

13th July 2018

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Downstream - Soil Groundwater Focus
Delivery Group
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York Road
London
SE1 7NA.

Our Reference GB-12038454-20180713-CORext-PERA

Dear Sir

Shell Camden Town: Planning Application ref 2018/0561, Preliminary Environmental Risk Assessment (PERA)

1. Introduction

This letter presents the findings of a review of information of potential chemical impacts to land quality resulting from historical or current use at Shell Camden Town located at 109-113 York Way, Camden Town, London, N7 9QE. This PERA has been undertaken by AECOM Infrastructure and Environment (UK) Ltd (AECOM) on behalf of their client, Shell Oil Products UK Ltd to support an application to discharge Condition 4a of the above planning application. This PERA takes into account the historical and environmental context of the site and has been produced in line with the requirements of Environment Agency report CLR11.

Shell proposes to erect a single storey side extension (hereafter known as 'the Development Area') to existing petrol station shop. The objective of this review is to support the application for planning permission reference 2018/0561 and to provide conclusions on any potential risks presented by potential chemical impacts or the requirement for further site investigation.

2. Overview of Previous Works

A Phase 1 investigation for the wider Shell Camden Town site ('The Site') was undertaken by AECOM (formerly URS) in July 2015. A Phase 2 Comprehensive Environmental Site Assessment was undertaken between October and December 2015, followed by vapour monitoring in February 2016, March 2017 (PID), July 2017 and September 2017.

This report reviews and summarises phases of investigation completed to date, and makes conclusions as to the potential environmental risk to human health and controlled waters posed by the proposed erection of single storey side extension to existing petrol station shop.

The reports reviewed as part of this assessment are referenced below:

1. URS, P1 Environmental Site Assessment (Ref: 46370434-001), dated September 2015
2. URS, P2 Comprehensive Environmental Site Assessment (Ref: 46370434-002), dated January 2016
3. AECOM, Comprehensive Vapour Monitoring Report (Ref: 46370434-003), dated March 2016
4. AECOM, Comprehensive Vapour Monitoring Event Report (Ref: 60481562-12038454), dated June 2018

3. Historic Site Use and Chemicals of Potential Concern

A review of the URS, P1 Environmental Site Assessment report (**Ref. 1**) indicates the following site history for Wider Site boundary:

- 1873 - 1896: The majority of the site was occupied by two unreferenced buildings including the development area where the shop extension will be.
- 1896 - 1953: Additional unreferenced buildings appear on the site. One terraced house appears to be located on the northern site boundary.
- 1953 -1973: Central unreferenced building now annotated as 109 to 113 York Way. Building on southern site boundary has been remodelled and then removed by 1969.
- 1973 – 1982: All previous buildings and terraced property have been removed. The site appears to have been developed into a petrol filling station.
- 1992-1994 Site has been developed and reflects current configuration

In terms of potential chemical impacts, the most significant historic site uses identified is the petrol filling station use of the site since 1972 (date of installation of first tank farm).

In July 2015, a fuel infrastructure integrity issue was identified at Shell Camden Town along with associated odours in the site shop. Information provided by Shell's facility management company (JCI) indicated that fuel was positively identified below the drip tray for Pump 7/8. A repair was carried out, the sump below the dispenser cleaned out and ducting between the dispenser and the shop building was foam filled to prevent vapour ingress. The volume of unaccounted for loss could not be quantified by JCI.

The chemicals of potential concern (COPC) associated with this site use are:

- Total Petroleum Hydrocarbons (TPH);
- Benzene, Toluene, Ethylbenzene and Xylenes (BTEX);
- Polycyclic aromatic hydrocarbons (PAHs)
- Volatile Organic Compounds (VOC);
- Semi Volatile Organic Compounds (SVOC); and
- Asbestos (from demolition of previous buildings)

4. Geology and Hydrogeology

Based on a review of the reports listed in Section 2, the development area (and the wider site) is directly underlain by hardstanding, further underlain by made ground. The made ground generally comprises sandy gravel/gravelly sand (maximum thickness 1.3m) underlain by gravelly clay (maximum thickness greater than 1.25m).

