
DY6 7XT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number: 33155

Project Name: Keltruck Limited Midland Distribution Centre, Groby

Client: ATC Design and Build Ltd

Engineer:

Date Drilled: 15/05/2024

Diameter: 102mm

Depth Cased: 1.00m

Borehole:

Sheet 1 of 1

Logged By:

Checked By:

Drilled By:

WS01

JH

KCD

SB

National Grid:

Ground Level:

Final Depth: 5.45m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests		SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
					Depth (m bgl)	Type		
MADE GROUND. Dark grey silty sandy GRAVEL with a moderate hydrocarbon type odour. Gravel is angular to sub-angular hardcore. PID = 11.9ppm				▼ 0.20	0.00 0.00	B ES		
MADE GROUND. Black silty GRAVEL with a moderate hydrocarbon type odour. Gravel is angular to sub-angular ash. PID = 18.1ppm		0.65			0.65 0.65	B ES		
Firm brown silty slightly gravelly CLAY with a slight hydrocarbon type odour. Gravel is sub-angular mudstone. (Superficial Deposits) PID = 6.5ppm		1.20			1.20 1.20	S 7 (1,1,1,2,2,2) B		
Firm grey and dark grey slightly sandy slightly gravelly CLAY with a slight hydrocarbon type odour. Gravel is sub-angular to sub-rounded quartz, quartzite and mudstone. (Superficial Deposits) PID = 16.6ppm		1.55			1.55 1.75	B HV 40kPa		
Soft brownish grey and brown sandy slightly gravelly CLAY with a slight hydrocarbon type odour. Gravel is sub-angular quartz. (Superficial Deposits) PID = 30ppm		2.00			1.90 2.00	HV 56kPa B 4 (1,1,1,1,1,1)		
Very soft and soft brown and reddish brown sandy slightly gravelly CLAY with occasional relic rootlets. Gravel is sub-rounded quartz and quartzite. (Superficial Deposits) PID = 13ppm		2.70			2.00 2.00	S ES		
Firm reddish brown with occasional grey mottling sandy CLAY with occasional becoming some mudstone lithorelicts (from 4.00m) and a moderate hydrocarbon type odour. (Edwalton Member) PID = 47ppm		3.30		▼ 3.00	2.65 2.70	HV 36kPa B 14kPa		
Very stiff reddish brown with occasional grey mottling slightly sandy CLAY with many mudstone lithorelicts and a moderate hydrocarbon type odour. (Edwalton Member) PID = 69ppm		4.00		3.45	2.80 3.00	HV 6 (1,1,1,1,2,2) B		
					3.00 3.30	S B		
					3.70 3.85	HV 50kPa HV 52kPa		
					4.00 4.00	B 29 (3,4,5,7,8,9) S		
					4.00 5.00	ES S 34 (4,5,6,7,9,12)		
Borehole Complete at 5.45m		5.45						

Samples/Tests

U Undisturbed
D Disturbed
B Bulk
W Water
S/C SPT/CPT
ES Environmental Sample
HV Hand Shear Vane
NR No Recovery
Water Strike
Water Level

Document 4.144

Other Information:

1. Roadstone hard standing penetrated using hydraulic breaker prior to drilling.
2. Hand excavated service avoidance pit dug to 1.20m.
3. First groundwater ingress encountered at 0.20m, standing at 0.20m after 20 minutes of observation.
4. Second groundwater ingress encountered at 3.45m, rising to 3.00m after 20 minutes of observation.
5. 50mm ID HDPE monitoring standpipe installed to 5.00m (slotted from 5.00m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.20m, security cover fitted at surface.



Project Number: 33155
Project Name: Keltruck Limited Midland Distribution Centre, Groby
Client: ATC Design and Build Ltd
Engineer:
Date Drilled: 15/05/2024
Diameter: 102mm
Depth Cased: 0.00m

Borehole:	WS02
Sheet 1 of 1	
Logged By:	JH
Checked By:	KCD
Drilled By:	SB

Samples/Tests U Undisturbed D Disturbed B Bulk W Water S/C SPT/CPT ES Environmental Sample HV Hand Shear Vane NR No Recovery  Water Strike  Water Level	Other Information: 1. Tarmac hard standing penetrated using hydraulic breaker prior to drilling. 2. Hand excavated service avoidance pit dug to 1.20m. 3. Groundwater encountered at 1.50m, rising to 1.45m after 20 minutes of observation. 4. 50mm ID HDPE monitoring standpipe installed to 5.00m (slotted from 5.00m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.30m, security cover fitted at surface.
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Building 62, Third Avenue
The Pensnett Estate
Kingswinford
DY6 7XT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number: 33155
Project Name: Keltruck Limited Midland Distribution Centre, Groby
Client: ATC Design and Build Ltd
Engineer:
Date Drilled: 13/05/2024
Diameter: 102mm
Depth Cased: 0.00m

Borehole:	WS03
Sheet 1 of 1	
Logged By:	JH
Checked By:	KCD
Drilled By:	SB

National Grid:
Ground Level:
Final Depth: 4.45m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests		SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
					Depth (m bgl)	Type		
MADE GROUND. Concrete.		0.20			0.20	B		
MADE GROUND. Reddish brown and brown very clayey sandy GRAVEL. Gravel is angular to sub-angular brick, mudstone and burnt shale.		0.50			0.20 0.50	ES B		
Stiff and in parts firm and very stiff reddish brown and brown with occasional grey mottling slightly sandy CLAY. (Superficial Deposits)								
Stiff becoming very stiff (from 2.00m) reddish brown with grey mottling CLAY with many mudstone lithorelicts. (Edwalton Member)		1.40			1.20 1.20 1.40 1.70 1.90 2.00 2.00	S 12 (2,2,3,3,3,3) B B HV 240kPa HV 228kPa S 20 (4,5,4,4,5,7) B		
Very stiff and in parts stiff reddish brown with grey mottling CLAY with many mudstone lithorelicts. (Edwalton Member)		2.45		▼ 2.50				
					3.00 3.00	S 24 (4,5,5,5,6,8) B		
					4.00	S 50 (6,8,8,10,14,18)		
Borehole Complete at 4.45m		4.45						

Samples/Tests U Undisturbed D Disturbed B Bulk W Water S/C SPT/CPT ES Environmental Sample HV Hand Shear Vane NR No Recovery Water Strike Water Level	Other Information: 1. Concrete hard standing penetrated using corer prior to drilling. 2. Hand excavated service avoidance pit dug to 1.20m. 3. Groundwater encountered at 2.50m, standing at 2.50m after 20 minutes of observation. 4. 50mm ID HDPE monitoring standpipe installed to 4.00m (slotted from 4.00m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.30m, security cover fitted at surface.
--	---



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Windowless Sampler Borehole Log

Project Number: 33155
Project Name: Keltruck Limited Midland Distribution Centre, Groby
Client: ATC Design and Build Ltd
Engineer:
Date Drilled: 13/05/2024
Diameter: 102mm
Depth Cased: 0.00m

Borehole:	WS04
Sheet 1 of 1	
Logged By:	JH
Checked By:	KCD
Drilled By:	SB

National Grid:
Ground Level:
Final Depth: 5.45m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests		SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
					Depth (m bgl)	Type		
MADE GROUND. Tarmac.		0.10			0.10	B		
MADE GROUND. Dark grey clayey sandy GRAVEL. Gravel is angular to sub-angular hardcore.		0.25			0.25	B		
Soft and firm, with some stiff pockets, reddish brown with grey mottling slightly sandy CLAY with occasional relic rootlets. (Superficial Deposits)								
Soft grey and dark grey sandy slightly silty slightly gravelly CLAY with occasional relic rootlets. Gravel is sub-angular carbonaceous mudstone and coal. (Superficial Deposits)		1.20			1.20	S 8 (1,2,2,1,2,3)		
Stiff and very stiff reddish brown with occasional grey mottling sandy CLAY with mudstone lithorelicts. (Edwalton Member)		1.45			1.20	B		
2.00m-2.70m: Occasional relic rootlets.					1.45	B		
					1.65	HV 174kPa		
					1.90	HV 186kPa		
					2.00	B 11 (1,2,2,3,3,3)		
					2.00	S		
Firm and stiff reddish brown CLAY with occasional becoming some (from 3.00m) mudstone lithorelicts. (Edwalton Member)		2.70			2.70	D 66kPa		
					2.70	HV 68kPa		
					2.90	HV 12 (2,2,2,3,3,4)		
					3.00	B		
					3.00	S		
3.75m: Becoming very stiff.				▼ 3.45				
Very stiff reddish brown with grey mottling CLAY with many mudstone lithorelicts. (Edwalton Member)		4.00			4.00	S 33 (2,4,5,6,10,12)		
					4.50	B		
					5.00	S 51 (5,10,12,12,12,15)		
Borehole Complete at 5.45m		5.45						

Samples/Tests

U Undisturbed
D Disturbed
B Bulk
W Water
S/C SPT/CPT
ES Environmental Sample
HV Hand Shear Vane
NR No Recovery
 Water Strike
 Water Level

Document 4.144

Other Information:

1. Tarmac hard standing penetrated using corer prior to drilling.
2. Hand excavated service avoidance pit dug to 1.20m.
3. No groundwater encountered
4. Borehole backfilled on completion.



