Stage 1: Tier 2 Site Investigation GQRA

Project Reference: P25.114.GQRA

KAO Data Centre – KLON-03

Prepared For

JCA

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Revision – Requested by	**Nature of Revision**	**Date**

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The data collected through direct operations in the production of this report has been so obtained, unless directly otherwise stated, in accordance with current UK guidance, law or accepted industry practice, including but not limited to: BS.5930: 1990 Code of Practice for Site Investigations (Amendment 3: 2015+A1:2020), & BS.10175: 2011 + A2: 2017 Investigations into Potentially Contaminated Sites. Exact exploratory locations will depend upon access conditions, site use and plant capability, IGL do not accept liability for issues arising from material identified between or outside of the area of exploratory locations.

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Human Health Risk Assessment Criteria
The Environment Agency has undertaken revision of the Soil Guideline Values (SGVs) which are partially complete. Where standards are available using the "new" approach, these have been utilised for correlative purposes. Where standards have not yet been revised, guidance following the "old" approach has been utilised. Please note that upon release of the remaining guidelines, the standards contained within this report may be subject to change. In addition, the second edition of the LQM CIEH guidance has now been released and will be utilised in favour of previously published guideline values.

Third Parties
The findings and opinions conveyed in this report are based on information obtained from a variety of sources, including that from previous Site investigations and chemical testing laboratories. IGL has assumed that such information is correct. IGL cannot and does not guarantee the authenticity or reliability of the information it has relied upon and can accept no responsibility for inaccuracies with the data supplied by other parties.

The accuracy of the historical map extracts supplied cannot be guaranteed and it should be noted that different conditions may have existed between mapping sheet editions. Therefore, there can be no certainty that all areas of contamination have been identified during the Stage 1: Tier 1 Preliminary Risk Assessment.

Definitions
Reference to the word "contamination" in this report does not relate to the statutory definition of contaminated land under 1990 Environmental Protection Act unless otherwise stated. The definition used in this report is: "Land that contains substances that, when present in sufficient quantities or concentrations, are likely to cause harm, directly or indirectly, to man, to the environment, or on occasion to other targets" (NATO CCMS, 1985).

1. INTRODUCTION

1.1 Brief

Impact Geotechnical Ltd (IGL) were instructed by JCA Engineering Ltd (the Client) (Q24.453.1), to carry out a ground investigation and compile a Stage 1: Tier 2 Site Investigation Generic Quantitative Risk Assessment (GQRA) at KAO Data LON 03 (i.e. KLON-03), located within the wider KAO Data Centre, London Road, Harlow, CM17 9NA (hereafter referred to as the "site"). In summary, the site comprises a construction site, with associated compound and temporary offices.

IGL have previously issued a Stage 1: Tier 1 Preliminary Risk Assessment (PRA) (Ref: P25.114.PRA, Dated: March 2025) for the wider KAO Data Centre locale, encompassing the site (i.e. KLON-03). The previous report document should be read in conjunction with this report for completeness. A summary is included within later report sections.

The brief was to undertake a ground investigation to identify any ground condition issues that may affect redevelopment of the site (specific to KLON-03) in terms of geo-environmental aspects. Specifically, the intrusive ground investigation was required in order to assess the pollutant linkages, and associated risks, mindful of the proposed development, as identified within the PRA.

The report has been formulated in accordance with BS10175:2011+A2:2017 *Investigations into Potentially Contaminated Sites – Code of Practice* and *Land Contamination: Risk Management* (LCRM): 2020, published by the Environment Agency. For the purpose of this risk assessment a 'Commercial' land-use setting will be used based on the design proposals.

1.2 Proposals

Proposals relate to the KAO Data Centre, a data centre campus to accommodate four separate commercial data centres, titled KLON-01, KLON-012, KLON-03 and KLON-04. The study site pertains to KLON-03; which was under construction at the time of the investigation, with the piled foundations having been installed and ancillary works to the proposed ring road. The proposals include limited amenity soft-landscaping. A proposed site plan is included within Appendix A.

1.3 Limitations

The scope of works excludes any commentary and recommendations pertaining to geotechnical aspects involved with the detailed design of temporary and permanent works associated with the planned construction.

2. SITE LAYOUT

The description below relates to site conditions at the time of the investigation only.

2.1 Location and Topography

The site is centred on National Grid Reference TL 471 101, at the eastern extents of the Town of Harlow; situated at approximately 70m AOD (Above Ordnance Datum), according to Ordnance Survey. The wider surrounds very gradually slope down towards the south-west.

2.2 Site Description

The study area comprises the construction site pertaining to KAO Data LON 03 (i.e. KLON-03). KLON-03 is an approximate 140m by 90m rectangular plot, set within KAO Business/Data Park.

The majority of the study area relates to the proposed data centre, with the footprint encompassing the majority of the site. The southern portion of the site includes a lay-down area and contractor car park for the JCA Engineering Ltd compound, which is located south of the investigation area. The eastern part of the site pertains to the Natta lay-down and storage area. Items being stored within the Natta lay-down included shipping containers, skip, ACO drains, concrete slabs and kerbing stones.

The majority of the site was laid to a mixture of tarmac, scalpings and compacted crushed hardcore. Access to site is afforded by the site security hut 100m south of the KL0N03 boundary, located off from London Road.

2.3 Surroundings

The immediate surroundings comprise JCA Engineering Ltd compound, contractor car park, and broader KAO Business/Data Park. The wider surrounds are predominantly a mixture of a residential and commercial setting.

3. PHYSICAL SETTING

3.1 Geology

GeoIndex (BGS, 2025) indicates that the site is underlain by Superficial Deposits of the Lowestoft Formation, over Bedrock Geology of the London Clay Formation. The table below identified the expected composition of the published strata and the associated aquifer classification.

Superficial / Drift Geology	
Unit Name	Lowestoft Formation
Geology Description	Till with chalk and flint, that is typically grey and greyish brown Clay, and variably sandy and gravelly
Aquifer Class	Unproductive Strata
Aquifer Description	Rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
Bedrock / Solid Geology	
Unit Name	London Clay Formation
Geology Description	Bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty Clay
Aquifer Class	Unproductive Strata
Aquifer Description	Rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

Table 3.1: Geology and Hydrogeology

3.2 Geological Hazards

The British Geological Survey (BGS, 2025) has provided the available published Geological Hazard directory information for the study site. The information returned is displayed in the table below. Where multiple records are present, the worst case classification is presented below.

Hazard	Risk Level
Shrink Swell Clays	Low
Landslides	Very Low
Collapsible Ground	Very Low
Running Sands	Very Low
Ground Dissolution	Negligible
Compressible Ground	Negligible

Table 3.2: Geological Hazards

3.3 Radon

The site is located within an Lower probability radon area, as less than 1% of homes are estimated to be at or above the radon Action Level. In order to meet requirements from building regulations it is recommended that a detailed radon search is commissioned by BGS, subject to a search fee, to ensure the correct level of radon protection is required. IGL have not commissioned this search.

3.4 Hydrology

3.4.1. Surface Water Features

The nearest surface water feature is listed as being approximately 230m south, considered to be a pond.

3.4.2. Flooding

The site is located within an EA Flood Zone 1 (i.e. low probability of flooding).

3.5 Controlled Waters

3.5.1. Abstraction Licences

There are no licenced water abstractions (including potable, groundwater and surface water) in or within a 1000m radius of the study area.

3.5.2. Source Protection Zones

The site is not located within a Source Protection Zone (SPZ). However, it should be noted that Source Protection Zones III (Total Catchment) is located 140m north-west.

4. PREVIOUS REPORT

A Stage 1: Tier 1 PRA Report was completed by IGL (Ref: P25.114.PRA, Dated: March 2025) at the wider KAO Data Centre, which included KLON-03. The purpose of the PRA was to provide information on the expected geology and hydrogeology, the development history and most recent uses of the site, potential sources of contamination, and, to enable the development of a preliminary Conceptual Site Model (CSM) and risk assessment.

Following a site walkover, review of historical maps, and information on public record, the preliminary CSM identified a potential contaminant sources:

On-Site

- Made Ground as a result of the historical development of the site; likelihood of Asbestos Containing Soil (ACSs) from ACMs possibly present throughout the fabric of the former structures. Contaminants of Concern (CoC) are likely to include heavy metals, Polycyclic Aromatic Hydrocarbons (PAHs) and Asbestos Containing Soils (ACSs).

- Occupation of the site as a laboratories and works from circa 1965 until recently. This includes the storage of fuels and oils. Contamination is likely to have occurred within areas associated with the transfer and storage of these materials, through leaks and spills etc, including any tanks (including Underground Storage Tanks USTs). COCs include heavy metals, aromatic hydrocarbons, Total Petroleum Hydrocarbons (TPHs) and Semi/Volatile Organic Compounds (S/VOCs).

Off-Site

- Leaks and spillages of fuels and oil from the 25,000L HVO fuel tanks and associated infrastructure at the neighbouring KAO Data Centre buildings. COCs are specific to hydrocarbons.

In summary, the preliminary CSM identified a **Low** risk from the sources to all identified receptors, including commercial end users, future maintenance workers, and groundworkers. A **Low** risk is defined as, 'The site should be considered suitable for the present or future use and environmental setting. Contaminants may be present but unlikely to have unacceptable impact on key targets'.

Consequently, further assessment of the pollutant linkages was not deemed specifically necessary. Nevertheless, some basic recommendations made for the purposes of due diligence.

4.1 Due Diligence

Whilst the identified pollutant linkages within the PRA were characterised as having generally Low risks, there remained some uncertainty to the ground/groundwater conditions in and around KLON-03, as previous investigations failed to specifically target this area. As such, it was recommended that a supplementary investigation be undertaken within this location as part of the 'baseline' environmental surveys being completed as part of the EA permitting process. As part of this investigation it was recommended that a soil screening exercise be completed to inform on salient contamination levels.

