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APPENDIX 7

OUTLINE SURFACE & FOUL WATER DRAINAGE STATEGY

INDICATIVE NORTH

Key

- EX–FWS — Existing Adopted Surface Water Sewer
- Proposed Surface Water Sewer
- Proposed Surface Water Manhole
- Attenuation Tank
- Site Boundary
- Proposed Storm Pumping Station
- Potential storm exceedance flow routes for storm events greater than 1 in 100 plus 40% climate change
- Rising Main

NOTES

1. This drawing is to be read in conjunction with all relevant Architects, Engineers and other specialist details and specifications.
2. Do not scale from this drawing.
3. Drawing issued for preliminary discussions only, further to approval from Planning, Local Authority, Sewerage Undertaker, Environment Agency and any other governing parties. Following receipt of further information and comments the scheme may be revised.
4. Drawing based upon PRC architects layout drawing ref: 11045_FE-010_P4 Site Layout
5. The location and level of all existing services are to be identified prior to construction and the engineer advised of any clashes.
6. Locations and extent of drainage features, including SuDS facilities and discharge point indicative only.
7. No hydraulic modeling, geotechnical and structural assessment of the proposal has been carried out at this stage.

SuDS Design:

Site not suitable for infiltration due to made ground and clay substrata
SuDS options on this site:

- Attenuation tank - modular cellular units (95% void) with suitable access for maintenance. Tank to be below basement / courtyard level to prevent flooding from surcharge.
- flow vortex control - which will restrict storm discharge to all storm events up to 1 in 100 year plus 40% climate change.
- Trapped gullies & drainage channel outlets - will effectively remove oils, hydrocarbons and silt from the highway runoff prior to discharge.
- Tanked Porous paving - will effectively remove oils and improve water quality

Management and Maintenance of SuDS:

The drainage system will be designed to minimise maintenance requirements however, a full maintenance scheme will be established for these elements not offered for adoption.

The layout management arrangements will be constructed at the detail stage. A maintenance plan for the SuDS drainage system will be prepared prior to site occupancy to ensure drainage system remains operational and effective for the lifetime of the development.

Storm Drainage Design Criteria:

- Total discharge rate: 2 l/s
- Storm design based upon storm events up to and including the 1 in 100 year storm event plus 40% climate change.
- The total proposed Impermeable Area: 0.228Ha
- The total site area = 0.286 Ha
- Total Attenuation volume required: 138m³ (subject to detailed calculations)

This Drainage Design Is Subject To:

- Full ground investigation report
- Porosity test in accordance with BRE 365
- Detail drainage and levels design
- Further discussion with Thames Water, LA, LLFA, EA
- S106 application approved
- Confirmation of existing storm discharge point required. (CCTV Survey)

Finished Floor Level - 13.45m
Basement Level - 10.15m

FOR PLANNING PURPOSES ONLY

Rev.	Amendments	Date	By	Chkd.

Drawing Status

CWA
Intelligent Engineering

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Station Road
Hampton
London

Outline Surface Water Drainage Strategy

Drawing Number	Revision
CWA-19-207-SK001	P4

Drawn by	NR	Checked by	JSP
Date	July 2019	Scale	1:200 @ A1

Upper Garden Terrace
Lower Garden Terrace
External garden at lower level
External garden at lower level
Lower Courtyard Garden
Patio
Upper Terrace
Patio
Suites entrance
Reception
Suites entrance
Main entrance
Staff entrance
Refuse
Deliveries
Existing site access
Existing site access
Silt Trap manhole
Silt Trap manhole
Shalllow sub-base permeable block paving to provide run-off treatment for surface water
Underground Storage facility providing attenuation of run-of for all storm water events up to and including the 1 in 100 year + 40% climate change.
Attenuation cellular tank size 4m x 36m x 1m deep = 145m³
Package pumping station. Twin pumps discharge at 2 l/s.
Sewer diameter TBC (Thames Water)
Potential discharge route to public sewer, subject to Thames Water approval
Potential connection point subject to Thames Water approval (Section 106 Application approval).
blue outline = approved footprint
blue outline = approved footprint
blue outline = approved footprint
STATION ROAD
STATION ROAD
BUS STOP
BUS STOP
76e
76f
76g
74c
76d
74
72
70
75
77 to 81
54
Tarmac
Concrete paving slabs
Concrete paving slabs
Concrete paving slabs
Kerb Rails
Wall ht 1m
Wall ht 1m
Wall ht 1m
Duct
Gas
Pipe
Post
Warehouse

INDICATIVE NORTH

Key

- EX–FWS — Existing Adopted Foul Water Sewer
- Existing Manhole
- Proposed Foul Water Drain
- Proposed Foul Water Inspection Chamber
- Proposed Foul Water Manhole
- Proposed Foul Pumping Station
- Rising Main

NOTES

1. This drawing is to be read in conjunction with all relevant Architects, Engineers and other specialist details and specifications.
2. Do not scale from this drawing.
3. Drawing issued for preliminary discussions only, further to approval from Planning, Local Authority, Sewerage Undertaker, Environment Agency and any other governing parties. Following receipt of further information and comments the scheme may be revised.
4. Drawing based upon PRC architects layout drawing ref: 11045_FE-010_P4 Site Layout
5. The location and level of all existing services are to be identified prior to construction and the engineer advised of any clashes.
6. Locations and extent of drainage network and discharge point indicative only.
7. No hydraulic modeling, geotechnical and structural assessment of the proposal has been carried out at this stage.
8. Drainage Position subject to detailed design and coordination with foul system and structural foundations
9. Foul design based on 85 units is which equates to 4.05 l/s peak flow.

This Drainage Design Is Subject To:

- Detail drainage and levels design
- Further discussion with Thames Water, LA, LLFA, EA
- S106 application approved

Finished Floor Level - 13.45m
Basement Level - 10.15m

Upper Garden Terrace
Lower Garden Terrace
Lower Courtyard Garden
Patio
Suites entrance
Reception
Main entrance
Service entrance
Refuse
Drop-off / deliveries
Existing site access
means of escape route
blue outline = approved footprint
STATION ROAD
76e
76f
76g
74c
76d
74
72
70
Ref: 6601(TBC)
CL: 13.56
IL: 10.99 (TBC)
1 in 103 TBC
175mm diameter
Package pumping station. Twin pumps. Rate TBC. 24 hour storage volume.
Potential discharge route to public sewer, subject to Thames Waters approval
Potential connection point subject to Thames Water approval (Section 106 Application approval).
Ref: 7601 (TBC)
CL: 12.28
IL: 10.13 (300Ø)
IL: 10.255 (175Ø)
300Ø

FOR PLANNING PURPOSES ONLY

Rev.	Amendments	Date	By	Chkd.

Drawing Status

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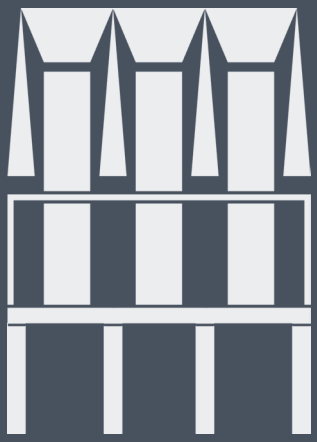
Station Road
Hampton
London

Outline Foul Water Drainage Strategy

Drawing Number		Revision
CWA-19-207-SK003		P4
Drawn by	NR	Checked by JSP
Date	July 2019	Scale 1:200 @ A1



HAMPTON MEWS

LAND CONTAMINATION REPORT

February 2016

ENVIRONMENTAL

Phase 1 and 2 Site Investigation

Prepared for UK Pacific Hampton Station LLP

HAMPTON TRAFFIC UNIT, LONDON

Ref. 1374-14 | 08 October 2014

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TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

1) LCM Environmental Ltd were commissioned by UK Pacific Hampton Station LLP to undertake a Phase 1 and 2 Site Investigation at the former Hampton Traffic Unit, London. The assessment has been considered in the context of proposed redevelopment of the site for residential purposes.