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Windowless Sampler Borehole Log

Project Number: 33155
Project Name: Keltruck Limited Midland Distribution Centre, Groby
Client: ATC Design and Build Ltd
Engineer:
Date Drilled: 14/05/2024
Diameter: 102mm
Depth Cased: 0.00m

Borehole:	WS05
Sheet 1 of 1	
Logged By:	JH
Checked By:	KCD
Drilled By:	SB

National Grid:
Ground Level:
Final Depth: 0.75m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water		Samples/Tests		SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
				Level (m bgl)	Depth (m bgl)	Type			
MADE GROUND. Concrete.		0.15			0.75	0.15	B		
MADE GROUND. Dark grey very clayey silty GRAVEL. Gravel is angular to sub-angular ash and hardcore.		0.35				B			
MADE GROUND. Brown sandy clayey GRAVEL with a low cobble content. Gravel and cobbles are hardcore.		0.60				B			
MADE GROUND. Soft grey and brownish grey gravelly slightly sandy CLAY with a moderate sulphurous type odour. Gravel is angular to sub-angular hardcore and ash.		0.75							
Borehole Complete at 0.75m									



Project Number: 33155

Project Name: Keltruck Limited Midland Distribution Centre, Groby

Client: ATC Design and Build Ltd

Engineer:

Date Drilled: 13/05/2024

Diameter: 102mm

Depth Cased: 0.00m

National Grid:

Ground Level:

Final Depth: 0.80m

Borehole:

Sheet 1 of 1

Logged By:

Checked By:

Drilled By:

WS06

JH

KCD

SB

Samples/Tests U Undisturbed D Disturbed B Bulk W Water S/C SPT/CPT ES Environmental Sample HV Hand Shear Vane NR No Recovery  Water Strike  Water Level	Other Information: 1. Concrete hard standing penetrated using corer prior to drilling. 2. Hand excavated service avoidance pit dug to 0.80m. 3. Borehole terminated at 0.80m due to water ingress and dense ground. 4. Groundwater encountered at 0.60m, standing at 0.60m after 20 minutes of observation. 5. Borehole backfilled on completion.
--	---



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Kingswinford
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Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number: 33155
Project Name: Keltruck Limited Midland Distribution Centre, Groby
Client: ATC Design and Build Ltd
Engineer:
Date Drilled: 14/05/2024
Diameter: 102mm
Depth Cased: 0.00m

Borehole:	WS07
Sheet 1 of 1	
Logged By:	JH
Checked By:	KCD
Drilled By:	SB

National Grid:
Ground Level:
Final Depth: 5.45m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests		SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
					Depth (m bgl)	Type		
MADE GROUND. Concrete.		0.20			0.20	B		
MADE GROUND. Brown dark grey and grey silty sandy GRAVEL. Gravel is angular to sub-angular hardcore, sandstone and occasional brick.		0.40			0.20	ES		
Firm and in parts stiff reddish brown with occasional grey mottling slightly sandy CLAY. (Superficial Deposits)					0.40	B		
Firm in parts stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is sub-angular to sub-rounded mudstone. (Superficial Deposits)		1.20			1.20	S 7 (2,2,1,2,2,2)		
				▼ 1.40	1.20	B		
					1.45	B		
					1.70	HV 96kPa		
					1.90	HV 98kPa		
Very stiff and in parts stiff reddish brown with grey mottling slightly sandy CLAY with some becoming many (from 2.45m) mudstone lithorelicts. (Edwalton Member)		2.00			2.00	S 17 (2,2,2,3,5,7)		
					2.00	B		
				▼ 2.70				
					2.90	HV 138kPa		
					3.00	S 20 (2,3,3,4,5,8)		
					3.00	B		
		3.45		▽ 3.45				
Very stiff reddish brown with grey mottling slightly sandy CLAY with many mudstone lithorelicts. (Edwalton Member)					3.85	HV 204kPa		
					4.00	S 21 (2,3,4,5,6,6)		
					4.00	B		
				▽ 5.00				
					4.90	HV 122kPa		
					5.00	S 35 (4,6,7,8,9,11)		
Borehole Complete at 5.45m		5.45						

Samples/Tests U Undisturbed D Disturbed B Bulk W Water S/C SPT/CPT ES Environmental Sample HV Hand Shear Vane NR No Recovery Water Strike Water Level	Other Information: 1. Concrete hard standing penetrated using corer prior to drilling. 2. Hand excavated service avoidance pit dug to 1.20m. 3. First groundwater ingress encountered at 3.45m, rising to 2.70m after 20 minutes of observation. 4. Second groundwater ingress encountered at 5.00m, rising to 1.40m after 20 minutes of observation. 5. Borehole backfilled on completion.
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Windowless Sampler Borehole Log

Project Number: 33155
Project Name: Keltruck Limited Midland Distribution Centre, Groby
Client: ATC Design and Build Ltd
Engineer:
Date Drilled: 13/05/2024
Diameter: 102mm
Depth Cased: 0.00m

Borehole:	WS08
Sheet 1 of 1	
Logged By:	JH
Checked By:	KCD
Drilled By:	SB

National Grid:
Ground Level:
Final Depth: 3.45m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests		SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
					Depth (m bgl)	Type		
MADE GROUND. Grey and dark grey silty sandy GRAVEL. Gravel is angular to sub-angular hardcore.					0.00 0.00	B ES		
Stiff and in parts firm reddish brown with occasional grey mottling slightly sandy slightly gravelly CLAY. Gravel is sub- angular mudstone. (Superficial Deposits)		0.60		1.00	0.60	B		
					1.20	S 9 (2,2,2,2,2,3)		
					1.20	B		
Stiff reddish brown slightly sandy CLAY. (Edwalton Member)		1.50		1.45	1.50	B		
Firm and in parts stiff CLAY with many mudstone lithorelicts. (Edwalton Member)		1.85			1.85	D		
					2.00	S 17 (2,2,3,4,5,5)		
Very stiff reddish brown with occasional grey mottling slightly sandy CLAY with many mudstone lithorelicts. (Edwalton Member)		2.50			2.50	B		
					3.00	S 44 (4,5,8,8,14,14)		
Borehole Complete at 3.45m		3.45						

Samples/Tests

U Undisturbed
D Disturbed
B Bulk
W Water
S/C SPT/CPT
ES Environmental Sample
HV Hand Shear Vane
NR No Recovery
 Water Strike
 Water Level

Document 4.144

Other Information:

1. Hard standing penetrated using hydraulic breaker prior to drilling.
2. Hand excavated service avoidance pit dug to 1.20m.
3. Groundwater encountered at 1.45m, rising to 1.00m after 20 minutes of observation.
4. Borehole backfilled on completion.

Dynamic Cone Penetrometer Test Results Sheet

Test ID: DCP1

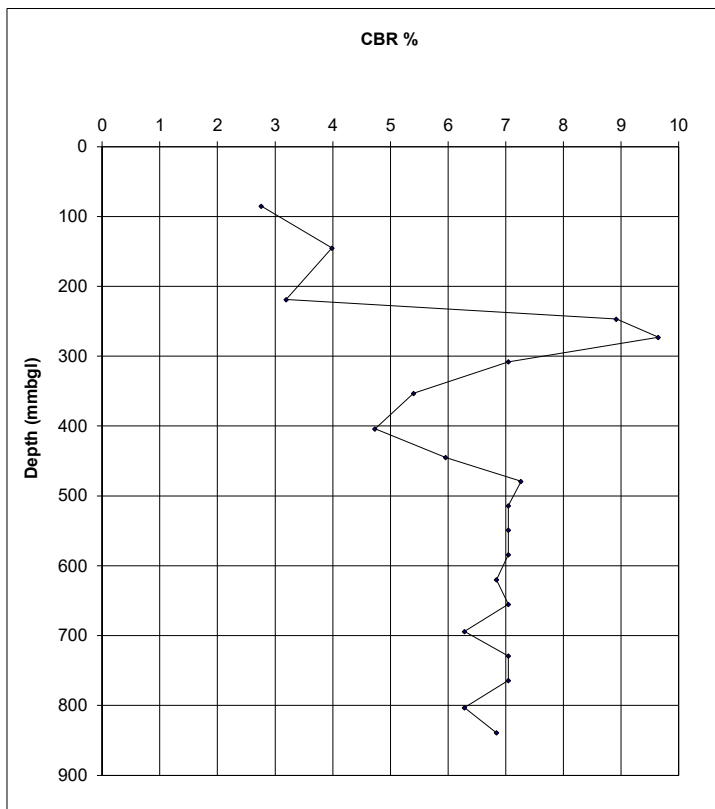
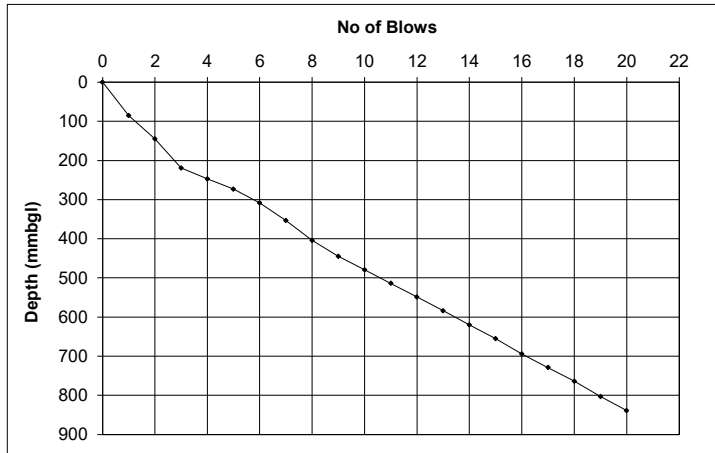
Project: Keltruck, Leicester.

Project No: 33155

Start depth (mmbgf): 0

Date: 23.05.24

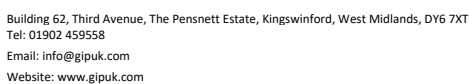
Blows	Depth (mmbgf)	Total Blows	Depth of Penetration (mm)	mm/blow	CBR%
0	0	0	0		
1	85	1	85	85.0	2.8
1	145	2	60	60.0	4.0
1	219	3	74	74.0	3.2
1	247	4	28	28.0	8.9
1	273	5	26	26.0	9.6
1	308	6	35	35.0	7.0
1	353	7	45	45.0	5.4
1	404	8	51	51.0	4.7
1	445	9	41	41.0	6.0
1	479	10	34	34.0	7.3
1	514	11	35	35.0	7.0
1	549	12	35	35.0	7.0
1	584	13	35	35.0	7.0
1	620	14	36	36.0	6.8
1	655	15	35	35.0	7.0
1	694	16	39	39.0	6.3
1	729	17	35	35.0	7.0
1	764	18	35	35.0	7.0
1	803	19	39	39.0	6.3
1	839	20	36	36.0	6.8



SUMMARY

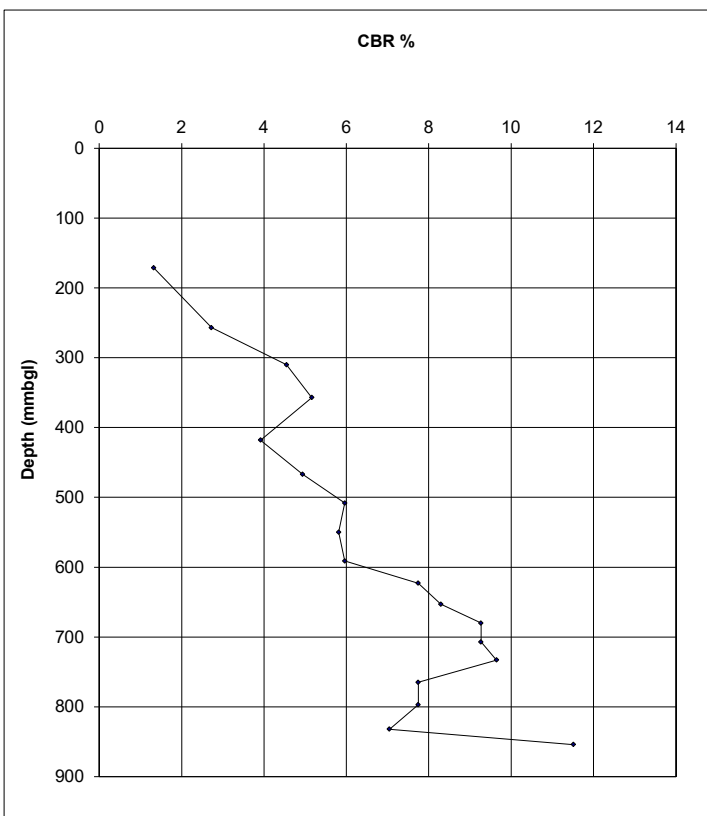
CBR (Minimum) 2.8 %
CBR (Maximum) 9.6 %

TRRL, Road Transport Note 8.
Log CBR = -1.057 log (mm/blow) + 2.48



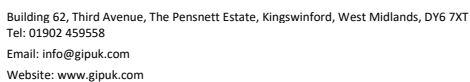
Test ID: DCP2

Date: 23.05.24



CBR (Minimum)	1.3 %
CBR (Maximum)	11.5 %

Log CBR = -1.057 log (mm/blow) + 2.48



Test ID: DCP3

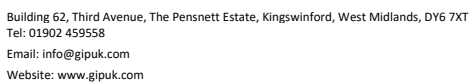
Date: 23.05.24

The graph displays the California Bearing Ratio (CBR) percentage at various depths (0 to 900 mm bgl) for three boreholes. The x-axis represents CBR % (0 to 25) and the y-axis represents Depth (mm bgl) (0 to 900). Borehole 1 (leftmost line) shows the lowest CBR values, while Borehole 3 (rightmost line) shows the highest values. Borehole 2 (middle line) shows intermediate values. All three boreholes show a general trend of increasing CBR with depth, with some fluctuations.