5. FIELDWORKS

An investigation was required to identify the ground conditions on site to inform on the proposed development in terms of geo-environmental aspects.

5.1 Site Management and Preparation

The following intrusive works were undertaken over 10th to 13th February 2025, supervised by an Engineer from IGL. The works were carried out in general accordance with statutory guidance including BS5930:2015+A1:2020 *Code of Practice for Site Investigations* and BS 10175:2011+A2:2017 *Investigation of Potentially Contaminated Sites: Code of Practice*.

Prior to any excavations taking place, a Cable Avoidance Tool (CAT) was used to check for the position of any underlying electrical services.

5.2 Rationale and Methodology

The scope was designed IGL, in agreement with the Client, based on the proposed development plans, and mindful of the existing structures and location or proposed structures. The objective of the scope was to advance intrusive locations to assist with determining the geo-environmental conditions on site, including to provide an indication to the underlying groundwater regime.

This was to be achieved with the completion of a cable percussive boreholes and windowless sample boreholes, to assess the nature of the underlying soils and groundwater conditions. Soil and groundwater samples were collected for subsequent geo-environmental laboratory analysis. A plan indicating intrusive locations can be viewed in Appendix B.

5.2.1. Cable Percussive Boreholes

Three boreholes (BH1, BH2 and BH3) were advanced through the base of their respective inspection pits to a maximum depth of 20.00mbgl (metres below ground level), completed using a cable percussive drilling rig. The primary objective was to allow for the assessment of underlying ground and groundwater conditions, production of detailed engineering logs and the recovery of samples for laboratory testing. Additionally, the boreholes were installed with groundwater monitoring standpipes; constructed with 50mm diameter UPVC plain and slotted pipe, and each finished at the surface within a rained barrel cover. More information regarding the monitoring well construction is included in Appendix C.

5.2.2. Windowless Sample Boreholes

Four windowless sample boreholes (WS1, WS2, WS3 and WS4) were completed using a tracked dynamic sampling rig to a maximum depth of 3.00mbgl (metres below ground level). The primary objective was to allow for the assessment of underlying ground conditions, production of detailed engineering logs and the recovery of samples for laboratory testing. The windowless sample boreholes were backfilled with arisings on completion.

5.2.3. Soil Sampling

All intrusive locations were logged, and visual/olfactory evidence of contamination noted in accordance with best practice. Soil sampling of the near surface materials was undertaken to assess generic contamination risks to human health. Environmental samples were handled using a fresh pair of nitrile gloves. Selected samples were placed in

sealable bags, sealed glass jars or plastic tubs (dependent on the exact laboratory requirement and analysis to be undertaken) and stored in a temperature-controlled environment before transit.

6. GROUND CONDITIONS

6.1 Summary of Ground Conditions

The following soil conditions were encountered during the investigation works. They are considered to be consistent with the published geology, and findings from previous works. A summary of the encountered ground strata is included within the table below. Please refer to the engineering logs within Appendix C for more detailed descriptions.

Stratum	Depth to Top (mbgl)	Depth to Base (mbgl)
Tarmac	Ground level	0.20
Made Ground	Ground level	>0.80 – 1.60
Lowestoft Formation	0.80 – 1.60	>3.00 – >20.00

Table 6.1: Summary of Ground Conditions

6.2 Soil Conditions

Photographs of the recovered soils are included within Appendix D. Information regarding each stratum is included below.

6.2.1. Surface Covering

The surface of one of the seven exploratory holes (BH1) comprised tarmac, recorded to be 200mm thick. The remaining exploratory holes were surfaced with Made Ground.

6.2.2. Made Ground

Made Ground was identified within all exploratory holes from ground level to the maximum depth of 1.60mbgl (metres below ground level), in the case of WS3.

The Made Ground soils across the site were found to be variable in terms of principal soil type, ranging from a Clay to a Sand, and locally recorded as a Gravel. In addition, the following items were encountered at varying degrees and locations within the Made Ground: brick, concrete, plastic, rusted metal and glass.

It is recommended that the reader reviews the logs within Appendix C for more information pertaining to the encountered Made Ground soils.

6.2.3. Lowestoft Formation

The initial natural soils were considered to be representative of the Lowestoft Formation, recorded from depths ranging 0.80m to 1.60mbgl, to the maximum intrusive depth of 20.00mbgl.

This stratum was firstly logged as a stiff light brown mottled grey and speckled white gravelly silty Clay, with the gravel recorded as flint. At depths circa 2.00-3.00mbgl, the cohesive soils transitioned to a stiff to very stiff dark grey and dark brown mottled silty Clay, with gravel of chalk, and occasionally with chert gravel. In addition, cobbles of chalk were occasionally encountered.

Within all three cable percussive boreholes (BH1, BH2 and BH3) a granular layer was encountered within the Lowestoft Formation. This layer was recorded from depths ranging from 10.50m to 14.70mbgl, described as a

brown clayey sandy angular to rounded fine to coarse Gravel of chert within BH1 and BH2; and, a brown speckled orangish brown very clayey slightly gravelly fine to coarse Sand within BH3.

6.3 Groundwater Conditions

Groundwater was encountered within four exploratory holes during the investigation, at depths ranging 0.40m to 14.40mbgl. Further information is tabulated below.

Hole ID	Groundwater Level (mbgl)	Groundwater level after 20 minute period (mbgl)	Comments
BH1	1.00	N/A	Seepage
	14.40	13.10	Strike
BH2	0.80	N/A	Seepage
	13.00	11.80	Strike
BH3	11.00	N/A	Seepage
WS4	0.40	N/A	Seepage

Table 6.2: Summary of Groundwater Levels During Investigation

Groundwater monitoring of the installed standpipes within each cable percussive borehole is included below (Appendix F).

Hole ID	Date and Time	Groundwater Level (mbgl)
BH1	3rd March 2025 – 12:25	11.86
BH2	3rd March 2025 – 12:35	11.50
BH3	3rd March 2025 – 12:15	11.33

Table 6.3: Groundwater Monitoring

6.4 Visual and Olfactory Observations

There was no significant visual/olfactory evidence of contamination noted during the ground investigation, other than the anthropogenic materials (i.e. brick, concrete etc.) encountered within the Made Ground soils. Furthermore, there was no evidence of any hydrocarbon-specific contamination within the soils (i.e. hydrocarbon stains, sheens and odours).

7. LABORATORY TESTING

Soil samples collected during the IGL investigation from various depths and locations were submitted to UKAS accredited laboratories. Laboratory test certificates are included as Appendix E.

7.1 Geo-Environmental Soil Testing

In light of the IGL PRA (Ref: P25.114.PRA, Dated: March 2025), it was suggested that a soil screening exercise is undertaken within the locale of KLON-03 with the aim to inform on salient contamination levels.

7.1.1. Rationale

Soil samples collected during the IGL investigation were submitted to a UKAS accredited laboratory for analysis against a generic contamination suite. This suite included heavy metals, speciated polyaromatic hydrocarbons (PAHs), Extractable petroleum hydrocarbons (EPHs), as well as an asbestos screen.

Seven soil samples were chosen at various locations and depths (ranging from 0.20m to 1.50mbgl) across KLON-03. Generally, samples were selected from the encountered Made Ground; and therefore, probable worst-case with respect to the site and development area. Furthermore, one sample was taken from natural soils to provide an indication as to Normal Background Concentrations (NBCs) of generic contaminants.

7.1.2. Generic Assessment Criteria

In order to assess the soil analysis with regard to potential human health risks, IGL has compared the results against Generic Assessment Criteria (GAC). GAC are conservative contaminant concentration values used for comparison purposes to assess the risks associated with contaminant concentrations on site and are derived using non-site-specific information. For the purposes of these works, these include the following:

- Suitable 4 Use Levels (S4ULs) Generic Assessment Criteria (GAC) developed by the Chartered Institute of Environmental Health (CIEH) in partnership with Land Quality Management Ltd. (LQM).
- Category 4 Screening Levels (C4SL) for lead, produced by CL:AIRE (2014).
- The UK Soil Guideline Values (SGVs) for selected metals, BTEX and phenols, produced by the EA and Department of Environment, Food and Rural Affairs (2009).

Comparisons have been made against the ‘Commercial’ land use setting, in light of the proposals. A conservative Soil Organic Matter (SOM) value of 1% is used for organic contaminants (i.e. EPH/TPH and PAHs) as a worst-case scenario, unless otherwise stated.

7.1.3. Soil Results

Laboratory certificates are included as Appendix E.

Asbestos

Asbestos was not detected within any of the tested samples, following the asbestos screen.

Heavy Metals

There were no exceedances of the screening criteria from any of the heavy metal determinands from the tested soil samples. Furthermore, all heavy metal determinands were reported at concentrations below the stringent 'Residential with homegrown produce – RwHP' land use setting criteria.

PAHs

There were no exceedances of the 'Commercial' screening criteria from any of the PAH determinands from the tested soil samples. Furthermore, all PAH determinands from four soil samples (BH1 at 0.70m, BH3 at 0.80m, WS1 at 0.20m and WS1 at 1.50m) were recorded below their respective laboratory Limit of Detection (LOD).

EPH

Whilst there are no specific screening criteria for returned EPH organics, the respective carbon chain range for EPH C6-C10, C10-C25, and C25-C40 do not go beyond that of the corresponding Total Petroleum Hydrocarbon (TPH) LQM bandings utilising the 'Commercial' setting.

7.1.4. Summary

Following laboratory analysis, there were no recorded exceedances of the 'Commercial' land use setting screening criteria for any of the determinands from the tested soil samples. Furthermore, asbestos was not detected within any of the samples following the asbestos screen.

