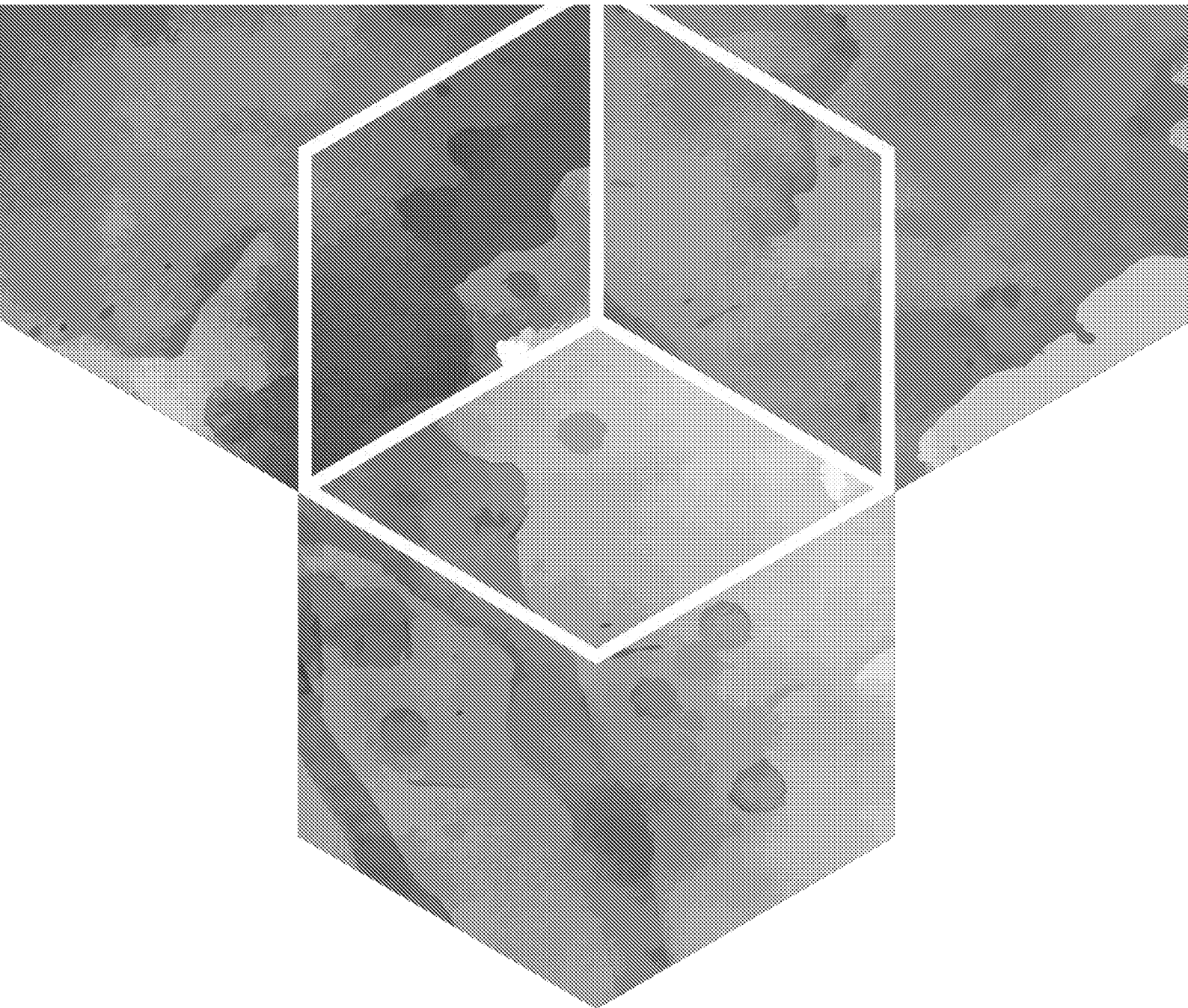
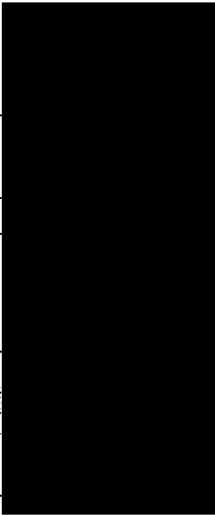


Land Science

46A TO 47 PIER ROAD,
LITTLEHAMPTON, BN17 5LW
PHASE II GEOTECHNICAL AND
GEO-ENVIRONMENTAL
INVESTIGATION
PIER ROAD LIMITED
24TH MARCH 2020

Site:	46A TO 47 PIER ROAD, LITTLEHAMPTON, BN17 5LW	
Title:	PHASE II GEOTECHNICAL AND GEO-ENVIRONMENTAL INVESTIGATION	
Project:	RESIDENTIAL DEVELOPMENT	
Client:	PIER ROAD LIMITED	
Contact:	ROBERT LUFF & CO.	
Date:	24 th MARCH 2020	
Reference:	LS 4823	
Version:	V1.0	
Prepared by:		JAKE TRANGMAR <u>Geo-Environmental Technician</u>
Prepared by:		JAVIER ZAPATA B.Eng. (Hons.), ICE <u>Civil Engineer</u>
Checked by:		MICHAEL ROSE M.Sc., B.Sc., FGS, AIEMA <u>Principal Geo-Environmental Consultant</u>
Authorised by:		ELLIOT TOMS CEnv M.Sc., B.Sc. (Hons.), FGS, MIEEnvSci <u>Managing Director</u>

DESK STUDIES GROUND INVESTIGATION CONSULTANCY

You depend on a project team to
get it right, first time.

At Land Science we aim to
understand our clients needs, and
appreciate the role ground issues
play within a wider context. That's
why we provide our clients with
a reliable service and first class
expertise tailored to specific
requirements.



CONTENTS

1	INTRODUCTION	5
2	INTRUSIVE INVESTIGATION	7
3	GROUND CONDITIONS.....	9
4	MONITORING DATA.....	11
5	GEO-ENVIRONMENTAL TESTING	13
6	GEOTECHNICAL FIELD TESTING	15
7	GEOTECHNICAL LABORATORY TESTING	16
8	GEOTECHNICAL ASSESSMENT	17
9	HUMAN HEALTH RISK ASSESSMENT	20
10	BUILT ENVIRONMENT RISK ASSESSMENT	24
11	CONTROLLED WATERS	26
12	GROUND GAS RISK ASSESSMENT.....	28
13	PRELIMINARY WASTE ASSESSMENT.....	30
14	SUMMARY AND CONCLUSIONS.....	32
15	REPORT CONDITIONS.....	34
	GLOSSARY OF TERMS.....	35
	ACCOMPANYING NOTES – SOIL CONTAMINATION	36
	REFERENCES.....	37

FIGURES

FIGURE 1:	Site Location Plan
FIGURE 2:	Existing Layout / Investigation Layout
FIGURE 3:	Proposed Layout / Investigation Layout

APPENDICES

APPENDIX A:	Photographs
APPENDIX B:	Engineering Logs
APPENDIX C:	Ground gas and Groundwater Monitoring
APPENDIX D:	Geotechnical Testing Results
APPENDIX E:	Contamination Testing Results

1 INTRODUCTION

1.1 General

Land Science was instructed by Robert Luff & Co. on behalf of Pier Road Limited (the Client) to undertake a Phase II Geotechnical and Geo-Environmental Ground Investigation in relation to the proposed redevelopment at 46A to 47 Pier Road, Littlehampton, BN17 5LW. The location of the site is shown on Figure 1, which is centred at grid reference TQ0276 0175.

1.2 The Site

The area under investigation comprised several recently vacated industrial buildings with areas of hardstanding.

The layout of the existing site is indicated on Figure 2, and a walkover survey is presented in section 4.0. The area was approximately 0.08 hectares. It was understood that the Client was in ownership of the site, and that this investigation was not a pre-purchase appraisal.

1.3 Form of Development

The proposed development was understood to comprise the demolition of the existing buildings and the construction of a three-storey building (commercial units at ground level and residential units on the first and second floors). The proposed development was covered under planning application number LU/287/17/PL.

Figure 3 illustrates the layout of the proposed redevelopment. The findings of this report may be not valid if the proposed development is altered.

1.4 Previous Investigations

The following previous investigations relevant to the site were made available:

- Phase I Site Investigation, Reports4Planning, November 2019

The report found the potential for significant pollutant linkages with historical uses of the site including sensitive features such as gas holders, and an underground tank (possibly

more than one). Additional to these findings, more recent land uses included a depot and garage with staining and possible infilled inspection pits being observed.

