JNP GROUP
CONSULTING ENGINEERS

TECHNICAL NOTE

Job name: KMCPRP-139-010-049 A629 Halifax Road

Job No: S12427

Note No: S12427-JNP-XX-XX-TN-G-1006

Date: 08/11/2024

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Subject: Updated Conceptual Site Model – Area B (Cavalry Arms)

1. Introduction

1.1 At the request of Kirklees Council, JNP Group has undertaken a review of the previous Phase I, GIR, and planning comments for Area B – Cavalry Arms to address outstanding comments raised by Kirklees Council (Environmental Health). This is required to progress with the proposals at the site from a Geo-environmental perspective, to gain approval for the proposed scheme given that no updated Conceptual Site Model (CSM) was undertaken following the previous ground investigation (undertaken by others).

1.2 This report aims to address comments from the EHO (reference: WK/202334886) in relation Condition 15 of Planning Permission 2021/92734. A meeting was also held with the EHO on 31st July 2024. It was agreed that a detailed updated CSM would be sufficient at this site to satisfy the EHO's comments and the Condition.

2. Location and Proposed Work

2.1 The site is the highway junction on the A629 Halifax Road between Birkby Road in the east and East Street in the west, approximately 3 km north-west of Huddersfield. The centre of the site is located at National Grid Reference 412240 418514. The site boundary includes land immediately adjacent to the Church of Jesus Christ of Latter-day Saints, and a small retaining wall adjacent to 402 Birkby Road.

2.2 Alterations to the highway junction on the A629 Halifax Road between Birkby Road and East Street are proposed, as shown in the GA Plan (TF5/Area B/GA-1, REV B, dated 01/22, Appendix A). These comprise widening of Birkby Road to the north east of the junction, works to the existing carriageway and pavements and new grassed areas to the north and south of Birky Road, on the eastern side of the junction.

2.3 In preparing this updated CSM, JNP Group has reviewed the following reports in conjunction with a variety of planning documents and responses from Kirklees Council:

- Leeds City Council Geotechnical Section. Cavalry Arms Junction, A629, Halifax Road, Huddersfield. Phase 1 Desk Study Report. Scheme Ref: 446368. November 2021.
- Leeds City Council Geotechnical Section. Cavalry Arms Junction, Huddersfield. Ground Investigation Report. Scheme Ref: 446368. February 2020.

- Consultation Response from: KC Environmental Health. Responding Ref: WK/202122840. 27 October 2021.

2.4 This report should be read in conjunction with the following:

- S12427-JNP-XX-XX-TN-G-1001– Summary of Existing Ground Conditions and Ground Investigation – Area B (Calvary Arms), dated 21st June 2024.

3. Summary of Site History

3.1 The site has remained relatively unchanged since the earliest historical maps, the existing highway in broadly the existing layout has been present since the 1850s. Residential gardens were present to the north of the site from the 1960s (it is assumed that these are for The Church of the Jesus Christ of Latter-day Saints and 402 Birkby Road).

3.2 Most notably in the area surrounding the site:

- A brick and tile works were present 200m north-west and 160m west of the site from the 1890s and 1930 to 1960s, respectively.
- A quarry was present in the 1960s, 200m to 500m north-west of the site; this was later described landfills. An additional landfill site was present 60m to the west of the site (it is assumed these are part of the brick and tile works).

4. Summary of Ground Conditions

Soils

4.1 The scope of the previous ground investigation comprised seven dynamic sampling boreholes to a maximum depth of 3.80m bgl. Made ground was encountered across the site and proven to 1.40m bgl, deleterious materials of brick were recorded. Firm and stiff sandy gravelly clay was recorded as residual soils between 2.20m to 2.65m bgl, overlying weathered bedrock (Coal Measures) which was encountered between 2.95m to 3.60m bgl, and comprised very weak siltstone and weak sandstone.

4.2 Ten soil samples were submitted for chemical analysis of heavy metals, PAH, asbestos and organic matter. No exceedances were recorded with respect to public open space screening values.

Groundwater

4.3 Groundwater was not encountered during the intrusive investigation but in the subsequent monitoring was noted at 3.67m bgl in WS002.

Gas

4.4 As part of the ground investigation, four rounds of gas monitoring were undertaken over two months. The response zones were in the 'residual soil'. Negligible flow, CO_2 and CH_4 was recorded.

5. Conceptual Site Model

5.1 This section uses information from the data sources presented herein and the original report to

provide an updated conceptual model and qualitative assessment of the potential risks posed to human health and environmental receptors from potential on-site and off-site sources of contamination. The potential risk are considered pre and post the proposed site works to identify if the works result in additional or increased risks.

5.2 The assessment is presented as a 'source-pathway-receptor' model in accordance with Part IIA of the Environmental Protection Act 1990. The categories of environmental risk used by JNP Group are given in the table that follows.

