



PROPOSED CHANGES

APPLICATION REPORT - Appendix

2 – OHL Phase 1 Preliminary Risk

Assessment (Part 1 of 2)

Drax Bioenergy with Carbon Capture and Storage

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1. INTRODUCTION AND OBJECTIVES

1.1. TERMS OF REFERENCE

- 1.1.1. WSP has been instructed by Drax Power Limited (the Applicant) to undertake a Preliminary Risk Assessment (PRA) to support work in relation to Proposed Change 2 (PC-02) to the Development Consent Order (DCO) for the Drax Bioenergy Carbon Capture and Storage (BECCS) project (the Proposed Scheme).
- 1.1.2. The location of PC-02 is situated near Rawcliffe Road, Airmyn, Goole, DN14 8JU and incorporate land that is outside of the current Order Limits and is not in the ownership of the Applicant.

1.2. AIMS

- 1.2.1. The key aims of this assessment are to support in the planning application for the development of the sites with the following:
 - a) Develop a preliminary Conceptual Site Model (CSM) to identify potential ground contamination risks associated with the development the Proposed Scheme at the Site; and
 - b) Evaluate likely exposure and its potential significance on identified receptors and provide risk management advice to support the development.

1.3. PROPOSED WORKS

- 1.3.1. PC-02 relates to the relocation of existing Overhead Lines (OHLs) in respect of two electrical OHLs (11kv overhead line crossing the A645 once, owned by Northern Power Grid ('OHL1'), and 11kv overhead line crossing Rawcliffe Road once, owned by Northern Power Grid ('OHL2')) and the telecommunications line (Telecommunications line crossing Rawcliffe Road twice, owned by Openreach ('TCL1')) which cross the access route to the Site at A614 (Rawcliffe Road) and the A645, to allow for the delivery of Abnormal Indivisible Loads (AILs) to the Drax Power Station Site.
- 1.3.2. OHL1, OHL2 and TCL1 are collectively referred to herein as 'the sites' where relevant and are shown in Plate 1-1 and Plate 1-2 below.