The phase II ground investigation has been carried out in accordance with the recommendations of the previous report. The CSM was updated and a few additional pollutant linkages were revised following the fieldwork and ground conditions encountered.

The site generally appeared similar to the description given in the Phase I report with the exception that the garage unit was now vacant.

1.5 Scope of Works

The proposed scope of works was to comprise the following:

- 8no. Dynamic (windowless) sampler boreholes
- 2no. 15m deep cable percussive borehole
- 5no. standpipe installations, to be monitored on three return visits

The dynamic sampler boreholes were conducted on 13th and 14th February 2020 and the cable percussive boreholes on the 16th to 25th February 2020. All the fieldwork was conducted under the supervision of Land Science. The 3no. return monitoring visits were conducted 4th, 11th and 18th March 2020.

1.6 Geotechnical Objectives

A geotechnical investigation was required to provide an interpretation of ground conditions with respect to foundations, and excavations.

1.7 Geo-Environmental Objectives

A phase II (intrusive investigation) was required, to provide a generic quantitative risk assessment (GQRA) in respect of the proposed redevelopment, adjacent land uses, and the wider environment, in the context of the planning regime.

1.8 Standards

Where practicable, the investigation was undertaken in accordance with the following standards and guidance:

- Model Procedures for the Management of Contaminated Land, DEFRA and Environment Agency, September 2004 (“CLR11”).
- Guiding Principles for Land Contamination, Environment Agency, March 2010.
- National Planning Policy Framework, July 2018.
- Building Regulations Approved Document C: Site preparation and resistance to contaminants and moisture, HM Government, July 2013.
- NHBC Standards Chapter 4.1: Land Quality - Managing Ground Conditions, 2019.
- BS 5930:2015 Code of Practice for Site Investigations
- BS 1377:2018 Soils for Civil Engineering Purposes

Other technical sources have been cited in respect of specific aspects of the investigation, as referenced throughout the text. If a long delay exists between the investigation and commencement on site, it may be necessary to check whether any standards have changed in the intervening period.

1.9 Conditions and other matters

Reference should be made to the Report Conditions section at the end of this report.

2 INTRUSIVE INVESTIGATION

A factual record of the conditions encountered during the physical investigation of the site is presented in the following sections.

2.1 Investigation Strategy

Based on the findings of the conceptual site model and also the geotechnical objectives, the intrusive investigation was based on the following strategy:

Aspect	Position	Targets			Testing, installations etc
		Depth / strata	Existing Location	Proposed Location	
Dynamic Sampler boreholes	DS1	5m	South western corner	South western corner	-
	DS2		Centre of the front yard area	Southern end of the proposed building	MW
	DS3		In front of the existing domestic garage units	Within the footprint of the proposed building	-
	DS4		South eastern corner		-
	DS5		Within the vacant commercial garage unit	Proposed undercroft carparking area	-
	DS6		Within vacant depot building		MW
	DS7		Within the vacant commercial garage unit		MW
	DS8		Rear yard area	Proposed uncovered carparking area	-

Aspect	Position	Targets			Testing, installations etc
		Depth / strata	Existing Location	Proposed Location	
Cable Percussive	BH1	15.00m	South western corner of the site / in front of the existing domestic garage units	South western corner of the new building / immediately east of the refurbished building	MW, SPTs
	BH2	15.00m	South eastern corner of the site	South eastern corner of the new building	MW, SPTs

An explanation of the excavation and testing types are given in the following sections.

Generally all of the shallow Dynamic Sampler boreholes achieved their target depths with the exception of DS3 which encountered an obstruction at a depth of 1.00m (possible concrete). There was insufficient access at DS8 to the rear yard area for the Dynamic Sampler Rig, and samples were collected from this location with the use of hand pitting tools.

BH1 had to be repositioned due to a concrete obstruction at a depth of 1.00m that could not be chiselled through (2 hours). This was probably the same obstruction that was encountered at DS3. All other positions achieved their target depth.

2.2 Dynamic (Windowless) Sampling (DS)

Dynamic Sampling entails 1m long hollow tubes with liners driven into the ground and retracted in order to obtain samples. The process is repeated sequentially to the target depth, unless impenetrable strata or borehole instability prevent further progress. The liners are split, logged, tested, and subsampled. Sample compression can occur within the liners, and the sampler can sometimes become blocked. Sample recovery is typically class 2 as defined in Eurocode 7.

2.3 Cable Percussive Boreholes (BH)

Cable Percussion is a traditional drilling technique which essentially involves repeatedly dropping a hollow sampling tube from height into the ground, and removing any plug of soil that is retrieved. Clay cutters, chisels, a shelling attachment and casing can also be used down the hole.

2.4 Monitoring Wells (MW)

Monitoring wells were installed in five of the investigative positions.

The Made Ground was found to be relatively shallow (less than 1.00m in thickness) and the monitoring wells were installed with response zones within the Alluvium at DS2, DS6 and DS7 to enable gas and groundwater monitoring from this stratum. The installations were sealed through the overlying Made Ground.

Dual monitoring wells were installed within BH1 and BH2; one shallow (within the Sub Alluvial Gravels) and one deeper well (within the underlying chalk) to allow groundwater sampling from these two strata. Bentonite seals were installed at BH1 and BH2 through the Made Ground, Alluvium and at the boundary between the Raised Beach Deposits and the Chalk at these two locations.

The pipework was 50mm diameter HDPE, sealed using hydrated bentonite pellets and the slotted response zone packed with 10mm pea shingle.

2.5 Standard Penetration Test (SPT)

A Standard Penetration Test is used to determine the bearing capacity of soils. There are two versions of the test, a cone test in granular soils (SPT(c)) and a split-spoon sampler for use in cohesive soils (SPT(s)). The appropriate equipment is attached to the drilling rods and is driven into the ground using a calibrated percussive mechanism and the number of blows required to penetrate six intervals of 75mm is recorded, the first two intervals are discarded as 'seating blows', while the final four intervals are added together to calculate the N-Value. The drilling rods, test equipment, hammer weight and drop etc are all specified under the relevant British Standards.

3 GROUND CONDITIONS

3.1 General

The expected ground conditions were anticipated to comprise Made Ground overlying a succession of Alluvium, Sub Alluvial Gravels and Chalk at depth. The investigation confirmed the anticipated ground conditions. A summary of the encountered conditions is presented below.

Base Depth m					Strata
DS1	DS2	DS3	DS4	DS5	
0.20	0.20	0.20	0.20	0.10	Hardstanding
0.60	0.60	1.00+	0.60	0.70	Made Ground
4.30	4.70	-	4.40	4.80	Alluvium - Peat
5.00+	5.00+	-	5.00+	5.00+	Alluvium - Sand

Base Depth m					Strata
DS6	DS7	DS8	BH1	BH2	
0.20	0.20	0.20	0.10	0.20	Hardstanding
0.60	0.40	0.80+	1.10	1.30	Made Ground
4.00+	4.40	-	4.00	4.50	Alluvium - Peat
-	5.00+	-	5.40	6.40	Alluvium - Sand
-	-	-	9.20	9.10	Sub Alluvial Gravels
-	-	-	15.00+	15.00+	White Chalk Subgroup – Grade C

The identification of materials encountered as specific geological strata is tentative and should be used as a guide, and interpolation between or below investigation points should be treated with caution.

3.2 Hardstandings

All positions were located within concrete hardstanding which was encountered to depths of between 0.10m and 0.20m.

3.3 Made Ground

Made Ground was encountered at all locations below the hardstanding generally to depths of between 0.40 to 1.30m (base unproven at DS3 and DS8). The Made Ground generally comprised brown silty sandy Gravel with abundant fragments of concrete and brick.

3.4 Alluvium

Alluvium was encountered below the Made Ground and was initially noted as being very soft to soft grey slightly gravelly, slightly peaty, sandy CLAY with chalk fragments, flint gravel, shell and carboniferous deposits. With an increase in depth the Alluvium graded to a dark brown gravelly clayey SAND from depths of between 4.30 to 4.70m bgl.

3.5 Sub Alluvial Gravels

The two deeper Cable Percussive boreholes encountered a dense sandy GRAVEL between the Alluvium and the Chalk which has been interpreted as Sub Alluvial Gravels which was encountered between depths of between 5.40 and 9.20m bgl).

3.6 White Chalk Subgroup

The White Chalk Subgroup was only encountered in the two deeper Cable Percussive boreholes and was proved to a maximum depth of 15.00mbgl. The description and classification of the chalk was in accordance with CIRIA guide C574.

