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Our ref: R150095/LN
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Haringey Council London Borough
Planning, Regeneration & Economy,
Level 6, River Park House,
225 High Road,
Wood Green,
N22 8HQ

Dear Sir/Madam,

Discharge of planning conditions pertaining to Ashley House and Cannon Factory permission ref. HGY/2016/4165 and Reserved Matters Permission ref. HGY/2018/2353 and Ashley Park permission ref. HGY/2019/0108 (Appeal ref. APP/Y5420/W/19/3232707)

On behalf of our client Notting Hill Home Ownership, the following Ground Contamination Reports and Remediation Strategy has been prepared to facilitate the discharge of Part A of Condition 25 of the Ashley House and Cannon Factory permission ref. HGY/2016/4165 and Reserved Matters Permission ref. HGY/2018/2353 and Parts A of Condition 8 of the Ashley Park permission ref. HGY/2019/0108 (Appeal ref. APP/Y5420/W/19/3232707).

Notting Hill Home Ownership (NHHO) intends to progress delivery of the two schemes together on an integrated basis. This single technical report provides the necessary information to cover the conditions attached to the two respective planning permissions. The applicant has agreed this approach to discharge the corresponding conditions attached to both planning permissions in pairs with Officers at Haringey.

Yours faithfully,



Liam Norris MRICS
Partner
For and on behalf of calfordseaden LLP

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Contaminated Land Results Review

Ashley House & Cannon Factory, Ashley Road South, Tottenham Hale, London

Date: October 2019

Client Name: Notting Hill Genesis

Document Reference: WIE16248-100-R-1-2-1-TN

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS OHSAS 18001:2007)

Issue	Prepared by	Checked & Approved by
1-2-1	Ben Greenfield Senior Consultant	Freddie Alcock Associate Director

1. Introduction

Waterman Structures on behalf of Notting Hill Genesis (client) instructed Waterman Infrastructure & Environment Limited (Waterman) to undertake a contaminated land review of the August 2019 Socotec Factual and Interpretative report on Ground Investigation undertaken on Ashley House & Cannon Factory, Ashley Road South, Tottenham Hale, London. The ground investigation is supplementary to the following reports prepared by RSK, and was undertaken in accordance with the below Ground Investigation Specification prepared by Waterman Structures;

- Waterman Structures, June 2018, Ground Investigation Specification, Ashley House & Cannon Factory, Ashley Road South, Tottenham Hale, London, STR14205;
- RSK, April 2015, Environmental Site Assessment, Cannon Factory, Ashley Road, Tottenham Hale, London, N17 9LH, 27782R01 (00); and
- RSK, February 2015, Geo-Environmental Assessment, Ashley House, Tottenham Hale, 27663 R01 (00).

2. Proposed Development

Proposed buildings on the Ashley House site will comprise a four and a seven storey building, primarily in residential use with the exception of the ground floor which will be in commercial use. Soft and hard landscaping will surround the buildings. Private soft landscaping or basements are not proposed.

Proposed buildings on the Cannon Factory site will comprise a seventeen storey building with residential uses on the second to seventeenth floor, and commercial use on the ground and first floor. Undercroft parking will be present on the Cannon House site. The area surrounding the building will be a mix of soft and hard landscaping. Basements or private soft landscaping is not proposed.

3. Environmental Site Setting

The two pieces of land (Ashley House, and Cannon Factory) are located 200 – 250m north/north west of Tottenham Hale Railway Station at National grid reference (TQ344987).

Ashley House is generally level at 9.0mAOD and is occupied by a two storey building along the western boundary, warehouse along the northern boundary, and the remainder of the land used as a yard and parking area. Previous walkovers reported two underground diesel tanks, a fuel pump, an effluent tank, waste oil tank, and an electrical sub-station on the Ashley House site (Appendix A).

Historically the Ashley House site was a farm between 1850 – 1898 prior to becoming occupied by a multiple factories in 1913 (braid and bootlace factory, woollen factory and a pencil factory). In 1936 the Ashley House site was occupied by a printing ink and varnish factory which included various tanks chimneys and a water cooling tower. From 1991 to present the Site has remained as it currently exists.

