Site Condition Report – WE4588AB

Kao Harlow Campus

Date:	**March 2025**	**Issue:**	**1.0**
Reference:	**10311670**	**Status:**	**Issue**

Issuing Office: **Glasgow**

DOCUMENT CONTROL

Issue	Date	Status	HDR Author	HDR Approval	Notes
1.0	27/03/2024	Issue	27/03/2024_LP	27/03/2024_NS	First issue.

CONTENTS

Page No.

APPENDICES

1.0 INTRODUCTION

This Site Condition Report (SCR) has been prepared by HDR on behalf of the operator Harlow Operations Ltd (company number 09227383), currently trading as Kao Data Limited, hereafter referred to as 'Kao'.

This SCR has been prepared by HDR to support the application to a vary the existing Medium Combustion plant (MCP) Environmental Permit (EP):

Permit Ref: EPR / WE4588AB
Issue date: 21/06/2022
Operator name: Harlow Operations Ltd
Site name: Kao Data Campus
Address: London Road, Harlow, CM17 9NA
Grid reference: TL 471099

During the enhanced Environment Agency (EA) pre-application meeting during the permit application, the EA confirmed that a Substantial Variation is required to update the existing MCP permit into an installation permit under section 1.1 Part A(1) of schedule 1 of the Environmental Permitting Regulations. The plant >1MWth will also be MCP.

This SCR is intended to provide the EA with a description of the baseline conditions prior to permitted site operations commencing. The baseline data presented herein should be referred to upon surrender of the sites environmental permit (once issued) to demonstrate no deterioration of the land has occurred due to operations.

The extent of the land covered by this SCR and the Permit Application Area are shown on the plan in Appendix A.

This report has been prepared based on the information made available and the conditions at the time of writing. This report is only valid to the extent that the information provided is accurate and complete. For further information please refer to the Non-technical summary report submitted with the application.

This SCR has been prepared in accordance with the EAs guidance for Applicants (H5) – Site Condition Report document with Sections 2-4 submitted with the application for a permit.

Sections 5-8 are to be maintained during the life of the permit.

Sections 9-11 are to be completed if / when the permit is surrendered.

2.0 BACKGROUND

2.1 Site details

Name of the applicant	Harlow Operations Ltd (trading as Kao Data Limited)
Installation name	Kao Harlow Campus
Installation address	London Road, Harlow, CM17 9NA
National grid reference	TL 471099
Document reference and dates for Site Condition Report at permit application and surrender	Permit reference WE4588AB MCP Permit issued: 21/06/2022 Installations permit issued: Permit surrendered: Not applicable
Document references for site plans (including location and boundaries)	Appendix A – updated Site Plan and Emissions Points

2.2 Site Development Plans

The Harlow campus ('the site') has been operating as a data centre (DC) since 2018 with a site plan shown in Appendix A. The campus and currently has x2 operational Data Centres, KLON-01 and KLON-02 with construction underway on a third datacentre, KLON-03. Whilst there are future plans for a fourth building, KLON-04, these are still unknown and for this reason these changes are not included in this variation.

Each Data Centre uses Emergency Standby Generators or 'ESGs' to provide emergency power in the event of a grid electrical failure. The ESGs are located externally to the Data Centre they serve. The current MCP permit allows for operation of x8. ESGs (x5 at KLON-01 and x3. at KLON-02). This variation is to add x17 ESGs as follows:

- x2 ESGs at KLON-01
- x4 ESGs at KLON-02
- x11 ESGs at KLON-03

Once fully operational, there will be 25 no. ESGs in total. Each ESG is fed from a bulk fuel tank that sits below the generator. There are also urea storage tanks for some of the generators that have been fitted with selective catalytic reduction (SCR) to provide NOX abatement. These are due to be commissioned from Q3 2025 to Q4 2026.The locations and layouts can be seen in Appendix A.