Available British Geological Survey (BGS) geological maps indicate that there are no superficial deposits beneath the site. The solid geology underlying the site is indicated to be the London Clay Formation. This was confirmed during an Arcadis 2002 site investigation summarised in the URS P1 report (**Ref. 1**) when the London Clay was proven to be at least 4.2m thick and comprised clay and gravelly clay. No sand or gravel horizons were reported at depth. It is anticipated that the London Clay is 60-100m thick beneath the site. The Woolwich and Reading Beds Formation, Thanet Formation and Upper Chalk Formation are indicated to be present at depth beneath the London Clay.

The nearest surface water feature is a pond located 659m south of the site. The Grand Union Canal is approximately 850m south west of the site at its nearest point. There are no reported surface water abstractions located within 1 kilometre (km) of the site.

The Environment Agency (EA) classifies the London Clay Formation as Unproductive Strata. The Woolwich and Reading Beds Formation and the Thanet Formation are classified as Secondary A Aquifers and the Upper Chalk is classified as a Principal Aquifer.

Three (3) groundwater abstractions are reported to be located within 1km of the site. The abstractions are all licensed by Hanson Quarry products Europe Ltd for general use relating to "Secondary Category (High loss)" and are located 648m south of the site. According to report **Ref. 2**, the London Borough of Camden does not hold

any information regarding private groundwater abstractions. The site is not located within an EA defined Source Protection Zone (SPZ).

5. Conceptual Site Model

A Conceptual Site Model (CSM) figure with text summarising potential sources, pathways and receptors for the Development Area and Wider Site is presented in Annex C. The CSM takes into account the previous site investigation findings that are summarised below. No potentially complete pollutant linkages to controlled water receptors were identified for the Site.

6. Site Investigation Findings

The 2016 CESA (**Ref. 2**) reported a 2015 investigation of the Wider Site which combined a site wide assessment with targeted intrusive locations in proximity of the identified human health receptors: residents in adjacent basements of neighbouring properties and on site workers.

One intrusive location VP105 from the AECOM (2015) site investigation (and one aborted location VP105A) were located within the Development Area.. Two locations from the same 2015 investigation are in the immediate vicinity to the Development Area: MW102 located approximately 3m to the north and VP101 approximately 4m northwest. The approximate location of the shop extension with respect to previous site investigation locations is shown on the figures presented in Annex A and B.

Site Wide Findings

Laboratory analytical data from the soil and soil vapour samples collected from the Wider Site were compared by AECOM to screening criteria protective of on site workers (including Shell shop staff and site users) using a continued petroleum use (CPU) end use scenario and off-site residents (in adjacent residential properties to the north, north west and south, including those with basements) using a high density residential (HDR) end use scenario.

All concentrations in soil and soil vapour were below CPU and HDR GAC.

The Characteristic Gas Situation is classified as 1 for the site, with a risk classification of Very Low. Ground gases have therefore not been considered further in the risk assessment.

Asbestos was not reported in any of the samples collected

Findings within Footprint of Proposed Extension (the Development Area)

VP105, located in the footprint area of the proposed extension, is one of the deeper wells that was screened in the London Clay to assess risks from lateral migration of deep vapours in permeable horizons (if present) to neighbouring basements. Perched water was reported in the well at the time of tube retrieval and the tubes were saturated so were not analysed. The presence of water at this depth indicates that any unsaturated zone is limited in thickness and that there are not laterally migrating vapours since vapour cannot migrate through water. Furthermore the presence of water indicates that neighbouring basements are watertight and so vapours are unlikely to migrate into them.

No visual or olfactory signs of COPC were reported in VP105 (terminated at 3m bgl) and in VP105A (terminated at 0.6m bgl due to refusal on large slab of concrete). Soil samples collected from VP105/0.4mbgl and VP105/2.7m bgl reported all analytes below detection limit with the exception of ethanol (0.107 mg/kg) and EC21-EC35 Aromatics (0.34mg/kg) atVP105/0.4m bgl, which were below GAC.