This is somewhat reflective of the largely absent visual and olfactory evidence of grossly contaminated soils encountered within the exploratory holes during the investigation.

7.2 Groundwater Testing

Groundwater analysis was considered beneficial in order to refine background composition levels of the encountered groundwater.

7.2.1. Rationale

A groundwater grab sample taken from BH2, at a depth of 13.90mbgl, was submitted for a generic contamination groundwater suites. Rationale is tabulated below.

Source / Location	Hole ID and Sample Depth (mbgl)	Description of Groundwater	Analysis	Rationale for Sample Analysis
From the granular layers of the Lowestoft Formation (Unproductive Aquifer)	BH2 at 13.90	Slightly turbid, pale brown	Heavy metals, speciated PAHs, BTEX, MTBE and speciated TPH (CWG)	Generic contamination groundwater suite to provide an indication to groundwater concentrations

Table 7.1: Groundwater Analysis Rationale

7.2.2. Screening Criteria

In the absence of dedicated UK groundwater standards, groundwater analytical results were screened against the conservative Water Framework Directive (WFD), Environmental Quality Standards (EQS), UK Drinking Water Standards (DWS) as taken from the Water Supply Regulations (WSR) (2000), the New Dutch List (Dutch Target and Intervention Values, 2000) and the US EPA Drinking Water Standards (and Health Advisories).

Where a number of standards are available for a particular compound, the standard selected for screening purposes is based on the most relevant standard for the receptor, in the first instance. Thereafter, statutory standards are prioritised over non-statutory standards.

7.2.3. Groundwater Results

Laboratory certificates are included as Appendix E.

Dissolved Heavy Metals

There were no recorded exceedances of the groundwater assessment criteria for any of the dissolved heavy metal determinands from the groundwater sample from BH1 at 13.90mbgl.

PAHs

Exceedances of WSR (2000) was reported for two PAH determinands: benzo(b)fluoranthene and benzo(a)pyrene, from BH1 at 13.90mbgl. Benzo(b)fluoranthene was recorded as 0.11ug/l, and benzo(a)pyrene as 0.07ug/l. The criteria limit of benzo(b)fluoranthene for WSR (2000) is 0.1ug/l, with benzo(a)pyrene being 0.01ug/l.

There were no other reported exceedances.

TPH, BTEX and MTBE

One exceedance of the stringent WSR (2000) criteria was recorded for Aromatic >C21-C35 banding. There were no other exceedances.

7.2.4. Summary

Exceedances of the Water Supply Regulations (2000) were recorded for benzo(b)fluoranthene, benzo(a)pyrene and TPH Aromatic >C21-C35 banding. There were no other notable exceedances of the groundwater assessment criteria for any of the tested contaminants from the tested sample. The marginally elevated hydrocarbon-specific determinands may be as a result of the drilling lubricants used, considering the grab sample that was ran for analysis.

The UK Drinking Water Standards (DWS) Water Supply Regulations (WSR) (2000) is a particularly stringent assessment criteria for groundwater quality, as the maximum allowable values provided are specific to potable water directly taken from a household tap. In light of this, this assessment criteria is often used as a ‘worst-case’.

8. GROUND GAS AND SOIL VAPOUR ASSESSMENT

The IGL Stage 1: Tier 1 PRA Report (Ref: P25.004.PRA, Dated: March 2025) identified generally **Low** risks from ground gas and soil vapour associated with the sources identified. In general accordance with BS8576:2013 *Guidance on investigations for ground gas – permanent gases and volatile organic compounds*, and utilising a multiple-lines-of-evidence approach, the ground gas/soil vapour potential and associated risks can be defined. Information detailed in the table below has either been taken from a review of previous reports and/or interpreted from the intrusive investigation conducted. The extent of monitoring deemed necessary to assess the ground gas and vapour regime is determined by the generation potential of the source, i.e. what is the risk that large volumes of gas can be generated and can plausibly migrate to pose a credible hazard to the identified receptors.

Factor	Evidence for Ground Gas/Soil Vapour Potential on Site	Evidence against Ground Gas/Soil Vapour Potential on Site
Landfills	-	There are no recorded landfills within a 300m radius of site.
Made Ground organic content	Made Ground present on site	Made Ground thickness across site relatively shallow (i.e. <1.60m). No significant evidence of any ground gas generating material (peat, decomposing organic matter). TOC average from all tested sample has been reported as 0.9%. With reference to BS8576, Made Ground with low degradable organic content can be said to have a 'Very Low' ground gas generation potential.
Natural Soil organic content	-	No evidence of any ground gas generating material (peat, decomposing organic matter) within natural soils.
Site Investigation	-	Laboratory analysis reported no significantly elevated levels of hydrocarbon specific contaminants; reflective of the largely absent hydrocarbon-specific visual and/or olfactory evidence of contamination encountered across the site.
Volatiles	-	Soil laboratory results returned comparatively low concentrations of hydrocarbon-specific contaminants.

Table 8.1: Factors Influencing Ground Gas/Soil Vapour Potential

8.1 Ground Gas and Soil Vapour Potential

With respect to Table 8.1, and with reference to BS8576, the site is classified as having a **Very Low** ground gas generation and soil vapour potential. It is unlikely that large volumes of ground gas and soil vapour will be generated from the underlying Made Ground and natural soils; these soils either reported no easily degradable material, no significant areas of hydrocarbon contamination, and/or present a low ground gas generation potential. Consequently, ground gas monitoring is not considered necessary at this stage, and the site can be classified as Characteristic Situation 1 (CIRIA C665) and no ground gas mitigation is deemed required within the proposed development.

9. GEO-ENVIRONMENTAL DISCUSSION AND CONCLUSIONS

The following conclusions have been made based on the investigation undertaken to date in light of the outlined proposals. Any alterations to the proposals may warrant a reassessment. In summary, proposals include for the construction of a new Data Centre (KLON-03) with associated ring road and amenity soft-landscaping.

9.1 Discussion of Findings

The preliminary Conceptual Site Model (Ref: P25.114.PRA, Dated: March 2025) identified the following potential sources of contamination:

On-Site

- Made Ground as a result of the historical development of the site; likelihood of Asbestos Containing Soil (ACSs) from ACMs possibly present throughout the fabric of the former structures. Contaminants of Concern (CoC) are likely to include heavy metals, Polycyclic Aromatic Hydrocarbons (PAHs) and Asbestos Containing Soils (ACSs).

- Occupation of the site as a laboratories and works from circa 1965 until recently. This includes the storage of fuels and oils. Contamination is likely to have occurred within areas associated with the transfer and storage of these materials, through leaks and spills etc, including any tanks (including Underground Storage Tanks USTs). COCs include heavy metals, aromatic hydrocarbons, Total Petroleum Hydrocarbons (TPHs) and Semi/Volatile Organic Compounds (S/VOCs).

Off-Site

- Leaks and spillages of fuels and oil from the 25,000L HVO fuel tanks and associated infrastructure at the neighbouring KAO Data Centre buildings. COCs are specific to hydrocarbons.

In summary, the preliminary CSM identified a **Low** risk from the sources to all identified receptors, including commercial end users, future maintenance workers, and groundworkers.

9.1.1. Significance of Soil Results

Soil samples were submitted to the laboratory for analysis against a generic contamination suite.

Analytical results from selected samples did not identify levels of tested organic or inorganic contaminants exceeding the relevant 'Commercial' GAC screening criteria. It is also noted that values were generally below the more stringent 'Residential' land use scenarios. Asbestos was not detected in any of the samples analysed.

The results are considered to be generally congruent with the logging descriptions of the soils encountered; whilst Made Ground soils were encountered these were formed by reworked natural soils, which would be expected to be relatively 'inert' in terms of potential contaminants.

9.1.2. Ground Gas and Soil Vapour

The site has been defined as Characteristic Situation 1 (CS1) (**Very Low Risk**) following the assessments included within Section 8. The typical source generation for CS1 is given in CIRIA C665 as, 'Natural soils with low organic content, or "typical" Made Ground'. Consequently, no special precautions for ground gas mitigation are required to be incorporated into the proposed structures.

9.1.3. Controlled Water

During subsequent monitoring, groundwater levels were recorded within the installed standpipes of the cable percussive boreholes at depths ranging 11.33m to 11.86mbgl.

Whilst elevated levels of benzo(b)fluoranthene, benzo(a)pyrene and TPH Aromatic >C21-C35 banding have been identified, the magnitude of impact from these contaminants to controlled waters is thought to be slight. As discussed with the preliminary CSM, the sensitivity of controlled waters was considered to be low, due to the absence of an underlying productive aquifer, SPZs, sensitive water bodies and abstractions within the site and surrounds. Moreover, the criteria used is considered to be overly conservative with respect to the site, and not wholly representative of the conditions.

As a result, the risks to controlled waters associated with the source-pathway-receptor pollutant linkage identified within the PRA remain as **Negligible to Low**.

9.2 Conceptual Site Model

The refined Conceptual Site Model has been formulated in general accordance with BS EN ISO 21365:2019 *Soil Quality – Conceptual Site Models for Potentially Contaminated Sites* and following information collated within the Site Investigation conducted and is intended to complete the GQRA, in accordance with LCRM 2020.

Following the GQRA undertaken on site to date, including soil laboratory testing, the risks from the identified pollutant linkages within the preliminary CSM (Ref: P25.114.PRA, Dated: March 2025) are considered to be remain as **Negligible to Low**. This is defined as, ‘the site should be considered suitable for the present or future use and environmental setting. Contaminants may be present but unlikely to have unacceptable impact on key targets’. As such, whilst risks were addressed and identified with the Preliminary CSM, these do not need to be further refined.