Table 5.1 Risk Matrix

Environmental Risks		
HIGH		Issues within this category likely to provide a significant cost or liability. Further detailed investigation may be required to clarify the risk.
MEDIUM		It is possible that issues within this category may provide a cost or liability. Further investigation may be required to clarify the risk.
LOW		It is unlikely that issues within this category will provide a significant cost or liability. Basic investigation may be required to clarify the risk.
NONE		No source – pathway – receptor linkage present.

5.3 Potential On-Site Sources of Contamination:

- Contaminants associated with the road infrastructure (heavy metals, hydrocarbons, and fill materials) – note the original GIR assessment used threshold screening values for POS to represent post construction conditions. Therefore this is included to assess risks during construction and in the event unexpected contamination is encountered.

5.4 Potential Off-Site Sources of Contamination

- A brick and tile works formerly to the west, later probably used as a landfill site.
- A quarry formerly to the north-west of the site later described as landfill.
- Source of the risk is limited to landfill gas generated from the landfills.

5.5 Receptors:

Human Health

- Construction workers during the redevelopment phase.
- End users in nearby properties (residential and church).

Controlled Waters

- Coal Measures.
- There are no surface water courses in vicinity of the site.

Ecology:

- Sensitive ecological receptors not anticipated.

Property / Infrastructure:

- Build-up of gases with potential for explosion in nearby properties.

5.6 Pathways

5.7 Potential contaminant migration pathways considered relevant to the site are:

Human Health

- Ingestion of contaminated soils and dust particles by construction workers;
- Direct physical contact with near surface soils and contaminated dust particles by construction workers;
- Inhalation of wind-blown contaminated dust by construction workers;
- Inhalation of landfill gases, migrating vertically into buildings post construction;

Controlled Waters

- On-site contamination leaching into underlying aquifers.

Ecological

- Migration of contamination through groundwater and subsequent uptake by plant roots;
- Direct contact between ecological receptors and contaminated surface water;
- Direct contact between ecological receptors and contaminated soils;
- Ingestion of contaminated soils/surface waters by ecological receptors.

Property

- Migration of landfill gas into buildings.

5.8 Pollutant Linkages

5.9 A contaminant, pathway and receptor must all be present for a pollutant linkage and therefore risk to exist. Potential sources, pathways and receptors have been assessed above. The following table summarises the viable pollutant linkages potentially active at the site during and post development. These are put in context with the current risk where relevant.

Table 5.2 Potential Source-Pathway-Receptor Linkages

Source	Pathway	Receptor	During Construction	Post Construction
Contaminated soils	Ingestion of soil Ingestion of dust Dermal contact	Construction workers	**Low risk** Potential contact with soils on-site during construction works. Contamination sources not identified using screening thresholds for POS. No risk therefore from ingestion of soils. Limited potential for unanticipated contamination – to be assessed and remedial actions proposed if identified. Risks from dermal contact mitigated by PPE. Risks from dust mitigated by damping down during dry / windy weather.	**No risk** Work will not be conducted within the adjacent residential garden areas. No contact with contaminated soils anticipated.
	Leaching	Coal Measures	**No risk** Contamination sources not identified. Limited potential for unanticipated contamination – to be assessed and remedial actions proposed if identified. Near surface predominantly cohesive soils will limit infiltration potential.	**No risk** Contamination sources not identified. Limited potential for unanticipated contamination – to be assessed and remedial actions proposed if identified. Roads and pavements are impermeable preventing infiltration.
	Ingestion of soil Ingestion of dust Dermal contact Plant uptake	Ecological receptors	**No risk** No receptors identified.	**No risk** No receptors identified.

Source	Pathway	Receptor	During Construction	Post Construction
			Contamination sources not identified Limited potential for unanticipated contamination – to be assessed and remedial actions proposed if identified.	Contamination sources not identified
Landfill Gas	Inhalation of landfill gases	Residents in nearby properties.	**No risk** No structures on site so no risk to construction workers.	**No risk** Proposed works could affect gas migration pathways. However, potential sources are to the west / northwest so the works will not impact any migration pathways. Soft standing is also retained near to the garden areas. The risk therefore remains the same as pre-construction.
	Migration of gas into buildings	Adjacent Properties	**No risk** No structures on site so no risk to buildings.	**No risk** Proposed works could affect gas migration pathways. However, potential sources are to the west / northwest so the works will not impact any migration pathways. Soft standing is also retained near to the garden areas. The risk therefore remains the same as pre-construction.

6. Conclusions and Recommendations

6.1 Following review and subsequent update of the conceptual site model, it is considered that there is negligible change to the gas risk to the adjacent properties at the site due to the nature of the proposals and the existing ground conditions, and that a monitoring based approach is not required to demonstrate this.

6.2 JNP Group do not consider there to be significant risk to human health or controlled waters from elevated soil concentrations at the site as none have been identified to date. There is a small risk to construction workers from unanticipated contamination which would be mitigated by suitable remedial measures should this be encountered.

6.3 JNP Group recommend that a CEMP be completed for the site.

Document Issue Record

Technical Note No	Rev	Date	Prepared	Reviewed	Approved
TN-G-1006	-	November 2024	BR	JP	SLL/PT

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