Findings from MW102 and VP101, Close to Footprint of Extension

Active vapour samples were collected from shallow wells MW102 and VP101 in proximity of the proposed shop extension. A vacuum could not be maintained in the leak check before sampling, indicating potential leakage of the sample train when under high vacuum. The maximum vapour concentration in either well was a factor of at least 600 below the GAC, indicating that even if 600 times as much ambient air was sampled as air from the well then there would not be a GAC exceedance.

Furthermore, no significant vapour impact was noted in VP102 which is the same distance to pump island P7/ P8 where the integrity concern was reported as the distance from the pump island to these wells. Since vapour would be expected to migrate at the same rate in all directions within similar strata then the absence of significant impact at VP102 supports the observed low vapour concentrations in VP101 and MW102. It is therefore concluded that there is unlikely to be risk from soil vapour in the Wider Site to the Development Area where the extension is proposed.

Soil samples collected from VP101/0.7m bgl reported all analytes below the detection limit. No soil samples were analysed from the nearby MW102 however no visual or olfactory evidence of COPC was identified down to 2.0m bgl.

The Comprehensive Vapour Monitoring Event Report (**Ref. 4**) based on PID readings from all the wells (March 2017) and on soil vapour analytical data collected from MW4 and MW105 (respectively approximately 20m northwest and 28m west from the proposed construction area) found that no COPC exceeded the HDR or CPU GAC, therefore it is considered unlikely that COPC pose an unacceptable risk.

7. Site Investigation Scheme

Based on the comprehensive investigation completed to date, no further site investigation is proposed. It is considered by AECOM that the areas of primary concern across the Development Area have been adequately characterised

8. Proposed Site Use and Assessment

It is understood that the building works proposed will comprise the erection of a single storey side extension to the east of the existing petrol station shop and that the extension will entirely cover the Development Area. The footprint of the building is provided on the figure shown in Annex A and B, is approximately 5m x 9m and it occupies the area between the eastern wall of the shop and the eastern site boundary where the jet wash is currently located.

It is understood that the extension will be constructed with a suspended floor over pad foundations with limited excavation works required during its construction.

The wider site human health assessment undertaken as part of the GQRA was assessed against CPU and HDR GAC and did not identify any potential risk to the receptors on or off-site. Some of the locations used for the Wider Site assessment are in the footprint (VP105) or in the immediate proximity (MW102 and VP101) of the proposed extension. The gas regime at the site is classified as CS1, indicating that no additional gas protection measures are required.

In addition the data collected from the within the proposed extension footprint area or in proximity of the area did not indicate potential unacceptable COPC impacts to the identified receptors.

The wider site assessment for soil and groundwater did not identify potential pollutant linkages to controlled waters receptors. It is not anticipated that COPC beneath the proposed extension, or the proposed construction methods, could impact the identified controlled waters receptors.

9. Conclusions

An extension of the shop at the Shell Camden Town site is proposed to be developed (the Development Area) on the eastern part of the shop where the jet wash is currently located. Previous reports detail the setting, history, and soil and groundwater quality of the Wider Site, of which the shop extension forms only a part.

The environmental setting for the shop extension is as described for the Wider Site. A review of desk-based information for the shop extension found that the only potentially significant specific source of COPC on the Development Area was the use of the site as a petrol station since 1972.

Previous site investigations are considered to have adequately characterised the both the Development Area and the Wider Site with regard to potential risk to sensitive receptors from soil and perched water impacts. Intrusive works have been undertaken within the specific footprint of the shop extension (VP105 was sampled for soils and monitored for vapour and gas). It is considered that this analytical data can also be viewed in the context of data

obtained from adjacent portions of the Wider Site to assess the shop extension area site conditions in particular with respect to made ground composition, ground vapour/ gas and groundwater quality.

Based on the data provided in the reports listed in Section 2, above, we do not consider that a viable pathway exists between the identified soil and perched water impacts and future site users, neighbours or controlled waters receptors. As such we consider that no unacceptable risks to environmental receptors from the proposed extension to the shop have been identified.

Further site investigation is not proposed because the site is considered to be adequately characterised. AECOM considers that there is sufficient information to recommend the discharge of the Condition 4a of Town Planning Application 2018/0561.