2.3 Site activities

As mentioned above, the installation is a data centre and utilises ESGs to provide emergency power in the event of grid failure. The ESGs are on site solely to support the data centre when the main electricity supply is not available and will run on Diesel / Hydrotreated Vegetable Oil (HVO). Operation is likely to be limited to maintenance and testing only and thus fuel deliveries will be rare events, 0-2 deliveries per year.

The total rated thermal input of the 25 no. ESGs is approximately 152.29 MWth (refer to Thermal Schedule in supporting information).

The location of the generators, fuel tanks, emissions points (flues / stacks) and surface water connections are shown in the Site Plan found in Appendix A. The installation boundary encompasses the listed activities only.

Further details can be found in the Environmental Risk Assessment (ERA) and the Non-Technical Summary (NTS) that accompanied the application for an Environmental Permit.

2.4 Site Setting

The site is located in an urban area of Harlow to the East of the city centre between Mark Hall South and Church Langley. The A414 runs north to south along the western boundary of the site, with London Road running along the eastern boundary. The site is approximately 2 miles from Junction 7 of the M11. The site is currently accessed by two entrance points from London Road. The site was formerly the London Road Campus, and the land-use largely comprises buildings and car-parking.

The surrounding area has supported various office and light industrial buildings as part of a business park. associated with the historic use of the site as a telecommunication centre for research and development.

There are multiple Habitats and statutory and non-statutory sites in the local area as noted in the EA Enhanced conservation screening report in Appendix I.

For further details in regards site location, history, underlying geology and hydrology please refer to the previous site investigation reports found in the appendices.

2.5 Site investigations

The following site investigations were completed as part of planning requirement for the development of the site and the application for a permit.

- Appendix B - Stage 1: Desktop Study & Walkover Survey at KAO Business Park (Constructive Evaluation Limited, 2014)

- Appendix C - Stage 2: Site Investigation at KAO Business Park (Constructive Evaluation Limited, 2014) The investigation provided information on the underlying ground conditions and analysis on the presence of contamination on site from exploratory borehole locations.

- Appendix D - An additional Ground Investigation was required in 2016 in order to supplement geotechnical information obtained during the first phase of investigative works and complete an extensive Waste Acceptance Criteria.

- Appendix E - In 2021, Impact Geotechnical Limited (IGL) were instructed to carry out a Ground Investigation report in relation to the proposed development at KAO Business Park, following proposals to construct a new Data Centre building.

- Appendix F, Appendix G & Appendix H - IGL were instructed to undertake additional bore hole investigations for the KLON-03 plot in 2024-2025.

    - Stage 1: Tier 1 Preliminary Risk Assessment – Kao Data Centre (Impact Geotechnical, 2025) (Appendix F)

    - Stage 1: Tier 2 Site Investigation GQRA – KAO Data Centre KLON-03 (Impact Geotechnical, 2025) (Appendix G)

    - Interim Baseline Report – Kao Data Centre (Impact Geotechnical, 2025) (Appendix H)

2.6 Proposed monitoring

The sole risk to soil and groundwater is regarded to be the use of liquid fuels such as Diesel / HVO. The installation of boreholes to facilitate ongoing soil and groundwater monitoring is going to increase the risk to the environment as it will present a potential pathway to ground for pollutants e.g. in the unlikely event of a spillage.

To mitigate the risks of spillages and fuel entering the environment, the site has separators, with leak detection in place along with comprehensive spill control Site Operating Procedures (SOPs) and Emergency Operating Procedures (EOPs) in place, to prevent and contain pollution at source before it enters the environment.

Given the above we are proposing that there is no requirement to complete ongoing soil and groundwater monitoring unless there is a pollution incident that warrants further investigation e.g. significant spillage which has led to pollution of the environment.

3.0 CONDITION OF THE LAND AT PERMIT ISSUE

Table 3.1 – Environmental setting

<table>
<tr><th>Condition area</th><th>Description</th></tr>
<tr><td>Site History</td><td>The historical land use has been detailed in several of the previous reports referenced in Section 2.5 with an excerpt from Appendix H below. Fur

Prior to the 1960s, the site was relatively undeveloped. At this time, the Mark Hall Sports Ground was established to the north of the site, whilst laboratories, smaller buildings and a car park occupied the south. The laboratories and associated buildings have since been demolished and the KAO Data Centre constructed.