The Cannon Factory site is generally level at 8.80mAOD and is occupied by a two storey building along the western boundary, adjoining warehouses along the northern and eastern boundaries, and the remainder of the Site surfaced with hardstanding. A small electrical sub-station was observed on the Cannon Factory site during the walkover in 2015.

The Cannon Factory site was undeveloped until the 1940's when warehouses and a rubber factory occupied the site. From 1970 to present partial redevelopment to the large warehouse in the northern Site portion has occurred.

Geology generally encountered are included in Table 1.

Table 1: Site Geology

Stratum	Thickness (m)	Description
Ashley Road		
Made Ground	0.59 – 1.2	Sub-base underlain by a sandy gravelly clay with fragments of brick, concrete
Enfield Silt Member	1.10 – 1.27	Orangish/yellowish brown slightly sandy gravelly CLAY
Kempton Park Gravel Member	1.14 – 3.50	Orangish brown very gravelly SAND to very sandy GRAVEL.
London Clay Formation	15.0	Grey and dark brown CLAY
Cannon Factory		
Made Ground	0.25 – 2.17	Sub-base underlain by a silty gravelly sand.
Enfield Silt Member	0.7 – 1.60	Orangish/yellowish brown slightly sandy gravelly CLAY
Kempton Park Gravel Member	3.20 – 4.60	Orangish brown very gravelly SAND to very sandy GRAVEL.
London Clay Formation	15.80 – 16.30	Grey and dark brown CLAY

The Made Ground and London Clay Formation are both unproductive strata. The Enfield Silt Member and the Kempton Park Gravel Member are both Secondary A Aquifers. The Site is within a groundwater Source Protection Zone II, however it is understood this relates to abstractions to the aquifer underlying the London Clay Formation. The London Clay Formation is of sufficient thickness to be an aquiclude preventing the migration to the underlying sensitive aquifers where it remains unpenetrated.

Surface water receptors include the Pymmes Brook and River Lea 380m east. Surface water or groundwater abstractions are absent within 500m of the Site. Given the distance to the surface water receptors (Pymmes Brook and River Lea) 380m east, and the intervening industrial and commercial land uses they are unlikely to be sensitive receptors with any impact unlikely to be directly attributable to the Site.

Landfills are absent within 250m of the Site, with the closest being 465m north.

4. Ground Investigation Results

4.1 Soil

Ground investigations completed by RSK (2015) and by Socotec (2018) recorded visual and olfactory evidence of contamination in both the Ashley House and Cannon Factory site's. These included; potential Asbestos Containing Material (ACM) in the shallow Made Ground, and evidence of gross petroleum hydrocarbon contamination. ACM was generally widespread across both site's and gross petroleum

hydrocarbon contamination localised in one location on the Cannon Factory site, and generally widespread on the Ashley House site.

Soil samples were tested by Socotec Laboratories for metals, BTEX (benzene, ethyl benzene, toluene, xylene), TPH CWG (petroleum hydrocarbons), asbestos (ID and quantification), and Volatile Organic Contaminants (VOC). The contaminants tested generally match the possible Contaminants of Concern (CoC) given the Site's historical and current use. A review of the result identifies deviant laboratory results at three locations due to the holding time being exceeded (not scheduled in sufficient time by Socotec); BH4 (0.9mbgl, 1.60mbgl), PH1A (1.2mbgl, 2.3mbgl), and PH3 (1.2mbgl). Where reviewed by the regulatory authority they may not accept these results due to them being deviant. Given they are restricted to three locations the removal of them is unlikely to affect the overall conclusions, however an assessment needs to be completed demonstrating this.

The soil laboratory results were assessed against Generic Assessment Criteria (GAC) relevant for a residential land use without plant uptake (1% Soil Organic Matter (SOM) content). The assessment undertaken by Socotec identified several contaminants in exceedance of the residential land use without plant uptake GAC. These were primarily recorded on the Ashley House site and included heavy metals, Poly-cyclic Aromatic Hydrocarbons (PAH), and asbestos. On the Cannon House site with the exception of asbestos only one exceedance of PAH was recorded.