Yours sincerely,



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Enclosures: **Annex A:** Opt 1 Extension – scope drawing
 Annex B: Site investigation locations figures from AECOM CESA report, annotated with approximate location of the Shop Extension.
 Annex C: Conceptual Site Model

Annex A: Opt 1 Extension – scope drawing



- 1** Drain back and make safe existing fuel system in accordance with Shell's HSSE procedures
- 2** Break up forecourt areas to the extent shown and redevelop site infrastructure including fuel pipework, drainage, tank chambers, etc.
- 3** Allow for a full clean wiring for PA speakers. Undertake structural and condition survey and undertake any remedial repairs (subject to PM direction)
- 4** Empty out and clean existing tanks & chambers, break up forecourt as required to expose existing fuelling system. Install new feed lines to provide all grades to all islands
- 5** Install new Tokheim Q510's (6No 8 hose normal traffic flow) on new pre-cast concrete pump islands with barrier & integral signage.
- 6** Re-surface forecourt with leak tight concrete pavement construction.
- 7** Retain existing petrol interceptor, gulp & clean to recharge coalescent filter, & test oil sensor linked back to shop via TUS350 tank gauge.
- 8** Drainage channels to be installed due to extent of works & general condition
- 9** Drainage subject to detailed CCTV survey and condition report by ARTELIA appointed Contractor as well as Statutory utility search to establish services & sewerage provisions within the vicinity.
- 10** Area of to have new concrete to Shell Global standard. PMC to advise on exact extent.
- 11** Upon completion of the works carry out valet and repainting works to the site.

Existing Interceptor to be gulped, cleaned, new filter installed and oil sensor & alarm wired into tank gauge (If not Class 1 replace with new subject to PM direction)

Relocate existing above

NOTES
Project Brief was a Re-pump WITH SHOP EXTENSION (Car wash removed)

Planning	Adverts	PO	Landlord	Highways	Property	Building Control	EHO	C2D	Other
					?			?	
			TBC Shell	n/a	TBC Shell	n/a	license	Legals	-

EXISTING TANK TO PUMP SCHEDULE

PROPOSED TANK TO PUMP SCHEDULE

FUEL SYSTEM - NEW PUMPS & SUCTION PIPEWORK SYSTEM

EQUIPMENT ORDER - PUMPS

EXTERNAL WORKS - LEGEND

Denotes area to be paved forecourt spec concrete with DOT
sub base with brushed finish & trowel edge margins

Denotes area to scarified SMA wearing course

Denotes area to be pavement spec concrete with brushed finish & trowel edge margins

R&R	Existing manhole to be broken out, raised and re-bedded with new concrete margin
N	New heavy duty manhole, cover and frame to be installed with heavy duty concrete margin

SCOPE DRAWING

RL_{dm}

project managers & architects

PROJECT : SHELL CAMDEN TOWN
109-113 YORK WAY, CAMDEN TOWN
LONDON, NW7 9QE

TITLE : OPT 1 EXTENSION - SCOPE DRAWING



DWG No :	1481-01	OPT1	2017
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**Annex B: Site investigation locations figures from AECOM CESA
report, annotated with approximate location of the Shop Extension**

DO NOT SCALE

RESIDENTIAL
WITH BASEMENTSCAMDEN
(one way)No.23
(brick building)
(4 storey)RESIDENTIAL
WITH BASEMENTSPETROL
INTERCEPTOR
VENTPETROL
INTERCEPTOR

VP107A

VP107B

MW105

A/G OFFSET FILLS

TANK VENT PIPE POSITION

refuse area

TANKER STAND

MW4

LINE OF CANOPY OVER

SALES BUILDING

RESIDENTIAL
WITH BASEMENTS

RESIDENTIAL

No.115A

No.117

T4

T5

T6

T7

T8

T9

T10

T11

T12

T13

T14

T15

T16

T17

T18

T19

T20

T21

T22

T23

T24

T25

T26

T27

T28

T29

T30

T31

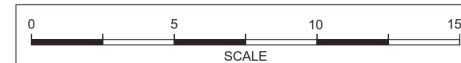
T32

T33

T34

YORK
(one way)