<table>
<tr><th>Date Range</th><th>Relevant Observations</th></tr>
<tr><td>1874 – 1955</td><td>During this time the CE site and immediate surrounds remain relatively unchanged, comprising agricultural and rural land. Some minor residential developments beyond 150-300m radius.</td></tr>
<tr><td>1962 – 1966</td><td>Construction of unspecified works at northern end of CE study area. A414 road constructed. In addition, tennis courts and pavilion to the north-east.</td></tr>
<tr><td>1993 – 1995</td><td>The unspecified works are now labelled as laboratory. Furthermore, additional buildings are located on the study area, also labelled as laboratories; together with a car park.</td></tr>
<tr><td>2002</td><td>A multi-storey car park is located to the west.</td></tr>
<tr><td>2012</td><td>Several buildings within the north of the site have been replaced by a larger single ‘L’ shaped block considered to be offices.</td></tr>
</table>
Table 6.1.2: CE Historical Maps Summary</td></tr>
<tr><td>Geology

Data sources:
• Appendix C – Stage 2: Site Investigation (2014)</td><td>The findings of the site investigation are presented in Appendix C (and others) and indicates that the majority of the site is situated on superficial deposits of the Lowestoft Formation (unproductive) with an area in the south on Head Deposits, underlain by the London Clay Formation.

The Lowestoft Formation forms an extensive sheet of chalky till, with outwash sands and gravels, silts and clays. The till is characterised by its chalk and flint content.

The Head Deposits forms gravel, sand and clay depending on the upslope source and distance from the source. The deposits are poorly sorted.

The London Clay Formation consists of dark bluish to brownish grey, stiff heavily fissured Clay. The clay contains variable amounts of fine-grained sand and silt and weathers to orange-brown clay near the surface.</td></tr>
</table>

Condition area	Description
Hydrogeology Data source: • Appendix C – Stage 2: Site Investigation (2014)	The hydrogeology of site is characterised by two types of aquifers – an Aquifer within Superficial Deposits and an Aquifer within Bedrock Deposits. 1. Aquifer within Superficial Deposits • Lowestoft Formation – rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow. • Head Deposits – due to variable characteristics of the rock type, the layer has been designated as both minor and non-aquifer in different locations. 2. Aquifer within Bedrock Deposits • London Clay Formation – underlain by unproductive strata (rock layers or drift deposits) with low permeability that have negligible significance for water supply or river base flow.

Condition area	Description
Ecological Designated Sites Data source: • Appendix I - Pre-Application Enhanced Conservatiob Screening Report	The EA nature and heritage Screening Report in Appendix I notes the following ecological sites: x1 Local Nature Reserve (LNR) within 2,000m of the site: • Harlow Marsh x2 SAC, SPA and Ramsar site within 10,000m of site: • Epping Forest (SAC) • Lee Valley (SPA and Ramsar) x3 Ancient Woodlands within 2,000m of the site: • Markhall Wood • Barnsley/Brenthall Wood • Harlow Park x21 Local Wildlife Sites (LWS) within 2,000m from the site: • Markhall Wood • Rye Meads Gravel Pit • Perry Spring • Gravelpit Spring, New Hall • New Hall Reedbeds • Brenthall/Barnsley Wood • Newpond Spring • Gravelpit Springs, Latton Farm • Kingsdon Ponds • Brays Grove • The Moors • Vicarage Wood • Harlow Common • St Andrew's, Netteswellbury • Latton Common • Harlow Park • Netteswell Plantation • Feltimore Meadows • Marshgate Spring • Foster Street Burial Ground • Mill Street Green

Table 3.2 – Pollution history and historical land use:

Condition area	Description
Pollution incidents	As per Appendix F and Appendix H, there are no records of pollution incidents within 300m of the site
Historical land-uses and associated contaminants Data source: • Appendix B - Stage 1 Walkover and Survey (2014) • Appendix F - Stage 1 Preliminary Risk Assessment (2025) • Appendix G - Stage 1 Site Investigation GQRA (2025)	The walkover survey in Appendix B identified potential sources of contamination as follows: • Diesel tank in the west • Numerous electrical substations • Various bottled fuels • Historic use of laboratories and associated activities No offsite potential sources of contamination were identified in the 2014 walkover survey. From the public record information (see Appendix B), the only recorded national incident (list 2) within 500m of site was located 208m southeast with the pollutant listed as 'inorganic chemicals/product – acid'. This had a Category 4, or 'No Impact', effect on water, land and air. The Stage 1 Preliminary Risk Assessment of KLON-03 (Appendix F) identified one potential source of contamination. Leaks and spillages of fuels and oil from 25,000L fuel tanks and the associated infrastructure was identified at the neighbouring KAO Data Centre buildings. This potential source of contamination is immediately off-site but is within the KAO Data Centre wider boundary. Potential sources of contamination identified from the 2025 risk assessment (Appendix F) include the Made Ground as a result of the historical development of the site. Therefore, there is a likelihood of Asbestos Containing Soil (ACSs) from probable Asbestos Containing Material (ACMs) present throughout the fabric of the previous structure. Contaminants of concern likely include heavy metals, Polycyclic Aromatic Hydrocarbons and ACSs (Appendix G). Additionally, historical use of site and surrounding area as unspecified works and laboratories, including the presumed industrial nature of the works and presence of tanks, is raised as a potential source of contamination associated with the transfer and storage of these materials, through leaks and spills etc. Contaminants of concern include heavy metals, aromatic hydrocarbons, Total Petroleum Hydrocarbon and Semi/Volatile Organic Compounds (Appendix G).

Table 3.3 – Waste and Landfill

Condition area	Description
Waste management facilities Data source: • Appendix B - Stage 1 Walkover and Survey (2014) • Appendix F - Stage 1 Preliminary Risk Assessment (2025) • Appendix J – Groundsure maps	**Landfill Sites** There are no records of active or recent landfills within a 500m radius of the site. **Registered Waste Transfer Sites** There are no records within a 250m radius of the site. **Licensed Waste sites / Waste Management Facilities** There are no records within a 500m radius of the site. **Waste Exemptions** There are multiple facilities within 500m of the site that have an exemption for waste activities such as storage, treatment, use or disposal of waste. The only recorded Environment Agency Licensed Waste Site within 1500m of the site is the Harlow Waste Transfer Station, located 1439m northwest.

Table 3.4 – Licensed activities

Condition area	Description
Licensed industrial activities and Licensed pollutant release Data source: • Appendix B - Stage 1 Walkover and Survey (2014) • Appendix F - Stage 1 Preliminary Risk Assessment (2025) • Appendix J – Groundsure maps	**Licensed Industrial Activities (Part A(1))** None(apart from permit WE4588AB for Kao Data MCO permit) **Industrial Land Use** There are 10 records of Industrial Land Use within 500m of the site (Appendix F). • 0m SW, Arrow Electronics UK Ltd, Status: Inactive • 0m SW, Radio Tech Ltd, Statis: Inactive • 81m SE, Acecleaning@Live.co.uk, Status: Inactive • 81m SE, Teva Pharamaceuticals (Uk) Ltd, Status: Inactive • 294m E, Grover Transport Services, Status: Inactive • 388m E, 5 Star Flooring & Steam Cleaning, Status: Inactive • 388m NW, Clarkes 4 Pest Control, Status: Inactive • 423m S, Tesco Petrol Filling Station, Status: Active • 436m S, S&R Dry Cleaners, Status: Inactive • 490m S, Clean & Sew Ltd, Status: Inactive