Depth (mm bgl)	Borehole 1 CBR %	Borehole 2 CBR %	Borehole 3 CBR %
50	4.5	-	-
90	5.5	-	-
150	6.5	-	-
180	7.5	-	-
200	8.5	-	-
220	9.5	-	-
250	10.5	-	-
280	11.5	-	-
300	12.5	-	-
320	13.5	-	-
350	14.5	-	-
380	15.5	-	-
400	16.5	-	-
420	17.5	-	-
450	18.5	-	-
480	19.5	-	-
500	20.5	-	-
520	21.5	-	-
550	22.5	-	-
580	23.5	-	-
600	24.5	-	-
620	25.5	-	-
650	26.5	-	-
680	27.5	-	-
700	28.5	-	-
720	29.5	-	-
750	30.5	-	-
780	31.5	-	-
800	32.5	-	-
820	33.5	-	-
850	34.5	-	-
880	35.5	-	-
900	36.5	-	-

CBR (Minimum)	4.3 %
CBR (Maximum)	20.1 %

TRRL, Road Transport Note 8.
 $\text{Log CBR} = -1.057 \log (\text{mm/blow}) + 2.48$



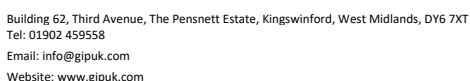
Test ID: DCP4

Date: 23.05.24

The graph displays the relationship between Depth (mm bgl) on the Y-axis and CBR % on the X-axis. The Y-axis ranges from 0 to 900 mm bgl, and the X-axis ranges from 0 to 100 CBR %. Multiple data series are plotted, showing CBR % values at different depths. The graph illustrates how CBR % generally decreases with increasing depth, with some series showing significant variability at shallower depths.

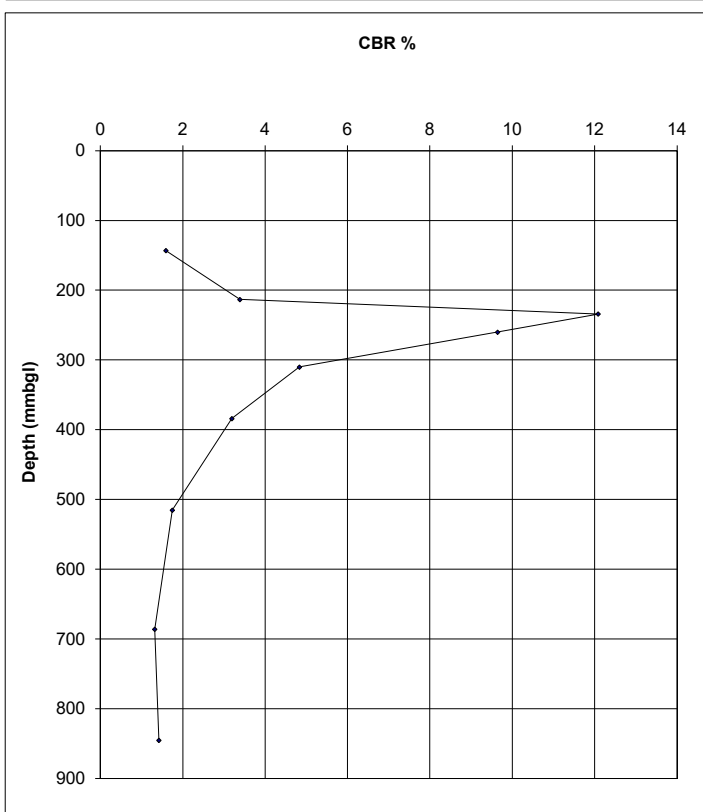
CBR (Minimum)	4.9 %
CBR (Maximum)	94.6 %

TRRL, Road Transport Note 8.
 $\text{Log CBR} = -1.057 \log (\text{mm/blow}) + 2.48$



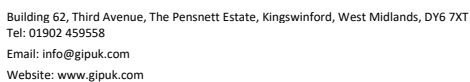
Test ID: DCP5

Date: 23.05.24



CBR (Minimum)	1.3 %
CBR (Maximum)	12.1 %

Log CBR = -1.057 log (mm/blow) + 2.48



Test ID: DCP6

Date: 23.05.24

CBR %

Depth (mm bgl)

Depth (mm bgl)	Method 1 (CBR %)	Method 2 (CBR %)	Method 3 (CBR %)
100	3	3	3
125	13	8	13
150	20	10	20
175	22	11	22
200	25	12	25
225	28	13	28
250	30	14	30
275	32	15	32
300	35	16	35
325	38	17	38
350	35	18	35
375	32	19	32
400	30	20	30
425	28	21	28
450	25	22	25
475	22	23	22
500	20	24	20
525	18	25	18
550	15	26	15
575	12	27	12
600	10	28	10
625	8	29	8
650	5	30	5
675	3	31	3
700	2	32	2
725	1	33	1
750	0	34	0
775	0	35	0
800	0	36	0
825	0	37	0
850	0	38	0
875	0	39	0
900	0	40	0

CBR (Minimum)	2.3 %
CBR (Maximum)	38.6 %

TRRL, Road Transport Note 8.
 $\text{Log CBR} = -1.057 \log (\text{mm/blow}) + 2.48$

APPENDIX C



General Stats

Document 4.49

Document 4.49

Notes on the Statistical Calculations for Use With the CLEA Model

The preceding tables are from a spreadsheet which takes the analytical data from chemical analyses of soils and compares them with a critical concentration (C_c) using a number of statistical methods. The spreadsheet has been written using the methodology described in "Guidance on Comparing Soil Contamination Data with a Critical Concentration" – May 2008 (The Chartered Institute of Environmental Health and CL:AIRE with support from The Soil and Groundwater Technology Association)

The aim of the assessment is to prove, or otherwise, that the land under investigation is fit for purpose in that the level of contamination is low compared to an appropriate measure of risk. In statistical terms this question is handled using formal hypotheses. These are:-

The **Null Hypothesis** = $H_0 \mu \geq C_c$ (or the true mean is greater than or equal to the critical value)

and

The **Alternative Hypothesis** = $H_1 \mu < C_c$ (or the true mean is less than the critical value)

If the Null Hypothesis is proven incorrect then the land is deemed fit for purpose and the Alternative Hypothesis is true. If the Null Hypothesis is proven correct then the land is deemed unfit for purpose or remediation is necessary to render it fit for purpose.

Following verification of the data a process of statistical methods is used.

- Firstly the Grubbs Outlier test is used to determine the presence of any anomalously high values in the data. These may either be "hot spots" of contamination or possibly erroneous results.
- Accounting for any outliers using the above method the data is tested to determine whether it falls within a normal distribution using the Shapiro-Wilks normality test.
- If the data does not deviate from normality then the 95% confidence limit is calculated using the one-sample t-test. Otherwise the 95% Upper confidence limit is calculated using the one-sided Chebychev Theorem.
- The Upper 95% confidence limit is then compared to the C_c

The critical concentrations (C_c) used in this assessment are the Soil Screening Values (SSV) from the ATRISKSIL website www.atrisksoil.co.uk. These are generated by Atkins Consultants.

If the Null Hypothesis is rejected then there is an at least 95% confidence level that the true mean concentration of the site is less than the critical concentration and no further action is required. If the Null Hypothesis is accepted then the true mean concentration is deemed to be greater than the critical concentration and the land is unsuitable for its proposed end use or requires remediation to render it suitable.

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Analytical Report Number : 24-021251

Replaces Analytical Report Number: 24-021251, issue no. 1

Additional analysis undertaken.

Asbestos Quantification added to samples 208291 & 299 as per client's request.

Project / Site name:	Keltruck Groby	Samples received on:	23/05/2024
Your job number:	KCD 33155	Samples instructed on/ Analysis started on:	23/05/2024
Your order number:		Analysis completed by:	11/06/2024
Report Issue Number:	2	Report issued on:	12/06/2024
Samples Analysed:	9 soil samples		

Signed:



Joanna Szwagrak
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-021251
Project / Site name: Keltruck Groby

Lab Sample Number	208291	208292	208293	208294	208295
Sample Reference	WS1	WS1	WS1	WS1	WS2
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.00-0.65	0.65-1.20	2.00-2.45	4.00-5.00	0.00-0.50
Date Sampled	22/05/2024	22/05/2024	22/05/2024	22/05/2024	22/05/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Stone Content	%	0.1	NONE	-	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	-	23	15	16	3.5
Total mass of sample received	kg	0.1	NONE	-	0.9	0.2	0.3	0.8

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Detected	-	-	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SPU	-	-	-	PKU
Actinolite detected	Type	N/A	ISO 17025	Not-detected	-	-	-	-
Amosite detected	Type	N/A	ISO 17025	Not-detected	-	-	-	-
Anthophyllite detected	Type	N/A	ISO 17025	Not-detected	-	-	-	-
Chrysotile detected	Type	N/A	ISO 17025	Detected	-	-	-	-
Crocidolite detected	Type	N/A	ISO 17025	Not-detected	-	-	-	-
Tremolite detected	Type	N/A	ISO 17025	Not-detected	-	-	-	-

Asbestos % by hand picking/weighing	%	0.001	ISO 17025	< 0.001	-	-	-	-
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Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	Loose Fibres	-	-	-	-
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General Inorganics

pH (L099)	pH Units	N/A	MCERTS	-	7.9	-	-	9.1
Total Cyanide	mg/kg	1	MCERTS	-	8.4	-	-	< 1.0
Organic Matter (automated)	%	0.1	MCERTS	-	9	-	-	6.7