10. GEO-ENVIRONMENTAL RECOMMENDATIONS

The following recommendations are based on the plans proposed at the time of writing this report and may be subject to change. The design of the site investigation incorporated information from previous reports along with consideration of the development plans. Potential contamination sources were investigated as far as reasonably practicable and within the permitted timeframe.

Following the investigation to date, generally worst-case **Low** risks have been identified to the site from potential sources of contamination outlined. Consequently, no specific requirements are needed to address any specific contaminated land measures. Moreover, a Remediation Options Appraisal and Remediation Strategy are not specifically mandatory. Nevertheless, some basic recommendations have been made for the purposes of due diligence.

10.1 Watching Brief

A watching brief should be maintained on site, particularly during ground works. This must be undertaken as part of good working practices and in case there are any areas of unidentified contamination.

During any ground works, an appraisal of the exposed soils should be made by the on-site manager or developer's nominated person. If any material is noted to show visual and/or olfactory sign of contamination this material should be stockpiled separately and tested prior to its appropriate removal off site or re-use where necessary. A suitably qualified environmental specialist should be contacted to advise what further investigation is required.

The on-site manager/developer's nominated person should be able to display the relevant level of qualification and/or experience in managing construction works on contaminated land.

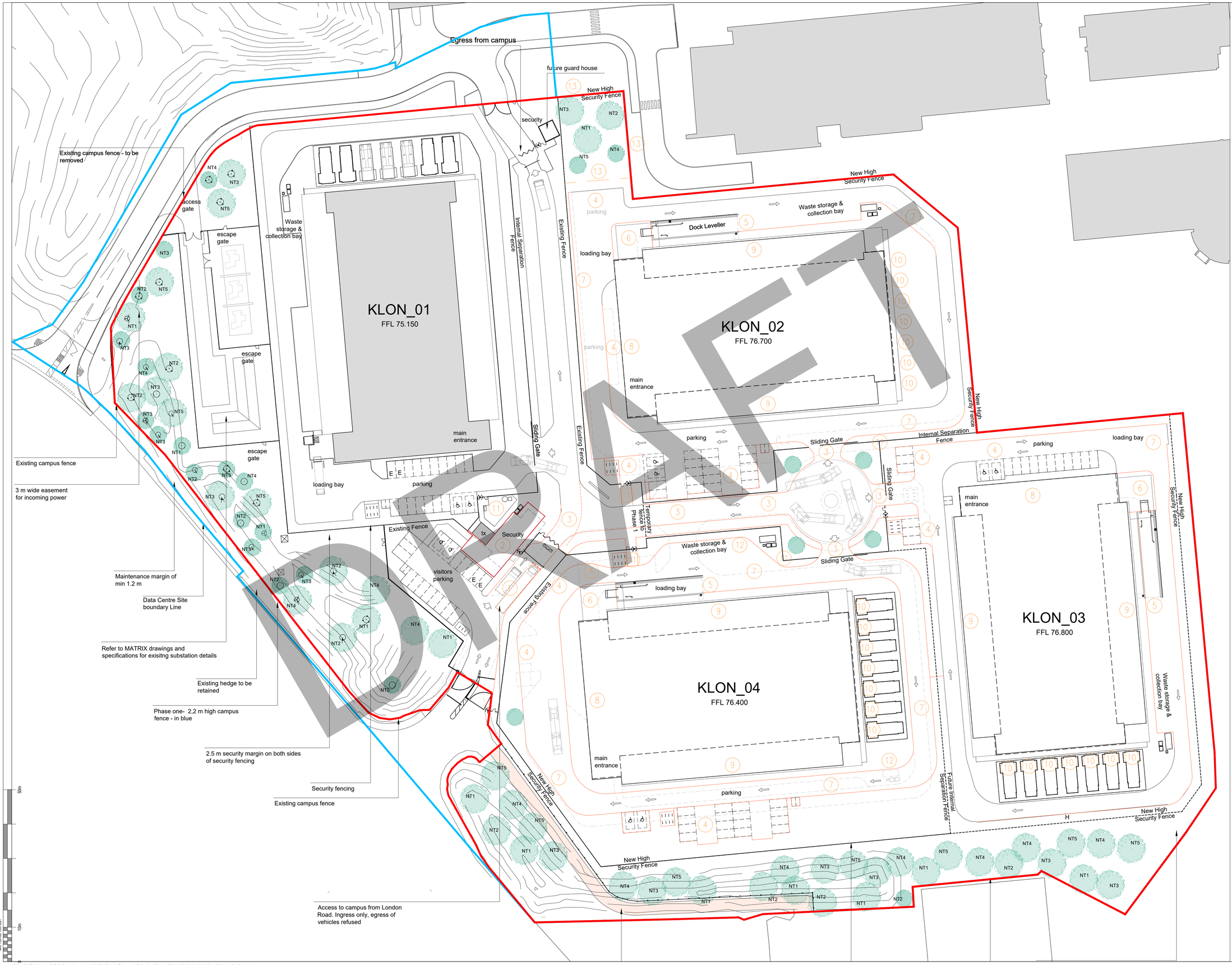
10.2 Services

It is recommended the services are situated within lined trenches. The trenches should be lined with a geotextile membrane and backfilled with clean fill, such as pea shingle, which will demarcate the services from the surrounding soils, protecting both the services and the future maintenance workers.

10.3 Statutory Consultees

We would recommend that this report be forwarded to the relevant Statutory Consultees including the Local Council's Environmental Health and Planning Department to seek their comments and subsequent approval prior to works commencing on site

APPENDIX A – SITE PLANS



DO NOT SCALE FROM THIS DRAWING. ALL DIMENSIONS TO BE CHECKED ON SITE.
THIS DRAWING IS SUBJECT TO REVISION. PLEASE CHECK THE CURRENT VERSION OF THIS DRAWING PRIOR TO USE.
THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATIONS AND CONTRACT DOCUMENTATION.

Drawing must be printed in colour.

No. NUMBER OF CHANGE IDENTIFIED ON SCHEDULE L02-XX-XX-PL-J-00014 LDO CHANGE TRACKER.

KAO DATA OWNERSHIP

PLANNING APPLICATION BOUNDARY

POSITION ON PREVIOUSLY APPROVED MASTERPLAN

LOCATION OF REVISED ELEMENTS SHOWN IN ORANGE

Rev	Drawn By	Date	Chkd By	Date	Apprvd By	Date
B	AB	12.07.21	AB	12.07.21	AB	12.07.21
	Initial Issue for comment / client review.					
A	AB	02.07.21	AB	02.07.21	AB	02.07.21
	Initial Issue for comment / client review.					

Revisions

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E: post@mc-a.co.uk
W: www.mc-a.co.uk

JCA ENGINEERING LIMITED

Client

KAO DATA

Project

KAO CAMPUS
KAO DATA LON_02
KLON_02

Drawing Title

PHASE 2 MASTERPLAN
PLANNING VARIATIONS

Status S0

Scale 1:500 @A1 Proj.No. 20017

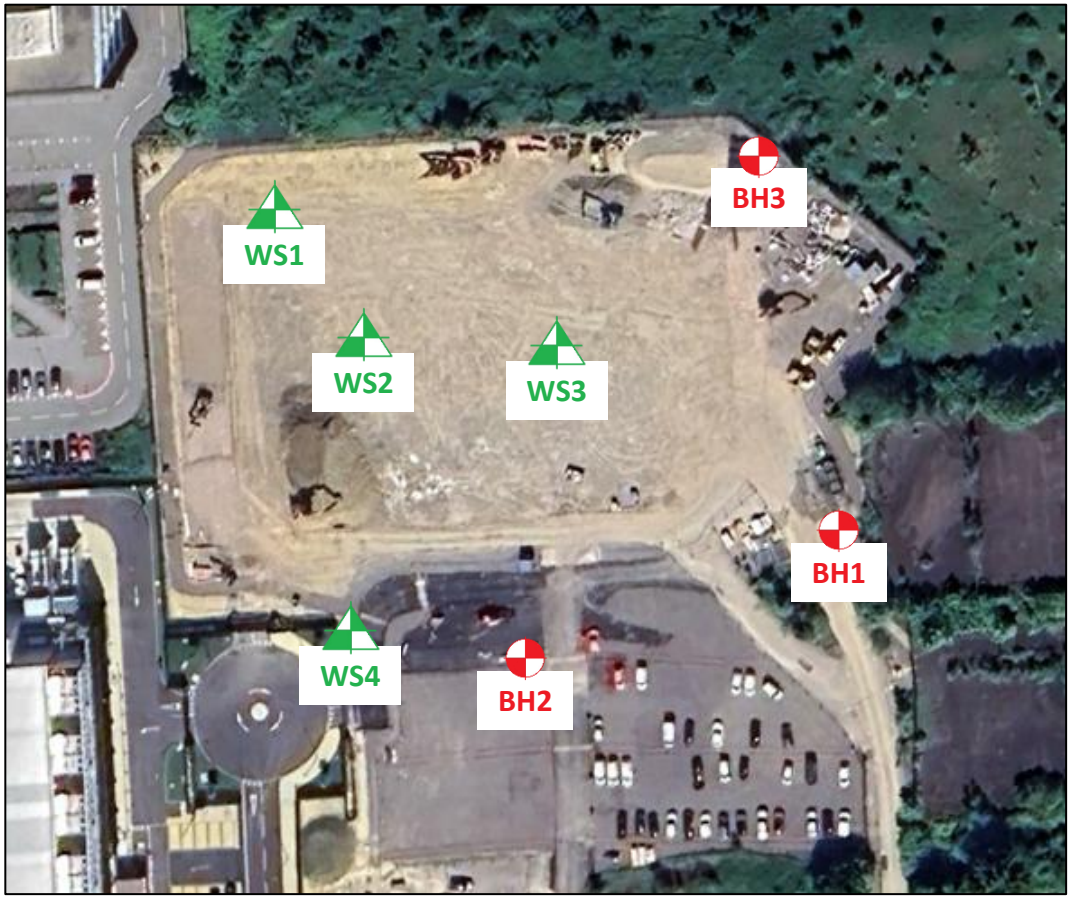
Drawing No. KL02-MCA-00-00-DR-A-08001

Revision B

DATE PLOTTED: 13.07.2021

FILE NAME: P:\MCA Projects 2020\20017 KAO Park - London 2_3&4\20017 drawings\02 - AutoCAD\02 - Sheets\0- series\08 Series\KL02-MCA-00-00-DR-A-08001 MasterPlan Planning Changes.dwg

APPENDIX B – HOLE LOCATION PLAN



Cable percussive borehole

Windowless sample borehole

Project:	KAO Data Centre	**Title:**	Hole Location Plan
Job Number:	P25.114	**Client:**	JCA Engineering Ltd
Drawing:	P25.114/HLP	**Revision:**	-
Drawn:	RG	**Date:**	13/02/2025
Checked by:	GC	**Scale:**	NTS

Notes:
1. Do not scale from this drawing.
2. All dimensions must be checked on site prior to commencement of work.
3. Where applicable this drawing is to be read in conjunction with other consultants drawings.
4. This drawing is the copyright of Impact Geotechnical Ltd.