The chalk was described as an off white putty chalk with occasional flint gravel. These materials were classified as Grade C (or better) based on the SPT tests undertaken within this stratum.

3.7 Roots and Rootlets

No roots or rootlets were identified within any of the boreholes.

3.8 Field Evidence of Contamination

No odours or visual evidence of contamination was noted within the Made Ground; however, some samples of the underlying Alluvium were noted to have a slight organic odour.

Made Ground was identified below the existing hardstanding to depths of up to 1.30m, and such materials may be imported from an unknown source or mixed with hazardous materials, and as such may contain a wide range of potential contaminants. All such materials should be treated as suspect unless proven otherwise. Preliminary testing has been carried out, as described in section 5.0.

3.9 Groundwater

Groundwater was struck during the excavation of the following positions.

Position	Strike	Rest level (after 20 minutes)
DS2	0.50m	0.05m
DS3	0.30m	0.30m
DS7	0.40m	0.30m
BH1	4.50m	None recorded
BH2	0.50m	0.20m

The level of water in a borehole can be affected by the drilling process and speed of infiltration; short-term rest levels should be used with caution.

The addition of water and/or the use of casing to assist drilling BH1 and BH2 may have masked groundwater strikes.

Groundwater levels may vary seasonally and with variations in rainfall. Water may also become perched upon cohesive strata or around features such as foundations, and may also occur from leaking drains and water mains etc.

3.10 Stability and Casing

Casing was used within DS01, DS02 and from DS4 to DS07 to a depth of 3.00m and to the full depth of drilling for BH1 and BH2.

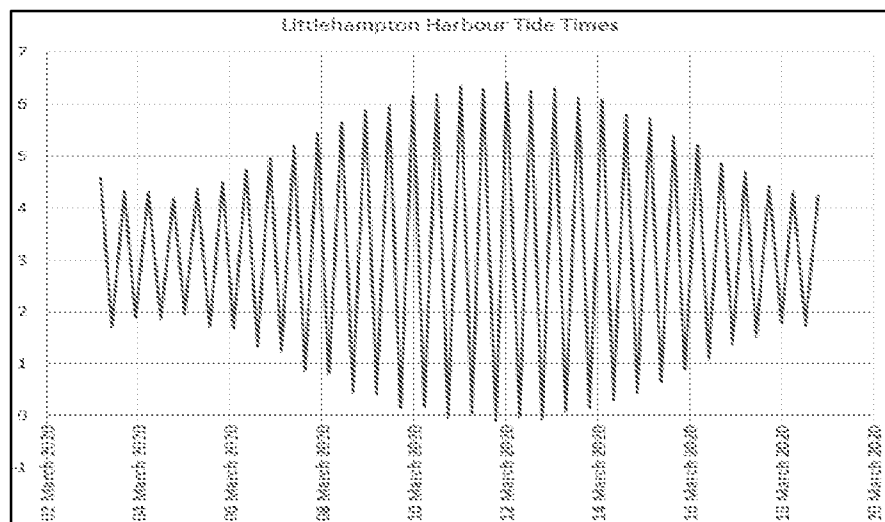
4 MONITORING DATA

4.1 Groundwater Monitoring

Recorded groundwater levels during all monitoring visits are listed in the tables below. Values are in m Below ground level; NR=Not Recorded; S = shallow; D = Deep, ALL = Alluvium, SAG = Sub Alluvial Gravels, CHALK = White Chalk Sub Group.

Position/ Date	DS2 ALL	DS6 ALL	DS7 ALL	BH1S SAG	BH1D CHALK	BH2S SAG	BH2D CHALK
04/03/2020	0.65	0.80	0.35	1.99	1.91	1.56	1.76
11/03/2020	0.83	0.76	0.36	1.47	1.44	1.31	1.28
18/03/2020	0.79	0.86	0.42	2.01	2.00	1.82	1.93

During the second monitoring visit (11/03/2020) the water within all of the standpipes was bailed out and left for 20 minutes; rapid rises in the water levels were noted in all positions. The water levels were noted to be highly variable, with the sites proximity to the River Arun it is anticipated that these levels are to be tidal influenced (rise with high tides and fall with low tides).



4.2 Ground Gas Monitoring

The results of the ground gas monitoring are summarised on the following table. Depending on the parameter with the maximum (peak) or minimum readings are reported, as stated.

Date	Methane (max) % v/v	Carbon Dioxide (max) % v/v	Oxygen (min) % v/v	PID ppm	Flow (steady state) l/hr	Percentage of response zone flooded.
DS2						
04/03/2020	0.0	0.0	20.1	0.0	0.0	100%
11/03/2020	0.0	1.9	7.4	0.1	+113.4 for first few seconds then remained at 0.0	100%
18/03/2020	0.0	2.3	6.1	0.0	+56 for first few seconds then remained at 0.0	100%
DS6						
04/03/2020	0.0	0.0	20.1	0.1	0.0	100%
11/03/2020	0.0	0.0	20.4	0.7	0.0	100%
18/03/2020	0.0	0.0	20.5	0.0	0.0	100%
DS7						
04/03/2020	0.0	0.0	14.8	0.2	-47.4 for first few seconds then remained at 0.0	100%
11/03/2020	0.0	0.0	18.0	1.0	+41.4 for first few seconds then remained at 0.0	100%
18/03/2020	0.0	0.0	18.0	0.1	-32 for first few seconds then remained at 0.0	100%
BH1S						
04/03/2020	0.0	0.0	20.1	0.1	0.0	100%
11/03/2020	0.0	0.0	20.4	0.2	+1.8 for first few seconds then remained at 0.0	100%

Date	Methane (max) % v/v	Carbon Dioxide (max) % v/v	Oxygen (min) % v/v	PID ppm	Flow (steady state) l/hr	Percentage of response zone flooded
18/03/2020	0.0	0.0	20.2	0.0	0.0	100%
BH1D						
04/03/2020	0.0	0.0	20.2	0.0	0.0	100%
11/03/2020	0.0	0.0	20.3	0.1	+3.4 for first few seconds then remained at 0.0	100%
18/03/2020	0.0	0.0	20.3	0.4	-7.5 for first few seconds then remained at 0.0	100%
BH2S						
04/03/2020	0.0	0.0	19.8	0.0	-27.6 for first few seconds then remained at 0.0	100%
11/03/2020	0.0	0.0	20.0	0.6	+20.9 for first few seconds then remained at 0.0	100%
18/03/2020	0.0	0.0	20.1	0.0	-1.2 for first few seconds then remained at 0.0	100%
BH2D						
04/03/2020	0.0	0.0	18.7	0.0	-65 for first few seconds then remained at 0.0	100%
11/03/2020	0.0	0.6	14.9	0.5	+24.3 for first few seconds then remained at 0.0	100%
18/03/2020	0.0	1.0	13.2	0.1	0.0	100%

Below is a summary of the atmospheric pressure conditions during the monitoring visits:

Visit	Pressure (recorded on site)	Published pressure trend
04/03/2020	1010mB	Rising High
11/03/2020	1013mB	Fluctuating High
18/03/2020	1027mB	Fluctuating High

5 GEO-ENVIRONMENTAL TESTING

5.1 PID Screening

All soil samples were screened for VOC's in headspace broadly in accordance with the methodology set-out in CIRIA C682. Due to interference from humidity and other factors, Land Science adopts a method detection limit of 1.0ppm to avoid reporting false positive readings. None of the samples exhibited VOC's above the detection limit, with the exception of the following tests.

Position	Strata	Result
DS1	Alluvium	1.50m (6.4ppm), 2.00m (6.2ppm), 2.50m (7.1ppm), 3.00m (7.6ppm), 3.50m (8.5ppm), 4.00m (8.4ppm), 4.50m (8.2ppm), 5.00m (8.1ppm)
DS02		1.50m (4.2ppm), 2.00m (5.1ppm), 2.50m (6.5ppm), 3.00m (6.8ppm), 3.50m (7.4ppm), 4.00m (7.9ppm), 4.50m (7.8ppm), 5.00m (7.6ppm)
DS04		1.50m (3.4ppm), 2.00m (3.2ppm), 2.50m (4.6ppm), 3.00m (9.2ppm), 3.50m (9.0ppm), 4.00m (9.4ppm), 4.50m (9.2ppm), 5.00m (9.5ppm)
DS05		1.50m (4.4ppm), 2.00m (5.1ppm), 2.50m (6.2ppm), 3.00m (7.4ppm), 3.50m (8.2ppm), 4.00m (8.4ppm), 4.50m (8.2ppm), 5.00m (8.5ppm)
DS06		1.50m (1.8ppm), 2.00m (2.7ppm), 2.50m (3.4ppm), 3.00m (3.6ppm), 3.50m (9.2ppm), 4.00m (9.0ppm)
DS07		1.50m (1.8ppm), 2.00m (2.9ppm), 2.50m (3.7ppm), 3.00m (3.8ppm), 3.50m (9.0ppm), 4.00m (9.2ppm), 4.50m (9.4ppm), 5.00m (9.4ppm)
BH2		1.00m (3.0ppm), 2.00m (3.5ppm), 3.00m (6.5ppm), 4.00m (7.2ppm), 5.00m (7.6ppm)

Overall the readings were towards the lower end of the unit's detection limit (0.1ppm to 9999ppm).