2) Information obtained from the study of historical maps and from public data sources indicates that the site layout was constructed into its present form in c.1914, and the surrounding area has not experienced any significant land use changes since c.1991. Commercial and Residential urbanisation of the surrounding area began in c.1896, with Beveree Sports Field developed north east of the site during c.1956. Historic site use relating to the use of the site as a police station from c.1914 onwards poses a high risk for ground contamination due to associated underground storage of fuel. These risks must be investigated so that the health risks to site workers, future site residents, and the risks to the environment are minimised.

3) According to Landmark's Envirocheck data, the site is thought not to be susceptible to extreme flooding from rivers or seas.

4) The preliminary conceptual site model (PCSM) raised suspicion of possible contamination due to the underground fuel storage tanks located on site associated with its use as a police station. The sites underlying hydrogeology increases the concern due to its high permeability (Taplow Gravel) and principal aquifer classification. Therefore if the storage tanks leak there is a possible pathway for the contamination to migrate to other parts of the site, or further. A ground investigation was performed on site to explore these potential issues.

5) The investigation specifically focused on areas around the underground petrol storage tanks and the interceptor. Although we didn't uncover any contaminated soil at the front of the station (site closest to Station road) around the two larger tanks, one smaller tank, and the petrol interceptor, we did find contaminated soil at the rear of the station (site furthest from Station road) in the area around the two smaller underground tanks.

6) We also encountered groundwater at depths around 3.65m beneath the site.

7) The contamination is considered to be confined to a 1m band of sand from approximately 3.4- 4.4m in the area where borehole ws5 was situated. Other boreholes drilled in the area have not raised the same concern for contamination.

2. INTRODUCTION

The purpose of the environmental risk assessment (desk study) and walkover survey was to develop a site-specific conceptual model to determine potential contaminants of concern associated with present and historic site use and to identify potential receptors for a preliminary appraisal of risks. This report has been prepared to support the planning application for the proposed re-development of the site.

The assessment has been based on observations made during a site walkover survey together with a review of publically available information on the site history. A Landmark Envirocheck report has been acquired for the site to provide information on site history and surrounding land uses available on the public registers, together with consultation with site operatives and management personnel.

2.1 INSTRUCTION

The report has been prepared in accordance with an instruction, dated 28^{h} August 2014, from Mr E. Newell of UK Pacific Hampton Station LLP. In accordance with current best-practice guidelines, a phased approach has been adopted for the assessment, commencing with a Phase 1 Desk Study and Site Walkover.

2.2 SCOPE OF WORKS

It was the aim of this investigation to carry out a Phase 1 Desk Study and site walkover survey and a ground investigation for the client at the following site:

60-68 Station Road,
Hampton
Middlesex
TW12 2DA

The objectives of the investigation were as follows:

- Upon receiving instruction, attend the site to carry out a site walkover survey to delineate the site area, obtain photographs, and make pertinent observations relating to the storage and maintenance of fuel, the general condition of the site, drainage aspects, and any evidence of spills.
- The acquisition and interpretation of a Landmark Envirocheck report with historical maps and environmental sensitivity data.
- Identify the relevant possible receptors, pathways and therefore any pollutant linkages and assess the consequential level of risk to the immediate area and controlled waters.
- Prepare a preliminary conceptual model from an understanding of the site, and determine if there is a significant risk to the identified receptors associated with identified pollutant linkages.
- Present the findings of the risk assessment in a report, ensuring that the analytical strategy adopted is informed and appropriate, taking into account factors such as site history, geology and current use.

2.3 LIMITATIONS

(1) This report has been prepared for UK Pacific Hampton Station LLP in accordance with their instruction dated 28 August 2014. The report is intended to provide information relevant to the site to assist with the development of a preliminary conceptual model to assess environmental risks and liabilities associated with the site.

(2) It should be noted that subsoils are inherently variable and by their very nature are hidden from view such that no investigation can be exhaustive to the extent that all soil conditions are revealed. Conditions may therefore be present beneath the site that were not apparent from the operations carried out at the site thus far.

(3) The boreholes have been logged in accordance with BS:5930 and should be used to consider the environmental aspects of the site, as per the agreed scope. They are not suitable for the consideration of geotechnical aspects.

(4) The assessment has been carried out on the basis of redevelopment of the site for residential use with outdoor spaces, and the need for remedial works considered in the context of reducing the risk to future on site residents, nearby residents, groundwater and eco-systems.

(5) LCM Environmental does not extend responsibility or owe any duty of care to any third party for the whole or any part of the contents. The investigation and reportage has been undertaken with all reasonable skill, care and due diligence. LCM Environmental disclaims any responsibility to the client or others in respect of any matter(s) outside the agreed scope of works.

(6) This report has addressed all of the environmental concerns that were apparent on site during the time of the site walkover and the observations reported do not purport to constitute a full survey of on-site activities. As such there may be non-compliant activities that take place at the site that were not apparent during the site walkover which have not been documented in this report. Similarly, this assessment has been based to a large extent on third party data acquired from Landmark Information Group. This data has been taken at face value and has not been subjected to any third party validation.

3. DESK STUDY ASSESSMENT

3.1 SITE LOCATION

The site comprises currently of the closed Hampton Traffic Unit. This report focuses on the environmental risks and liabilities of the area in relation to the potential contamination on-site and the surrounding geology.

The approximate National Grid Reference (NGR) for the site is TQ 13760 69720. The site covers an area of approximately 0.26 ha.

Present and historic potential contaminated site uses have been identified in the surrounding area; G Kingsbury ltd garage (c.1956 - present) 124m south east, and Waterworks filter beds (c.1919 – c.1992) approximately 150m west. The Landmark data also suggests that there is Local Authority Landfill Coverage on site, however after referring to the Environment Agency Landfill map it is noted that the nearest is an historic landfill (Kempton Park Gravel Pit) approximately 1.2km west.

A detailed site description obtained from a site walkover of the site carried out on 6th September 2014 can be found in Section 3.2

Figure 1: Street Map showing the approximate location of the site (denoted by orange arrow)

3.2 SITE DESCRIPTION

This description should be read in conjunction with the Indicative Site Layout Plan which can be found in Appendix B of this report. The facilities described cover the site area of approximately 0.26 hectares located in Hampton. Furthermore, primary consideration is given to principal features pertinent to the assessment and as such this site description does not purport to constitute an exhaustive feature list.

The site is located on Station road, and access is limited to one large gated entrance and one small door entrance from the road. The gated entrance is large enough to facilitate vehicles and is padlocked for security.

As you enter the site, you find to the right a car parking area (approx. 28 x 40m^2) which is characteristically flat and covered by concrete. To the left there is a building complex of offices and rooms for personnel. At the rear of the site there is a large building with a ramp (approx. 20m in length) to access the top floor. The ground floor is for vehicle maintenance use as it offers a car washing facility and refuelling station, the top floor is for workshop and stores.