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Impact Geotechnical Limited
www.impactgeo.co.uk

APPENDIX C – STRATIGRAPHIC LOGS

Percussion Drilling Log

Project Name: KAO Data Centre	Client: JCA Engineering Ltd	Date: 10/02/2025
Location: London Road, Harlow, CM17 9NA	Contractor: Impact Geotechnical Ltd	
Project No. : P25.114	Crew Name: ISJ	Drilling Equipment: Dando CP Rig

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH1	CP		RG	1:50	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES		0.20			TARMAC.
		0.70	ES		0.60			MADE GROUND: Brown clayey sandy angular to sub-rounded fine to coarse Gravel of concrete, limestone and brick. Sand is fine to coarse. Locally very clayey. Low cobble content of sub-angular cobbles of brick and concrete. Rare bits of plastic.
	▼	1.00	ES		0.80			MADE GROUND: Greenish brown and brown slightly sandy gravelly Clay. Sand is fine and medium. Gravel is sub-angular fine and medium flint and chalk. Occasional bits of timber.
								At 0.60mbgl: Geotextile membrane.
					2.10			Stiff light brown mottled brown and speckled white gravelly silty CLAY. Gravel is sub-angular to rounded fine to coarse chalk. (LOWESTOFT FORMATION).
		2.50	ES					Stiff to very stiff dark grey and dark brown mottled speckled white slightly sandy gravelly CLAY. Sand is fine. Gravel is sub-angular to sub-rounded fine and medium chalk. (LOWESTOFT FORMATION).
					5.70			Very stiff dark grey speckled white gravelly silty CLAY. Gravel is sub-angular and sub-rounded fine to coarse chalk. Rare to occasional sub-rounded medium and coarse gravel of chert. Low cobble content of sub-rounded chalk cobbles. (LOWESTOFT FORMATION).

1 2 3 4 5 6 7 8 9 10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

CAT scanned prior to drilling. Buried service inspection pit to 1.20mbgl. Groundwater seepage at 1.00mbgl. Groundwater strike at 14.40m, rising to 13.10mbgl after a period of 20 minutes. Installed with groundwater monitoring standpipe comprising: 3.00m plain pipe within bentonite seal; and, 17.00m slotted pipe within gravel pack surrounds; finished within raised barrel cover.

Percussion Drilling Log

Project Name: KAO Data Centre	Client: JCA Engineering Ltd	Date: 10/02/2025
Location: London Road, Harlow, CM17 9NA	Contractor: Impact Geotechnical Ltd	
Project No. : P25.114	Crew Name: ISJ	Drilling Equipment: Dando CP Rig

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH1	CP		RG	1:50	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Very stiff dark grey speckled white gravelly silty CLAY. Gravel is sub-angular and sub-rounded fine to coarse chalk. Rare to occasional sub-rounded medium and coarse gravel of chert. Low cobble content of sub-rounded chalk cobbles. (LOWESTOFT FORMATION).
		14.20	GW		14.20			Brown clayey sandy angular to rounded fine to coarse GRAVEL of chert and quartzite. Sand is fine to coarse. (LOWESTOFT FORMATION).
					14.70			Stiff dark grey and dark brown mottled and speckled white very gravelly silty CLAY. Gravel is sub-angular and sub-rounded fine to coarse chalk. Occasional sub-rounded medium and coarse gravel of chert. (LOWESTOFT FORMATION).
					17.10			Stiff dark grey mottled speckled white sandy gravelly CLAY. Sand is fine. Gravel is sub-angular and sub-rounded fine to coarse chalk. (LOWESTOFT FORMATION). *From 17.10m to 17.40mbgl: Locally very gravelly.*
					20.00			End of Borehole at 20.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

CAT scanned prior to drilling. Buried service inspection pit to 1.20mbgl. Groundwater seepage at 1.00mbgl. Groundwater strike at 14.40m, rising to 13.10mbgl after a period of 20 minutes. Installed with groundwater monitoring standpipe comprising: 3.00m plain pipe within bentonite seal; and, 17.00m slotted pipe within gravel pack surrounds; finished within raised barrel cover.

Percussion Drilling Log

Project Name: KAO Data Centre	Client: JCA Engineering Ltd	Date: 11/02/2025
Location: London Road, Harlow, CM17 9NA	Contractor: Impact Geotechnical Ltd	
Project No. : P25.114	Crew Name: ISJ	Drilling Equipment: Dando CP Rig

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH2	CP		RG	1:50	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES		0.20			MADE GROUND: Black speckled light brown sandy angular and sub-angular fine and medium Gravel of tarmac, flint, limestone and granite. Sand is medium and coarse. (SCALPINGS).
	▼	0.80	ES		0.50 0.70			MADE GROUND: Brown and greenish brown clayey slightly sandy angular to sub-rounded fine to coarse Gravel of concrete, limestone and brick. Sand is fine to coarse. Locally very clayey. Low cobble content of sub-angular cobbles of brick and concrete. Frequent bits of rusted metal.
					1.30			MADE GROUND: Greenish brown and brown slightly sandy gravelly Clay. Sand is fine and medium. Gravel is sub-angular fine and medium flint.
								At 0.50mbgl: Geotextile membrane.
								MADE GROUND: Stiff light brown mottled brown and speckled white gravelly silty Clay. Gravel is angular to rounded fine to coarse chalk, brick and flint. Medium cobble content of angular and sub-angular cobbles of brick.
								Stiff to very stiff grey and brown mottled speckled white slightly sandy gravelly CLAY. Sand is fine. Gravel is sub-angular to sub-rounded fine and medium chalk. (LOWESTOFT FORMATION).
		5.00	ES		4.50			Stiff to very stiff grey and brown mottled speckled white slightly sandy gravelly CLAY. Sand is fine. Gravel is sub-angular to sub-rounded fine and medium chalk. (LOWESTOFT FORMATION).

1 2 3 4 5 6 7 8 9 10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

CAT scanned prior to drilling. Buried service inspection pit to 1.20mbgl. Groundwater seepage at 0.80mbgl. Groundwater strike at 13.00m, rising to 11.80mbgl after a period of 20 minutes. Installed with groundwater monitoring standpipe comprising: 5.00m plain pipe within bentonite seal; and, 15.00m slotted pipe within gravel pack surrounds; finished within raised barrel cover.

Percussion Drilling Log

Project Name: KAO Data Centre	Client: JCA Engineering Ltd	Date: 11/02/2025
Location: London Road, Harlow, CM17 9NA	Contractor: Impact Geotechnical Ltd	
Project No. : P25.114	Crew Name: ISJ	Drilling Equipment: Dando CP Rig

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH2	CP		RG	1:50	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Stiff to very stiff grey and brown mottled speckled white slightly sandy gravelly CLAY. Sand is fine. Gravel is sub-angular to sub-rounded fine and medium chalk. (LOWESTOFT FORMATION).
					13.00			Brown clayey sandy angular to rounded fine to coarse GRAVEL of chert. Sand is fine to coarse. Occasional sub-angular and sub-rounded fine and medium gravel of quartzite and chalk. (LOWESTOFT FORMATION).
		13.90	EW		13.90			Very stiff dark grey speckled white gravelly silty CLAY. Gravel is sub-angular and sub-rounded fine to coarse chalk. Occasional sub-rounded medium and coarse gravel of chert. Rare angular medium and coarse gravel of siltstone. Low cobble content of angular and sub-angular cobbles of flint and chalk. (LOWESTOFT FORMATION).
					20.00			End of Borehole at 20.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

CAT scanned prior to drilling. Buried service inspection pit to 1.20mbgl. Groundwater seepage at 0.80mbgl. Groundwater strike at 13.00m, rising to 11.80mbgl after a period of 20 minutes. Installed with groundwater monitoring standpipe comprising: 5.00m plain pipe within bentonite seal; and, 15.00m slotted pipe within gravel pack surrounds; finished within raised barrel cover.