The purpose of the screening was to identify samples which may be impacted by organic contaminants (such as VOC's, SVOC's, petroleum hydrocarbons, diesel, etc) and to assist in prioritising samples for laboratory analysis.

5.2 Geochemical Laboratory Analysis

Samples were selected for geochemical analysis, based on the following rationale:

- Made Ground was encountered across the site from depths of between 0.40 to 1.30m bgl, which may contain a wide range of contaminants. Selected samples of Made Ground from each position were tested for a routine screening suite (LS1) and were screened for Asbestos.
- Where the Made Ground was noted to be relatively shallow, samples from the top of the Alluvium (just below the base of the Made Ground) were also tested for the routine screening suite (LS1),
- Elevated PID readings were detected (as described in section 5.1); the samples with the highest values in each position were tested for speciated total petroleum hydrocarbons (TPH7) and Volatile suites. Selected samples of Made Ground were tested for speciated Total Petroleum Hydrocarbons following recordings of hydrocarbons within the LS2 testings.
- Selected samples of the Made Ground from across the site were also tested for a Waste Acceptance Criteria test (LS2) to help provide an assessment for the disposal of soil arisings from the sites.
- Samples of groundwater were obtained from DS2, DS6, DS7 and from the dual installations at, BH1 and BH2 (S = shallow and D = deep). Were taken and analysed for a general screen (LS1), speciated total petroleum hydrocarbons (TPH7) and Volatile suites,

The scope and extent of testing was considered appropriate and in accordance with the Conceptual Site Model and preliminary risk assessment.

A summary of the testing scheduled is given below:

Sample	Strata	Suite				
		LS1	Asbestos	TPH7	Volatile	LS2
DS1 0.30m	Made Ground	✓	✓	✓	-	✓
DS1 1.00m	Alluvium	✓	-	-	-	-
DS1 3.50m		-	-	✓	✓	-
DS2 0.30m	Made Ground	✓	✓	-	-	-
DS2 4.00m	Alluvium	-	-	✓	✓	-

Sample	Strata	Suite				
		LS1	Asbestos	TPH7	Volatile	LS2
DS3 0.50m	Made	✓	✓	✓	-	✓
DS4 0.30m	Ground	✓	✓	-	-	-
DS4 1.50m	Alluvium	✓	-	-	-	-
DS4 4.00m		-	-	✓	✓	-
DS4 5.00m		-	-	✓	✓	-
DS5 0.30m	Made	✓	✓	✓	-	✓
DS5 5.00m	Ground	-	-	✓	✓	-
DS6 0.30m	Made	✓	✓	-	-	-
DS6 1.00m	Alluvium	✓	-	-	-	-
DS06 3.50m		-	-	✓	✓	-
DS7 0.30m	Made	✓	✓	✓	-	✓
DS7 4.50m	Alluvium	-	-	✓	✓	-
DS7 5.00m		-	-	✓	✓	-
DS8 0.30m	Made	✓	✓	-	-	-
BH1 0.50m	Ground	✓	✓	✓	✓	✓
BH1 4.00m	Alluvium	-	-	✓	✓	-
BH2 0.50m	Made	✓	✓	✓	✓	-
BH2 3.00m	Alluvium	-	-	✓	✓	-
BH2 4.00m		-	-	✓	✓	-
BH2 5.00m		-	-	✓	✓	-
BH1S	Water	✓	-	✓	✓	-
BH1D		✓	-	✓	✓	-
BH2S		✓	-	✓	✓	-
BH2D		✓	-	✓	✓	-
DS2		✓	-	✓	✓	-
DS6		✓	-	✓	✓	-
DS7		✓	-	✓	✓	-

The relevant screening suites are defined below. Where duplicate analysis exists between suites, each test is performed only once:

Suite	Definition
LS1 (soil)	Screening suite: pH, fraction of organic carbon, Metals and Non Metals, water soluble Sulphate, Sulphide, total Cyanide, total Phenols, speciated PAH's.
Asbestos	Asbestos screen: Laboratory screening for fibres and Asbestos Containing Materials; identification where identified. Using polarising light and dispersion staining as described in HSG 248, HSE Contract Research Report No 83/1996 and in Davies et al, 1996.
LS1 (water)	Screening suite: pH, Metals and Non Metals, total Sulphate, Sulphide, total Cyanide, total Phenols, speciated PAH's.
TPH7	Speciated TPH: Total petroleum hydrocarbons CWG banding incl. aliphatic and aromatic split plus BTEX and MTBE.
Volatiles	Volatile Organic Compounds (VOCs)/Semi-Volatile Organic Compounds (SVOCs): Determination of volatile and semi volatile organic compounds in soil by headspace GC-MS.
LS2	Waste Acceptance Criteria: Total Organic Carbon, Loss on Ignition, BTEX, speciated PCB's, Mineral Oil (EC10 – EC40), pH, Acid Neutralisation Capacity, speciated PAH's, 10:1 leachable Metals and Non Metals.

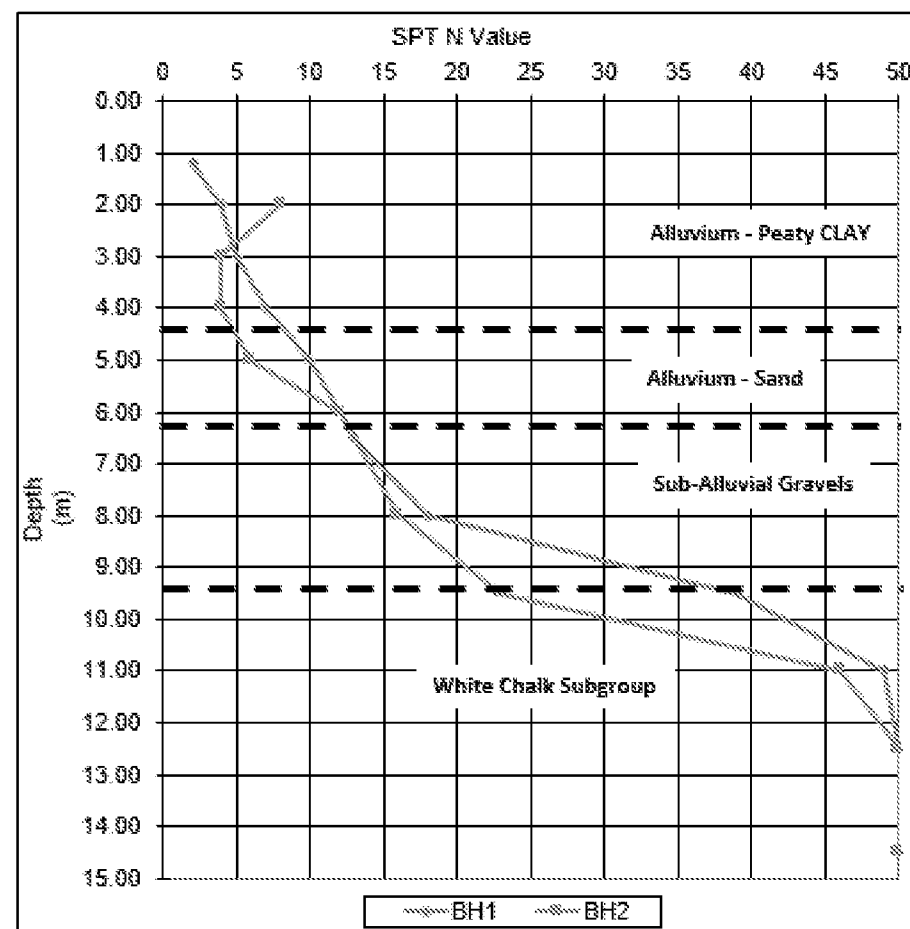
The results of geochemical analysis are discussed in section 7.0.