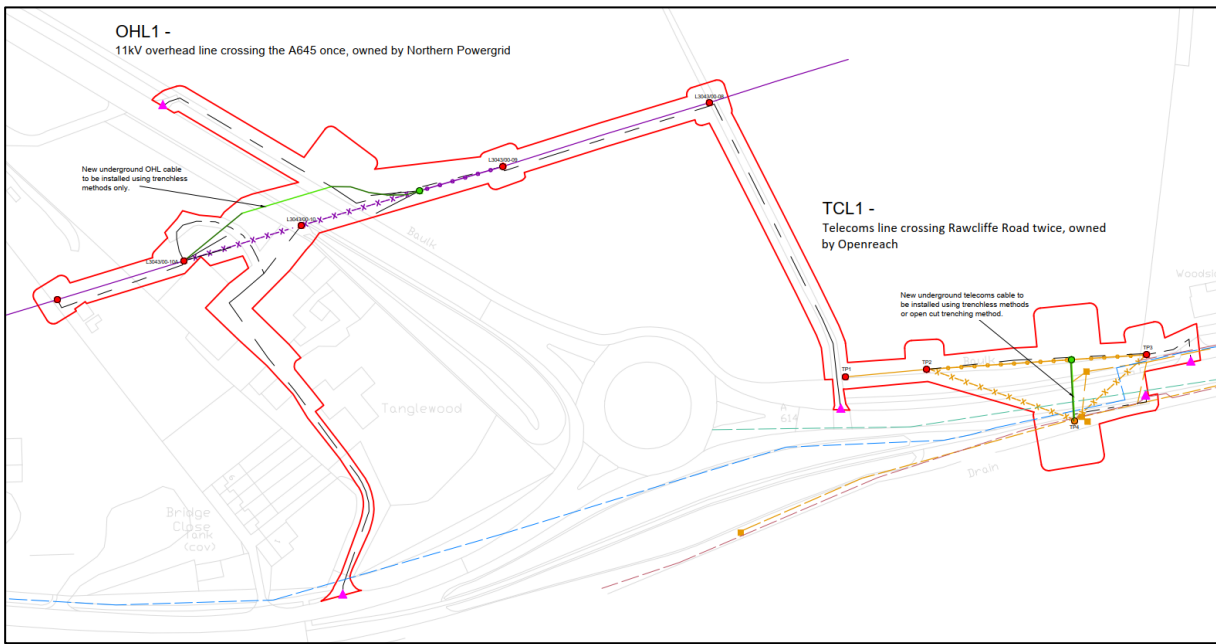


Plate 1-1 - Drawing Showing Location of OHL1 and TCL1

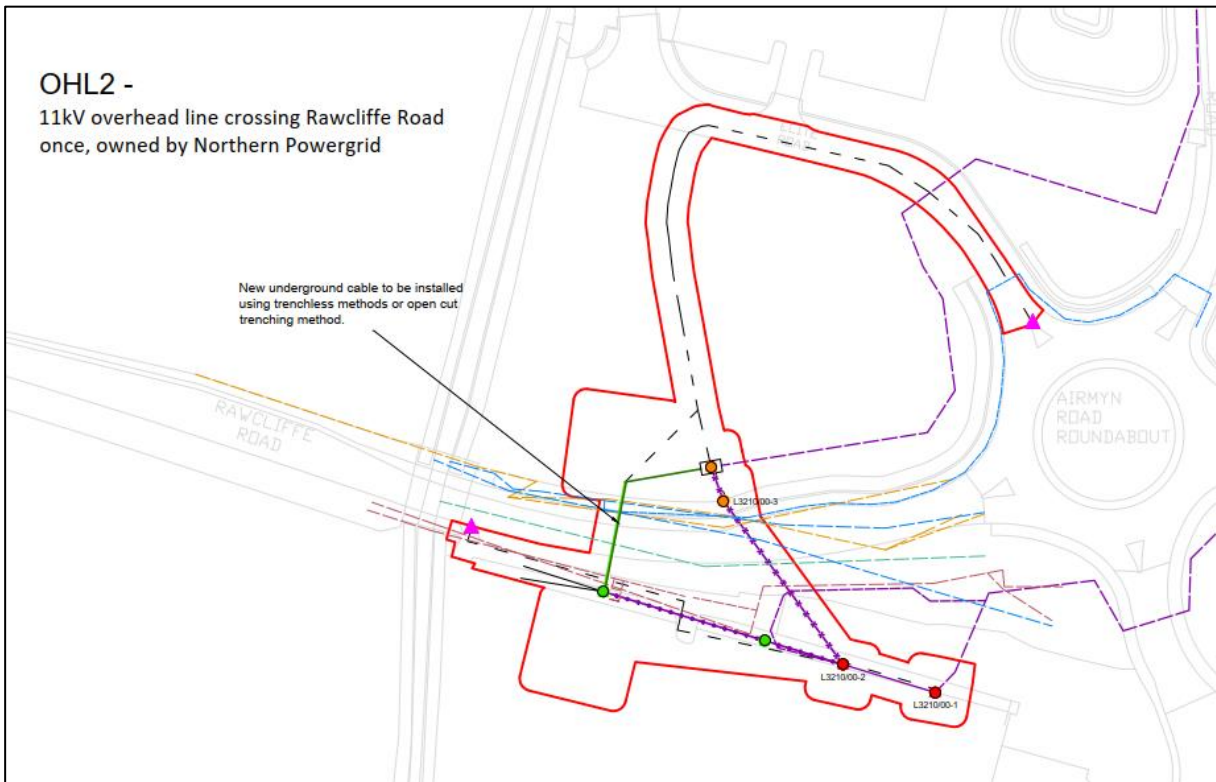


Plate 1-2 - Drawing Showing Location of OHL2

1.3.3. In order to carry out the undergrounding of the cables (both the electricity and telecommunications lines), a number of different methodologies are considered. It is likely that a mixture of these methodologies will be employed:

- a) Trenchless Construction Methods: Horizontal directional drilling (HDD) is proposed using a surface launched drilling rig. An entry pit and exit pit would

be excavated within the driving compound and receptor compound, respectively.

- b) Thrust Boring/Auger Boring is a Trenchless Construction method using a launch pit, the auger is rotated to drill into the soil and excavate the ground whilst a jacking rig pushes the auger and casing forward. Excavated material is moved behind the casings and can be removed by hand, mechanically or using muck skips.
- c) Open Cut Construction would involve open excavation works which would create an open cut trench of a depth adequate for achieving the minimum depth of 750 mm.

1.3.4. The locations of these lines and general arrangement plans are presented in **Appendix A**.

1.4. PROJECT SCOPE

1.4.1. To assist in meeting the aims as stated in **Section 1.2**, the scope of this assessment comprised:

- a) Completion of a Site walkover;
- b) A review of publicly available historical maps and plans (where available) to identify former land uses and potential contaminative activities on and surrounding the sites;
- c) A review of relevant regulatory databases;
- d) Contact relevant regulators (Environmental Agency and Local Authority);
- e) A review of relevant publicly available information relating to hydrological features, hydrogeology, neighbouring land use, ecologically sensitive uses and geology in order to establish the environmental setting of the sites;
- f) Develop a preliminary conceptual site model via the source-pathway-receptor contaminant linkage approach;
- g) Outline the environmental risks and / or opportunities, with respect to ground conditions, which may potentially arise as liabilities or constraints associated with PC-02; and,
- h) Preparation of a Geo-Environmental Preliminary Risk Assessment Report.

1.5. LEGISLATIVE CONTEXT AND GUIDANCE

1.5.1. This report has been prepared in general accordance with:

- a) Part 2A of the Environmental Protection Act 1990; and,
- b) The National Planning Policy Framework 2019. The National Planning Policy Framework 2019.

- 1.5.2. The following good practice and statutory guidance was considered, and the assessment was undertaken in general accordance with:
- a) Environment Agency (EA) Land Contamination Risk Management (LCRM), 2021; and,
 - b) CIRIA C552 'Contaminated Land Risk Assessment. A guide to good practice', 2001.