Percussion Drilling Log

Project Name: KAO Data Centre	Client: JCA Engineering Ltd	Date: 11/02/2025 - 12/02/2025
Location: London Road, Harlow, CM17 9NA	Contractor: Impact Geotechnical Ltd	
Project No. : P25.114	Crew Name: ISJ	Drilling Equipment: Dando CP Rig

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH3	CP		RG	1:50	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.40			MADE GROUND: Greyish brown clayey sandy angular and sub-angular fine to coarse Gravel of concrete and flint. Rare sub-angular medium and coarse gravel of brick. Rare bits of plastic and polystyrene.
		0.80	ES		1.30			MADE GROUND: Soft to firm brown gravelly Clay. Gravel is angular and sub-angular fine to coarse brick and flint. Medium cobble content of angular and sub-angular cobbles of brick.
		1.40	ES		1.50			MADE GROUND: Firm greenish brown mottled sandy silty slightly organic Clay. Sand is fine. Occasional sub-angular to rounded fine and medium gravel of flint. Rare sub-angular fine and medium gravel of brick.
					2.30			Stiff light brown mottled brown and speckled white gravelly silty CLAY. Gravel is sub-angular to rounded fine to coarse chalk. (LOWESTOFT FORMATION).
								Stiff grey and brown mottled speckled white slightly sandy gravelly CLAY. Sand is fine. Gravel is sub-angular to sub-rounded fine and medium chalk. (LOWESTOFT FORMATION).
					6.20			Very stiff dark grey speckled white gravelly silty CLAY. Gravel is sub-angular and sub-rounded fine to coarse chalk. Rare to occasional sub-rounded medium and coarse gravel of chert. Low cobble content of sub-rounded chalk cobbles. (LOWESTOFT FORMATION).

1 2 3 4 5 6 7 8 9 10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

CAT scanned prior to drilling. Buried service inspection pit to 1.20mbgl. Slight groundwater seepage at 11.00mbgl. Installed with groundwater monitoring standpipe comprising: 5.00m plain pipe within bentonite seal; and, 15.00m slotted pipe within gravel pack surrounds; finished within raised barrel cover.

Percussion Drilling Log

Project Name: KAO Data Centre	Client: JCA Engineering Ltd	Date: 11/02/2025 - 12/02/2025
Location: London Road, Harlow, CM17 9NA	Contractor: Impact Geotechnical Ltd	
Project No. : P25.114	Crew Name: ISJ	Drilling Equipment: Dando CP Rig

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH3	CP		RG	1:50	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	11.00	ES		10.50			Very stiff dark grey speckled white gravelly silty CLAY. Gravel is sub-angular and sub-rounded fine to coarse chalk. Rare to occasional sub-rounded medium and coarse gravel of chert. Low cobble content of sub-rounded chalk cobbles. (LOWESTOFT FORMATION).
								Brown speckled orangish brown very clayey slightly gravelly fine to coarse SAND. Gravel is angular and sub-angular fine and medium flint. (LOWESTOFT FORMATION).
					12.20			Very stiff dark grey speckled white gravelly silty CLAY. Gravel is sub-angular and sub-rounded fine to coarse chalk. Occasional sub-rounded medium and coarse gravel of chert. Low cobble content of angular and sub-angular cobbles of chalk. (LOWESTOFT FORMATION).
					20.00			End of Borehole at 20.000m

11 12 13 14 15 16 17 18 19 20

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

CAT scanned prior to drilling. Buried service inspection pit to 1.20mbgl. Slight groundwater seepage at 11.00mbgl. Installed with groundwater monitoring standpipe comprising: 5.00m plain pipe within bentonite seal; and, 15.00m slotted pipe within gravel pack surrounds; finished within raised barrel cover.

Percussion Drilling Log

Project Name: KAO Data Centre	Client: JCA Engineering Ltd	Date: 13/02/2025
Location: London Road, Harlow, CM17 9NA	Contractor: Impact Geotechnical Ltd	
Project No. : P25.114	Crew Name: SG	Drilling Equipment: Archway Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS1	WLS		RG	1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.30			MADE GROUND: Firm brown sandy gravelly Clay. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse flint and concrete. Medium cobble content of sub-angular cobbles of flint and concrete.
		0.50	ES		0.90			MADE GROUND: Firm greenish brown slightly sandy gravelly Clay. Sand is fine and medium. Gravel is angular to well-rounded fine to coarse flint. Occasional coarse gravel-sized pieces of clay pipe. Low cobble content of sub-angular cobbles of flint.
		1.50	ES					*From 0.60m to 0.90mbgl: Light brown mottled light grey gravelly clay on southern side of starter pit wall.*
					2.80			Stiff to very stiff light brown mottled light grey and speckled white gravelly silty CLAY. Gravel is sub-angular to rounded fine to coarse chalk. (LOWESTOFT FORMATION).
					3.00			*At 2.30mbgl: Thinly laminated with dark reddish brown medium Sand.*
								Very stiff dark grey and dark brown mottled speckled white slightly sandy gravelly CLAY. Sand is fine. Gravel is sub-angular to sub-rounded fine and medium chalk. (LOWESTOFT FORMATION).
								End of Borehole at 3.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

CAT scanned prior to drilling. Buried service inspection pit to 1.20mbgl. Groundwater not encountered. Backfilled with arisings.

Percussion Drilling Log

Project Name: KAO Data Centre	Client: JCA Engineering Ltd	Date: 13/02/2025
Location: London Road, Harlow, CM17 9NA	Contractor: Impact Geotechnical Ltd	
Project No. : P25.114	Crew Name: SG	Drilling Equipment: Archway Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS2	WLS		RG	1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.40	ES		0.60			MADE GROUND: Brown speckled red silty very gravelly fine to coarse Sand. Gravel is angular to sub-rounded fine to coarse brick, concrete and flint. Frequent fine to coarse gravel-sized pieces of slate. Occasional bits of plastic, rusted metal and textile.
		1.00	ES					*At 0.45mbgl: Geotextile web.*
					1.40			MADE GROUND: Reworked soft to firm light brown mottled light grey speckled white and red gravelly silty Clay. Gravel is sub-angular and sub-rounded fine to coarse chalk. Frequent sub-angular fine to coarse gravel of brick.
					2.20			Stiff to very stiff light brown mottled light grey and speckled white gravelly silty CLAY. Gravel is sub-angular to rounded fine to coarse chalk. (LOWESTOFT FORMATION).
					3.00			Very stiff dark grey and dark brown mottled speckled white slightly sandy gravelly CLAY. Sand is fine. Gravel is sub-angular to sub-rounded fine and medium chalk. Occasional scattered relict roots. (LOWESTOFT FORMATION).
								End of Borehole at 3.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

CAT scanned prior to drilling. Buried service inspection pit to 1.20mbgl. Groundwater not encountered. Backfilled with arisings.

Percussion Drilling Log

Project Name: KAO Data Centre	Client: JCA Engineering Ltd	Date: 13/02/2025
Location: London Road, Harlow, CM17 9NA	Contractor: Impact Geotechnical Ltd	
Project No. : P25.114	Crew Name: SG	Drilling Equipment: Archway Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS3	WLS		RG	1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES					MADE GROUND: Brown speckled red silty very gravelly fine to coarse Sand. Gravel is angular to sub-rounded fine to coarse brick, concrete and flint. Frequent fine to coarse gravel-sized pieces of slate. Occasional bits of plastic, ceramic and glass fragments.
					0.80			*At 0.45mbgl: Geotextile web.*
		1.00	ES					MADE GROUND: Reworked soft to firm light brown mottled light grey speckled white and red gravelly silty Clay. Gravel is sub-angular and sub-rounded fine to coarse chalk. Locally abundant with sub-angular fine to coarse gravel of brick. Scattered 10mm layers of dark brown medium and coarse sand.
					1.60			Stiff to very stiff light brown mottled light grey and speckled white gravelly silty CLAY. Gravel is sub-angular to rounded fine to coarse chalk. (LOWESTOFT FORMATION).
		2.00	ES					*From 2.60m to 3.00mbgl: Becoming darker brown.*
					3.00			End of Borehole at 3.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

CAT scanned prior to drilling. Buried service inspection pit to 1.20mbgl. Groundwater not encountered. Backfilled with arisings.

Percussion Drilling Log

Project Name: KAO Data Centre	Client: JCA Engineering Ltd	Date: 13/02/2025
Location: London Road, Harlow, CM17 9NA	Contractor: Impact Geotechnical Ltd	
Project No. : P25.114	Crew Name: SG	Drilling Equipment: Archway Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS4	WLS		RG	1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES		0.40			MADE GROUND: Brown slightly clayey sandy angular to sub-rounded fine to coarse Gravel of brick, concrete and flint. Sand is fine to coarse. Occasional pieces of timber, metal, metal sheeting and plastic.
		0.70	ES		0.80			MADE GROUND: Very soft to soft green and brownish green mottled black slightly sandy slightly gravelly slightly organic Clay. Sand is fine and medium. Gravel is sub-angular medium and coarse flint.
								End of Borehole at 0.800m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

CAT scanned prior to drilling. Groundwater seepage at 0.40mbgl. Terminated at 0.80mbgl on metal obstruction. Backfilled with arisings.

APPENDIX D – PHOTOGRAPHS

1.

2.

3.

4.

Project:	KAO Data Centre	**Title:**	Site Photographs
Job Number:	P25.114	1. BH1 2. BH1 starter pit 3. BH1 arisings 4. BH2	IMPACT GEOTECHNICAL Impact Geotechnical Limited www.impactgeo.co.uk
Client:	JCA Engineering Ltd		
Produced by:	RG		
Checked by:	GC		

5.

6.

7.

8.

Project:	KAO Data Centre	**Title:**	Site Photographs
Job Number:	P25.114	5. BH2 starter pit 6. BH3 7. BH1 monitoring standpipe 8. BH2 monitoring standpipe	IMPACT GEOTECHNICAL Impact Geotechnical Limited www.impactgeo.co.uk
Client:	JCA Engineering Ltd		
Produced by:	RG		
Checked by:	GC		

9.

10.

11.

12.