WAY



NOTES

- Site Boundary
- ⊕ Shallow Vapour Monitoring Well
- ⊕ Deep Vapour Monitoring Well
- ⊕ Refusal Location
- ⊕ Historical Well - Failed Seal Test (Not Sampled)
- - - Historical Tank Location
- Proposed shop extension

DESCRIPTION

STATUS

FOR INFORMATION

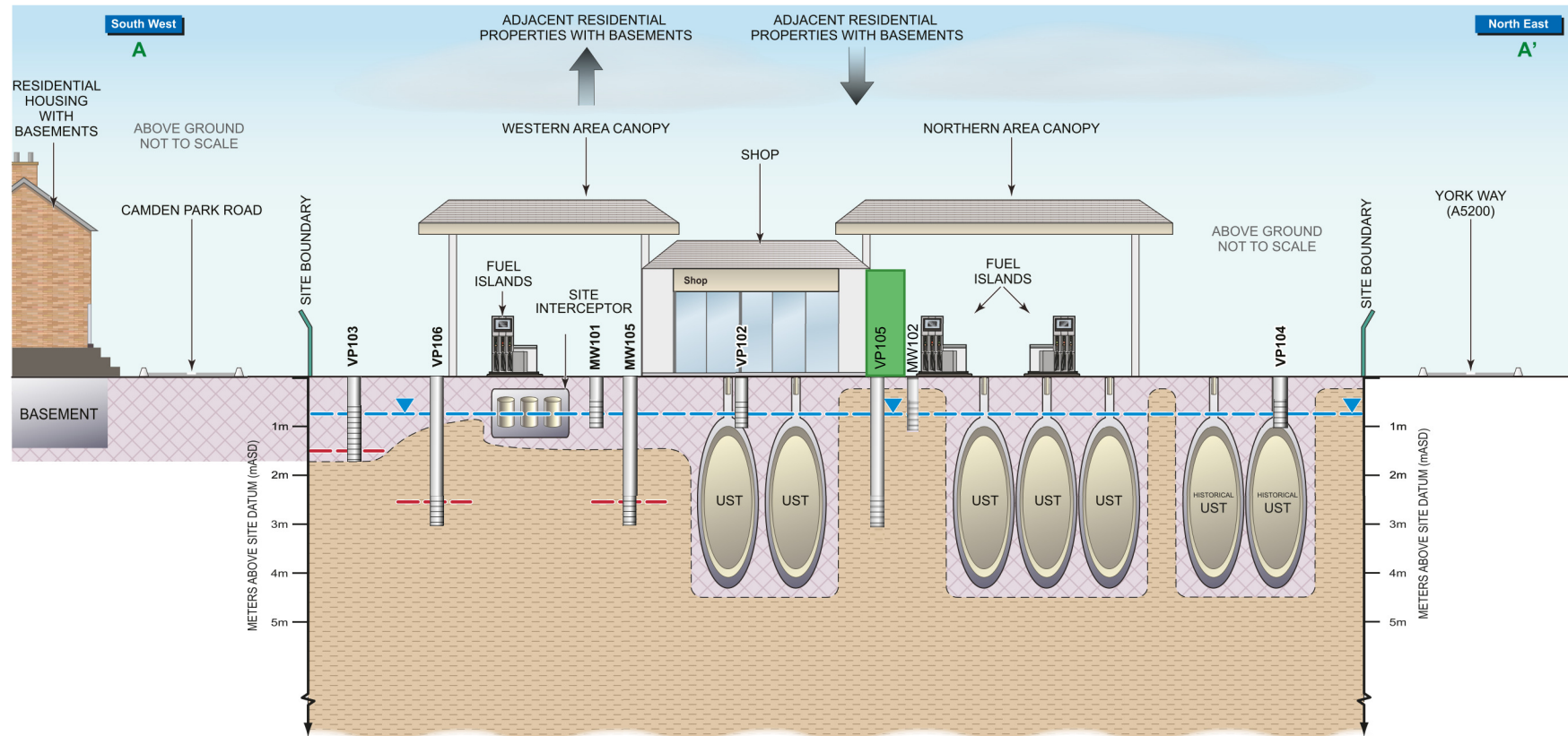
CONSULTING ENGINEERS

AECOM

BRIDGEWATER HOUSE, WHITWORTH STREET, MANCHESTER, M1 6LT
TEL 0161-907-3500 FAX 0161-907-3501CLIENT
SHELL UK OIL PRODUCTS LTDPROJECT
SHELL CAMDEN TOWNDRAWING TITLE
Figure 2
Site Features Plan