6 GEOTECHNICAL FIELD TESTING

6.1 Standard Penetration Testing (SPT's)

In-situ standard penetration tests (SPT's) were undertaken within the two cable percussive boreholes, in order to assess the relative density of the materials encountered. The blow count (N) to drive the cone 300mm after any seating blows is recorded and is used as a measure of the relative density of granular soils (as defined in BS5930:2015). The results may also be used to estimate the consistency of cohesive soils, using an empirical correlation. The results are summarised below.

Position	Strata	Range of results	Density
BH1	Alluvial Deposits - Peat	N = 2 to 4	Very Soft
	Alluvial Deposits - Sand	N = 5 to 10	Loose
	Sub Alluvial Gravels	N = 13 to 18 (readings increase with depths)	Medium Dense
	White Chalk subgroup	N = 39 at 9.50m N = 49 at 11.00m N = 50+ at 12.50m and 14.50m	Not applicable
BH2	Alluvial Deposits - Peat	N = 4 to 8	Very Soft to Soft
	Alluvial Deposits - Sand	N = 4 to 6	Very Loose to Loose
	Sub Alluvial Gravels	N = 12 to 16	Medium Dense
	White Chalk subgroup	N = 23 at 9.50m N = 46 at 11.00m N = 50+ at 12.50m and 14.50m	Not applicable



7 GEOTECHNICAL LABORATORY TESTING

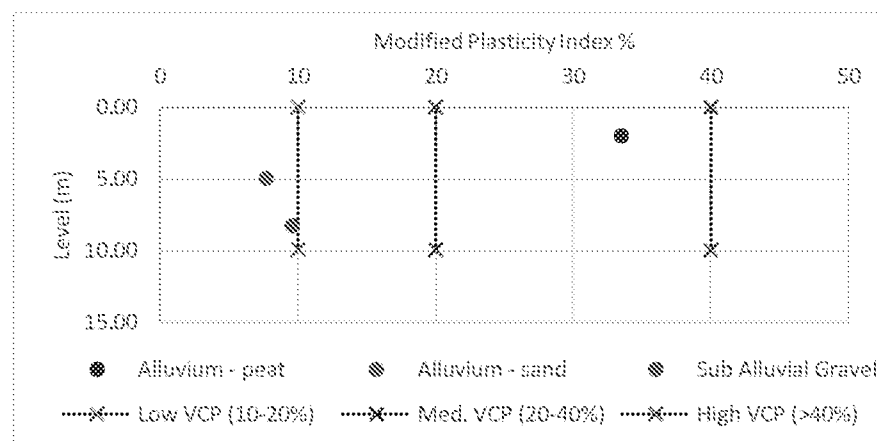
7.1 General

Samples of soil and groundwater were sent for laboratory geotechnical testing; copies of the results are appended, and summaries are given in the following tables. The testing was undertaken in accordance with the relevant British Standards in BS1377 following documented quality procedures.

7.2 Plasticity Indexes (Atterberg Limits)

Atterberg Limit tests were undertaken on selected samples of cohesive soils. A modified plasticity index (PI') was calculated following the NHBC methodology, to account for any non-shrinkable percentage not passing the 425µm sieve. These test results are summarised below

Strata	No. of tests	Plasticity Index %	Modified Plasticity Index %
Alluvium – peat	1	33.8	33.5
Alluvium – sand	1	14.3	7.7
Sub Alluvial Gravels	1	22.3	9.6



7.3 pH and Sulphate

Geochemical testing for water soluble Sulphate and pH were undertaken, and the results are summarised on the following table.

Strata	No. of tests	Water soluble Sulphate (SO ₄ g/l)	pH (value)
Made Ground	11	0.094 to 0.40	8.2 to 11.0
Alluvium – peat	3	0.062 to 0.42	8.1 to 10.0
Alluvium - Sand	2	0.061 to 1.00	8.7 to 9.1
Sub Alluvial Gravels	3	0.25 to 0.49	8.3 to 9.0
White Chalk Subgroup	2	0.23 to 0.33	7.8
Groundwater	7	0.0278 to 2.53 (total Sulphate)	7.6 to 9.5

7.4 Bulk and Dry Density

Bulk density, dry density and saturated moisture content tests were carried out on samples from the White Chalk Subgroup as described overleaf. The density of the chalk has been interpreted from the CIRIA C574 - intact dry density scale for Chalk (Page 86 Table 3.2).

Strata	No. of tests	Bulk density (Mg/m ³)	Dry density (Mg/m ³)	Saturated Moisture Content Ws
White Chalk subgroup	1	2.09	1.71 (High Density)	21.5 (High Density)

8 GEOTECHNICAL ASSESSMENT

The following recommendations have been made with respect to geotechnical design.

8.1 General Foundation Design

The proposed development was understood to comprise the demolition of the existing buildings and the construction of a three-storey building (commercial units at ground level and residential units on the first and second floors).

Significant thicknesses of Alluvial soils (including clays with varying layers of peat/organic material) were encountered within each position, to base depths of around 5.00 m bgl. The engineering characteristics of the Alluvium are such that high total and differential settlements may occur at relatively light foundation bearing capacities.

A shallow water table standing at levels of between 0.35m and 1.47m bgl was encountered. Based on the ground and groundwater conditions encountered, it is considered that traditional strip foundations would not be appropriate for the proposed development.

On this basis, it is recommended that consideration may be given to an alternative foundation solution, such as the use of piles.

8.2 Volume Change Potential

Soil shrinkability has been assessed following the NHBC Standards Chapter 4.2 (January 2018 edition). Although not strictly applicable to this form of development It is recommended that the advice of this publication (or similar guidance) is taken when designing and constructing foundations in the zone of influence of trees and hedgerows that currently exist, are to be planted, or have recently been felled.

Strata	% passing 425µm sieve	Modified Plasticity Index	Shrinkability classification
Alluvium peat	-	10-20%	Low volume change potential
Alluvium Sand	<10%	<10%	Not susceptible to significant volume change

Specifications for heave precautions on low soils are summarised below.

Volume Change Potential		Low
Minimum void dimension	Against side of traditional foundations and ground beams etc.	0mm
	Beneath ground beam and suspended in-situ concrete ground floors etc.	50mm
	Beneath suspended precast concrete or timber floors etc.	200mm
Minimum allowance for potential ground movement for new drains		50mm

The Made Ground was also noted to be highly variable in composition (clays, sands, gravels), the cohesive material may have a high volume change potential and consideration should be given for an allowance for potential ground movement for new drains.

As the Alluvium was fully saturated in places heave may not be an issue unless there was a long period of drought lowering groundwater levels etc.

8.3 Piled Foundations

The working load for piled foundations will depend on the installation technique, the dimensions of the individual piles and any pile groups, in addition to the ground conditions. The construction of piled foundations is a specialist job and the advice of a reputable contractor should be sought prior to finalising the design.

Preliminary working load capacities have been calculated for varying diameters of bored piles taken into the White Chalk Subgroup, below:

Depth (m)	300mm diameter	450mm diameter	600mm diameter
13	285	560	925
14	320	615	995
15	360	670	1070

These working loads have been calculated on the basis of the ground and groundwater conditions encountered within the boreholes and based on the following assumptions:

- The contribution to the working load on the upper 3.00m has been ignored.
- In accordance with CIRIA Project Report 11 factors of safety of 2.5 and 5 were used on the skin friction and end bearing working loads respectively.

- No account has been taken for potential negative skin frictions that may develop within the Alluvial Deposits or Made Ground

Piles should be taken at least five times the pile diameter into the founding strata.

The bearing values given are applicable to single vertically loaded piles. Where groups of piles are to be constructed, the bearing value of each individual pile should be reduced by a factor of 0.8 and a calculation made to check for the factor of safety against block failure.

In accordance with the NHBC Standards, heave precautions may be required on the upper portions of piles and on ground beams within the zone of influence of trees.

The piling contractor should be aware that the boreholes were cased to depths of 15.00m in order to prevent collapse as drilling progressed.

With the previous and current site usage it is recommended that a piling risk assessment for approval by the relevant statutory bodies is undertaken. This may include a piling monitoring exercise and collection of groundwater samples from dedicated monitoring wells for laboratory analysis prior to, during and after piling to assess impacts to groundwater due to penetrative works.

8.4 Excavations

The risks arising from excavation works should be properly assessed and appropriate safety precautions should be adopted. Reference may be made to various guidance including BS8000-1:1989, BS6031:2009 and CIRIA C97.

The likelihood of excavation instability through different strata has been assessed as summarised below. It should be noted that all open unsupported excavations have the potential to collapse.