Project:	KAO Data Centre	**Title:**	Site Photographs
Job Number:	P25.114	9. BH3 monitoring standpipe 10. WS1 11. WS1 arisings 12. WS1 GL to 3.00mbgl	IMPACT GEOTECHNICAL Impact Geotechnical Limited www.impactgeo.co.uk
Client:	JCA Engineering Ltd		
Produced by:	RG		
Checked by:	GC		

13.

14.

15.

16.

Project:	KAO Data Centre	**Title:**	Site Photographs
Job Number:	P25.114	13. WS2 14. WS2 arisings 15. WS2 GL to 3.00mbgl 16. WS3	IMPACT GEOTECHNICAL Impact Geotechnical Limited www.impactgeo.co.uk
Client:	JCA Engineering Ltd		
Produced by:	RG		
Checked by:	GC		

17.

18.

19.

20.

Project:	KAO Data Centre	**Title:**	Site Photographs
Job Number:	P25.114	17. WS3 arisings 18. WS3 GL to 3.00mbgl 19. WS4 20. WS4 arisings	IMPACT GEOTECHNICAL Impact Geotechnical Limited www.impactgeo.co.uk
Client:	JCA Engineering Ltd		
Produced by:	RG		
Checked by:	GC		

APPENDIX E – LABORATORY CERTIFICATES

Normec DETS

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Ryan Gunn
Impact Geotechnical Ltd
1 Glasspool
Denmead
Waterlooville
Hampshire
Hants
PO7 6EA

Normec DETS Limited
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 25-01665

Site Reference:	KAO Data Centre
Project / Job Ref:	P25.114
Order No:	P25.114
Sample Receipt Date:	17/02/2025
Sample Scheduled Date:	18/02/2025
Report Issue Number:	1
Reporting Date:	28/02/2025

Authorised by:

Steve Knight
Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

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Soil Analysis Certificate						
DETS Report No: 25-01665	**~Date Sampled**	10/02/25	10/02/25	11/02/25	11/02/25	11/02/25
Impact Geotechnical Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: KAO Data Centre	**~TP / BH No**	BH1	BH1	BH2	BH2	BH3
~Project / Job Ref: P25.114	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: P25.114	**~Depth (m)**	0.30	0.70	0.30	13.90	0.80
Reporting Date: 28/02/2025	**DETS Sample No**	764849	764850	764851	764852	764853

Determinand	Unit	RL	Accreditation	(n)		(n)		(n)
Asbestos Screen [S]	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected		Not Detected
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1		< 1
Organic Matter (SOM)	%	< 0.1	MCERTS	2.2	0.5	6.5		< 0.1
Arsenic (As)	mg/kg	< 2	MCERTS	11	12	9		14
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.4	0.4	0.3		0.6
Chromium (Cr)	mg/kg	< 2	MCERTS	19	19	17		18
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2		< 2
Copper (Cu)	mg/kg	< 4	MCERTS	21	19	18		23
Lead (Pb)	mg/kg	< 3	MCERTS	55	27	40		25
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1		< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	14	20	13		23
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2		< 2
Zinc (Zn)	mg/kg	< 3	MCERTS	120	63	94		73

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Soil Analysis Certificate						
DETS Report No: 25-01665	**~Date Sampled**	13/02/25	13/02/25	13/02/25		
Impact Geotechnical Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied		
~Site Reference: KAO Data Centre	**~TP / BH No**	WS1	WS1	WS4		
~Project / Job Ref: P25.114	**~Additional Refs**	None Supplied	None Supplied	None Supplied		
~Order No: P25.114	**~Depth (m)**	0.20	1.50	0.70		
Reporting Date: 28/02/2025	**DETS Sample No**	764854	764855	764856		

Determinand	Unit	RL	Accreditation	(n)				
Asbestos Screen [S]	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected		
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1		
Organic Matter (SOM)	%	< 0.1	MCERTS	1.2	< 0.1	0.2		
Arsenic (As)	mg/kg	< 2	MCERTS	14	12	14		
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.3	< 0.2	0.4		
Chromium (Cr)	mg/kg	< 2	MCERTS	21	15	17		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2		
Copper (Cu)	mg/kg	< 4	MCERTS	12	15	41		
Lead (Pb)	mg/kg	< 3	MCERTS	22	10	37		
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
Nickel (Ni)	mg/kg	< 3	MCERTS	17	22	21		
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Zinc (Zn)	mg/kg	< 3	MCERTS	60	47	162		

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 25-01665	**~Date Sampled**	10/02/25	10/02/25	11/02/25	11/02/25	13/02/25
Impact Geotechnical Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: KAO Data Centre	**~TP / BH No**	BH1	BH1	BH2	BH3	WS1
~Project / Job Ref: P25.114	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: P25.114	**~Depth (m)**	0.30	0.70	0.30	0.80	0.20
Reporting Date: 28/02/2025	**DETS Sample No**	764849	764850	764851	764853	764854

Determinand	Unit	RL	Accreditation	(n)		(n)	(n)	
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	0.69	< 0.1	0.69	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	0.16	< 0.1	0.12	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	1.55	< 0.1	5.49	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	1.60	< 0.1	5.75	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	1.11	< 0.1	4.38	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	0.84	< 0.1	2.93	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	1.27	< 0.1	5.29	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.50	< 0.1	2.25	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	1.61	< 0.1	6.86	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.65	< 0.1	2.28	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	0.17	< 0.1	0.55	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.56	< 0.1	1.55	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	10.7	< 1.6	38.1	< 1.6	< 1.6

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 25-01665	**~Date Sampled**	13/02/25	13/02/25			
Impact Geotechnical Ltd	**~Time Sampled**	None Supplied	None Supplied			
~Site Reference: KAO Data Centre	**~TP / BH No**	WS1	WS4			
~Project / Job Ref: P25.114	**~Additional Refs**	None Supplied	None Supplied			
~Order No: P25.114	**~Depth (m)**	1.50	0.70			
Reporting Date: 28/02/2025	**DETS Sample No**	764855	764856			

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	0.15			
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.27			
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.25			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.15			
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.18			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.19			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.22			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.16			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	0.23			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	1.8			

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Soil Analysis Certificate - EPH Banded						
DETS Report No: 25-01665	**~Date Sampled**	10/02/25	10/02/25	11/02/25	11/02/25	13/02/25
Impact Geotechnical Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: KAO Data Centre	**~TP / BH No**	BH1	BH1	BH2	BH3	WS1
~Project / Job Ref: P25.114	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: P25.114	**~Depth (m)**	0.30	0.70	0.30	0.80	0.20
Reporting Date: 28/02/2025	**DETS Sample No**	764849	764850	764851	764853	764854

Determinand	Unit	RL	Accreditation	(n)		(n)	(n)	
EPH (C6 - C10) : HS_1D_MS+EH_1D_Total	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
EPH (>C10 - C25) : EH_1D_Total	mg/kg	< 1	NONE	112	7	138	1	< 1
EPH (>C25 - C40) : EH_1D_Total	mg/kg	< 6	NONE	661	38	1260	46	< 6
EPH (C6 - C40) : HS_1D_MS+EH_1D_Total	mg/kg	< 6	NONE	773	45	1400	47	< 6

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Soil Analysis Certificate - EPH Banded						
DETS Report No: 25-01665	**~Date Sampled**	13/02/25	13/02/25			
Impact Geotechnical Ltd	**~Time Sampled**	None Supplied	None Supplied			
~Site Reference: KAO Data Centre	**~TP / BH No**	WS1	WS4			
~Project / Job Ref: P25.114	**~Additional Refs**	None Supplied	None Supplied			
~Order No: P25.114	**~Depth (m)**	1.50	0.70			
Reporting Date: 28/02/2025	**DETS Sample No**	764855	764856			

Determinand	Unit	RL	Accreditation	(n)				
EPH (C6 - C10) : HS_1D_MS+EH_1D_Total	mg/kg	< 1	NONE	< 1	< 1			
EPH (>C10 - C25) : EH_1D_Total	mg/kg	< 1	NONE	< 1	5			
EPH (>C25 - C40) : EH_1D_Total	mg/kg	< 6	NONE	< 6	9			
EPH (C6 - C40) : HS_1D_MS+EH_1D_Total	mg/kg	< 6	NONE	< 6	14			

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Water Analysis Certificate						
DETS Report No: 25-01665	**~Date Sampled**	11/02/25				
Impact Geotechnical Ltd	**~Time Sampled**	None Supplied				
~Site Reference: KAO Data Centre	**~TP / BH No**	BH2				
~Project / Job Ref: P25.114	**~Additional Refs**	None Supplied				
~Order No: P25.114	**~Depth (m)**	13.90				
Reporting Date: 28/02/2025	**DETS Sample No**	764852				

Determinand	Unit	RL	Accreditation	(hg)				
pH	pH Units	N/a	ISO17025	7.4				
Electrical Conductivity (at 25°C)	uS/cm	< 5	ISO17025	1370				
Total Cyanide	µg/l	< 5	ISO17025	< 5				
Sulphate as SO_4	mg/l	< 1	ISO17025	340				
Sulphide	mg/l	< 0.1	NONE	< 0.1				
Total Organic Carbon (TOC)	mg/l	< 1.0	ISO17025	15.4				
Hardness - Total	mgCaCO3/l	< 0.25	NONE	604				
Arsenic (dissolved)	µg/l	< 0.2	ISO17025	1.4				
Barium (dissolved)	µg/l	< 0.2	ISO17025	28.9				
Beryllium (dissolved)	µg/l	< 0.2	ISO17025	< 0.2				
Boron (dissolved)	µg/l	< 1	ISO17025	59				
Cadmium (dissolved)	µg/l	< 0.2	ISO17025	< 0.2				
Chromium (dissolved)	µg/l	< 0.2	ISO17025	< 0.2				
Copper (dissolved)	µg/l	< 0.2	ISO17025	0.3				
Lead (dissolved)	µg/l	< 0.2	ISO17025	5.7				
Mercury (dissolved)	µg/l	< 0.04	ISO17025	< 0.04				
Selenium (dissolved)	µg/l	< 0.2	ISO17025	0.6				
Vanadium (dissolved)	µg/l	< 0.2	ISO17025	< 0.2				
Zinc (dissolved)	µg/l	< 1	ISO17025	56				
Total Phenols (monohydric)	µg/l	< 10	ISO17025	< 10				