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	1.5	-	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	0.77	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	1	-	-	0.17
Fluorene	mg/kg	0.05	MCERTS	-	1.8	-	-	0.16
Phenanthrene	mg/kg	0.05	MCERTS	-	5	-	-	1.5
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.32
Fluoranthene	mg/kg	0.05	MCERTS	-	15	-	-	1.6
Pyrene	mg/kg	0.05	MCERTS	-	16	-	-	1.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	6.3	-	-	0.34
Chrysene	mg/kg	0.05	MCERTS	-	7.1	-	-	0.61
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	7.6	-	-	0.53
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	3.1	-	-	0.28
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	4.6	-	-	0.53
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	2.6	-	-	0.29
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	2.7	-	-	0.48

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	74.9	-	-	7.94
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Analytical Report Number: 24-021251
Project / Site name: Keltruck Groby

Lab Sample Number				208291	208292	208293	208294	208295
Sample Reference				WS1	WS1	WS1	WS1	WS2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.65	0.65-1.20	2.00-2.45	4.00-5.00	0.00-0.50
Date Sampled				22/05/2024	22/05/2024	22/05/2024	22/05/2024	22/05/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	26	-	-	25
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	1.1	-	-	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	< 1.8	-	-	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	23	-	-	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	84	-	-	43
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	340	-	-	11
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	69	-	-	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	78	-	-	81
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	230	-	-	73

Petroleum Hydrocarbons

TPHCWG - Aliphatic >C5 - C6 HS_ID_AL	mg/kg	0.02	NONE	-	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aliphatic >C6 - C8 HS_ID_AL	mg/kg	0.02	NONE	-	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aliphatic >C8 - C10 HS_ID_AL	mg/kg	0.05	NONE	-	< 0.050	< 0.050	< 0.050	< 0.050
TPHCWG - Aliphatic >C10 - C12 EH_CU_ID_AL	mg/kg	1	MCERTS	-	21	5	< 1.0	< 1.0
TPHCWG - Aliphatic >C12 - C16 EH_CU_ID_AL	mg/kg	2	MCERTS	-	1900	110	31	5.3
TPHCWG - Aliphatic >C16 - C21 EH_CU_ID_AL	mg/kg	8	MCERTS	-	5200 ^{\$§}	190	62	37
TPHCWG - Aliphatic >C16 - C35 EH_CU_ID_AL	mg/kg	10	MCERTS	-	14000	260	84	1000
TPHCWG - Aliphatic >C21 - C35 EH_CU_ID_AL	mg/kg	8	MCERTS	-	8800	72	22	1000
TPHCWG - Aliphatic >C5 - C35 EH_CU+HS_ID_AL	mg/kg	10	NONE	-	16000 ^{\$§}	380	120	1100

TPHCWG - Aromatic >EC5 - EC7 HS_ID_AR	mg/kg	0.01	NONE	-	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 HS_ID_AR	mg/kg	0.01	NONE	-	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 HS_ID_AR	mg/kg	0.05	NONE	-	< 0.050	< 0.050	< 0.050	< 0.050
TPHCWG - Aromatic >EC10 - EC12 EH_CU_ID_AR	mg/kg	1	MCERTS	-	8.1	4.2	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 EH_CU_ID_AR	mg/kg	2	MCERTS	-	610	79	23	< 2.0
TPHCWG - Aromatic >EC16 - EC21 EH_CU_ID_AR	mg/kg	10	MCERTS	-	1900	120	44	52
TPHCWG - Aromatic >EC21 - EC35 EH_CU_ID_AR	mg/kg	10	MCERTS	-	920	28	31	800
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_ID_AR	mg/kg	10	NONE	-	3500	230	97	850

VOCs

MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.005	NONE	-	< 0.005	< 0.005	< 0.005	< 0.005
Benzene	mg/kg	0.005	MCERTS	-	< 0.005	< 0.005	< 0.005	< 0.005
Toluene	mg/kg	0.005	MCERTS	-	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	mg/kg	0.005	MCERTS	-	< 0.005	< 0.005	< 0.005	< 0.005
p & m-xylene	mg/kg	0.005	MCERTS	-	< 0.005	< 0.005	< 0.005	< 0.005
o-Xylene	mg/kg	0.005	MCERTS	-	< 0.005	< 0.005	< 0.005	< 0.005

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-021251
Project / Site name: Keltruck Groby

Lab Sample Number	208296	208297	208298	208299
Sample Reference	WS3	WS6	WS7	WS8
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.20-0.50	0.15-0.35	0.20-0.40	0.00-0.60
Date Sampled	22/05/2024	22/05/2024	22/05/2024	22/05/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	-
Moisture Content	%	0.01	NONE	13	28	8.9	-
Total mass of sample received	kg	0.1	NONE	0.9	0.8	0.9	-

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	-	Detected
Asbestos Analyst ID	N/A	N/A	N/A	PKU	PKU	-	SPU
Actinolite detected	Type	N/A	ISO 17025	-	-	-	Not-detected
Amosite detected	Type	N/A	ISO 17025	-	-	-	Not-detected
Anthophyllite detected	Type	N/A	ISO 17025	-	-	-	Not-detected
Chrysotile detected	Type	N/A	ISO 17025	-	-	-	Detected
Crocidolite detected	Type	N/A	ISO 17025	-	-	-	Not-detected
Tremolite detected	Type	N/A	ISO 17025	-	-	-	Not-detected

Asbestos % by hand picking/weighing	%	0.001	ISO 17025	-	-	-	< 0.001
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Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	-	-	-	Loose Fibres
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General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.9	10.7	10.2	-
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-
Organic Matter (automated)	%	0.1	MCERTS	0.3	3.4	0.4	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.1	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	0.11	0.13	< 0.05	-
Pyrene	mg/kg	0.05	MCERTS	0.12	0.1	< 0.05	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.07	< 0.05	< 0.05	-
Chrysene	mg/kg	0.05	MCERTS	0.08	< 0.05	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.14	< 0.05	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.1	< 0.05	< 0.05	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.06	< 0.05	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.06	< 0.05	< 0.05	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	< 0.80	-
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Analytical Report Number: 24-021251
Project / Site name: Keltruck Groby

Lab Sample Number	208296	208297	208298	208299
Sample Reference	WS3	WS6	WS7	WS8
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.20-0.50	0.15-0.35	0.20-0.40	0.00-0.60
Date Sampled	22/05/2024	22/05/2024	22/05/2024	22/05/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	13	8.2	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	130	16	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	67	120	60	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	37	60	16	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	35	57	14	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	38	68	61	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	51	310	82	-

Petroleum Hydrocarbons

TPHCWG - Aliphatic >C5 - C6 HS_ID_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	-
TPHCWG - Aliphatic >C6 - C8 HS_ID_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	-
TPHCWG - Aliphatic >C8 - C10 HS_ID_AL	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	-
TPHCWG - Aliphatic >C10 - C12 EH_CU_ID_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-
TPHCWG - Aliphatic >C12 - C16 EH_CU_ID_AL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	-
TPHCWG - Aliphatic >C16 - C21 EH_CU_ID_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	-
TPHCWG - Aliphatic >C16 - C35 EH_CU_ID_AL	mg/kg	10	MCERTS	< 10	19	< 10	-
TPHCWG - Aliphatic >C21 - C35 EH_CU_ID_AL	mg/kg	8	MCERTS	< 8.0	19	< 8.0	-
TPHCWG - Aliphatic >C5 - C35 EH_CU+HS_ID_AL	mg/kg	10	NONE	< 10	19	< 10	-

TPHCWG - Aromatic >EC5 - EC7 HS_ID_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	-
TPHCWG - Aromatic >EC7 - EC8 HS_ID_AR	mg/kg	0.01	NONE	< 0.010	0.012	< 0.010	-
TPHCWG - Aromatic >EC8 - EC10 HS_ID_AR	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	-
TPHCWG - Aromatic >EC10 - EC12 EH_CU_ID_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-
TPHCWG - Aromatic >EC12 - EC16 EH_CU_ID_AR	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	-
TPHCWG - Aromatic >EC16 - EC21 EH_CU_ID_AR	mg/kg	10	MCERTS	< 10	< 10	< 10	-
TPHCWG - Aromatic >EC21 - EC35 EH_CU_ID_AR	mg/kg	10	MCERTS	< 10	< 10	< 10	-
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_ID_AR	mg/kg	10	NONE	< 10	< 10	< 10	-

VOCs

MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.005	NONE	< 0.005	< 0.005	< 0.005	-
Benzene	mg/kg	0.005	MCERTS	< 0.005	< 0.005	< 0.005	-
Toluene	mg/kg	0.005	MCERTS	< 0.005	0.013	< 0.005	-
Ethylbenzene	mg/kg	0.005	MCERTS	< 0.005	< 0.005	< 0.005	-
p & m-xylene	mg/kg	0.005	MCERTS	< 0.005	< 0.005	< 0.005	-
o-Xylene	mg/kg	0.005	MCERTS	< 0.005	0.014	< 0.005	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-021251
Project / Site name: Keltruck Groby
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
208291	WS1	0.00-0.65	138	Loose Fibres	Chrysotile	< 0.001	< 0.001
208299	WS8	0.00-0.60	145	Loose Fibres	Chrysotile	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 24-021251

Project / Site name: Keltruck Groby

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
208292	WS1	None Supplied	0.65-1.20	Brown sand with gravel and clinker
208293	WS1	None Supplied	2.00-2.45	Brown clay and sand with gravel
208294	WS1	None Supplied	4.00-5.00	Brown clay and sand with gravel
208295	WS2	None Supplied	0.00-0.50	Brown loam and sand with gravel and vegetation
208296	WS3	None Supplied	0.20-0.50	Brown clay and sand with gravel
208297	WS6	None Supplied	0.15-0.35	Brown clay and sand with gravel
208298	WS7	None Supplied	0.20-0.40	Brown clay and sand with gravel

Analytical Report Number : 24-021251

Project / Site name: Keltruck Groby

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references	HSE Report No: 83/1996, HSG 248 (2021), HSG 264 (2012) & SCA Blue Book (draft)	A006B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088	D/W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

Analytical Report Number : 24-021251
Project / Site name: Keltruck Groby

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

\$\$ - Result was reported from high dilution. The result should be interpreted with caution.