Strata	Stability
Made Ground	Generally unstable. May be battered back to a safe angle. Deeper excavations may require trench support.
Alluvium	Marginally stable in the short term. Spalling and collapse should be expected, particularly in long or deep excavations which are left open for prolonged periods.

Excavations which are to remain open for prolonged periods will require trench support. All excavations taken beneath the water table are likely to become highly unstable. Significant collapse and over-dig expected. Consideration should be given to the use of dewatering and full-trench support.

It is considered that normal-rated plant and machinery will be sufficient for undertaking excavations. Breakers will be required for removing any former foundations, etc.

Care should be taken so as not to undermine existing structures, services, or adjacent property.

Adjacent excavations should generally be tackled in order of depth with the deepest first. Vehicles and spoil heaps etc. should not surcharge excavations, and edge protection and fencing should be used as appropriate. Frozen materials should generally not be used as backfill.

8.5 Pavements

The design of pavements will depend on the performance requirements and specification, as well as the ground conditions and finished levels etc. The suitability of shallow soils encountered as a formation level for pavements is summarised as follows:

Strata	Base Depth range	Suitability
Made Ground	0.40 to 1.30m	Only suitable for pavements with low performance requirements. A CBR value for these materials will not reflect the possible settlements that may occur. The materials will be frost susceptible so a minimum pavement thickness of 450mm will be required, and the formation will need to be adequately proof-rolled and treated.

The formation level should be carefully inspected, and any soft or loose zones should be removed and replaced with engineering fill, well-compacted in layers to a suitable specification. Consideration might be given to installing geotextiles. Cohesive formations will degrade rapidly if exposed to standing water for even short periods. All engineering fill should be granular and non-frost susceptible (i.e. <10% fine material passing 425µm sieve).

Any hard spots in the formation level such as old foundations may induce reflective cracking in the pavement and allowance should be made for removing any slabs or other hard spots etc. that may be present.

8.6 Building Materials

Based on BS8500-1:2015+A1:2016, the results of the Sulphate and pH analyses fell into Class DS-2 and an ACEC class AC-2 is deemed appropriate. The advice of this publication should be taken for the design and specification of all sub surface concrete.

Buried plastics used for potable water supplies should be upgraded to resist chemical contamination. Metal or aluminium barrier pipework will be acceptable. No pipework should be laid where there is evidence of hydrocarbons.

8.7 Surface Water Drainage

Soakaways may potentially cause subsidence and are therefore generally not permitted within 5m of any sensitive structures. Given the confines of the site the shallow groundwater table and contamination risks, it is concluded that soakaways are therefore unlikely to be acceptable. Consideration might be given other means of disposal such as discharge to surface water sewer.

9 HUMAN HEALTH RISK ASSESSMENT

9.1 General

A Tier 1 Generic Quantitative Risk Assessment (GQRA) has been prepared for soil contamination. It should be noted that the presence of a possible contaminant does not necessarily imply that a site or area is contaminated or that there is any unacceptable risk to human health.

The conceptual site model identified a potential pollutant linkage in terms of Made Ground and industrial use on and off site. Proposed plans for the development have been updated following the initial Phase I assessment and there are only two very small sized areas of communal soft landscaping – no private garden areas (See Figure 3 for details) with the remainder of the site covered with hard landscaping / buildings. Therefore, the previously identified pathway for ingestion of flora has been removed, the other pathways would still be present.

Source	Pathway	Receptor
Made Ground / contamination associated with recent and historical site usage	Indoor /outdoor ingestion of dusts Indoor /outdoor ingestion of soil Indoor/outdoor inhalation of fugitive dusts Indoor/outdoor inhalation of soil vapours Indoor/outdoor exposure to soil through dermal contact	End Users Adjacent Land Users
Offsite industrial sites (Wharfs, timber yards tanks, builders' yards, electrical sub stations,		

9.2 Screening Values

Several different partly overlapping schemes are currently in use in the UK, based on the Environment Agency's CLEA Model but with differing toxicological parameters. For the purpose of this report these schemes have and have been applied in the following hierarchy:

- Suitable For Use levels (S4UL) recently published by LQM in association with the CIEH.
- Category 4 Screening Levels (C4SL) recently published by the DEFRA and CL:AIRE.

The soil chemical analysis results have been compared against respective screening values for Residential (without vegetable uptake) land uses.

Whilst other standards exist, such as the LQM Generic Assessment Criterion and the Environment Agency's Soil Guideline Values, these are considered to have been superseded by the above publications.

For contaminants where the respective screening value is dependent on Soil Organic Matter (SOM), the corresponding value for 1.00% was used (the arithmetic mean was 2.20%).

Where no standard exists, the contaminant is either not considered a priority in terms of human health (at least in the scenario being considered), or no screening value has been published.

The following results exceeded their respective screening criteria:

Determinand	Screening value	Results exceeding the screening value
Naphthalene	2.3 mg/kg	DS5 0.30m (3.1mg/kg)
Chrysene	30 mg/kg	DS5 0.30m (42mg/kg)
Benzo (a) anthracene	11 mg/kg	BH2 0.50m (34mg/kg), DS1 0.30m (18mg/kg), DS2 0.30m (31mg/kg), DS4 0.30m (26mg/kg), DS5 0.30m (60mg/kg), DS6 0.30m (28mg/kg), DS6 1.00m (11mg/kg), DS8 0.30m (14mg/kg)
Benzo (b) Fluoranthene	3.9 mg/kg	BH1 0.50m (7.3mg/kg), BH2 0.50m (25mg/kg), DS1 0.30m (17mg/kg), DS2 0.30m (47mg/kg), DS4 0.30m (16mg/kg), DS5 0.30m (47mg/kg), DS6 0.30m (28mg/kg), DS6 1.00m (12mg/kg), DS7 0.30m (8.9mg/kg), DS8 0.30m (19mg/kg)
Benzo (a) pyrene	3.2	BH1 0.50m (5.4mg/kg), BH2 0.50m (24mg/kg), DS1 0.30m (11mg/kg), DS2 0.30m (31mg/kg), DS4 0.30m (16mg/kg), DS5 0.30m (41mg/kg), DS6 0.30m (23mg/kg), DS6 1.00m (8.7mg/kg), DS7 0.30m (5.2mg/kg), DS8 0.30m (11mg/kg)
Di-Benzo (a,h)anthracene	0.31 mg/kg	BH1 0.50m (0.9mg/kg), BH2 0.50m (3.7mg/kg), DS1 0.30m (2.2mg/kg), DS1 3.50m (0.35mg/kg), DS2 0.30m (6.3mg/kg), DS4 0.30m (2.7mg/kg),

Determinand	Screening value	Results exceeding the screening value
		DS5 0.30m (6.5mg/kg), DS6 0.30m (4.1mg/kg), DS6 1.00m (1.6mg/kg), DS8 0.30m (2.2mg/kg),
Arsenic	40 mg/kg	DS8 0.30m (120mg/kg)
Beryllium	1.7 mg/kg	DS8 0.30m (1.9mg/kg)
Lead	300 mg/kg	DS4 0.30m (390mg/kg), DS5 0.30m (520mg/kg), DS6 0.30m (710mg/kg), DS7 0.30m (570mg/kg), DS8 0.30m (540mg/kg)

The Made Ground was found to be shallow at a number of locations, in this case, a sample of the underlying natural soils was taken for laboratory sampling (DS06 1.00m). This sample of natural soil was noted to have exceedances of a number of PAHs (Benzo(a)Anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene and Di-benzo(a,h) Anthracene.

Further investigation with respect to the elevated concentration of Lead could be undertaken in the form of BARGE testing (assessment of the bio-accessible percentage).

With respect to Polycyclic Aromatic Hydrocarbons (PAH's) and for this assessment Land Science have adopted the surrogate marker approach described in Appendix E or the C4SL suite of documents i.e./ using benzo(a)pyrene as a representative compound for all genotoxic PAH's that may be present in soils at this site. This approach was used as benzo(a)pyrene was detected in all of the Made Ground samples, and the other PAH's identified above the individual screening values were all classed as genotoxic. The table below summarises the revised screening assessment:

Determinand	GAC	Concentration		Results above GAC value
		Mean	Max	
Benzo(a)Pyrene (as surrogate marker)	5.3	14.9	41.0	BH1 0.50m (5.4mg/kg), BH2 0.50m (24mg/kg), DS1 0.30m (11mg/kg), DS2 0.30m (31mg/kg), DS4 0.30m (16mg/kg), DS5 0.30m (41mg/kg), DS6 0.30m (23mg/kg), DS6 1.00m (8.7mg/kg), DS8 0.30m (11mg/kg),

The LQM PAH double ratio tool was used to assess the potential source of the elevated PAH's. The various calculated ratios all fell into the range for combustion grass/wood/coal. Most of the tests results for the deeper samples tested for PAHs fell within the range for

Carbonisation and coke oven tar on the ratio between Fluoranthene / Pyrene which may possibly be linked to the historical gas works on the site. None of the signatures matched these associated with the petroleum products/combustion which may be associated with their use at the commercial garage that was recently on site.