4.2 Groundwater

Socotec have identified the Secondary A Aquifer in the Kempton Park Gravel Member as being potentially at risk from contaminants originating on-site, and as likely being in hydraulic continuity with the Pymmes brook and River Lea east of the Site. The sensitive Secondary A Aquifers in the Lambeth Group and Thanet Sands, and the Principal Aquifer have been excluded from assessment due to the overlying London Clay Formation. We would agree with this assessment, and the prioritisation of the Secondary A Aquifer in the Kempton Park Gravel Member as the controlled water receptor sampled from and assessed.

Socotec sampled from BH01 – BH04 on one occasion during the ground investigation. The four boreholes are installed solely in the Kempton Park Gravel Member. It is unclear what methodology Socotec used to take the groundwater samples, given the absence of in-situ parameters it is likely the groundwater samples were collected using bailers. Bailers are an energetic groundwater sampling technique in which the water column is highly agitated leading to the loss of volatile contaminants. The groundwater volatile contaminant concentrations recorded may therefore be unrepresentative and have underestimated the vapour risk to future Site users. Given the potential for chlorinated solvents and petroleum hydrocarbons we would expect the groundwater samples to have been taken using low flow techniques minimising the volatile contaminant loss. This is consistent with best practice, and may be picked up by the regulatory authorities. Socotec should be asked to confirm the groundwater sampling techniques used.

Groundwater samples from both the Socotec and RSK investigations were assessed against the Environment Agency derived Environmental Quality Standards (EQS) and the UK Drinking Water Standards for petroleum hydrocarbons only. The bioavailable contaminants (zinc, lead, nickel, copper, manganese) threshold criteria have not been calculated using the EA M-BAT tool and therefore are highly conservative.

The groundwater contaminant concentrations are generally consistent with soil contaminant concentrations with elevated metals and petroleum hydrocarbons in exceedance. A petroleum hydrocarbon hotspot is recorded in BH02 (Ashley House) and WS107 (RSK) (Cannon Factory). The Socotec report alludes to the

potential for off-site contamination sources to be the cause of the petroleum hydrocarbon contamination on Ashley House however no assessment has been made of the groundwater flow direction and whether this could be the cause. Given the potential petroleum hydrocarbon contamination sources recorded on Ashley House the contamination may also be originating on site. An assessment of the groundwater flow direction through review of the relative groundwater levels and comparison of contaminant concentrations up hydraulic and down hydraulic of the Site should be completed to determine the impact the Site is having on the groundwater regime.

Socotec conclude on the Ashley House site an unacceptable risk to controlled waters exists requiring further investigation and risk assessment. We would agree with this conclusion and would expect as a minimum an additional groundwater sampling round in Socotec and RSK monitoring wells to be required.

On the Cannon Factory site the risk to controlled waters is assessed as low. Given the petroleum hydrocarbon concentrations recorded at BH02 together with the oily sheen recorded on the groundwater during sampling we consider a potentially unacceptable risk is present requiring further investigation and assessment. This should include a supplementary groundwater sampling round and review of the relative groundwater levels to confirm the current groundwater sampling results, groundwater flow direction, and the potential impact off-site receptors may be having. Dependent on the results additional exploratory holes may be required down hydraulic gradient of the Cannon Factory site to confirm gross petroleum hydrocarbon contamination is not extending off-site.

4.3 Ground Gas

A review of possible ground gas sources has not been undertaken by Socotec. In the RSK reports the ground gas sources assessment is limited to only landfills which they identify as being not present in the surrounding area and therefore excluding them as a possible ground gas risk. As part of the Socotec report we would expect an assessment of the potential for a significant ground gas regime comprising a review of potential sources supplemented by the geology encountered in the RSK investigations.