APPENDIX D





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Environmental Science

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Analytical Report Number : 24-028267

Project / Site name:	Keltruck, Groby Water Testing Round 1	Samples received on:	28.06.2024
Your job number:		Samples instructed on/ Analysis started on:	02.07.2024
Your order number:	KCD-2024-107	Analysis completed by:	10.07.2024
Report Issue Number:	1	Report issued on:	10.07.2024
Samples Analysed:	5 water samples		

Signed:

Rafał Szczepańczyk
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



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Analytical Report Number: 24-028267

Project / Site name: Keltruck, Groby Water Testing Round 1

Your Order No: KCD-2024-107

Lab Sample Number				244019	244020	244021	244022	244023
Sample Reference				WS1	WS2	WS3	UP SW	DOWN SW
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00-4.83	1.41-3.90	2.05-4.93	0.00	0.00
Date Sampled				27/06/2024	27/06/2024	27/06/2024	27/06/2024	27/06/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	7	7.3	7.3	8	7.9
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10

Total Phenols

Total Phenols (Monohydric) Low Level	µg/l	1	NONE	1.8	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	0.25	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	0.88	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	1.5	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	1.1	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	0.15	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	0.19	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	0.27	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	4.36	< 0.16	< 0.16	< 0.16	< 0.16
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	0.15	ISO 17025	2.83	0.52	0.71	2.28	2.35
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	0.03	< 0.02	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.2	0.3	0.6	0.4	0.6
Copper (dissolved)	µg/l	0.5	ISO 17025	0.5	1.7	3.5	2.8	3.3
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.9	1.1	6.5	0.8	0.8
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	0.7	1.3	< 0.6	< 0.6
Vanadium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	1.6	2	2.9	3
Zinc (dissolved)	µg/l	0.5	ISO 17025	4.2	1.2	2.1	3.1	2

Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
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Environmental Science

Analytical Report Number: 24-028267

Project / Site name: Keltruck, Groby Water Testing Round 1

Your Order No: KCD-2024-107

Lab Sample Number				244019	244020	244021	244022	244023
Sample Reference				WS1	WS2	WS3	UP SW	DOWN SW
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00-4.83	1.41-3.90	2.05-4.93	0.00	0.00
Date Sampled				27/06/2024	27/06/2024	27/06/2024	27/06/2024	27/06/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		

Petroleum Hydrocarbons

TPH - Aliphatic >EC5 - EC6 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC6 - EC8 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC8 - EC10 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC10 - EC12 _{EH_1D_AL_MS}	µg/l	10	NONE	20	< 10	< 10	< 10	< 10
TPH - Aliphatic >EC12 - EC16 _{EH_1D_AL_MS}	µg/l	10	NONE	330	< 10	< 10	< 10	< 10
TPH - Aliphatic >EC16 - EC21 _{EH_1D_AL_MS}	µg/l	10	NONE	550	< 10	< 10	< 10	< 10
TPH - Aliphatic >EC21 - EC35 _{EH_1D_AL_MS}	µg/l	10	NONE	280	< 10	< 10	< 10	< 10
TPH - Aliphatic >EC5 - EC35 _{HS+EH_1D_AL_MS}	µg/l	10	NONE	1200	< 10	< 10	< 10	< 10

TPH - Aromatic >EC5 - EC7 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC7 - EC8 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC8 - EC10 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC10 - EC12 _{EH_1D_AR_MS}	µg/l	10	NONE	52	< 10	< 10	< 10	< 10
TPH - Aromatic >EC12 - EC16 _{EH_1D_AR_MS}	µg/l	10	NONE	250	< 10	< 10	< 10	< 10
TPH - Aromatic >EC16 - EC21 _{EH_1D_AR_MS}	µg/l	10	NONE	230	< 10	< 10	< 10	< 10
TPH - Aromatic >EC21 - EC35 _{EH_1D_AR_MS}	µg/l	10	NONE	40	< 10	< 10	< 10	< 10
TPH - Aromatic >EC5 - EC35 _{HS+EH_1D_AR_MS}	µg/l	10	NONE	580	< 10	< 10	< 10	< 10

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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**Analytical Report Number : 24-028267****Project / Site name: Keltruck, Groby Water Testing Round 1****Water matrix abbreviations:****Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Total petroleum hydrocarbons with carbon banding by GC-MS in water	Determination of total petroleum hydrocarbons in water by GC-MS/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L070B	W	NONE
BTEX and/or Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA 8260	L073B	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW	L080	W	ISO 17025
Monohydric phenols (low level) in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	ISO 17025
Total petroleum hydrocarbons by GC-MS HS in water	Determination of total petroleum hydrocarbons in water by GC-MS HS	In-house method	L088B	W	ISO 17025
pH at 20°C in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method	L099	W	ISO 17025

Analytical Report Number : 24-028267

Project / Site name: Keltruck, Groby Water Testing Round 1

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated PAHs and/or Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds (including PAH) in leachate by extraction in dichloromethane followed by GC-MS	In-house method based on USEPA 8270	L102B	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

Analytical Report Number : 24-028267

Project / Site name: Keltruck, Groby Water Testing Round 1

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
DOWN SW	N/A	W	244023	c	pH at 20°C in water (automated)	L099	c
UP SW	N/A	W	244022	c	pH at 20°C in water (automated)	L099	c
WS1	N/A	W	244019	c	pH at 20°C in water (automated)	L099	c
WS2	N/A	W	244020	c	pH at 20°C in water (automated)	L099	c
WS3	N/A	W	244021	c	pH at 20°C in water (automated)	L099	c



4041



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Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT

i2 Analytical Ltd.
7 Woodshots Meadow,
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Analytical Report Number : 24-028905

Replaces Analytical Report Number: 24-028905, issue no. 1
Additional analysis undertaken.
Hardness Total Added To All Samples By Laboratory

Project / Site name:	Keltruck, Groby Water Testing, Round 2	Samples received on:	03/07/2024
Your job number:		Samples instructed on/ Analysis started on:	04/07/2024
Your order number:	KCD 2024 110	Analysis completed by:	12/07/2024
Report Issue Number:	2	Report issued on:	13/07/2024
Samples Analysed:	5 water samples		

Signed:

Joanna Wawrzeczko
Senior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



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Environmental Science

Analytical Report Number: 24-028905

Project / Site name: Keltruck, Groby Water Testing, Round 2

Your Order No: KCD 2024 110

Lab Sample Number				247515	247516	247517	247518	247519
Sample Reference				WS1	WS2	WS3	SW U/S	SW D/S
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.00	4.00	3.00	None Supplied	None Supplied
Date Sampled				02/07/2024	02/07/2024	02/07/2024	02/07/2024	02/07/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	6.9	7.2	7	7.9	7.9
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Hardness - Total	mg CaCO ₃ /l	1	ISO 17025	509	489	637	467	470

Total Phenols

Total Phenols (Monohydric) Low Level	µg/l	1	NONE	1.1	1.6	1.6	1.5	1.5
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	0.27	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	0.93	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	1.5	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	0.96	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	0.18	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	0.25	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	4.05	< 0.16	< 0.16	< 0.16	< 0.16
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	0.15	ISO 17025	2.96	0.41	0.46	2.09	2.07
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	0.02	< 0.02	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.2	0.6	0.4	0.7	0.5
Copper (dissolved)	µg/l	0.5	ISO 17025	3.8	2.5	6.9	3.8	4.8
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.7	1.2	8.1	0.7	0.8
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.2	1.4	1.6	2.8	2.7
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.2	7.6	5.9	11	9.2

Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
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Petroleum Hydrocarbons

TPH - Aliphatic >EC5 - EC6 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC6 - EC8 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC8 - EC10 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC10 - EC12 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aliphatic >EC12 - EC16 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aliphatic >EC16 - EC21 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



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Analytical Report Number: 24-028905

Project / Site name: Keltruck, Groby Water Testing, Round 2

Your Order No: KCD 2024 110

Lab Sample Number				247515	247516	247517	247518	247519
Sample Reference				WS1	WS2	WS3	SW U/S	SW D/S
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.00	4.00	3.00	None Supplied	None Supplied
Date Sampled				02/07/2024	02/07/2024	02/07/2024	02/07/2024	02/07/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
TPH - Aliphatic >EC21 - EC35 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aliphatic >EC5 - EC35 _{HS+EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH - Aromatic >EC5 - EC7 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC7 - EC8 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC8 - EC10 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC10 - EC12 _{EH_1D_AR_MS}	µg/l	10	NONE	64	< 10	< 10	< 10	< 10
TPH - Aromatic >EC12 - EC16 _{EH_1D_AR_MS}	µg/l	10	NONE	260	< 10	< 10	< 10	< 10
TPH - Aromatic >EC16 - EC21 _{EH_1D_AR_MS}	µg/l	10	NONE	200	< 10	< 10	< 10	< 10
TPH - Aromatic >EC21 - EC35 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aromatic >EC5 - EC35 _{HS+EH_1D_AR_MS}	µg/l	10	NONE	530	< 10	< 10	< 10	< 10

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



4041

**Analytical Report Number : 24-028905****Project / Site name: Keltruck, Groby Water Testing, Round 2****Water matrix abbreviations:****Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Total petroleum hydrocarbons with carbon banding by GC-MS in water	Determination of total petroleum hydrocarbons in water by GC-MS/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L070B	W	NONE
BTEX and/or Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA 8260	L073B	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW	L080	W	ISO 17025
Monohydric phenols (low level) in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	ISO 17025
Total petroleum hydrocarbons by GC-MS HS in water	Determination of total petroleum hydrocarbons in water by GC-MS HS	In-house method	L088B	W	ISO 17025
pH at 20°C in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method	L099	W	ISO 17025

Analytical Report Number : 24-028905

Project / Site name: Keltruck, Groby Water Testing, Round 2

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated PAHs and/or Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds (including PAH) in leachate by extraction in dichloromethane followed by GC-MS	In-house method based on USEPA 8270	L1028	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