9.3 Arsenic

It is noted that the screening value for Arsenic set at 40mg/kg under the S4UL system which assumes all Arsenic ingestion will enter the body. However, Arsenic tends to have a low solubility in stomach acid, and it is seldom the case that all ingested Arsenic would be *bio-available*. Physiological Based Extraction Testing (PBET analysis) is a laboratory method to assess the bio-available fraction of Arsenic, which can be used to provide a more reliable assessment with respect to Arsenic. Given the likely outcome of PBET testing, it is unlikely that the PBET testing would be 30% or lower for the the arsenic value at DS8 0.30m to be below the screening value of 40mg/kg and as such remediation is required at WS8.

9.4 Volatiles

No Volatiles were found above their respective screening criteria, however, a number of volatiles were found to be in excess of their respective detection limits (where no screening values had been set) and have been detailed in the following table.

Determinant	Detection Limit (µg/kg)	Results exceeding screening value (µg/kg)	
		DS4 4.00m	DS6 3.50m
N-Propylbenzene	1	14	11
1,3,5-Trimethylbenzene	1	58	32
1,2,4-Trimethylbenzene	1	31	84
Sec-Butylbenzene	1	11	8.7
p-Isopropyltoluene	1	14	9.3

9.5 Speciated TPH

The risks from TPH's are assessed differently from other contaminants. The ratio of an individual group of carbon bands to the respective GAC is calculated (a Hazard Quotient) and these are totalled to derive a sample specific Hazard Index. A Hazard Index exceeding

1.0 suggests a potential significant risk to human health in the exposure scenario considered. The calculated Hazard Indexes are summarised below.

Sample	Total TPH (mg/kg)	Hazard Index	Notes
BH1 0.50m	163	0.22	No significant risk Identified
BH1 4.00m	<10	0.00	
BH2 0.50m	3700	1.76	Potential risk identified
BH2 3.00m	<10	0.00	No significant risk Identified
BH2 4.00m	<10	0.00	
BH2 5.00m	196	0.10	
DS1 0.30m	920	0.46	
DS1 3.50m	97	0.07	
DS2 4.00m	100	0.08	
DS3 0.50m	600	0.19	
DS4 4.00m	165	0.10	
DS4 5.00m	29	0.04	
DS5 0.30m	3250	1.65	Potential risk identified
DS5 5.00m	<10	0.00	No significant risk Identified
DS6 3.50m	<10	0.00	
DS7 0.30m	2330	0.51	
DS7 4.50m	<10	0.00	
DS7 5.00m	<10	0.00	

The speciated Total Petroleum tests undertaken above were carried out based on the fieldwork observations (slight hydrocarbon odours) and positive PID readings. The tests above may have been false positives whereby moisture in the sample influenced the PID reading.

None of the soil (or groundwater) sample tested positive for any BTEX derivatives.

9.6 Asbestos

A total of ten samples of Made Ground were screened for the presence of Asbestos, and a summary of the results is presented below.

Sample	Asbestos present	Type	Quantification
BH1 0.50m	None detected	-	-

Sample	Asbestos present	Type	Quantification
BH2 0.50m	None detected	-	-
DS1 0.30m	None detected	-	-
DS2 0.30m	None detected	-	-
DS3 0.50m	Detected	Chrysotile	0.001%
DS4 0.30m	None detected	-	-
DS5 0.30m	Detected	Chrysotile	<0.001%
DS6 0.30m	None detected	-	-
DS7 0.30m	None detected	-	-
DS8 0.30m	None detected	-	-

9.7 PCBs

Polycyclic Biphenyls (PCBs) were detected above analytical detection limits in soil samples collected from DS5 at 0.30 m (0.12 mg/kg). There are currently no published soil screening values for PCBs.

9.8 End Users

The results of the chemical analysis indicated a localised zone of PAHs and Heavy metals within the majority of the samples of shallow soils across the site and localised vapour risk from TPHs within the Made Ground at BH2 and WS5.

With respect to where the identified Source Pathway Receptor linkages will be at the site there are two proposed soft landscaped areas one at the rear of the site (WS8) and one at the front (BH2).

In terms of vapours emanating from the underlying soils the only soil tests that indicated a potential risk were within the Made Ground at BH2 and DS5. Although the Made Ground at these locations may be removed as part of the groundworks, further testing is recommended to determine the extent (with depth and laterally) of the elevated hydrocarbons.

9.9 Adjacent Land Users

Surrounding land uses were identified to comprise a mixture of commercial and residential land uses, analogous with the proposed development on site. With reference to section 9.8, a possible risk was posed to human health from PAHs and Heavy Metals.

The majority of the proposed development will be covered by hardstanding, limiting any potential for migration of potential contaminants off site to Adjacent land users. Remediation is recommended for the proposed soft landscaped areas removal of Made Ground and replacement with 'clean' imported subsoil and topsoil further limiting the potential for possible movement of contamination off site.

Temporary pathways may exist during the development in relation to the potential for the inhalation of dusts, albeit not particularly significant. Control measures should be taken to prevent generation of dust, including but not limited to dampening down of exposed soils and wheel washing.

Elevated TPHs were noted within the shallow samples of Made Ground from BH2 (0.50m) and DS5 (0.30m) which may pose a potential on going risk to adjacent land users from vapours. It is noted in Section 9.8 that the Made Ground at these positions be removed which should also remove any potential risk to adjacent land users from vapours.

9.10 Conclusions

The results of the chemical analysis indicated that elevated PAHs and heavy metals within the Made Ground at the site. The majority of the proposed development will be covered with hardstanding (buildings and car parking) with two small landscaped areas. Preliminary remediation recommendations should include: -

- Post demolition inspection of the exposed soils following removal of the exiting building (including ground floor slab) to assess whether any potential contamination from interceptors / tanks etc,
- Localised remediation around BH2 and DS5 where elevated concentrations of hydrocarbons were detected,
- Removal and replacement of shallow soils within the two communal soft landscaped areas,
- Incorporation of a vapour barrier within the ground floor construction.

A copy of this report should be submitted to the relevant authorities for approval in sufficient time prior to commencement on site.

A suitably qualified Environmental Consultant should prepare a full *Implementation, Verification Monitoring and Maintenance Plan*. An appropriate level of supervision and testing will be required, to form part of a formal *Verification Report*.

10 BUILT ENVIRONMENT RISK ASSESSMENT

10.1 General

The conceptual site model identified a potential pollutant linkage in terms of terms of direct contact of new concrete and new potable water supplies with potential contaminants within the Made Ground. A potential phytotoxic risk was also identified to soft landscaping.

Source	Pathway	Receptor
Soils: Made Ground / contamination associated with recent and historical site usage	Uptake of contaminants by plants growing in the vicinity of, or on, the site	Soft landscaping Potable water supplies
Off site industrial sites (Wharfs, tanks, builders yards, electrical sub stations, timber yards)	Ingestion of tainted mains water	

In addition to the above receptors Land Science have also assessed the potential risk posed by the identified sources to structural concrete (buried foundations).

10.2 Soft Landscaping

A number of documents include guidance on screening levels of phytotoxic contaminants within soils, including:

- BS3882:2015 "Specification for topsoil and requirements for use" (although stipulated as not to be used in contaminated land risk assessment).
- ICRCL in publication 70/90 1990 'Notes on the Restoration and Aftercare of Metalliferous Mining Sites for Pasture and Grazing' (although indirectly withdrawn) (where marked *).

The results of the chemical analysis for determinands known to pose a potential phytotoxic risk to plant growth are summarised on the following table, together with the respective adopted screening values for plant growth. The results of the chemical analysis were evaluated singularly without the use of statistical tools.

Determinand	Phytotoxicity Value (mg/kg)			Results in excess of screening value
	pH <6.0	pH 6.0-7.0	pH >7.0	
Zinc	<200	<200	<300	DS6 0.30m (640mg/kg), DS8 0.30m (360mg/kg) No exceedances
Copper	<100	<135	<200	
Nickel	<60	<75	<110	
Cadmium *	50			
Arsenic *	1.000			

On this basis, it was concluded that elevated Zinc in the vicinity of DS6 and DS8, might pose a risk of phytotoxic effects on plant growth. DS6 was located within an area of proposed hardstanding and no source pathway receptor linkages would be present between the soils and proposed soft landscaping at this location. However, DS8 was located close to an area of proposed soft landscaping in the northern end of the site and the Made Ground in these proposed soft landscaped areas will need to be removed and replaced with 'clean' imported certified topsoil.