1.6. SOURCES OF INFORMATION

- 1.6.1. The following sources of information have been used in the production of the report:
- a) Groundsure Geo Insights report, Order No: GS-9026933 and Historical report, Order No: GS-9026932, dated 02 September 2022 (TCL1 and OHL1);
 - b) Groundsure Geo Insights report, Order No: WSP-9026223 and Historical report, Order No: WSP-9026222 dated 02 September 2022 (OHL2);
 - c) Flood Map for Planning website, <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map?easting=539483&northing=181055>, accessed on 06 September 2022;
 - d) MAGIC website, <https://magic.defra.gov.uk/>, accessed on 06 September 2022;
 - e) Department of the Environment Industry Profiles accessed on 09 September 2022;
 - f) Public Health England, UK Maps of Radon (<https://www.ukradon.org/information/ukmaps>), accessed 06 September 2022;
 - g) The British Geological Survey (BGS) Geological maps Sheet No. 079, Goole, 1:63 360 / 1:50,000 Drift Edition (1971) (online);
 - h) British Geological Society, Borehole Records, accessed on 07 September 2022; and,
 - i) Zetica UXO Pre-Desk Study Assessment, dated 02 September 2022.

1.7. LIMITATIONS

- 1.7.1. This report is addressed to and may be relied upon by Drax Power Limited and may not be relied upon or transferred to any other parties without the express written agreement of WSP UK Ltd.
- 1.7.2. This report should be read and used in full. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party. WSP

cannot be held liable for third party information. Full details of the limitations are provided as **Appendix B**.

1.8. UNDERSTANDING RISK

- 1.8.1. It is important to recognise that any risks identified during a preliminary assessment such as that presented below are perceived risks based on the recorded information reviewed. A more detailed assessment of the actual risks can only be assessed following intrusive investigations. The preliminary assessments presented herein are qualitative based on professional judgements following review of the available data and within the context of the existing/proposed use. Those risk categories presented (Very Low, Low, Low to Moderate, Moderate, High, Very High) follow guidance presented in CIRIA Publication C552, Contaminated Land Risk Assessment – A Guide to Good Practice. CIRIA states that risk levels should be based both on an understanding of both the probability (likelihood) of a risk occurring and the magnitude of the potential consequence (severity) of a risk. CIRIA defines four levels of probability and four levels of severity with relation to contaminated land, as presented in **Appendix C**.

2. SITE SETTING

2.1. SITE DESCRIPTION AND CURRENT USE

- 2.1.1. The sites are located in Goole, East Riding of Yorkshire and occupies land that is governed by the East Riding of Yorkshire Council. Site Location Plan and general arrangement plan is presented in **Appendix A**.
- 2.1.2. A Site walkover was conducted on 13 October 2022 and representative photographs are included in **Appendix D**. A summary of the Site details, including observations made during the walkover, are presented in **Table 2-1**.

Table 2-1 - Summary of Site Details

Details	Comments
Name and Address of Site	Rawcliffe Rd, Airmyn, Goole DN14 8JU (nearest address)
Grid Reference	TCL1 and OHL1 – 470528, 423848 OHL2 – 471581, 423854
Site Description and Current Use	The OHL1 and TCL1 site is irregular in shape and covers a area of 1.2229 hectares. The OHL2 site is in a V-shape arrangement and covers an area of 0.5895 hectares. The sites are generally comprised of agricultural land with the A614 and A645 traversing the sites.
Site Setting and Surrounding Area	The immediate and wider surrounding area of all three sites comprises agricultural land. To the north and to the east of the OHL2 site there are commercial premises including a large furniture store building to the north and a motorway service linked to the M62 to the east comprising a shell petrol station, a Premier Inn Hotel and a McDonald's. A few commercial premises including an automotive bodyshop lie to the west of the TCL1 and south of the OHL1 sites.
Surface Cover & Topography	The sites are predominantly covered by agricultural land. However, a road passes roughly through each site providing a flat asphalt surface.
Potentially Contaminative Land Uses	No potentially contaminative land uses were observed during the walkover.

3. SITE HISTORY

3.1. ON-SITE AND OFF-SITE HISTORY

3.1.1. Historical maps were obtained as part of the Groundsure reports (**Appendix E**) and were reviewed to identify potentially contaminative former land uses on-site and within a 250 m radius of the Order Limits.

ON-SITE SUMMARY

3.1.2. A summary of the on-site features relevant to contaminated land are presented in **Table 3-1**, below. Further detail is available on the historical maps, as presented within **Appendix E**.

Table 3-1 - Summary of Pertinent History of the Site

Dates and Map Scale	Land Uses
TCL1	
1853 (1:10,560)	Rawcliffe Lane runs through the majority of the Site.
1965 (1:2,500)	Rawcliffe Lane is now labelled Rawcliffe Road and has expanded. A drain now runs east to west through the north-west of the Site.
2022 (1:10,000)	No significant changes.
OHL1	
1853 (1:10,560)	Agricultural fields covered the Site.
1948 – 1950 (1:10,560)	Railway land associated with Airmyn & Rawcliffe Station encroaches onto the western boundary of the Site.
1993 – 1994 (1:2,500)	The railway station and associated land are no longer present and the A645 has been constructed in its place. The A645 covers the western half of the Site.
2022	No significant changes.