Figure 2: Aerial photograph of the site showing the approximate site boundary

3.3 INFORMATION OBTAINED FROM OTHER SOURCES

An Environmental Enquiry was made with the London Fire and Emergency Planning Authority in regards to the status of the underground tanks located on site. Information obtained specifies the 5 tanks situated on site, their size, and when they were filled in.

There are 3 petrol storing tanks situated at the front of the site (site closest to Station road) underneath the car parking area. 2 of these are quite large both with capacity of 45,721L, and a smaller tank with a capacity of 2,300L. All 3 are single skin steel tanks and were solid filled c.1975. There is also an underground petrol interceptor tank located in this area.

Towards the rear left of the site (site furthest from Station road) there are 2 underground petrol storage tanks located underneath the concrete. Not as much information is available on these tanks other than their storage capacity; 1 tank has a capacity of 22,000L and the other 9,000L. Both are situated in the courtyard area in-between the back building and the maintenance building.

3.4 GEOLOGY

According to the local BGS geological map the site's bedrock geology is formed of London Clay. This sedimentary bedrock is formed of clay and silt approximately 34 – 56 million years ago. Clay is considered impervious with low permeability. Overlying the bedrock geology are superficial deposits of the site are formed of Taplow Gravel. These deposits consist of sand and gravel and were formed up to 2 million years ago. Due to the granular characteristics of these soils the geology is considered to have high permeability.

3.5 HYDROLOGY

The nearest surface water body is the River Thames, located 268m south of the site.

Based on the underlying geology of the area, there is high susceptibility to groundwater flooding on site. No other surface water features are considered to be within the risk zone.

3.6 HYDROGEOLOGY

The bedrock geology (London Clay Formation) is designated as unproductive strata, with low permeability. The superficial deposits (Taplow Gravel Formation) is designated as a principal aquifer with high permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. As a result we assess the site to have high groundwater vulnerability.

The site does not lie within a Source Protection Zone and is therefore not considered to cause risk to potential groundwater sources such as boreholes, springs, and wells used to supply drinking water.

3.7 SITE HISTORY

Historical maps of the site area obtained via Landmark, presented in Appendix F of this report, have been reviewed to provide data on the site history. Pertinent information determined from review of these maps is set out in the following table:

Table 1: Historical Mapping Review

Mapping Date	On-site	Off-site
1865 – 1880 Hampton (1:2,500)	The land is covered by woodland, and undeveloped green space.	The surrounding land use is a mixture of fielded grassland and woodland. To the north/north west of the site there is a railway line, and situated south of the site is Southwark and Vauxhall water works. There is a police station located approximately 150m south east of the site.
1895 - 1896 Hampton (1:2,500)	The land has been cleared of woodland, and developed for residential/commercial use. The site is largely occupied by gardens and outside space, with buildings located in the south of the site.	The surrounding area has experienced urbanised redevelopment in the nature of residential and commercial infrastructure. However the redevelopment has largely taken place in the south/south east/south west of the site, with the land situated north/north east/north west still mostly undeveloped.
1914 - 1915 Hampton (1:2,500)	The site has been redeveloped and is now in use as a police station.	Areas north of the site have undergone development for residential/commercial use. The waterworks located south/south west has advanced west of the site and is in use as filter beds.
1934 Hampton (1:2,500)	There are no notable changes to the site.	120m east of the site is a timber yard. There are no other significant changes in the surrounding area.
1957 - 1962 Hampton (1:2,500)	There are not notable changes to the site.	The development of Beveree Sports Field approximately 100m east of the site. A joinery works 100m and garage 105m are established south east of the site.
1968 - 1974 Hampton (1:2,500)	Buildings have been removed to build a car park on site.	The timber yard and joinery mentioned above have been cleared.
1991 - 1992 Hampton (1:2,500)	There are no notable changes to this site.	An unspecified works has been developed approximately 100m south east of the site.
2014 Hampton (1:10,000)	There are no significant changes on site.	The filter beds (mentioned above) associated with the water works have been redeveloped and the area is now in use as a green park.

3.8 DATA REVIEW

A report was acquired for the site to provide an indication of the site history and surrounding land uses available on the public registers. The report provides data from a number of service providers including the British Geological Survey, Environment Agency and English Nature. The report is included in Appendix F.

The location of data point references is provided relative to the National Grid Reference for the site centre. The search radius extends 250m from the site centre.

Table 2: Risk Matrix

Degree of risk (R) = Likelihood (L) x Effect (E)

Likelihood (L)	Description	Probability	Effect (E)	Description	Increase in cost and time
5	Almost certain	>70%			
4	Probable	50-70%	4	Very high	>10%
3	Likely	30-50%	3	High	4-10%
2	Unlikely	10-30%	2	Low	1-4%
1	Negligible	<10%	1	Very low	<1%
Risk (R)	**Risk Level**	**Action**			
1-5	Trivial	None			
6-10	Significant	Undertake appropriate mitigation measures to reduce the risk level by appropriate on-site practice at little additional cost.			
>10	Substantial	Designers should take such risks into account and avoid or reduce risk level to acceptable levels. Additional resources required.			

Table 3: Environmental Data Review

Data Type	Distance from site	Hazard	Likelihood	Effect	Degree of risk	Mitigation measures
Police Station	On site	Area may have been subjected to contamination due to leaking of underground fuel storage tanks.	3	3	9	Remove any contaminated ground from site
Garage	124m south east	Potential to have associated underground fuel tanks.	1	3	4	None Required

4. PRELIMINARY CONCEPTUAL MODEL

4.1 RATIONALE

The site characterisation attempts to identify potential previous and existing site sources of contamination. The conceptual model links the identified sources likely to cause significant possibility of significant harm via pathways to identified critical receptors. The conceptual model is therefore based on a number of identified source-pathway-receptor scenarios. For land to be classified as contaminated a significant pollutant linkage will need to be identified which will include each component of the conceptual model. The absence or removal of a source or interception of a pathway will 'break' the pollutant linkage.

The conceptual model is characterised by identification of the following:

- On-site sources which may impact on-site receptors via plausible pathways
- On-site sources which may impact off-site receptors via plausible pathways
- Off-site sources which may impact on-site receptors via plausible pathways

4.2 ON-SITE TO ON-SITE

Sources

The sources are divided into primary and secondary. The primary source is defined as the generic land use and the secondary source is the likely constituents of concern relating to the primary source, which may be affecting the soil, groundwater or soil gas.

Historic and current sources of potential contaminants may be associated with the following:

- Underground tanks storing diesel for police vehicle use

Potential contaminants of concern which may be encountered on the site include:

- Semi-Volatile Organic Compounds (SVOC)
- Total Petroleum Hydrocarbons (TPH)
- Poly Aromatic Hydrocarbons (PAH)
- Volatile Organic Compounds (VOC)

Pathways

Migration pathways requiring consideration include:

- Vapour phase migration through the unsaturated zone
- Dissolved phase migration within groundwater
- Light non-aqueous phase migration on surface of groundwater

Exposure pathways associated with the current site and future use include:

- Dermal contact
- Outdoor inhalation of vapours
- Leaching of mobile contaminants to groundwater

Receptors

The potential receptors are identified as follows:

- Human beings (Future residents on site, site visitors, site workers)
- Groundwater
- Structures
- Eco-systems

The following table summarises the potential pollutant linkages associated with current site use. The degree of risk (R) is calculated by multiplying the likelihood (L) with the effect (E).