APPENDIX E



		GIP Ltd, Building 62, Third Avenue, The Pensnett Estate, Kingswinford, West Midlands, DY6 7XT Tel: 01902 459558 Email: info@gipuk.com Website: www.gipuk.com						STANDPIPE GAS & GROUNDWATER MONITORING RESULTS							
CONTRACT No. 33155		SITE: Keltruck, Midland Distribution Centre, Markfield Rd, Groby, Leicester LE6 0FS						CLIENT : ATC Design and Build Ltd							
REPORT DATE: 22/08/2024								ENGINEER :							
CHECKED:		NOTES:													
Borehole. ID No	Date/Time	CH ₄ (%) (by Volume)	CO ₂ (%) (by Volume)	O ₂ (%) (by Volume)	H ₂ S (ppm)	CO (ppm)	Flow Rate (l/h)	Peak Flow (l/h)	Differential Pressure (mbar)	Atmospheric Pressure (mbar)	Groundwater (mbgl)	Base of Standpipe (mbgl)	PID (ppm)	Monitoring Technician Initials	
WS1	23/05/2024	12.4	4.5	0.0	0	0	<0.5	<0.5	0	1000	1.27	5.00	1.2	GIP	
WS1	06/06/2024	16.8	4.5	-0.1	0	0	<0.5	<0.5	0	1004	1.48	5.00	1.2	GIP	
WS1	21/06/2024	2.7	2.2	17.6	0	1	<0.5	<0.5	0	1010	1.55	5.00	0.0	Enital	
WS1	27/06/2024	16.6	5.6	4.1	0	0	<0.5	<0.5	0	1007	1.00	5.00	0.0	Enital	
WS1	02/07/2024	4.2	4.7	8.9	0	0	<0.5	<0.5	0	1006	1.66	5.00	1.8	Enital	
WS1	13/08/2024	10.7	7.1	6.0	0	0	<0.5	<0.5	0	996	1.77	5.00	0.8	GIP	
WS2	23/05/2024	0.0	1.0	13.3	0	0	<0.5	62.5	0	999	1.61	5.00	1.9	GIP	
WS2	06/06/2024	0.0	2.3	7.4	0	0	<0.5	<0.5	0	1004	1.57	5.00	1.9	GIP	
WS2	21/06/2024	0.0	2.6	11.9	0	0	-8.7	-14	-3	1010	1.60	5.00	0.0	Enital	
WS2	27/06/2024	0.0	2.4	16.0	0	0	<0.5	<0.5	-2	1007	2.05	5.00	0.0	Enital	
WS2	02/07/2024	0.0	3.0	15.9	0	0	<0.5	<0.5	0	1006	1.61	5.00	0.7	Enital	
WS2	13/08/2024	0.0	4.1	13.2	0	0	<0.5	<0.5	0	997	1.72	5.00	4.0	GIP	
WS3	23/05/2024	0.0	1.0	20.0	0	10	<0.5	6.3	0	999	1.24	4.00	7.3	GIP	
WS3	06/06/2024	0.0	2.0	14.2	0	0	<0.5	<0.5	0	1003	1.39	4.00	7.3	GIP	
WS3	21/06/2024	0.0	0.1	19.8	0	0	<0.5	<0.5	0	1010	1.38	4.00	0.0	Enital	
WS3	27/06/2024	0.0	2.4	16.9	0	0	<0.5	-8.9	0	1007	1.41	4.00	0.0	Enital	
WS3	02/07/2024	0.0	1.5	19.6	0	0	<0.5	<0.5	0	1006	1.55	4.00	0.8	Enital	
WS3	13/08/2024	0.0	3.8	14.3	0	0	<0.5	<0.5	0	996	1.74	4.00	3.7	GIP	

Groundwater Monitoring
Well Development Record Sheet



CLIENT GIPUK
DATE 21/06/2024
WEATHER Sunny, dry ground, light winds, 20 degrees, 1013mbar

SITE Groby
TIME On: 07:30 Off: 11:00
MONITORING PERSONNEL Harry Marson & Isaac Hall

Monitoring	Time	DTL	DTB	End	EC	Temp	pH	Purge Volume	Odour	Sediment	Oil/grease	Colour	Turbidity	Comments
Location		m	m	m	mS/cm	C		L	description	description	visible	description	description	
WS1		1.55	4.94	3.9				20						
	08:45:00	2.5			918.89	14.37	7.01		Oil	High	Sheen	Brown	High	1st Purge
	08:52:00	3.45			912.24	14.14	6.99		Oil	Medium	Sheen	Brown	High	2nd Purge
	08:58:00	3.9			836.02	13.90	7.12		Oil	Medium	Sheen	Brown	High	3rd Purge
WS2		1.6	4.94	3.4				20						
	09:10:00	2.7			701.11	15.29	7.51		Oil	Medium	Sheen	Light brown	High	1st Purge
	09:14:00	2.93			707.46	15.02	7.44		Oil	Medium	Sheen	Light brown	High	2nd Purge
	09:18:00	3.4			689.52	15.25	7.45		Oil	Low	Sheen	Light brown	High	3rd Purge
WS3		1.38	3.97	3.79				8						
	09:35:00	2.6			1031.06	17.08	7.48		Oil	Medium	None	Light brown	High	1st Purge
	09:39:00	3.44			1087.74	15.35	7.37		Oil	Medium	None	Light brown	High	2nd Purge
	09:42:00	3.79			1057.79	16.98	7.52		Oil	High	None	Light brown	High	3rd Purge

Report Properties
Start Time = 2024-06-21 08:45:58
Time Offset = 01:00:00
Readings = 9

Date Time	Location Name	Latitude (°)	Longitude (°)	Device SN	Turbidity	Actual Conductivity	Specific Conductivity	Salinity	Resistivity	Density	Total Dissolved	RDO Concentrat	RDO Saturation	Oxygen Partial Pressure	pH (pH)	ORP (mV)	Temperatu re	pH mV	External Voltage (V)	Barometric		
					(NTU)	(µS/cm)	(µS/cm)	(PSU)	(Ω·cm)	(g/cm³)	(ppt)	ion (mg/L)	(%Sat)	(Torr)			(°C)	(mV)		Device SN	(mbar)	Temperatu re (°C)
21/06/2024 08:45	WS1	52.666126	-1.239102	Aqua TROLL	0.5273151	732.35046	918.89484	0.4552035	1365.4666	0.9995474	0.5972561	4.229141	41.865723	64.850044	7.0072975	178.46637	14.371643	-13.98603	17.189554	Wireless TR	1004.241	20.779873
21/06/2024 08:52	WS1	52.666142	-1.23908	Aqua TROLL	2.2815948	723.0376	912.24414	0.4516539	1383.054	0.9995776	0.5929652	4.5560966	44.87395	69.63644	6.9912915	133.25427	14.141462	-13.06241	17.164457	Wireless TR	1004.2629	20.659079
21/06/2024 08:58	WS1	52.666148	-1.239139	Aqua TROLL	0.5169997	658.95874	836.0159	0.4124295	1517.549	0.9995808	0.5436098	6.010823	58.25977	90.4702	7.124121	112.44243	13.901978	-20.61794	17.166542	Wireless TR	1004.2886	20.64
21/06/2024 09:10	WS2	52.665871	-1.239576	Aqua TROLL	242.84386	571.0948	701.1053	0.3442427	1751.0227	0.9993238	0.4557184	4.517055	45.589993	70.67597	7.5147414	93.60279	15.291288	-43.0733	17.21	Wireless TR	1004.0818	22.289263
21/06/2024 09:14	WS2	52.665879	-1.239616	Aqua TROLL	0.7105488	572.62976	707.46173	0.3473762	1746.3298	0.9993672	0.4598868	3.1513646	31.598278	48.998665	7.44475	98.18367	15.02433	-39.03124	17.174973	Wireless TR	1004.0833	22.77
21/06/2024 09:18	WS2	52.665901	-1.23951	Aqua TROLL	443.4533	561.13544	689.52203	0.3383468	1782.0192	0.9993252	0.4481874	3.1059778	31.32259	48.55863	7.4462056	98.7001	15.253631	-39.14565	17.199526	Wireless TR	1004.0822	22.86
21/06/2024 09:35	WS3	52.665341	-1.23847	Aqua TROLL	228.47772	874.8095	1031.0574	0.5144677	1142.9452	0.9991601	0.6701368	5.4789944	57.4691	88.87863	7.4828296	103.2506	17.075548	-41.50094	17.156	Wireless TR	1003.8456	23.287415
21/06/2024 09:39	WS3	52.665341	-1.23847	Aqua TROLL	0.8893346	887.16223	1087.7408	0.543092	1127.1803	0.999469	0.7071357	4.8474913	49.05235	75.924934	7.3739552	106.39114	15.345647	-35.0225	17.157814	Wireless TR	1003.8977	23.729034
21/06/2024 09:42	WS3	52.665338	-1.238475	Aqua TROLL	0.8580469	895.49854	1057.7877	0.5283188	1116.6965	0.9991872	0.6876353	7.5035353	78.57384	121.47109	7.515602	104.93581	16.982014	-43.37344	17.177046	Wireless TR	1003.9144	23.860847

Groundwater Monitoring
Low Flow - Sampling Record Sheet



CLIENT	GIPUK	SITE	Groby
DATE	27/06/2024	TIME	On: 07:00 Off: 12:30
WEATHER	Sunny, dry ground, 20 degrees, 1007mbar	MONITORING PERSONNEL	Harry Marson & Isaac Hall

Monitoring Location	Time	DTL m	DTB m	End m	EC mS/cm	Temp C	pH	DO %	Dissolved Oxygen PPM	ORP mV	Purge Volume L	Odour description	Sediment description	Oil/grease visible	Colour description	Turbidity description	Comments
WS1	08:39:00	1	4.83	1	329.61	17.47	6.99	17.03	1.63	-74.25	24	Oil	Low	Sheen	Brown	Medium	
WS2	09:27:00	2.05	4.93	2.05	12713.79	16.99	7.28	2.64	0.24	24.39	24	None	Low	None	Brown	Medium	
WS3	10:17:00	1.41	3.9	1.41	13106.62	15.70	7.63	92.06	8.59	74.02	24	None	Medium	None	Brown	High	

Test Properties

Test Type = Low-Flow Test
Test Date / Time = 2024-06-27 08:39:28
Time Offset = 01:00:00
Operator Name = Harry Marson
Project = BBV HS2
Initial Depth to Water = 1 m
Flow Cell Volume = 130 ml
Final Draw Down = 0.08 m
Estimated Total Volume Pumped = 24000 ml

Pump Properties

Pump Type = Peri
Flow Rate = 800 ml/min
Final Flow Rate = 800 ml/min
Pump Intake From TOC = 4 m

Tubing Properties

Tubing Type = LB6

Location Properties

Location Name = KELTRUCK WS1
Location ID = 01345e4f-b899-4924-b800-4680361bca17
Latitude = 52.6659459 Â°
Longitude = -1.2392034 Â°