Dates and Map Scale	Land Uses
(1:10,000)	
OHL2	
1853 (1:10,560)	Rawcliffe Lane runs east to west through the southern half of the Site. The northern half of the Site consists of agricultural fields.
1965 (1:2,500)	A field drain is now present running parallel with Rawcliffe Road through the south of the Site.
1977 (1:2,500)	Rawcliffe Road has expanded further to the north of the Site due to the addition of another lane that branches north-east. A drain is now present to the north of Rawcliffe Road and runs east to west through the north of the Site.
2022 (1:10,000)	No significant changes.

OFF-SITE SUMMARY

3.1.3. A summary of the off-site features within 250 m relevant to contaminated land are presented in **Table 3-2**, below. Further detail is available on the historical maps, as presented within **Appendix E**.

Table 3-2 - Summary of Pertinent History of Surrounding Area

Date and Map Scale	Surrounding Land Use
TCL1	
1853 (1:10,560)	Airmyn Wood approximately 50 m north-east. Agricultural land surrounds the Site in all directions.
1948 – 1950 (1:10,560)	Airmyn & Rawcliffe Station and associated railways constructed approximately 200 m west. Railway runs in a south-east to north-west orientation.
1993 – 1994 (1:2,500)	The railway station and associated tracks are no longer present and replaced by the construction of the A645 road.

Date and Map Scale	Surrounding Land Use
2022 (1:10,000)	No significant changes.
OHL1	
1853 (1:10,560)	Agricultural land and drains surround the Site in all directions.
1948 – 1950 (1:10,560)	Airmyn & Rawcliffe Station located approximately 75 m south.
1993 – 1994 (1:2,500)	The railway station and associated tracks are no longer present and replaced by the construction of the A645 road.
2022 (1:10,000)	No significant changes.
OHL2	
1853 (1:10,560)	Agricultural land and drains surround the Site in all directions.
1965 (1:2,500)	A garage has been constructed 50 m east.
1977 (1:2,500)	Rawcliffe Road has expanded immediately east of the Site by branching off to the north-east and connecting to the newly constructed M62 road. The M62 runs in a north-east to south-west orientation and is located approximately 160 m south-east of the Site at its closest point.
2003 (1:1,250)	Another garage and a petrol filling station have been constructed 125 m east of the Site.
2010 (1:10,000)	A hotel has been constructed 200 m east of the Site.

Date and Map Scale	Surrounding Land Use
2022 (1:10,000)	No significant changes.

4. ENVIRONMENTAL SETTING

4.1. GEOLOGY

- 4.1.1. British Geological Survey (BGS) Geological maps Sheet No. 079, Goole, 1:63 360 / 1:50,000 Drift Edition (1971) (online) and BGS 'Geology of Britain' online viewer were reviewed.
- 4.1.2. BGS mapping indicates that the superficial geology underlying the OHL2 site and the southern tip of the TCL1 site comprises Alluvium. The majority of the TCL1 site and entire OHL1 site comprises the Brighton Sand Formation. The bedrock geology underlying the entire of all the sites is recorded as the Sherwood Sandstone Group - Sandstone. The Sherwood Sandstone Group is subsequently underlain by Marl and the Upper, Middle and Lower Coal Measures.
- 4.1.3. Made Ground is likely to be present associated with road and development infrastructure across all three sites.
- 4.1.4. A review of publicly available BGS borehole logs was undertaken; no logs were identified within the Site boundary of any of the three sites; however multiple logs are located within 500 m of the sites. The logs have been summarised in **Table 4-1**, the full logs are presented in **Appendix F**.

Table 4-1 – Summary of BGS Borehole Logs

Stratum	Depth to top of Unit (m bgl)	Indicated thickness (m)	Typical Strata Description
OHL2			
Topsoil	0.00 – 0.00	0.40 – 0.80	Firm dark brown silty sandy Topsoil
Warp – Clay and Silt	0.00 – 0.80	2.40 – 7.00	Stiff brown and grey laminated silty clay with traces of vegetation.
Alluvium	7.30 – 7.80	11.95 – 12.70	Medium dense brown silty fine sand with small gravel and occasional fragments of sandstone.
Sherwood Sandstone Group	22.40 – 25.50	>0.60	Weathered red brown sandstone.
OHL1 and TCL1			

Stratum	Depth to top of Unit (m bgl)	Indicated thickness (m)	Typical Strata Description
Topsoil	0.00 – 1.40	0.40 – 0.91	Topsoil
Brighton Sand Formation	0.91 – 1.80	9.20 – 12.19	Layers of peat, grey sand, clay and gravel.
Sherwood Sandstone Group	11.00 – 12.19	320.60	Sandstone

4.1.5. One of the BGS logs located near the OHL1 and TCL1 sites was a coal exploratory hole (SE72SW40) that was drilled to a depth of 1,024.37 m bgl. The log confirmed the thickness of the Sherwood Sandstone Group and many other units beneath, including multiple coal seams. Due to the size and detailed nature of the log and the unlikelihood of any potential contamination reaching depths greater than the Sherwood Sandstone Group, only information regarding geological units above this was summarised.