Condition area	Description
	Licensed Pollutant Release (Part A (2)/B) • Onsite - Nortel, for Manufacture Of Fibre Reinforced Plastics • X3 Part B sites within 300m **Licensed Discharges to Controlled Waters** There are no records within a 500m radius of the site. **Pollutant release to surface waters (Red List)** There are no records within a 500m radius of the site. **Pollutant Release to Public Sewer** There are no records within a 500m radius of the site. **List 1 Dangerous Substances** There are no records within a 500m radius of the site. **Pollution Incidents (EA/NRW)** There is x1 incident 323m SE of the site in 2003 where inorganic chemical / products (acids) were released

Table 3.5 – Evidence of historical contamination

Condition area	Description
Evidence of Historical Contamination Data Source: • Appendix C – Stage 2: Site investigation (2014) • Appendix E – Stage 2: Ground Investigation Report (2021) • Appendix H – Interim Baseline Report (2025)	The results of the contamination testing from 2014 site investigations (Appendix C) conclude minor elevations of Polycyclic Aromatic Hydrocarbons (PAH), although concentrations were below the relevant and available guideline values. As per the Stage 2: Ground Investigation report (Appendix E), no visual evidence of soil or groundwater contamination was noted during the investigation works, with the exception of anthropogenic materials encountered within the Made Ground soils. Results from tested soil samples were inputted into a characterisation tool and results indicated that all soil samples reported no hazardous properties. The Interim Baseline report (Appendix H) that covers the KLON-03 plot reported the only evidence of contamination was identified within borehole sample WS13 at a depth of 0.80mblg. This was in the form of a moderate chemical odour with no staining. However, "All the results for both inorganic and organic determinants returned concentrations below the relevant and available GAC. Furthermore, all asbestos screens returned a negative result for the presence of fibres."

Table 3.6 - Baseline soil and groundwater reference data

Condition area	Description
Baseline soil and groundwater reference data Data Source: • Appendix C – Stage 2: Site investigation (2014) • Appendix D – Stage 2: Additional Ground Investigation (2016) • Appendix E – Stage 2: Ground Investigation Report (2021) • Appendix H – Interim Baseline Report (2025)	Extensive baseline soil and groundwater reference data has been obtained from the site investigation reports (See Appendices). **Soil:** For KLON-01 and KLON-02, all soil results returned concentrations below the relevant and available SGV/LQM guideline values (Appendix C). For the KLON-03 plot, the 2025 interim baseline report (Appendix H) determined that all soil samples results returned concentrations below the relevant Generic Assessment Criteria (GAC), which is used to assess the soil regarding potential human health risks. All asbestos screens returned a negative result for the presence of fibres. **Groundwater:** In the 2016 investigations of the KLON-01 and KLON-2 plots (Appendix D), groundwater was not encountered. In previous investigations in 2014 (Appendix C), elsewhere on-site groundwater was encountered at depths up to 0.80mbgl in WS14 and 1.40mblg in WS13.

	It was noted in Appendix E (2021 investigation) that several of the environmental sampling locations suffered from standing water at or near ground level. This is likely due to wate perched within the upper reworked deposits. Groundwater was encountered within the borehole at a depth of 12.20mbgl, rising to 11.50mbgl after 20 minutes. Appendix E concludes that groundwater levels may vary throughout the year based on seasonal changes. The levels reached by the borehole investigations may not be reflective of those at other times of the year. Furthermore, open excavations are likely to suffer from pooling of surface water during groundworks. If groundwater is identified within any of the excavations during construction, then it should be dealt with appropriately and removed. For the KLON-03 plot (Appendix H), groundwater analysis concluded that there were no significant exceedances of the groundwater assessment criteria for the tested contaminants that warranted further investigation.