Table 4: On-site to On-site Source – Pathway – Receptor Model

Source 1	Source 2	Migration Pathway	L	Exposure Pathway	E	Receptor	R
On-site historic and current spills of fuels and oils	BTEX, MTBE, TPH Aliphatic and Aromatic Fractions; volatile and semi-volatile organics	Vapour phase migration through the unsaturated zone. Liquid phase migration through unsaturated zone and leaching to groundwater.	3	Dermal contact; soil/dust ingestion; indoor and outdoor vapour inhalation; migration to groundwater	3	Future site residents, site visitors, site workers; groundwater; surface waters; eco-system	9

4.3 ON-SITE TO OFF-SITE

Source

The site has a history as a police station with associated underground fuel storage tanks. It is likely to be contaminated with some or all of the following substances:

- Hydrocarbon contamination (including TPH, PAH)
- Volatile Organic Compounds (VOC)
- Semi Volatile Organic Compounds (SVOC)

The potential for on-site to off-site pollutant linkages to exist must be investigated to minimise environmental liabilities and to safeguard sensitive off-site receptors.

Pathways

Migration pathways are likely to include leaching to groundwater through superficial soils, wind-blown dust transport and, less likely vapour phase migration through the unsaturated zone to an off-site receptor.

Leaching to groundwater is a potential pathway which is dependent on the surface water infiltration rate. The Police Station outdoor space was made up of a concrete surface with a drainage system. Cracks were visible in the concrete and were facilitating the growth of weeded plants.

Source contaminants which have leached to groundwater or directly entered groundwater may migrate off-site as light non-aqueous phase liquids (LNAPL) or as dissolved phase. Dense non-aqueous phase liquids (DNAPL) may sink in the groundwater and be deposited on a permeability contrast.

LNAPL may continue to volatise as transported off-site on the groundwater. This may result in vapour phase migration through the unsaturated zone to an off-site receptor.

Receptors

The potential receptors are identified as follows:

- Groundwater
- Human beings
- Eco-systems

The area itself is in an area of high groundwater vulnerability as the geological classification of the underling bedrock is sandy gravel – a designated principal aquifer which provides base flow to rivers.

The following table summarises the potential pollutant linkages associated with current site use. The degree of risk (R) is calculated by multiplying the likelihood (L) with the effect (E):

Table 5: On-site to Off-site Source – Pathway – Receptor Model

Source 1	Source 2	Migration Pathway	L	Exposure Pathway	E	Receptor	R
On-site underground fuel storage tanks	BTEX, MTBE, TPH Aliphatic and Aromatic Fractions; volatile and semi-volatile organics; chlorinated solvents	Vapour phase migration through the unsaturated zone. Liquid phase migration through unsaturated zone and leaching to groundwater.	3	Dermal contact; soil/dust ingestion; indoor and outdoor vapour inhalation.	3	Human beings passing the site (Site is located on a commercial street), site workers, visitors	9
Made ground	Contaminants in made ground (heavy metals, BTEX, MTBE, TPH Aliphatic and Aromatic Fractions, volatile and semi-volatile organics, chlorinated solvents	Wind-blown dust	3	Ingestion and inhalation of dust, inhalation of vapours	2	Human beings passing the site (Site is located on a commercial street), site workers, visitors	6
		Liquid phase migration through unsaturated zone and leaching to groundwater.	1	Direct contact	2	Structures and Services	2
			1	Uptake via contaminated groundwater	2	Controlled Waters; Eco-systems	2

4.4 OFF-SITE TO ON-SITE

Source

The sources are divided into primary and secondary. The primary source is defined as the generic land use and the secondary source is the likely constituents of concern relating to the primary source which may be affecting the soil, groundwater or soil gas.

There are significant potentially contaminative land uses within a 250m radius of the site; a garage located 124m south east, a dry cleaners 192m south east, and Thames Water Hampton water treatment works 250m south.

Pathways

On-site migration of potential off-site contaminants is only likely if the particular chemicals partition in the environment into vapour and liquid phase. Therefore mobile substances such as TPH, and VOCs, if present in sufficient quantity, may migrate on-site.

Possible pathways that may require consideration include:

- Vapour phase on preferential pathways

Receptors

The potential receptors are identified as follows:

- Site workers, future site residents, site visitors
- Groundwater

The following table summarises the potential pollutant linkages associated with the proposed development. The degree of risk (R) is calculated by multiplying the likelihood (L) with the effect (E):

Table 6: Off-site to On-site Source – Pathway – Receptor Model

Source 1	Source 2	Migration Pathway	L	Exposure Pathway	E	Receptor	R
Potential associated underground fuel storage tanks (garage 124m SE)	BTEX, MTBE, TPH Aliphatic and Aromatic Fractions; volatile and semi-volatile organics; chlorinated solvents	Vapour phase migration through the unsaturated zone. Liquid phase migration through unsaturated zone and leaching to groundwater.	2	Vapour inhalation; Dermal contact	2	Site workers, future site residents, site visitors	4
Use of hazardous cleaning solvents (dry cleaners 192m SE)	Perchloroethylene cleaning solvent	Vapour phase migration through the unsaturated zone. Liquid phase migration through unsaturated zone, leaching to groundwater, and transferring of waste.	2	Vapour inhalation; Dermal contact, ingestion	2	Site workers, future site residents, site visitors, groundwater, ecosystems	4
Made ground	Contaminants in made ground (heavy metals, BTEX, MTBE, TPH Aliphatic and Aromatic Fractions, volatile and semi-volatile organics, chlorinated solvents	Wind-blown dust Liquid phase migration through unsaturated zone and leaching to groundwater.	2	Ingestion and inhalation of dust, inhalation of vapours	2	Future site residents	4
			1	Direct contact	2	Structures and Services	2
			1	Uptake via contaminated groundwater	2	Controlled Waters; Eco-systems	2

5. GROUND CONDITIONS

13 no. window sample boreholes were attempted at the site on 23rd Sept 2014. 3 boreholes were completely aborted, and 2 were aborted at different depths. The pipe configuration comprised of 1m long transparent plastic tubes. This allowed us to cut open the piping and obtain approximate depth measurements of where variations occur within the soil.

The borehole details are as follows:

Borehole	Total Depth
WS1	5.0m
WS2	5.0m
WS3	3.0m
WS4	1.0m
WS5	5.0m
WS6	5.0m
WS7	5.0m
WS8	5.0m
WS9	4.0m
WS10	5.0m

The ground conditions were varied between the front of the police station (closest to Station road), where ws1 and ws2 and ws10 were situated, and towards the rear of the police station (furthest from Station road) where ws3 – ws9 were situated. The typical types of soils uncovered were made ground, sand, sandy gravels and soft sandy clay.

In the area surrounding the two tanks at the rear of the station (boreholes ws5, ws6, ws7, ws8) we encountered soils that could potentially be contaminated between 3.4-4.4m. These soils were mainly found in the sandy layer that sat on top of an impermeable clay boundary.

Groundwater was encountered at depths of 3.65m below ground level.