4.2. HYDROGEOLOGY AND HYDROLOGY

- 4.2.1. Made Ground is not classified by the EA. Both the Alluvium and Brighton Sand Formation are classified as a Secondary A Aquifer. The Sherwood Sandstone Group is classified as a Principal Aquifer.
- 4.2.2. There are three groundwater abstractions recorded within 1 km of all three sites. The abstractions are located approximately 496 m north-west from the OHL2 site and 649 m north-east from the TCL1 site and OHL1 site. They were used for spray irrigation at a maximum daily extraction rate of 1,200 m³.
- 4.2.3. The OHL2 site is not located within a groundwater Source Protection Zone (SPZ). However, the OHL1 site and the very western tip of the TCL1 site lie within Source Protection Zone 3 (Total Catchment).
- 4.2.4. Information from publicly available borehole logs located to the east of the OHL2 site indicate water strikes around 0.35 m bgl to 7.60 m bgl within the Alluvium. Logs within the vicinity of the TCL1 and OHL1 sites indicate the water strikes 0.92 m bgl within the Brighton Sand Formation. It is anticipated that groundwater within the Alluvium and Brighton Sand Formation flows broadly to the north towards the River Aire.
- 4.2.5. One BGS borehole has been identified as a well and is located within 1 km of all three sites. The well was installed within the Sherwood Sandstone Group and a license to extract up to 1,200 m³ of water per day. The resting water level within the borehole is at 5.15 m bgl.

4.2.6. There is a surface water drain located in the south of the OHL2 site. Multiple agricultural surface water drains are located off-site in all directions. The River Aire is located approximately 1.2 km north of the sites at its closest point.

4.2.7. There are no surface water abstractions recorded within 1 km of the Site.

4.3. MINING AND GROUND WORKINGS

4.3.1. The Coal Authority interactive viewer confirmed that the sites are located within a Coal Authority designated mining area. However, the interactive viewer shows there are no mine entries, abandoned mines, past shallow coal mine workings, surface mining, coal outcrops or high-risk development areas within 1km of the sites.

4.4. GROUND STABILITY

4.4.1. The ground stability hazards summarised in **Table 4-1** were outlined in the Groundsure report (ultimately sourced from the BGS).

Table 4-1 – Summary of Ground Stability Hazards

Hazard	Potential
Collapsible Deposits	Very Low to Negligible
Compressible Deposits	Moderate to Negligible
Ground Dissolution	Negligible
Landslide	Very Low
Running Sands	Low to Negligible
Shrinking or Swelling Clays	Very Low to Negligible

5. REGULATORY INFORMATION AND CONSULTATION

5.1. REGULATORY DATABASE

- 5.1.1. The Groundsure report includes information and data collected from several organisations including the EA, the Local Authority, the British Geological Survey (BGS), Department for Environment, Food & Rural Affairs (Defra), Health & Safety Executives (HSE), and the National Radiological Protection Board (NRPB).
- 5.1.2. It is considered that the information listed in **Table 5-1** represents those of potential concern in relation of contamination at the Site. The full Groundsure report is provided in **Appendix E**.

Table 5-1 - Summary of Database Searches

Descriptor	On-site	0-50 m	50-250 m	Details
Historical Industrial Land Uses	1	4	3	There were railway sidings located on the OHL1 site that were present in 1950. A railway station and sidings are also located 10 m south of the Site. The closest historical land use to the the OHL2 site is a garage that was located 39 m east.
Historical Garages	0	1	0	The closest historical garage was located approximately 38 m east of the OHL2 site.
Waste Exemptions	0	0	12	The closest waste exemption to the TCL1 and OHL1 site is a treatment of waste wood and waste plant matter by chipping, shredding, cutting, or pulverising on a farm. Other waste exemptions are for the following: <ul style="list-style-type: none"> • Use of waste in construction;

Descriptor	On-site	0-50 m	50-250 m	Details
				<ul style="list-style-type: none"> • Deposit of waste from dredging of inland rivers; • Burning waste in the open; • Cleaning, washing, spraying or coating relevant waste; • Recovery of scrap metal; • Spreading waste on agricultural land to confer benefit; • Use of mulch; • Incorporation of ash into soil; • Burning of waste as a fuel in a small appliance; • Use of waste for a specified purpose; and, • Storage of sludge.
Recent Industrial Land Uses	0	0	6	The closest land use is a vehicle cleaning service located 112 m east of the OHL2 site. The other land uses include a petrol station, a vehicle cleaning service, a water pumping station, a vehicle parts and accessories store and a electricity substation all located to the east of the Site.
Current or Recent Petrol Stations	0	0	1	The closest petrol station is a Shell petrol station located 154 m east of the OHL2 site.