DRAWN SQ	CHECKED BS	APPROVED BS	DATE MAR 2016
SCALE As Shown	DRG No. 60481562	REV.	

Annex C: Conceptual Site Model



NOTES



- MADE GROUND
- LONDON CLAY - UNPRODUCTIVE STRATA
- PERCHED WATER (LEVEL VARIABLE ACROSS SITE 0.32mbgl TO 1.44mbgl OCTOBER & DECEMBER 2015)
- ANTICIPATED LEVEL OF BASE OF ADJACENT BASEMENT
- PROPOSED EXTENSION

AREA OF POTENTIAL CONCERN

On-site

Historical

- Historical use of the site as a petrol filling station since c.1972 (including three (3) former tanks / five (5) compartments – now abandoned).
- Made Ground associated with historical buildings on the site.

Current

- Operational underground storage tanks (four (4) tanks / seen (7) compartments) in the centre of the site.
- Accidental releases to ground from off-set fill points, located along the eastern site boundary.
- Accidental releases to ground from dispenser pumps: six (6) car fuel islands.
- Accidental releases from fuel lines present between the tanks, off-set fill points and fuel islands.
- The forecourt interceptor located in the northeastern part of the site and associated drainage lines.
- Made Ground.

Off-Site, Historical

- Former reservoir approximately 100m north of the site active – infilled from 1938.

CHEMICALS OF POTENTIAL CONCERN

Current Potential On-site Sources

- TPH - Petroleum hydrocarbons.
- BTEX- Benzene, toluene, ethylbenzene and xylenes.
- Petroleum Additives- Methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), di-isopropyl ether (DIPE), and tertiary butyl alcohol (TBA).
- PAHs- Polycyclic aromatic hydrocarbons.
- Metals – arsenic, boron, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium and zinc.
- 1,2-dichloroethane (EDC) and 1,2-dibromoethane (EDB) (lead scavengers).
- 2-methylnaphthalene and n-hexane.
- Landfill gases such as methane and carbon dioxide
- Lead scavengers
- Asbestos

POTENTIAL PATHWAYS

Human Health

- Vapours – Migration of vapours through made ground above ground buildings.
- Particulate – Ingestion, inhalation, dermal contact, with soil particulates.
- Permeation – Migration of hydrocarbon substances through plastic potable water supply pipes.
- Gases – Migration of landfill gases through the made ground to above ground buildings.

Controlled Waters

- Leaching – Migration of hydrocarbon substances from soils into perched and deeper groundwater.
- Migration of impacted shallow perched water to surface water.

POTENTIAL RECEPTORS

Human Health

- On-site shop staff.
- On-site general public and visiting staff (such as contractors, including those conducting excavation works).
- Off-site residents in the surrounding residential dwellings to the north, north west, south west (with basements to the northwest, south and south west).

Controlled Waters

- Deeper groundwater within Secondary and Principal Aquifers.
- Surface water (Pond 659m south and Grand Union Canal 850m southwest of the site).

POSSIBLE COMPLETE POLLUTANT LINKAGES

Human Health

- None identified.

Controlled Waters

- None identified following P1ESA.

DESCRIPTION	DATE	REVISION
STATUS		

PRELIMINARY

CONSULTING ENGINEERS

AECOM

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SHELL UK OIL PRODUCTS LTDPROJECT
Shell Camden TownDRAWING TITLE
Figure 3
Conceptual Site Model

DRAWN	CHECKED	APPROVED	DATE
LCB	BS	BS	MAR 2016

ORIGINAL DRAWING A3

SCALE	DWG No.	REV.
AS SHOWN	60481562	