6. GENERIC QUANTITATIVE RISK ASSESMENT (GQRA)

Soil sampling was undertaken by LCM Environmental at various depths in each borehole. These samples were sent off for lab analysis to ascertain the contamination status of the subsoils. Each sample was tested for speciated TPH (Total Petroleum Hydrocarbons) and PAH (Polycyclic Aromatic Hydrocarbons), Heavy Metals and VOC (Volatile Organic Compounds). Results from the soil samples can be found in the appendix of the report. The laboratory testing focused on samples taken from groundwater level (3.5-4.0m below ground level).

6.1 CONTAMINATION ASSESSMENT METHODOLOGY

This section makes use of the site investigation findings, as described in the previous section, to evaluate further the potential pollutant linkages identified in Section 4.

TPH has been identified as being the principal constituent that has the potential to cause harm to human health or the environment.

No single universal method of analysis exists for the determining petroleum contamination due to the complexity and specificity of the source. The diverse chemical compounds exhibit a large range of behaviour in environmental media governed by their physiochemical properties. As a result of these characteristics, the assessment of risk from exposure to petroleum hydrocarbon mixtures is difficult. In the environment these mixtures can change through weathering (that may include volatilisation, biodegradation, partitioning, oxidation, etc.) further complicating the determination of risk from exposure. The more soluble or volatile compounds will migrate to other locations. The mostly non-mobile components are left behind at the release site. As a result, the receptors can be exposed to a different mixture than that originally released into the environment. Factors including locations of release, length of time between the release and exposure, media of exposure, etc. can all contribute to these differences.

A broad testing suite was scheduled on samples, including indicator compounds which are commonly prevalent alongside TPH.

TPH CWG tests were scheduled for the samples submitted for analysis; this test speciates the aliphatic and aromatic components separately within each carbon band (C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21 and C21-C35). Interpretative analysis of the distribution of TPH across the carbon spectrum can assist practitioners in determining the provenance of the TPH and its potential to cause harm to human health or the environment. This method was considered appropriate in order to

assess these risks and derive suitable recommendations for risk reduction measures within the context of the site.

6.2 LABORATORY RESULTS

These laboratory results are from the soil samples taken from the boreholes. The results included in this section highlight specifically the area at the rear of the station, where we encountered potential ground contamination. See appendix for full laboratory results.

Borehole	Depth (m)	Total TPH (mg/kg)	Total PAH (mg/kg)
WS1	3.0 – 5.0	<10	-
WS2	3.0 – 4.0	<10	-
WS5	3.6 – 4.0	2770	16.3
WS6	3.6 – 4.0	<10	-
WS7	3.5 – 3.7	<10	-

The results reveal that only borehole WS5 identified contaminated ground (2,770mg/kg).

These results support our investigation for potential ground contamination caused by leaking underground fuel tanks. Borehole ws5 was located by one of the petrol storage tanks found at the rear of the station (see site plan) and indicates that one of these tanks has leaked into the surrounding soils. However due to the other borehole soil sample results, the contamination does not appear to have spread to other areas on site.

7. SUMMARY AND RECOMMENDATIONS

The objective of this report was to investigate and quantify the environmental and human health risks and liabilities associated with on-site activities. It was also to consider the impact of off-site sources of contamination on the health and wellbeing of future site residents, site workers and visitors. This was achieved through a combination of on-site observations pertaining to potentially contaminative site use and through the interpretation of historical maps and data reports available on public registers, which enabled the development of a site-specific conceptual model. An intrusive investigation was then undertaken to target potential areas of concern and establish the contaminative status of the site.

A conceptual ground model of a site and its environs uses available information to form a preliminary assessment of contamination sources, pathways and receptors to allow exposure scenarios to be

determined and thereby offer recommendations on risk reduction to help minimise liabilities. LCM Environmental adopts these principals as the basis of our risk assessment.

The preliminary conceptual model has identified significant potential for on-site to on-site pollutant linkages associated with past and present usage of the site as a Police Station with underground fuel tanks. Historical maps suggest that the site was developed into a Police Station by c.1914, and has continued in this use to present day. Due to the historic nature of the site there is potential for the underground tanks to have leaked and possibly cause of contamination in the ground.

A garage 124m south east of the site was noted from the Envirocheck® data report, however it is considered to be of insignificant risk to the site. The hydrogeology is a sensitive receptor on site due to the underlying geology being classed as a principal aquifer of major permeability. The high groundwater vulnerability also poses as a possible pathway for contaminants to migrate off site.

Remediation of the site should comprise the removal of the 5 no. underground storage tanks and an area of ground approximately 30m^2 in area requires remediation. The contamination in this area is likely to have been caused by leakage of either the 2,000 or 5,000 gallon UST. Contamination testing carried out at WS1, 2 and 10 indicates that the two larger tanks (and smaller tank next to these) probably haven't leaked.

Report Prepared by: Scott Hunter (BSc. Hons), Project Manager

8. APPENDIX A – PHOTOGRAPHS

Photo 1

Photo 2: Police Station car park

Photo 3

Photo 4: Offices

Photo 5: Wastewater drain

Photo 6: Wastewater drain

Photo 7: Interceptor tank located at the front of the station

Photo 8: Car parking area

Photo 9: Front of the Police Station from Station road

Photo 10: View of Police Station from Station road

Photo 11: Front of Police Station

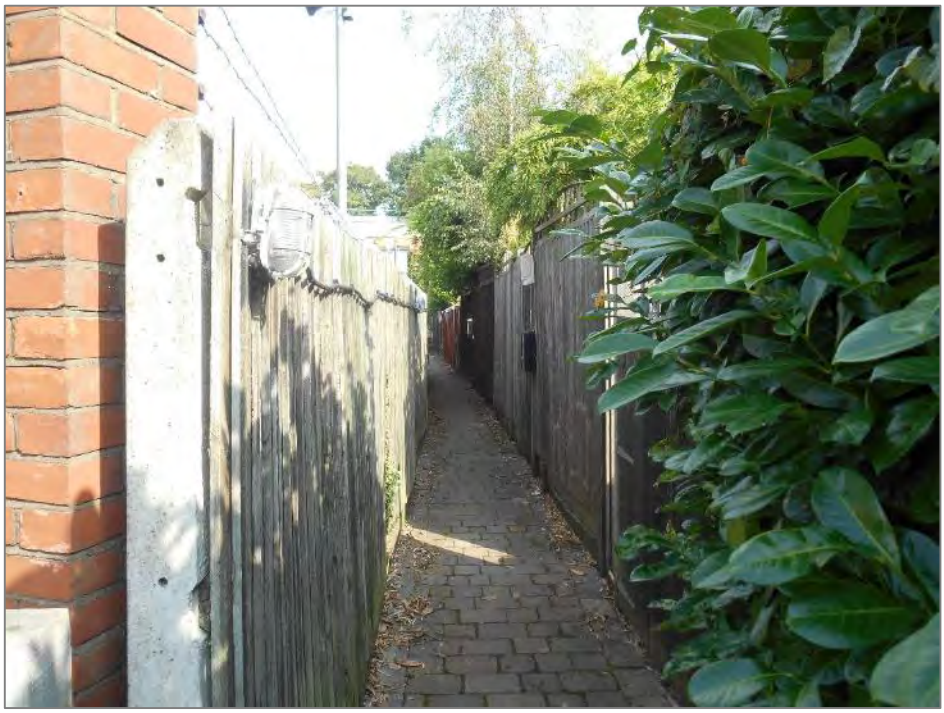


Photo 12: Walkway running along the East perimeter of the site

Photo 13: Fuel oil dispenser

Photo 14: In case of fire facilities

Photo 15

Photo 16:

Photo 17

Photo 18: Underground drainage pipes

Photo 19: Offices

Photo 20

Photo 21

Photo 22: Location of the two smaller underground fuel storage tanks located at the rear of the station

Photo 23

Photo 24: back of the Police Station building

Photo 25

Photo 26: Back of the Police Station building

Photo 27: View from ramp

Photo 28: View from ramp

Photo 29: Location of the two large underground tanks and one smaller tank

Photo 30: Underground tank located at the front of the station

Photo 31: Location of the Interceptor

Photo 32: Conditions inside the Interceptor

Photo 33: Conditions inside the interceptor

Photo 34:

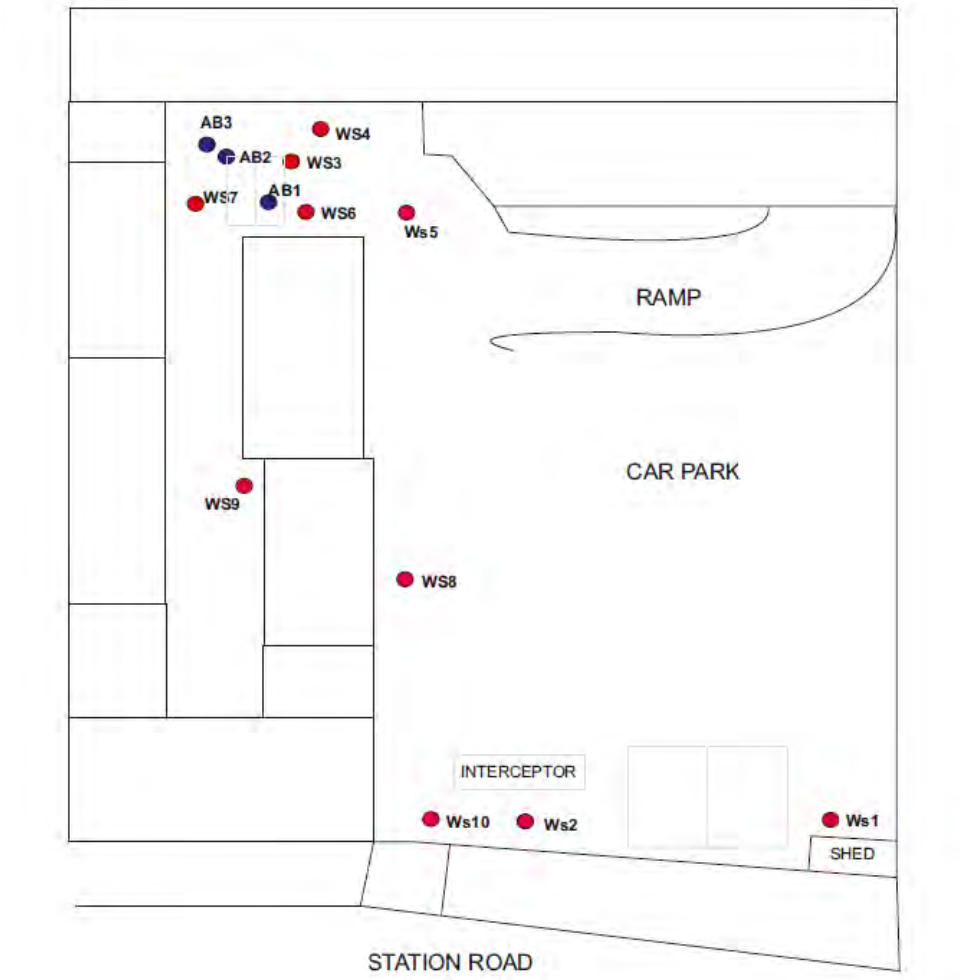
Photo 35: Underground fuel storage tank located at the rear of the station

Photo 36: Underground fuel storage tank located at the rear of the station

Photo 37: Underground drainage pipes

Petrol Interceptor

9. APPENDIX B – SITE LAYOUT PLAN



Soil Sampling Plan

Hampton, London

10. APPENDIX C – BOREHOLE LOGS

LCM ENVIRONMENTAL

Excavation Method Drive-in Window Sampler	**Dimensions** **Location:** See site plan	**Ground Level (mOD)** **Date**	**Site:** Hampton **Client** Pinnacle Regeneration Group **Engineer** Scott Hunter
Sheet 1 **Number** Ws1 **Job Number** 1374-14			

Depth (m)	Sample/tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0-0.25	Made Ground = Concrete Core		
0.0 - 1.0				0.0	1.0	Made Ground = pieces of black tarmac, pieces of red brick, grey/brown gravels		
1.0 - 2.0				0.0	1.0	Soft Clay = red/brown clay fine, elastic and sandy texture		
2.0 - 3.0				0.0	1.0	Sandy Clay = yellow/light brown coarse grain, soft clay		
3.0 - 3.9				0.0	0.9	Sand = yellow/light brown, coarse grain		
3.9 - 5.0				0.0	1.1	Wet sand = hit the groundwater. Wet yellow/brown sand. Fine, silty texture		

LCM ENVIRONMENTAL

Excavation Method Drive-in Window Sampler	**Dimensions**	**Ground Level (mOD)**	**Site:** Hampton / **Sheet 1**
	Location: See site plan	**Date**	**Client** Pinnacle Regeneration Group / **Number** Ws2
			Engineer Scott Hunter / **Job Number** 1374-14

Depth (m)	Sample/tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Made Ground = Concrete Core		
0.0 - 0.5				0.0	0.5	Made Ground =grey/brown gravels		
0.5 - 2.5				0.0	2.0	Sandy gravel = grey/brown sandy gravels with made ground components		
2.5 - 3				0.0	0.5	Sandy gravel = brown gravels with coarse grainy sand		
3.0 - 4.0				0.0	1.0	Sand = Mainly light brown sand with small pieces of gravel and flint		
4.0 - 5.0				0.0	1.0	Wet Sand = yellow/light brown sand		

LCM ENVIRONMENTAL

					Site: Hampton	**Sheet 1**	
Excavation Method Drive-in Window Sampler		**Dimensions**		**Ground Level (mOD)**	**Client** Pinnacle Regeneration Group	**Number** Ws3	
		Location: See site plan		**Date**	**Engineer** Scott Hunter	**Job Number** 1374-14	
Depth (m)	Sample/tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend / Water
						Made Ground = Concrete Core	
0.0 - 0.6				0.0	0.6	Made Ground = grey/brown gravels	
0.6 - 3.0				0.0	2..4	Sand = pure, golden sand, suspected backfilling	

LCM ENVIRONMENTAL

						Site: Hampton	**Sheet 1**
Excavation Method Drive-in Window Sampler		**Dimensions**		**Ground Level (mOD)**		**Client** Pinnacle Regeneration Group	**Number** Ws4
		Location: See site plan		**Date**		**Engineer** Scott Hunter	**Job Number** 1374-14
Depth (m)	Sample/tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend / Water
						Made Ground = Concrete Core	
0.0 - 1.0				0.0	1.0	Sand = pure, golden sand, suspect-ed backfilling	

LCM ENVIRONMENTAL

Site: Hampton			**Sheet 1**
Excavation Method Drive-in Window Sampler	**Dimensions**	**Ground Level (mOD)**	**Client** Pinnacle Regeneration Group	**Number** Ws5
	Location: See site plan	**Date**	**Engineer** Scott Hunter	**Job Number** 1374-14