Descriptor	On-site	0-50 m	50-250 m	Details
Licensed Pollutant Release	0	0	4	<p>The closest pollutant release is located 53 m south-east of the OHL2 site and is a historical permit for Waste Oil Burner 0.4 MW.</p> <p>The closest and only active permit is located 244 m north of the OHL2 site for Combustion and Incineration.</p>

5.2. SENSITIVE LAND USES

- 5.2.1. The Groundsure report indicates there are no Sites of Special Scientific Interest (SSSI) or Special Areas of Conservation within 1 km of all three sites. However, all three sites lie within a Nitrate Vulnerable Zone from surface water and a SSSI Impact Risk Zone.

5.3. AGRICULTURAL DESIGNATIONS

- 5.3.1. Based upon the post-1988 Agricultural Land Classification mapping, the land that all three sites lie within is classified as Grade 2, Best Most Versatile (BMV) land. This indicates the land is very good quality agricultural land.

5.4. LOCAL AUTHORITY ENQUIRY

- 5.4.1. The East Riding of Yorkshire Council were contacted via email on the 09 September 2022 regarding any environmentally pertinent information held relating to the sites for their respective land domains. A response was received on 22 September 2022 with the following pertinent additional information.

TCL1 and OHL1

- a) A Hussain Workshops located in Tanglewood encroaches onto the west of the OHL1 site ca. 2014 and covers an area of 7,918.04 m²; and
- b) Woodside Transport Café is located immediately north-east of the TCL1 site and has been identified as a potential petroleum site due to an HGV yard with 'piles of tyres', it is therefore considered the buildings on this site may be used as a haulage depot and for maintenance.

OHL2

- a) A petroleum license that was surrendered in 1989 is located approximately 500 m north-west at North Airmyn Grange;

- b) A historical Landfill site named Airmyn Tip is located approximately 475 m north-east and covers an area of 2,953.54 m². This was in operation between 1949 and 1979 and was a licensed landfill that accepted inert, industrial, commercial, and household waste; and,
- c) Airmyn Brick Yard was located approximately 250 m north-east ca. 1855.

5.5. ENVIRONMENT AGENCY ENQUIRY

- 5.5.1. The EA was also contacted on 09 September 2022. A response was received on 13 October 2022 with the following pertinent additional information.

“Airmyn Tip, a historical landfill, was noted to be 561 m north-east of the A614 Rawcliffe Road (M-N) Site (OHL2) with the ‘first input of material in January 1943 and last input in May 1979. The site is said to have taken inert material, commercial waste, household waste and slurry sludge. The waste comprised of Construction, medical, surgical, veterinary, food (vegetable canning waste), agricultural, wood, bags, concrete, spoil, rubble, paper, cartons, cardboard, slates, glass, metal, cement slurry, general factory waste, cesspool, septic tank, gully emptyings.”

- 5.5.2. Airmyn Household Waste Disposal Site (WML 60905) is now located just over 500 m north of the OHL2 site in the location of the historical Airmyn Tip landfill. A copy of the waste management license was provided and can be found in **Appendix G**.

5.6. UNEXPLODED ORDNANCE (UXO)

- 5.6.1. A review of Zetica online UXO mapping (02 September 2022) indicates that all three sites are located within an area with a low risk of unexploded ordnance. An excerpt of the UXO map is presented in **Appendix H**.

6. PRELIMINARY CONCEPTUAL SITE MODEL

6.1. INTRODUCTION

- 6.1.1. The preliminary Conceptual Site Model (CSM) is based upon the environmental conditions of the Site as described in the previous sections and was developed in the context of the PC-02.
- 6.1.2. The assessment followed a risk-based approach; with the potential environmental risk assessed qualitatively using the ‘source-pathway-receptor’ contaminant linkage concept introduced in the guidance documents (principally the EA’s LCRM) on the practical implementation of the Environmental Protection Act 1990.
- 6.1.3. Environmental risk can be defined as the combination of the consequence of a harmful effect and the probability of its occurrence. The existence of a contaminant linkage is primarily dependant on site usage and environmental conditions.
- 6.1.4. The environmental risk assessment has been carried out by identifying and evaluating the significance of the following:
- a) Potential sources of contamination: these include actual or potentially contaminating materials and activities, located either on or in the vicinity of the Site;
 - b) Potential receptors of contamination: these include future land users; and,
 - c) Potential pathways for contamination migration: these are the routes or mechanisms by which contaminants may migrate from the source to the receptor.

6.2. POTENTIAL SOURCES OF CONTAMINATION

- 6.2.1. **Table 6-1** provides a summary of the potential sources of contamination that may be present at the Site, as well as the likely nature of such sources.

Table 6-1 - Potential Sources of Contamination

Potential Source	Potential Contaminants of Concern	Likely / Anticipated Distribution
ON-SITE		
Made Ground	A wide range of potential contaminants, including asbestos, heavy metals, inorganics, petroleum hydrocarbons, polyaromatic hydrocarbons (PAH), BTEX (benzene, toluene, ethylbenzene and xylene), semi-volatile organic compounds (SVOC), volatile organic compounds	Across the majority of both the TCL1 and OHL2 sites and the western section of the OHL1 site.