Our review would identify no viable potentially significant ground gas sources;

- Landfills or coal mines are absent in the immediate surrounding area;
- The Made Ground is relatively shallow and is generally recorded as being granular and is unlikely to contain large quantities of readily degradable organic material which would identify it as potentially being a significant ground gas source.

Ground gas monitoring installations in both the RSK and Socotec ground investigations extend into the saturated zone and are therefore inappropriate for use in assessing the ground gas regime, resulting in an overly conservative assessment being made. As per best practice guidance the ground gas monitoring wells should be installed within the unsaturated zone to avoid interference from small quantities of organic material in the water column which would not otherwise have migrated to the surface without the well creating a preferential pathway.

Based on the ground gas monitoring results recorded by RSK and Socotec an overall Characteristic Situation 2 requiring basic ground gas protection measures is recommended for Ashley House and Characteristic Situation 1 (CS1) for Cannon Factory. The ground gas regime on both Site's should be reassessed with unrepresentative ground gas monitoring results identified and removed from consideration. Given the installation of these monitoring wells an assessment of the potential ground gas

sources coupled with a review of Total Organic Concentrations (TOC) recorded during the investigation is likely relied to be sufficient to determine the classification for both Sites.

4.4 Vapour

An assessment of the vapour risk to future Site users was undertaken initially through comparison of the SoBRA derived groundwater vapour threshold values (SoBRA_{GWVAP}) against the petroleum hydrocarbon concentrations. Chlorinated solvents were not recorded above the laboratories limit of detection. The Socotec reports based on the assessment against SoBRA_{GWVAP} threshold values an unacceptable risk to future Site users via the indoor vapour inhalation pathway is not present. A further assessment of the vapour risk is completed in Section 9.2.2, in which Socotec conclude given the maximum soil headspace concentration of 2.1ppm, and the absence of elevated Volatile Organic Contaminants (VOC) in soil and groundwater samples a significant risk from VOCs is not present. The Socotec report does not recommend any vapour protection measures in the proposed Development, beyond suitable decommissioning and removal of the underground fuel storage tanks.

5. Conclusions and Recommendations

The ground investigation and assessment by Socotec which includes a high level review of the work by RSK has generally identified the ground conditions present on-site given the restrictions present in locating the exploratory holes. However in their assessment Socotec have potentially been overly conservative on the ground gas risk, and under conservative on the risk to controlled water receptors. We would advise the ground investigation results assessment is revised potentially at the Remediation Strategy stage, which is supplemented by additional investigation on both sites (Ashley House and Cannon Factory).

We would advise the following are undertaken;

- The initial step should comprise the completion of an additional sampling round within existing groundwater monitoring wells to confirm the current groundwater contamination results. The results should then be assessed and used to identify whether further assessment through completion of a Detailed Quantitative Risk Assessment (DQRA) or supplementary investigation is required to clarify whether an unacceptable risk to receptors is present.
- During the revised re-assessment the following should be completed;
 - Confirmation the risk to future Site users remains suitable despite the deviant laboratory results;
 - Use of the M-BAT tool to derive the EQS threshold criteria for the bioavailable contaminant concentrations;
 - An assessment of the groundwater flow direction through a review of the relative groundwater levels. Once groundwater flow direction is confirmed the impact the Site is having on the surrounding groundwater contamination status accounting for the contamination concentrations present in up hydraulic gradient monitoring wells should be completed.
 - An assessment of the impact the Site is having on the groundwater contamination status accounting for which monitoring wells are up hydraulic gradient and which are down hydraulic gradient; and
 - A review of the Site's ground gas regime which brings it back to the first principles in assessing the ground gas sources and excludes the ground gas monitoring results from monitoring wells

not installed correctly. It is likely the review will focus on potential ground gas sources and the ground gas generation potential of Made Ground.

- The supplementary investigation should it be required is likely to focus on the delineation of the petroleum hydrocarbon contamination potentially present on the Cannon Factory around BH02. The possible widespread presence of asbestos below the concrete slab should be accounted for should a supplementary petroleum hydrocarbon delineation investigation be completed.