Depth (m)	Sample/tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Made Ground = Concrete Core		
0.0 - 0.45				0.0	0.45	Made Ground = grey/brown tarmac gravels		
0.45 - 0.7				0.0	0.25	Brown soft clay, with textures of silty sand and gravels		
0.7 - 1.93				0.0	1.23	Sandy clay = Light brown sandy clay		
1.93 - 3.30				0.5-0.9	1.37	Sand = yellow/brown saturated sand		
3.45 - 4.40				2900	0.95	Sand = Green/grey/brown colour, strong fuel odour		
4.40-4.50				270-700	0.10	Clay = Soft and grey in colour		
4.50 - 4.90				0.0	0.40	Sand = Black/grey saturated sand		

LCM ENVIRONMENTAL

	Site: Hampton		**Sheet 1**
Excavation Method Drive-in Window Sampler	**Dimensions**	**Ground Level (mOD)**	**Client** Pinnacle Regeneration Group	**Number** Ws6
	Location: See site plan	**Date**	**Engineer** Scott Hunter	**Job Number** 1374-14

Depth (m)	Sample/tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Made Ground = Concrete Core		
0.0 - 0.5				0.0	0.50	Made Ground = grey/brown tarmac gravels		
0.5 - 0.97					0.47	Brown soft clay, with textures of silty sand and gravels		
0.97 - 2.0					0.3	Sandy clay = Light brown sandy clay		
2.0 - 3.4					1.4	Sand = yellow/brown saturated sand		
3.4 - 4.25				800	0.80	Sand = Green/grey/brown colour, strong fuel odour		
4.25 - 4.35					0.10	Clay = Soft and grey in colour		
4.35 - 5.0				2.7	0.65	Sand = Black/grey saturated sand		

LCM ENVIRONMENTAL

	Site: Hampton		**Sheet 1**
Excavation Method Drive-in Window Sampler	**Dimensions**	**Ground Level (mOD)**	**Client** Pinnacle Regeneration Group	**Number** Ws7
	Location: See site plan	**Date**	**Engineer** Scott Hunter	**Job Number** 1374-14

Depth (m)	Sample/tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Made Ground = Concrete Core		
0.0 - 0.5					0.5	Made Ground = gravels		
0.5 - 0.9					0.4	Soft Clay = sandy clay, light brown colour		
0.9 - 2.3					1.4	Sandy Gravel = fine gravels and sands, light brown/yellow colour		
3.5 - 4.4				50	0.9	Sand = Green/grey saturated sand		
4.4 - 4.5					0.1	Clay = Grey clay, soft and grainy texture		
4.5 - 5.0				0.4	0.5	Sand = brown colour, fine gravel and coarse sand		

LCM ENVIRONMENTAL

	Site: Hampton		**Sheet 1**
Excavation Method Drive-in Window Sampler	**Dimensions**	**Ground Level (mOD)**	**Client** Pinnacle Regeneration Group	**Number** Ws8
	Location: See site plan	**Date**	**Engineer** Scott Hunter	**Job Number** 1374-14

Depth (m)	Sample/tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Made Ground = Concrete Core		
0.0 - 0.8					0.8	Made Ground = grey/brown gravels		
0.8 - 1.5						Soft Clay = light brown colour, grainy texture with coarse sands		
1.5 - 2.6					1.1	Sandy Gravel = fine gravels and sands, light brown/yellow colour		
2.6 - 3.5					0.9	Sand = soft, pure, golden sand		
3.5 - 3.7				10-30	0.2	Sand = green/grey colour, wet, saturated texture		
3.7 - 4.3				70	0.5	Sand = grey colour, coarse granular texture		
4.3 - 5.0				0.5-1.3	0.7	Sandy Gravel = light brown in colour fine gravels with sand		

LCM ENVIRONMENTAL

Excavation Method Drive-in Window Sampler	**Dimensions**	**Ground Level (mOD)**	**Client** Pinnacle Regeneration Group
	Location: See site plan	**Date**	**Engineer** Scott Hunter

Site: Hampton

Sheet 1

Number Ws9

Job Number 1374-14

Depth (m)	Sample/tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Made Ground = Concrete Core		
0.0 - 1.1				0.0	1.1	Made Ground = brown/grey gravels		
1.1 - 1.3				0.0	0.2	Sandy Clay = yellow/light brown colour		
1.4 - 2.0				0.0	0.6	Clay = red/brown colour, soft texture		
2.0 - 2.6				0.0	0.6	Sandy Gravels = fine gravels and sands		
2.6 - 2.7				0.0	0.1	Sandy Clay = brown colour, elastic, granular texture		
2.7 - 3.5				0.0	0.8	Sand = light brown/yellow sand		
3.5 - 4.0				0.0	0.5	Sandy Gravels = light brown/yellow sand with small pieces of gravels		

LCM ENVIRONMENTAL

Excavation Method Drive-in Window Sampler	**Dimensions**	**Ground Level (mOD)**	**Site:** Hampton / **Sheet 1**
	Location: See site plan	**Date**	**Client** Pinnacle Regeneration Group / **Number** Ws10
			Engineer Scott Hunter / **Job Number** 1374-14

Depth (m)	Sample/tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Made Ground = Concrete Core		
0.0 - 0.8				0.0	0.8	Made Ground = pieces of black tarmac and red brick, grey/brown gravels		
0.8 - 1.5				0.0	0.7	Sandy Clay = dark brown clay with a coarse sandy texture		
1.5 - 1.8				0.0	0.3	Sandy gravels = light brown colour, fine gravels and sand		
1.8 - 3.1				0.0	1.3	Sand = light brown/yellow colour		
3.1 - 4.5				0.0	1.4	Sandy Gravel = light brown sand with fine gravels		

11. APPENDIX D – CONTAMINATION RESULTS

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 14/05291
Issue Number: 1 **Date:** 03 October, 2014

Client:
LCM Environmental Ltd
Unit 1, Langlands Business Park
Uffculme,
Devon
EX15 3DA

Project Manager: Lindsey Butterworth/Scott Hunter
Project Name: Hampton
Project Ref: 1374-14
Order No: 1374 - 14
Date Samples Received: 01/10/14
Date Instructions Received: 01/10/14
Date Analysis Completed: 03/10/14

Prepared by:
Melanie Marshall
Laboratory Coordinator

Approved by:
Lianne Bromiley
Senior Client Manager

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 1247

Envirolab Job Number: 14/05291

Client Project Name: Hampton

Client Project Ref: 1374-14

Lab Sample ID	14/05291/2	14/05291/4	14/05291/6	14/05291/9	14/05291/12				Units	Method ref
Client Sample No										
Client Sample ID	WS1	WS2	WS5	WS6	WS7					
Depth to Top	3.00	3.00	3.60	3.60	3.50					
Depth To Bottom	5.00	4.00	4.00	4.00	3.70					
Date Sampled	23-Sep-14	23-Sep-14	23-Sep-14	24-Sep-14	24-Sep-14					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
MCERTS Sample Matrix Code	1A	1A	1	1A	1A					
% Stones >10mm$_A^{\#}$	10.7	8.2	<0.1	23.3	7.6				% w/w	A-T-044
pH$_D^{M\#}$	-	-	8.24	-	-				pH	A-T-031s
Arsenic$_D^{M\#}$	-	-	7	-	-				mg/kg	A-T-024s
Cadmium$_D^{M\#}$	-	-	<0.5	-	-				mg/kg	A-T-024s
Copper$_D^{M\#}$	-	-	1	-	-				mg/kg	A-T-024s
Chromium$_D^{M\#}$	-	-	11	-	-				mg/kg	A-T-024s
Lead$_D^{M\#}$	-	-	6	-	-				mg/kg	A-T-024s
Mercury$_D$	-	-	<0.17	-	-				mg/kg	A-T-024s
Nickel$_D^{M\#}$	-	-	10	-	-				mg/kg	A-T-024s
Selenium$_D^{M\#}$	-	-	<1	-	-				mg/kg	A-T-024s
Zinc$_D^{M\#}$	-	-	13	-	-				mg/kg	A-T-024s