Potential Source	Potential Contaminants of Concern	Likely / Anticipated Distribution
	(VOC) and ground gases (methane and carbon dioxide).	
Overground railway land	Asbestos, heavy metals, inorganics, petroleum hydrocarbons, biocides, mineral oils and greases, PAH, BTEX, VOCs, SVOCs and polychlorinated biphenyls (PCBs).	Western boundary of the OHL1 site.
OFF-SITE		
Made Ground	A wide range of potential contaminants, including asbestos, heavy metals, inorganics, petroleum hydrocarbons, PAH, BTEX, VOCs, SVOCs and ground gases (methane and carbon dioxide).	To the west of the OHL1 site and to the east of the OHL2 site.
Historical railway land and sidings	Asbestos, heavy metals, inorganics, petroleum hydrocarbons, PAH, BTEX, VOC, SVOC, mineral oils and greases and PCBs.	To the west of the OHL1 site.
Recent industrial land uses including a petrol station and garage.	A wide range of potential contaminants, including asbestos, heavy metals, organics, petroleum hydrocarbons, PAH, BTEX, VOC, SVOC, mineral oils and PCBs.	To the east of the OHL2 site.

6.3. POTENTIAL RECEPTORS

6.3.1. In the context of PC-02, the following potential receptors were identified:

HUMAN HEALTH

- a) Future site users;
- b) Construction workers and future maintenance workers; and,
- c) Third party neighbours.

CONTROLLED WATERS

Surface Waters

- a) Surface water drains

Aquifers

- a) Alluvium (Secondary A Aquifer);
- b) Brighton Sand Formation (Secondary A Aquifer);

- c) Sherwood Sandstone Group (Principal Aquifer).

BUILDING FABRIC

- a) Below ground structures.

6.3.2. The River Aire has been discounted as a receptor due to its distance from the Site (1.2 km north).

6.4. PLAUSIBLE PRELIMINARY CONTAMINANT LINKAGES

6.4.1. **Table 6-2** provides an evaluation of the potential contaminant linkages that were considered to be plausible on the basis of the information currently available for the Site and the proposed end use.

Table 6-2 Plausible Preliminary Contaminative Linkages

Potential Contaminant Sources	Potential Receptor	Potential Pathways	Comments
ON-SITE			
<ul style="list-style-type: none"> • Made Ground • Overground railway land 	<p><u>Human Health</u></p> <ul style="list-style-type: none"> • Future site users 	<ul style="list-style-type: none"> • Dermal contact • Indirect ingestion of contaminants • Inhalation of dust/fibres • Ground gas/vapour migration 	<p>Due to the historical development of roads through each site, there is the potential for contamination to be present within the soils and / or groundwater on-site although it is likely to be localised and limited in extent.</p> <p>PC-02 is understood to comprise the undergrounding of existing overhead power and telecoms lines. Where hardstanding is present (and in good condition), the exposure pathway of contaminated material to future site users will be limited and / or removed. Due to the nature of PC-02, exposure of future Site users is likely to be in localised areas of the Site i.e. only in public areas. Future site users are not likely to be on Site for extended periods of time. Therefore, the risk to future site users is therefore considered to be Low.</p> <p>Due to the presence of Made Ground soils at each Site, there is the potential for the generation and migration of ground gases and vapours on-site. However, as no enclosed</p>

Potential Contaminant Sources	Potential Receptor	Potential Pathways	Comments
			structures are proposed the risk to future site users is not considered to be plausible.
	<u>Human Health</u> <ul style="list-style-type: none"> Construction workers and future maintenance workers 		There is considered a Low to Moderate risk to construction and maintenance workers who are more likely to encounter asbestos fibres (such as within Made Ground) during groundworks or future maintenance. Risks to construction and maintenance workers should be managed via health and safety protocols during the works.
	<u>Human Health</u> <ul style="list-style-type: none"> Adjacent site users 		<p>PC-02 is limited in nature and areas which are currently in agricultural use will be returned to use upon completion of the works. Areas of the sites which are currently covered by hardstanding will be resealed following undergrounding of the lines, therefore the risk of exposure to potential contamination by adjacent site users is considered to be Low.</p> <p>Risks to adjacent site users should be managed and mitigated in line with Construction (Design and Management) regulations during construction phase of the development.</p> <p>Migration of ground gas and / or vapours off-site is considered to be Low.</p>

Potential Contaminant Sources	Potential Receptor	Potential Pathways	Comments
	<p><u>Controlled Waters –</u> <i>Surface Waters</i></p> <ul style="list-style-type: none"> • Surface water drains <p><i>Aquifers</i></p> <ul style="list-style-type: none"> • Alluvium and Brighton Sand Formation (Secondary A Aquifer) • Sherwood Sandstone Group (Principal Aquifer) 	<ul style="list-style-type: none"> • Vertical and lateral leaching from impacted soil • Vertical and lateral migration from groundwater 	<p>The OHL2 site is not located within a groundwater Source Protection Zone (SPZ). However, the OHL1 site and the very western tip of the TCL 1 site lie within an SPZ 3.</p> <p>There is potential for contaminants within any Made Ground to leach into the underlying Secondary A Aquifers. However potential Made Ground is anticipated to be largely underlying areas of hardstanding (such as under roadways) which will restrict infiltration and therefore leaching.</p> <p>There is a potential for potentially contaminated surface water run off from the site to migrate into the surface water drain on the OHL2 site. It is considered likely that PC-02 will have a surface water drainage system included within the design, therefore reducing the risk from contaminated run off to surface water courses.</p> <p>Therefore, the risk to Controlled Waters is considered to be Low.</p>