Well Properties

Well Diameter = 5 cm
Casing Type = Plastic
Total Depth = 4.83 m

Instrument Properties

Device Model = Aqua TROLL 500
Device SN = 1020167

						Actual	Specific			Total	RDO			Oxygen					External
						Conductivi	Conductivi			Dissolved	Concentra	RDO			Partial			Temperat	Voltage
		Depth to	Flow	Turbidity	ty	ty		Salinity	Resistivity	Density	Solids	tion	Saturation	Pressure	pH (pH)	pH mV	ORP (mV)	ure (Â°C)	
Date Time	Elapsed Time	Water (cm)	(ml/min)	(NTU)	(1016944)	(1017694)	(1017694)	(1017694)	(1017694)	(1017694)	(1017694)	(1015061)	(1015061)	(1015061)	(997076)	(997076)	(997076)	(1020167)	(1020167)
27/06/2024 08:39	00:00:00	100	800	320.7009	13258.92	16145.11	9.506919	75.42091	1.006295	10.49432	7.787754	82.96867	129.7616	8.836652	-118.7277	73.82359	15.64054	17.264	
27/06/2024 08:44	00:05:00	100	800	119.9329	13213.71	16446.71	9.683508	75.67896	1.006591	10.69036	0.934993	9.778143	15.30873	7.592369	-47.27364	52.53757	14.70816	17.282	
27/06/2024 08:49	00:10:00	100	800	125.3037	13364.91	16567.88	9.763783	74.82281	1.006624	10.76912	0.407572	4.279875	6.699362	7.273998	-29.10614	15.84495	14.87833	17.246	
27/06/2024 08:54	00:15:00	100	800	97.82905	13596.25	16769.03	9.896007	73.54971	1.006688	10.89987	0.216315	2.28372	3.573897	7.147726	-21.9059	-15.21145	15.09398	17.246	
27/06/2024 08:59	00:20:00	100	800	135.478	14157.65	16912.71	10.01037	70.6332	1.006527	10.99326	0.214425	2.331235	3.642466	7.064921	-17.25197	-44.32236	16.47127	17.282	
27/06/2024 09:04	00:25:00	100	800	115.9137	14370.76	16918.27	10.02327	69.58575	1.006414	10.99688	0.240994	2.655107	4.145236	7.015325	-14.43386	-63.6438	17.11636	17.255	
27/06/2024 09:09	00:30:00	100	800	94.18548	282.2351	329.6119	0.158622	3543.145	0.998815	0.214248	1.628196	17.03002	26.57583	6.990789	-13.03673	-74.24866	17.4746	17.264	

Notes

Test Notes: Brown, oil smell oil sheen , med turb low sed

Test Properties

Test Type = Low-Flow Test
Test Date / Time = 2024-06-27 09:27:16
Time Offset = 01:00:00
Operator Name = Harry Marson
Project = BBV HS2
Initial Depth to Water = 2.05 m
Flow Cell Volume = 130 ml
Final Draw Down = 0.15 m
Estimated Total Volume Pumped = 24000 ml

Pump Properties

Pump Type = Peri
Flow Rate = 800 ml/min
Final Flow Rate = 800 ml/min
Pump Intake From TOC = 4 m

Tubing Properties

Tubing Type = LB6

Location Properties

Location Name = KELTRUCK WS2
Location ID = 83bd4744-4973-46f5-b21b-0d6d866287db
Latitude = 52.6658358 °
Longitude = -1.23954236 °

Well Properties

Well Diameter = 5 cm
Casing Type = Plastic
Total Depth = 4.93 m

Instrument Properties

Device Model = Aqua TROLL 500
Device SN = 1020167

Date Time	Elapsed Time	Depth to Water (cm)	Flow (ml/min)	Turbidity (NTU)	Actual	Specific	Salinity (PSU)	Resistivity (Ω·cm)	Density (g/cm³)	Total	RDO	RDO Saturation (%Sat)	Oxygen	pH (pH)	pH mV (mV)	ORP (mV)	Temperature (°C)	External Voltage (V)
					Conductivity (µS/cm)	Conductivity (µS/cm)				Dissolved Solids (ppt)	Concentration (mg/L)		Partial Pressure (Torr)					
					(1016944)	(1017694)				(1017694)	(1015061)		(1015061)					
27/06/2024 09:27	00:00:00	205	800	834.9374	9777.967	12554.618	7.216657	102.27075	1.0049001	8.1605015	3.2253299	32.835594	50.657703	7.4259396	-37.59861	32.83466	13.420642	17.255
27/06/2024 09:32	00:05:00	205	800	616.4627	9786.014	12602.987	7.24478	102.18665	1.0049399	8.191942	0.6440459	6.540266	10.091377	7.3632193	-34.01756	29.93549	13.297572	17.246
27/06/2024 09:37	00:10:00	205	800	405.76407	9863.024	12617.115	7.257573	101.38878	1.0049092	8.201125	0.3532012	3.608552	5.566295	7.338006	-32.61566	27.050625	13.571619	17.237
27/06/2024 09:42	00:15:00	205	800	171.41243	10237.768	12641.117	7.292188	97.67754	1.004702	8.216726	0.2738946	2.8890302	4.4493446	7.3065553	-30.98488	27.24136	15.045989	17.282
27/06/2024 09:47	00:20:00	205	800	148.37941	10444.345	12650.526	7.307648	95.7456	1.0045726	8.222842	0.259549	2.785912	4.2864723	7.291791	-30.22671	25.930058	15.869402	17.255
27/06/2024 09:52	00:25:00	205	800	128.58728	10586.404	12675.627	7.32868	94.46078	1.0044992	8.239158	0.2495593	2.7071567	4.162805	7.285484	-29.91676	24.804722	16.370573	17.246
27/06/2024 09:57	00:30:00	205	800	114.31168	10768.81	12713.794	7.3587146	92.86077	1.0044075	8.263967	0.2401948	2.6396196	4.0558505	7.279236	-29.62112	24.389874	16.99046	17.264

Notes

Test Notes: Brown, med turb low sed no odour no oil

Test Properties

Test Type = Low-Flow Test
Test Date / Time = 2024-06-27 10:17:51
Time Offset = 01:00:00
Operator Name = Harry Marson
Project = BBV HS2
Initial Depth to Water = 1.41 m
Flow Cell Volume = 130 ml
Final Draw Down = 1.44 m
Estimated Total Volume Pumped = 24000 ml

Pump Properties

Pump Type = Peri
Flow Rate = 800 ml/min
Final Flow Rate = 800 ml/min
Pump Intake From TOC = 4 m

Tubing Properties

Tubing Type = LB6

Location Properties

Location Name = KELTRUCK WS3
Location ID = 7e972c67-f2c2-4692-b004-8596c048a2b8
Latitude = 52.6653896 Å°
Longitude = -1.2389924 Å°

Well Properties

Well Diameter = 5 cm
Casing Type = Plastic
Total Depth = 3.9 m

Instrument Properties

Device Model = Aqua TROLL 500
Device SN = 1020167

Date Time	Elapsed Time	Depth to Water (cm)	Flow (ml/min)	Turbidity (NTU)	Actual	Specific	Salinity (PSU)	Resistivity (i©â€œ...cm)	Density (g/cmÅ³)	Total	RDO	RDO Saturation (%Sat)	Oxygen	pH (pH)	pH mV (mV)	ORP (mV)	Temperatu re (Å°C)	External Voltage (V)
					Conductivi ty (ÅµS/cm)	Conductivi ty (ÅµS/cm)				Dissolved Solids (ppt)	Concentra tion (mg/L)		Partial Pressure (Torr)					
					(1016944)	(1017694)	(1017694)	(1017694)	(1017694)	(1017694)	(1015061)	(1015061)	(1015061)	(997076)	(997076)	(997076)	(1020167)	(1020167)
27/06/2024 10:17	00:00:00	141	800	797.5241	13916.064	17564.564	10.386445	71.8594	1.007227	11.416967	1.3703878	14.448082	22.27027	7.2434626	-27.28939	64.03412	14.124642	17.291
27/06/2024 10:22	00:05:00	141	800	1616.2206	13538.008	17251.53	10.177925	73.86611	1.0071301	11.213493	0.4666023	4.8715897	7.5121884	7.1804576	-23.66543	65.79365	13.729973	17.246
27/06/2024 10:27	00:10:00	141	800	1265.5106	6013.853	7309.815	4.0548244	166.28275	1.0021088	4.7513795	4.904201	51.451714	79.166824	7.306044	-31.02779	64.70169	15.717764	17.246
27/06/2024 10:32	00:15:00	141	800	818.2823	11849.65	14246.809	8.311496	84.39068	1.0052824	9.260426	7.7397165	84.15824	129.4187	7.5157876	-43.12038	65.95577	16.19061	17.255
27/06/2024 10:37	00:20:00	141	800	593.4819	6514.0244	7898.5693	4.4057803	153.51492	1.0023601	5.13407	8.435838	88.889046	136.7535	7.5770364	-46.57745	69.01707	15.822484	17.291
27/06/2024 10:42	00:25:00	141	800	441.8847	6780.264	8232.643	4.605206	147.48688	1.0025228	5.3512177	8.654724	91.19261	140.30716	7.60856	-48.37513	71.6349	15.763508	17.282
27/06/2024 10:47	00:30:00	141	800	436.396	10778.723	13106.622	7.590173	92.775375	1.0048182	8.519304	8.591408	92.064384	141.65883	7.634284	-49.83902	74.01909	15.700916	17.291

Notes

Test Notes: Brown no odour no oil high turb med sed

Report Properties
Start Time = 2024-06-27 09:21:41
Time Offset = 01:00:00
Readings = 2

Date Time	Location Name	Latitude (Â°)	Longitude (Â°)	Device SN	Turbidity (NTU)	Actual	Specific	Salinity (PSU)	Resistivity (Î©@â€¦cm)	Density (g/cmÂ³)	Total Solids (ppt)	RDO Concentration (mg/L)	RDO Saturation (%Sat)	Oxygen	pH (pH)	ORP (mV)	Temperat ure (Â°C)	pH mV	External Voltage (V)	Barometri c Pressure (mbar)	Temperat ure (Â°C)	
						Conductivi ty (ÂµS/cm)	Conductivi ty (ÂµS/cm)							Partial Pressure (Torr)								
27/06/2024 09:21	Downstream	52.66592	-1.239509	Aqua TROL	29.33474	10645.8	12321.44	7.121933	93.93378	1.004056	8.00889	7.242849	80.89629	124.2052	7.398423	22.82441	17.8799	-36.69119	17.1752	Wireless TR	997.3304	22.21967
27/06/2024 10:02	Upstream	52.6659	-1.239492	Aqua TROL	25.25774	10745.11	12182.82	7.042718	93.06559	1.003805	7.918816	4.159566	47.35466	72.57552	7.520738	22.31245	18.82142	-43.7989	17.17409	Wireless TR	997.2198	22.5701

Downstream: CLEAR LOW TURB LOW SEDIMENT NO ODOUR NO OIL
Upstream: CLEAR LOW TURB LOW SEDIMENT NO ODOUR NO OIL

Groundwater Monitoring
Low Flow - Sampling Record Sheet



CLIENT
DATE
WEATHER

GIPUK
02/07/2024
Cloudy, dry, cool, 1006mbar, 14 degrees

SITE
TIME
MONITORING PERSONNEL

Grobby
On: 08:00 Off: 11:30
Ian Sidgwick

Monitoring Location	Time	DTL m	DTB m	End m	EC mS/cm	Temp C	pH	DO %	Dissolved Oxygen PPM	ORP mV	Purge Volume L	Odour description	Sediment description	Oil/grease visible	Colour description	Turbidity description	Comments
WS1	10:14:00	1.66	4.92	1.66	1039.41	13.41	6.79	1.80	0.19	-146.08	2.5	Faint organic	Low fine	Tiny amount sheen	Pale grey brown	Low	Full sample collected
WS2	09:45:00	1.61	5.02	1.61	773.72	12.52	7.12	2.77	0.29	116.28	2.5	None	Low fine	None	Pale red brown	Low	Full sample collected
WS3	09:15:00	1.55	4.01	1.55	1023.61	13.01	6.94	4.27	0.45	120.84	2.5	None	Low fine	None	Pale red brown	Low	Full sample collected