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Water Analysis Certificate - Speciated PAH						
DETS Report No: 25-01665	**~Date Sampled**	11/02/25				
Impact Geotechnical Ltd	**~Time Sampled**	None Supplied				
~Site Reference: KAO Data Centre	**~TP / BH No**	BH2				
~Project / Job Ref: P25.114	**~Additional Refs**	None Supplied				
~Order No: P25.114	**~Depth (m)**	13.90				
Reporting Date: 28/02/2025	**DETS Sample No**	764852				

Determinand	Unit	RL	Accreditation				
Naphthalene	µg/l	< 0.01	NONE	0.04			
Acenaphthylene	µg/l	< 0.01	NONE	< 0.01			
Acenaphthene	µg/l	< 0.01	NONE	0.01			
Fluorene	µg/l	< 0.01	NONE	< 0.01			
Phenanthrene	µg/l	< 0.01	NONE	0.06			
Anthracene	µg/l	< 0.01	NONE	0.03			
Fluoranthene	µg/l	< 0.01	NONE	0.10			
Pyrene	µg/l	< 0.01	NONE	0.09			
Benzo(a)anthracene	µg/l	< 0.01	NONE	0.06			
Chrysene	µg/l	< 0.01	NONE	0.05			
Benzo(b)fluoranthene	µg/l	< 0.01	NONE	0.11			
Benzo(k)fluoranthene	µg/l	< 0.01	NONE	0.04			
Benzo(a)pyrene	µg/l	< 0.01	NONE	0.07			
Indeno(1,2,3-cd)pyrene	µg/l	< 0.01	NONE	< 0.01			
Dibenz(a,h)anthracene	µg/l	< 0.01	NONE	< 0.01			
Benzo(ghi)perylene	µg/l	< 0.008	NONE	< 0.008			
Total EPA-16 PAHs	µg/l	< 0.16	NONE	0.66			

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Water Analysis Certificate - TPH CWG Banded							
DETS Report No: 25-01665	**~Date Sampled**	11/02/25					
Impact Geotechnical Ltd	**~Time Sampled**	None Supplied					
~Site Reference: KAO Data Centre	**~TP / BH No**	BH2					
~Project / Job Ref: P25.114	**~Additional Refs**	None Supplied					
~Order No: P25.114	**~Depth (m)**	13.90					
Reporting Date: 28/02/2025	**DETS Sample No**	764852					

Determinand	**Unit**	**RL**	**Accreditation**					
Aliphatic >C5 - C6 : HS_1D_MS_AL	µg/l	< 10	NONE	< 10				
Aliphatic >C6 - C8 : HS_1D_MS_AL	µg/l	< 10	NONE	< 10				
Aliphatic >C8 - C10 : EH_CU_1D_AL	µg/l	< 10	NONE	63				
Aliphatic >C10 - C12 : EH_CU_1D_AL	µg/l	< 10	NONE	73				
Aliphatic >C12 - C16 : EH_CU_1D_AL	µg/l	< 10	NONE	< 10				
Aliphatic >C16 - C21 : EH_CU_1D_AL	µg/l	< 10	NONE	15				
Aliphatic >C21 - C34 : EH_CU_1D_AL	µg/l	< 10	NONE	154				
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	µg/l	< 70	NONE	304				
Aromatic >C5 - C7 : HS_1D_MS_AR	µg/l	< 10	NONE	< 10				
Aromatic >C7 - C8 : HS_1D_MS_AR	µg/l	< 10	NONE	< 10				
Aromatic >C8 - C10 : EH_CU_1D_AR	µg/l	< 10	NONE	< 10				
Aromatic >C10 - C12 : EH_CU_1D_AR	µg/l	< 10	NONE	< 10				
Aromatic >C12 - C16 : EH_CU_1D_AR	µg/l	< 10	NONE	< 10				
Aromatic >C16 - C21 : EH_CU_1D_AR	µg/l	< 10	NONE	< 10				
Aromatic >C21 - C35 : EH_CU_1D_AR	µg/l	< 10	NONE	61				
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	µg/l	< 70	NONE	< 70				
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Total	µg/l	< 140	NONE	365				

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Water Analysis Certificate - BTEX / MTBE						
DETS Report No: 25-01665	**~Date Sampled**	11/02/25				
Impact Geotechnical Ltd	**~Time Sampled**	None Supplied				
~Site Reference: KAO Data Centre	**~TP / BH No**	BH2				
~Project / Job Ref: P25.114	**~Additional Refs**	None Supplied				
~Order No: P25.114	**~Depth (m)**	13.90				
Reporting Date: 28/02/2025	**DETS Sample No**	764852				

Determinand	Unit	RL	Accreditation					
Benzene : HS_1D_MS	µg/l	< 1	ISO17025	< 1				
Toluene : HS_1D_MS	µg/l	< 5	ISO17025	< 5				
Ethylbenzene : HS_1D_MS	µg/l	< 5	ISO17025	< 5				
p & m-xylene : HS_1D_MS	µg/l	< 10	ISO17025	< 10				
o-xylene : HS_1D_MS	µg/l	< 5	ISO17025	< 5				
MTBE : HS_1D_MS	µg/l	< 10	ISO17025	< 10				

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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 25-01665	
Impact Geotechnical Ltd	
~Site Reference: KAO Data Centre	
~Project / Job Ref: P25.114	
~Order No: P25.114	
Reporting Date: 28/02/2025	

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
764849	BH1	None Supplied	0.30	11.2	Brown sandy gravel with stones and concrete
764850	BH1	None Supplied	0.70	15.1	Brown sandy clay with stones
764851	BH2	None Supplied	0.30	11	Brown sandy gravel with stones
764853	BH3	None Supplied	0.80	17.3	Brown clay with stones and brick
764854	WS1	None Supplied	0.20	15.1	Brown clay
764855	WS1	None Supplied	1.50	12.5	Light brown clay with chalk
764856	WS4	None Supplied	0.70	21	Brown sandy loam

Moisture content is part of procedure E003 & is not an accredited test

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Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 25-01665
Impact Geotechnical Ltd
~Site Reference: KAO Data Centre
~Project / Job Ref: P25.114
~Order No: P25.114
Reporting Date: 28/02/2025

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

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UKAS TESTING
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Water Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 25-01665
Impact Geotechnical Ltd
~Site Reference: KAO Data Centre
~Project / Job Ref: P25.114
~Order No: P25.114
Reporting Date: 28/02/2025

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	F	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	UF	Biological Oxygen Demand (BOD)	Determination using BOD sensors measuring the change of pressure	E133
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	F	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	F	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	F	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 – C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	F	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E115
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichlorometha	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Acidification, followed by high-temperature oxidation and IR detection.	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

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List of HWOL Acronyms and Operators
DETS Report No: 25-01665
Impact Geotechnical Ltd
~Site Reference: KAO Data Centre
~Project / Job Ref: P25.114
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Acronym	**Description**
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#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 eg. EH+HS_Total or EH_CU+HS_Total
~	Sample details provided by customer and can affect the validity of results

Benzene - HS_1D_MS
EPH (>C10 - C25) - EH_1D_Total
EPH (>C25 - C40) - EH_1D_Total
EPH (C6 - C10) - HS_1D_MS+EH_1D_Total
EPH (C6 - C40) - HS_1D_MS+EH_1D_Total
Ethylbenzene - HS_1D_MS
MTBE - HS_1D_MS
TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL
TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C34 - HS_1D_MS+EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR
TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH CWG - Aromatic C5 - C35 - HS_1D_MS+EH_CU_1D_AR
TPH CWG - Total >C5 - C35 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS

Certificate Key

Symbol	Description
F	Filtered sample
UF	Unfiltered sample
D	Dried sample
AR	As received sample
RL	Reporting limit
~	Sample details provided by customer and can affect the validity of results
M/S	Missing Sample
n	Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation
S	Subcontracted analysis
hg	Sample deviating for mercury due to inappropriate container
M	MCERTS accredited test
U	UKAS accredited test

APPENDIX F – MONITORING SHEETS

IMPACT GEOTECHNICAL

Borehole Monitoring Record

Project Name:	KAO Data Centre	Project Reference:	P25.114
Date:	3rd March 2025	Personnel:	RG
Weather:	Sunny	Ground Conditions:	Dry
Temp (°C):	13	Humidity (%):	N/A
Atmospheric Pressure:	N/A	Monitoring Round:	1

Groundwater Records											
Well No.		**BH1**	**BH2**	**BH3**							
Borehole Diameter (mm)		50	50	50							
Time Monitored		12:25	12:35	12:15							
Groundwater level (mbgl)		11.86	11.50	11.33							
Depth of installation (mbgl)		20.00	20.00	20.00							
Volume Purged		0	0	0							
Water Appearance		Brown turbid	Brown turbid	Brown turbid							
Gas Monitoring Records											
Atmospheric Pressure (mb)											
Downhole Pressure (mb)											
Flow Rate (l/hr)											
Methane (%)	Max.										
	Steady										
Carbon Dioxide (%)	Max.										
	Steady										
Oxygen (%)	Min.										
	Steady										
VOCs (ppm)											
H_2S (ppm)											
Carbon Monoxide (ppm)											
Notes:											