Potential Contaminant Sources	Potential Receptor	Potential Pathways	Comments
	<u>Building Fabric</u> <ul style="list-style-type: none"> Below ground structures. 	<ul style="list-style-type: none"> Direct contact with contaminated soils and groundwater 	Made Ground is likely to be present although likely to be localised, the risk to below ground structures is considered to be Low .
OFF-SITE			
<ul style="list-style-type: none"> Made Ground Historical railway land and sidings Recent industrial land uses including petrol stations and garages. 	<u>Human Health</u> <ul style="list-style-type: none"> Future site users; Construction workers and future maintenance workers. 	<ul style="list-style-type: none"> Ingestion or inhalation of impacted soils windblown from adjacent properties; Inhalation of asbestos fibres blown from adjacent properties; and, Ground gas/vapour migration. 	<p>The majority of the areas surrounding the sites are predominantly agricultural land. However, with the lack of hardstanding there is an increased risk of windblown dust / fibres migrating from adjacent properties. The risk is considered to be Low.</p> <p>As no enclosed structures are proposed the risk to human health receptors from migration of off-site ground gas and vapour is not considered to be plausible.</p>
	<u>Controlled waters – Surface waters</u> <ul style="list-style-type: none"> Surface water drains <u>Aquifers</u>	<ul style="list-style-type: none"> Vertical and lateral migration within groundwater. 	There is potential for contaminants from off-site sources to flow into the surface water drain located at OHL2 site. However, no significant contaminant sources have been identified within close proximity of the sites, therefore, the risk to Controlled Waters on the sites from off-site migration is considered to be Low .

Potential Contaminant Sources	Potential Receptor	Potential Pathways	Comments
	<ul style="list-style-type: none"> Alluvium and Brighton Sand Formation (Secondary A Aquifer) Sherwood Sandstone Group (Principal Aquifer) 		
	<ul style="list-style-type: none"> Below ground structures 	<ul style="list-style-type: none"> Vertical and lateral migration within groundwater. 	<p>No significant contaminant sources have been identified within close proximity of the sites, therefore, the risk to below ground structures on the Site from off-site migration is considered to be Low.</p>

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. CONCLUSIONS

- 7.1.1. Based on the information detailed within this report, the following conclusions have been made in the context of PC-02.
- 7.1.2. PC-02 comprises the undergrounding of the cables (both the electricity and telecommunications overhead lines) to allow for the delivery of Abnormal Indivisible Loads to the Drax Power Station Site.
- 7.1.3. The sites are generally comprised of agricultural land with the A614 and A645 traversing the sites. Generally the sites have remained unchanged from the earliest available mapping ca. 1853 to present day with the exception of the western half of the OHL1 site which was occupied by agricultural land from 1853 to 1948 when Airmyn & Rawcliffe Station and associated sidings was constructed and encroached onto the western boundary of the site. The railway and infrastructure were replaced by the A645 road by 1993 which now runs through the western half of the site up until present day. No significant sources of contamination were identified within the sites or surrounding areas.
- 7.1.4. The sites are anticipated to be underlain by variable deposits of Made Ground, a superficial geology comprising the Alluvium or Brighton Sand Formation (Secondary A Aquifer), and bedrock geology comprising the Sherwood Sandstone Group (Principal Aquifer).
- 7.1.5. There is a surface water drain located in the south of the OHL2 site. Multiple agricultural surface water drains are located off-site in all directions. The River Aire is located approximately 1.2 km north of the sites at its closest point.
- 7.1.6. In the context of PC-02, overall risks to human health are considered to be **Low**. There is considered a **Low to Moderate risk** to construction and maintenance workers who are more likely to encounter asbestos fibres (such as within Made Ground) during groundworks or future maintenance. Risks to construction and maintenance workers should be managed via health and safety protocols during the works.
- 7.1.7. The risk to Controlled Waters is considered to be **Low**. There is a potential for potentially contaminated surface water runoff from the site to migrate into the surface water drain on the OHL2 site which should be managed by surface water drainage system included within the design, therefore reducing the risk from contaminated runoff to surface water courses.
- 7.1.8. Risks to below ground structures is considered to be **Low**.

7.2. RECOMMENDATIONS

- 7.2.1. Due to the limited nature of this infrastructure work and the findings of this report a ground investigation and Generic Quantitative Risk Assessment is not considered to be necessary.
- 7.2.2. Measures to manage environmental risks should unexpected contamination be encountered during the works will be detailed within a Construction Environmental Management Plan.