Test Properties
Test Type = Low-Flow Test
Test Date / Time = 2024-07-02 10:14:02
Time Offset = 01:00:00
Operator Name = IS
Project = Groby
Initial Depth to Water = 1.66 m
Flow Cell Volume = 130 ml
Final Draw Down = 0.2 m
Estimated Total Volume Pumped = 2500 ml

Pump Properties
Pump Type = Peristaltic
Pump Intake From TOC = 4 m

Location Properties
Location Name = Groby WS01
Location ID = 83e29943-0e57-4dac-919e-712414691d92
Latitude = 52.66618106 Â°
Longitude = -1.23919874 Â°

Well Properties
Well Diameter = 5 cm
Total Depth = 4.92 m

Instrument Properties
Device Model = Aqua TROLL 500
Device SN = 893790

						Actual	Specific				Total					Oxygen		
						Conductivi	Conductivi	Salinity	Resistivity	Density	Dissolved	Turbidity	RDO	RDO	Partial	Temperatu	External	
			Depth to	pH mV		ty	ty	(PSU)	(Î@â€¦cm)	(g/cmÂ³)	Solids	(NTU)	Concentra	Saturation	Pressure	re (Â°C)	Voltage (V)	
Date Time	Elapsed	Water	pH (pH)	(mV)	ORP (mV)	(886075)	(886075)	(886075)	(886075)	(886075)	(886075)	(891223)	(893458)	(893458)	(893458)	(893790)	(893790)	
02/07/2024 10:14	00:00:00	166	6.786992	-4.076958	-74.72482	810.4288	1037.246	0.51574	1233.915	0.999709	0.67421	1817.265	4.275298	41.20741	59.80658	13.55119	17.426	
02/07/2024 10:19	00:05:00	179	6.803541	-4.963875	-136.3274	811.8456	1045.147	0.519651	1231.761	0.999744	0.679346	665.03	0.261912	2.511205	4.832008	13.31289	17.426	
02/07/2024 10:24	00:10:00	183	6.799767	-4.763603	-142.4166	810.9753	1039.715	0.516966	1233.083	0.999719	0.675815	472.762	0.217856	2.096591	4.24689	13.48157	17.453	
02/07/2024 10:31	00:17:05	186	6.794116	-4.458427	-146.0835	809.3669	1039.41	0.516758	1235.534	0.999728	0.675616	467.0543	0.187616	1.802805	3.827858	13.41253	17.426	

Notes:
Sample pale grey-brown, low fine particulates, tiny amount sheen, faint organic odour (unable to speciate)
Full sample collected

Test Properties
Test Type = Low-Flow Test
Test Date / Time = 2024-07-02 09:45:32
Time Offset = 01:00:00
Operator Name = IS
Project = Groby
Initial Depth to Water = 1.61 m
Flow Cell Volume = 130 ml
Final Draw Down = 0.16 m
Estimated Total Volume Pumped = 2500 ml

Pump Properties
Pump Type = Peristaltic
Pump Intake From TOC = 4 m

Location Properties
Location Name = Groby WS02
Location ID = cfc93242-431c-4b59-bca2-5e8de8faa9e5
Latitude = 52.66591193 Â°
Longitude = -1.2394808 Â°

Well Properties
Well Diameter = 5 cm
Total Depth = 5.02 m

Instrument Properties
Device Model = Aqua TROLL 500
Device SN = 893790

						Actual	Specific				Total				Oxygen		
						Conductivity	Conductivity				Dissolved		RDO	RDO	Partial		
		Depth to	pH mV			ty	ty	Salinity	Resistivity	Density	Solids	Turbidity	Concentra	Saturation	Pressure	Temperatu	External
		Water	pH (pH)	(mV)	ORP (mV)	(ÂµS/cm)	(ÂµS/cm)	(PSU)	(Î©â€¦cm)	(g/cmÂ³)	(ppt)	(NTU)	tion (mg/L)	(%Sat)	(Torr)	re (Â°C)	Voltage (V)
Date Time	Elapsed Time	(cm)	(1057304)	(1057304)	(1057304)	(886075)	(886075)	(886075)	(886075)	(886075)	(886075)	(891223)	(893458)	(893458)	(893458)	(893790)	(893790)
02/07/2024 09:45	00:00:00	161	7.257116	-29.35886	104.132	598.147	771.2976	0.379048	1671.83	0.999643	0.501343	4075.661	5.600886	53.57526	77.38951	13.24647	17.426
02/07/2024 09:50	00:05:00	171	7.128552	-22.39227	117.7171	590.0416	773.3813	0.379737	1694.796	0.999727	0.502698	1056.071	0.416381	3.92472	6.823887	12.58835	17.417
02/07/2024 09:55	00:10:00	176	7.125238	-22.21108	117.0257	589.5533	773.5833	0.379814	1696.199	0.999732	0.502829	747.4481	0.319079	3.004629	5.514643	12.54488	17.426
02/07/2024 10:00	00:15:00	177	7.122343	-22.05372	116.2771	589.2714	773.7184	0.379867	1697.011	0.999735	0.502917	537.8825	0.293904	2.765952	5.174662	12.51883	17.399

Test Properties
Test Type = Low-Flow Test
Test Date / Time = 2024-07-02 09:15:51
Time Offset = 01:00:00
Operator Name = IS
Project = Groby
Initial Depth to Water = 1.55 m
Flow Cell Volume = 130 ml
Final Draw Down = 0.4 m
Estimated Total Volume Pumped = 2500 ml

Pump Properties
Pump Type = Peristaltic
Pump Intake From TOC = 3 m

Location Properties
Location Name = Groby WS03
Location ID = 48cecc80-659e-4d24-a44b-11ff9b13cd56
Latitude = 52.66612735 Å°
Longitude = -1.23910151 Å°

Well Properties
Well Diameter = 5 cm
Total Depth = 4.01 m

Instrument Properties
Device Model = Aqua TROLL 500
Device SN = 893790

						Actual	Specific				Total					Oxygen		
						Conductivi	Conductivi	Salinity	Resistivity	Density	Dissolved	Turbidity	RDO	RDO	Partial	Temperatu	External	
			Depth to	pH mV		ty	ty	(PSU)	(Î@â€...cm)	(g/cmÂ³)	Solids	(NTU)	Concentra	Saturation	Pressure	re (Â°C)	Voltage (V)	
Date Time	Elapsed	Water	pH (pH)	(mV)	ORP (mV)	(886075)	(886075)	(886075)	(886075)	(886075)	(886075)	(891223)	(893458)	(893458)	(893458)	(893790)	(893790)	
02/07/2024 09:15	00:00:00	155	6.872207	-8.6689	128.5699	803.921	1025.862	0.50994	1243.903	0.999688	0.66681	3369.055	3.006875	29.0588	42.54722	13.67301	17.417	
02/07/2024 09:20	00:05:00	174	6.915638	-10.98156	120.7975	796.5285	1034.057	0.513657	1255.448	0.999783	0.672137	2220.825	0.214184	2.038062	4.151569	12.97355	17.417	
02/07/2024 09:25	00:10:00	186	6.925808	-11.52992	121.1885	791.8509	1026.78	0.509934	1262.864	0.999774	0.667407	1247.071	0.278452	2.652336	5.025728	13.02086	17.453	
02/07/2024 09:30	00:15:00	195	6.935047	-12.02583	120.8356	789.1069	1023.613	0.508287	1267.255	0.999775	0.665349	799.8888	0.448671	4.27221	7.327689	13.0054	17.417	

Notes:
Sample pale red-brown, low fine particulates, no sheen, no odour
Full sample collected

APPENDIX F



General Notes

1. The copyright of this report and other plans and documents prepared by Ground Investigation and Piling Limited are owned by them. No such report plan or document may be produced, published or adapted without their written consent. Copies of this report may, however, be made and distributed by the Client as an expedient in dealing with matters related to its commission.
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6. Unless stated otherwise, no consultations with authorities or funders or other interested third parties have been carried out. GIP Ltd are unable to give categorical assurance that the findings will be accepted by these third parties as such bodies may have unpublished, more stringent objectives. Further work may be required by these parties.
7. We are confident that the conclusions drawn from the findings of this investigation and desk study are appropriate for the proposed development. However, we cannot guarantee that they would be accepted by regulatory authorities without question. It is recommended that the reports are submitted and approval gained from such bodies, prior to the undertaking of detailed design, construction work or other irreversible processes.
8. The report will be based on the ground conditions encountered in the exploratory holes together with results of field and laboratory testing in the context of the proposed development. Conditions between exploratory holes have been interpolated, however soils and rock conditions are highly variable and may differ from our interpolation. There may be conditions, appertaining to the site, which may not be revealed by the investigation, and which may not be taken into account in the report.
9. The intrusive environmental site investigation aspects of the Services are limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on-site. In addition, chemical analysis was carried out for a limited number of parameters as stipulated in the quotation or contract between the client and GIP Ltd [based on an understanding of the available operational and historical information] and it should not be inferred that other chemical species are not present.
10. Methods of construction and/or design other than those proposed by the designers or referred to in the report may require consideration during the evolution of the proposals and further assessment of the geotechnical data would be required to provide discussion and recommendation appropriate to these methods.
11. The accuracy of the results reported will depend upon the technique of measurement, investigation and test used and these values should not be regarded necessarily as characteristic of the strata as a whole. Where such measurements are critical, the technique of the investigation will need to be reviewed and supplementary investigation undertaken in accordance with the advice of the company where necessary.
12. Whilst the report may express an opinion on possible configurations of strata between or beyond exploratory holes, or on possible presence of a feature based on either visual, verbal, written, cartographical, photographic or published evidence, this will be for guidance only and no liability can be accepted for its accuracy.
13. Ground conditions should be monitored during the construction of the works and the recommendations of the report re-evaluated on the light of these data by the supervising geotechnical engineers.

14. Any comments on groundwater conditions will be based on observations made at the time of the investigation, unless specifically stated otherwise. It should be noted, however, that the observations are subject to the method and speed of the boring, drilling or excavation and that groundwater levels will vary due to seasonal or other effects. This may have implications on other recommendations, including foundations and excavations.
15. Unless specifically stated, the investigation will not take into account possible effects of mineral extraction, solution features (e.g. in chalk or limestone) and geological faulting.
16. The economic viability of the proposals referred to in the report, or of the solutions put forward to any problems encountered, will depend on very many factors in addition to geotechnical considerations hence its evaluation will be outside the scope of the report.
17. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on-site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.



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