Table 3.7 – Supporting information sources

Condition area	Description
Supporting information and sources	The following have been provided as part of the application: • Stage 1: Desktop Study & Walkover Survey – KAO Business Park, Harlow (Constructive Evaluation Limited, 2014) (Appendix B) • Stage 2: Site Investigation at KAO Business Park (Constructive Evaluation Limited, 2014) (Appendix C) • Stage 2: Additional Ground Investigation – Project Nobel, Harlow Data Centre (Constructive Evaluation Limited, 2016) (Appendix D) • Stage 2: Ground Investigation Report – KAO Data Park, Harlow (Impact Geotechnical, 2021) (Appendix E) • Stage 1: Preliminary Risk Assessment – KAO Data Centre (Impact Geotechnical, 2025) (Appendix F) • Stage 1: Site Investigation GQRA – KAO Data Centre (Impact Geotechnical, 2025) (Appendix G) • Interim Baseline Report – KAO Data Centre (Impact Geotechnical, 2025) (Appendix H) • Site Plan & Emission Points (Appendix A) • EA Pre-application Conservation Screening Report (Appendix I) • Groundsure Insight Report (2024)

4.0 PERMITTED ACTIVITIES

Table 6 - Permitted activities

Permitted activities	Schedule 1 ref 1.1 Part A (1) a) (i) combustion plant >50 MWth. Operation of 25 no emergency back-up generators totalling 152MWth, with Directly Associated Activities (DAA) including diesel / HVO fuel storage, urea storage and surface drainage system. **Updated Site Condition Report for variation application Harlow campus 2025.** An application to vary the permit is being submitted to account for the following changes: • 2no. new generators are being installed at KLON-01. These are to be located internal to the main building. • 4no. new generators are being installed at KLON-02. These are to be located internal to the main building. • 11no. new generators are being installed at KLON-03. These are to be located internal to the main building. • 17no. bulk fuel tanks are to be installed. These will sit below each generator they serve and are referred to as 'belly tanks'. • 15no. Urea tanks are to be installed. These tanks will be located inside generator containers of the 4no. new ESGs at KLON-02 and 11no. new ESGs at KLON-03 and will provide urea for the selective catalytic reduction systems on each generator to mitigate NOx emissions.
Non-permitted activities undertaken	The installation boundary is limited to the permitted activities. The internal data halls and office space is not part of the permitted activities. In normal conditions these will operate using electricity provided by the National Grid.
Document references for: • **plan showing activity layout; and** • **environmental risk assessment.**	Please see the following folders / documents that accompanied the EPR application. In addition to this the following have been updated as part of the application to vary the existing Environmental permit. • BAT assessment • Environmental Risk Assessment • Site Plan and emissions points • Drainage Plan

5.0 CHANGES TO THE ACTIVITY

Have there been any changes to the activity boundary?	
Have there been any changes to the permitted activities?	
Have any 'dangerous substances' not identified in the Application Site Condition Report been used or produced as a result of the permitted activities?	
Checklist of supporting information	

6.0 MEASURES TAKEN TO PROTECT LAND

Measures taken to protect land	

7.0 POLLUTION INCIDENTS AND REMEDIATION

Checklist of supporting information	

8.0 SOIL GAS AND WATER QUALITY MONITORING (WHERE UNDERTAKEN)

Checklist of supporting information	

9.0 DECOMMISSIONING AND REMOVAL OF POLLUTION RISK

Checklist of supporting information	

10.0 REFERENCE DATA AND REMEDIATION (WHERE RELEVANT)

Checklist of supporting information	

11.0 STATEMENT OF SITE CONDITION

APPENDIX A

Site Plan And Emission Points

APPENDIX B

Stage 1: Desktop Study (Constructive Evaluation Limited, 2014)

APPENDIX C

Stage 2: Site Investigation (Constructive Evaluation Limited, 2014)

APPENDIX D

Stage 2: Additional Ground Investigation (Constructive Evaluation Limited, 2016)

APPENDIX E

Stage 2: Ground Investigation Report (Impact Geotechnical, 2021)

APPENDIX F

Stage 1: Tier 1 Preliminary Risk Assessment (Impact Geotechnical, 2025)

APPENDIX G

Stage 1: Tier 2 Site Investigation GQRA (Impact Geotechnical, 2025)

APPENDIX H

Interim Baseline Report – Kao Data Centre (Impact Geotechnical, 2025)

APPENDIX I

EA Pre-Application Enhanced Conservation Screening Report

APPENDIX J

Groundsure Maps