Envirolab Job Number: 14/05291

Client Project Name: Hampton

Client Project Ref: 1374-14

Lab Sample ID	14/05291/2	14/05291/4	14/05291/6	14/05291/9	14/05291/12				Units	Method ref
Client Sample No										
Client Sample ID	WS1	WS2	WS5	WS6	WS7					
Depth to Top	3.00	3.00	3.60	3.60	3.50					
Depth To Bottom	5.00	4.00	4.00	4.00	3.70					
Date Sampled	23-Sep-14	23-Sep-14	23-Sep-14	24-Sep-14	24-Sep-14					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
MCERTS Sample Matrix Code	1A	1A	1	1A	1A					
PAH 16										
Acenaphthene$_A^{M\#}$	-	-	0.15	-	-				mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	-	-	0.04	-	-				mg/kg	A-T-019s
Anthracene$_A^{M\#}$	-	-	0.18	-	-				mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	-	-	0.12	-	-				mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	-	-	0.09	-	-				mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	-	-	0.07	-	-				mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	-	-	0.06	-	-				mg/kg	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	-	-	<0.07	-	-				mg/kg	A-T-019s
Chrysene$_A^{M\#}$	-	-	0.12	-	-				mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	-	-	<0.04	-	-				mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	-	-	0.33	-	-				mg/kg	A-T-019s
Fluorene$_A^{M\#}$	-	-	0.72	-	-				mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	-	-	0.04	-	-				mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	-	-	12.9	-	-				mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	-	-	1.08	-	-				mg/kg	A-T-019s
Pyrene$_A^{M\#}$	-	-	0.38	-	-				mg/kg	A-T-019s
PAH (total 16)$_A^{M\#}$	-	-	16.3	-	-				mg/kg	A-T-019s
TPH Banded 10										
>C6-C10$_A^{\#}$	<10	<10	1810	<10	<10				mg/kg	A-T-007s
>C10-C12$_A^{\#}$	<10	<10	390	<10	<10				mg/kg	A-T-007s
>C12-C16$_A^{\#}$	<10	<10	44	<10	<10				mg/kg	A-T-007s
>C16-C21$_A^{\#}$	<10	<10	21	<10	<10				mg/kg	A-T-007s
>C21-C40$_A$	<10	<10	26	<10	<10				mg/kg	A-T-007s
TPH Total (sum of bands)$_A$	<10	<10	2770	<10	<10				mg/kg	A-T-007s
>C10-C40 (Sum of Bands)	<10	<10	408	<10	<10				mg/kg	Calc

REPORT NOTES

Notes - Soil chemical analysis
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General
This report shall not be reproduced, except in full, without written approval from Envirolab.
Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.
All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.
All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts.
Superscript "M" indicates method accredited to MCERTS.
If results are in italic font they are associated with an AQC failure and are not accredited. The results may be unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

TPH analysis of water by method A-T-007
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos in soil
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if present as discrete fibres/fragments. Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified a being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.
Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations.

Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

12. APPENDIX E – ENVIROCHECK REPORT

13. APPENDIX F – INFORMATION FROM OTHER SOURCES

LONDON FIRE
AND EMERGENCY
PLANNING AUTHORITY

Petroleum Group LFB Headquarters - 2nd Floor
169 Union Street London SE1 0LL
T 020 8555 1200 x30859
F 020 7960 3624
Minicom 020 7960 3629
london-fire.gov.uk

LCM Environmental
Unit 1 Langlands Business Park
Uffculme
Devon
EX15 3DA

London Fire and Emergency Planning
Authority runs the London Fire Brigade

Date 5 September 2014
Our Ref 24/014346
Your Ref 1374-14

FAO Scott Hunter

RECEIVED 09 SEP 2014

Dear Sir

THE ENVIRONMENTAL INFORMATION REGULATIONS 2004 - ENVIRONMENTAL ENQUIRY

Premises: 60-68 Station Road, Hampton, Middlesex TW12 2AX

As requested, a petroleum environmental search has been made in respect of the above premises.

A thorough search of current and historical files and databases has revealed information for the site as detailed in the attached form.

Please note that this report is restricted to matters currently known by the London Fire and Emergency Planning Authority. Although we hold extremely comprehensive records, it is possible that we do not hold any records whatsoever for some solid-filled and very old tanks. This will be for one of the following reasons:-

1. The records held by this Authority were passed to it from the Greater London Council in 1986. In 1965 the Greater London Council inherited petroleum related records from the London County Council and the outer London Boroughs / Councils. Some of the outer London records were incomplete.

2. For premises where petroleum tanks have been either removed or permanently made safe, the Authority's records have (in a minority of cases) been destroyed; and for these cases the Authority does not hold any records that indicate that there was ever a 'petroleum' interest at the premises.

As you are aware, a fee is levied for the provision of this information and payment should be made in accordance with the invoice, which will be sent under separate cover.

Any queries regarding this letter should be addressed to the person named below. If you are dissatisfied in any way with the response given, please ask to speak to the Head of Petroleum quoting our reference.

Yours faithfully,

for Assistant Commissioner (Fire Safety Regulation)
Deputy Commissioner's Directorate
petroleum@london-fire.gov.uk

Reply to Bola Afolabi
Direct **T** 020 8555 1200 x30847

ENVIRONMENTAL ENQUIRY DETAIL FORM

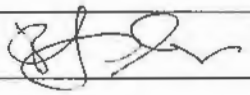
Premises:
60-68 Station Road, Hampton, Middlesex, TW12 2AX
Our Reference:
24/014346

Tank No.	Compartment No.	Year	Tank Type	Tank Capacity	Fuel Type	Current Status
1	1	1975	Single Skin Steel	45721	Solid Filled	Not in use
2	2	1975	Single Skin Steel	45721	Solid Filled	Not in use
3	3	1975	Single Skin Steel	2300	Solid Filled	Not in use
4			Unknown	22000		
5			Unknown	9000		

Current licence in force?
YES ☐ NO ☒
Date last licence(s) issued:
Unknown

Known leaks or spills at this site:
We have no records of leaks or spills at this site.

Comments:
Up until early 2000's the London Fire Brigade did not inspect crown properties including police force properties as they had Crown immunity under the then legislation. As such, our records for this location only cover the period starting from 1 March 2004 when the petroleum licence was due for renewal, after which we believe the site was decommissioned. Unfortunately, our records do not indicate the date of decommissioning. Our records further indicate that the 3 Tanks on the site at this time were solid filled, however we do not have any plans for the site or further information regarding the final disposition or fate of these tanks.

Signed:	
Name:	Ajibola Afolabi
Position:	Policy Support Officer
Date:	5th September 2014

Soils Limited
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