This aside, materials generally considered physically suitable for soft landscaping purposes were not encountered within the investigative positions, and verifiably suitable topsoil or sub-soil is likely to be necessary in order to facilitate and sustain plant growth in soft landscaped areas. The materials should meet the chemical standards set out in Section 9.2 and BS3882.

10.3 Structural Concrete

Recommendations with respect to Sulphate and buried concrete are made in section 8.6. It is noted that no onerous precautions in this respect are warranted.

10.4 Potable Water Supplies

The risk of chemical attack on water supply pipework has been assessed following the general Principles set out in the joint Water UK/HBF *Contaminated Land Assessment Guidance* dated January 2014. A summary of the main chemical criteria is reproduced below.

Test group (in mg/kg)	Polyethylene (PE)	Polyvinyl Chloride (PVC)	Metal or Aluminium Barrier
VOC's	0.5	0.125	Pass
VOC's + BTEX & MTBE	0.1	0.03	Pass
SVOC's (excl. PAH's etc.)	2.0	1.4	Pass
SVOC's + Phenols	2.0	0.4	Pass
SVOC's + Cresols & Chlorinated Phenols	2.0	0.04	Pass
Mineral oil EC11-20	10	Pass	Pass
Mineral oil EC21-40	500	Pass	Pass

The recorded concentrations of Hydrocarbons within the Made Ground exceeded the respective standard for Polyethylene pipework. In accordance with these guidelines, Metal, aluminium or barrier pipework may be suitable. The specification should be agreed with the local Water Utility.

Ethers, nitrobenzene, ketones, aldehydes and amines were not suspected. Redox potential and Conductivity should be checked where metal pipework is to be installed. Aluminium barrier pipework is acceptable under all conditions. No pipework should be laid where there is evidence of free product.

11 CONTROLLED WATERS

11.1 General

The conceptual site model identified a potential pollutant linkage in terms of contaminants within soils leaching out through the migration of water through the soil profile, entering the groundwater table and in turn impacting on water resources.

Source	Pathway	Receptor
Soils: Made Ground / contamination associated with recent and historical site usage	Surface water run-off from site, migrating off site	Groundwater Surface Water
Off site industrial sites (Wharfs, tanks, builders yards, electrical sub stations, timber yards)	Percolation and mobilisation of contaminants within the soil into waters held locally within pore space beneath the site.	

For a preliminary tier 1 risk assessment, the relevant analytical results have been compared directly against the standard set out in the water framework directive for surface waters, and the current UK potable water supply regulations.

11.2 Soil leachate screening

In comparison to the adopted surface water standards (Coastal), the following determinands exceeded the respective thresholds within the WAC testing:

Determinand	EQS	Units	DS1 0.30m	DS3 0.5m	DS5 0.30m	DS6 1.00m	DS7 0.30m	BH1 0.50m
Arsenic	0.01	mg/l	0.0098	0.0412	0.0366	<0.0011	0.0296	<0.0011
Copper	0.00376	mg/l	0.0099	0.0083	0.029	0.011	0.037	0.0057
Lead	0.001	mg/l	0.021	0.011	0.021	0.0019	0.0071	0.004
Zinc	0.0068	mg/l	0.011	0.011	0.0087	0.003	0.0041	0.0059

In comparison to the adopted drinking water standards, the following determinands exceeded the respective thresholds within the WAC testing:

Determinand	EQS	Units	DS1 0.30m	DS3 0.5m	DS5 0.30m	DS6 1.00m	DS7 0.30m	BH1 0.50m
Arsenic	0.01	mg/l	0.0098	0.0412	0.0366	<0.0011	0.0296	<0.0011
Lead	0.01	mg/l	0.021	0.011	0.021	0.0019	0.0071	0.004

The leachate testing undertaken as part of the WAC testing may overestimate the concentrations of potential leachable heavy metals; as such water samples were taken from each of the installation wells and the test results compared to the respective screening criteria in the following section.

11.3 Groundwater screening

In comparison to the adopted surface water standards (Coastal), the following determinands exceeded the respective thresholds:

Determinand	EQS	Exceedances
Phenol	7.7 µg/l	BH1S (70 µg/l)
Copper	3.76 µg/l	BH2S (4 µg/l), DS7 (11 µg/l)
Lead	1.3 µg/l	DS7 (5.7 µg/l)

In comparison to the adopted drinking water standards, the following determinands exceeded the respective thresholds.

Determinand	EQS	Exceedances
Sulphate	250000 µg/l	BH1S (2530000 µg/l), DS6 (366000 µg/l)
Arsenic	10 µg/l	DS7 (12.9 µg/l),
Boron	1000 µg/l	BH1S (2300 µg/l),
Selenium	10 µg/l	DS6 (17 µg/l), BH1D (29 µg/l),

Although some hydrocarbons and VOCs were detected within the samples taken from the deep installation at BH2 and DS6 they were not above their respective screening criteria. Using the SOBRA 2017 guidance for assessing the potential vapour risk from groundwater the concentrations were significantly low enough that no potential risk from vapours would be present.

11.4 Conclusion

With respect to the sulphate concentrations noted above the DWS in groundwater samples at the shallow install at BH1 and DS6 these are not considered to pose significant risks to controlled water receptors on the basis that although the Superficial soils are classed as a Secondary Aquifer and the underlying Chalk a Principal Aquifer the site is not in a potable water supply source protection zone; and no groundwater abstractions were identified in close proximity to the site.

With respect to the concentrations above EQS in groundwater samples (Arsenic, Copper, Lead and Zinc) the risks to controlled waters are considered likely to be acceptable due to the magnitude of the exceedances and the reduced potential for water to infiltrate through the soils as the majority of the site will be hard landscaped.

It is recommended that a piling method statement is undertaken and submitted to the relevant regulatory bodies. This document is required to detail the type of piling, methodology, measures to prevent / minimise potential impact to controlled waters (groundwater aquifers and surface waters), and a programme of works. This may include a piling monitoring exercise and collection of groundwater samples for laboratory analysis prior to, during and after piling to assess impacts to groundwater due to penetrative works.

In addition, it is recommended that surface water is disposed offsite via a sewer rather than the use of soakaways to limit and potential leaching and migration of contaminants

12 GROUND GAS RISK ASSESSMENT

12.1 General

Although not identified within the previous Phase I assessment, due to the presence of Peaty Alluvial Deposits below the site, Land Science have included a Ground Gas Assessment within this Phase II Assessment.

The risks associated with ground gases in respect of end users have been evaluated in general accordance with BS8485:2015 *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings* and CIRIA C665 (2007) entitled *Assessing Risks Posed by Hazardous Ground Gases to Buildings*.

The Conceptual Site Model identified the following source-pathway-receptor linkages in respect of potential ground gases and vapours:

Source	Pathway	Receptor
Ground gases arising from: Deep Made Ground (over 1.00m in thickness), Alluvium and degradation of any hydrocarbon contamination sourced from historical and recent uses of the site (gas works / garage etc).	Inhalation, explosion	End users

12.2 Gas Monitoring Rounds

It should be noted that the presence of a gas does not necessarily imply that a site or area is contaminated or that there is any unacceptable risk.

Concentrations of ground gases recorded may be affected by a variety of factors including atmospheric pressure, groundwater, rainfall and temperature, as well as the gas generation potential of the source. CIRIA C665 prescribe typical periods and frequency of monitoring visits required, as summarised on the following table (after CIRIA C665 Tables 5.5a and 5.5b):

Based on the results and the requirements of BS8485:2015 (see table overleaf), the monitoring visits undertaken to date are not sufficient to characterise the gas situation likely to be present at the site on account of Alluvium being encountered below the site a

further six visits over a six month period are required. However, a very shallow groundwater table was recorded at the site and the Alluvium would be fully waterlogged which would limit the potential for ground gas generation.

Generation potential ^{1,2}		Very Low	Low	Moderate	High	Very High
Example		Inert Made Ground	Alluvium or dock silt	Pre-1960 landfill	Shallow mine workings	Post '60's domestic landfill
Sensitivity of development	Low	4/1	6/2	6/3	12/6	12/12
	Moderate	6/2	6/3	9/6	12/12	24/24
	High	6/3	9/6	12/6	24/12 ³	24/24 ³
Notes: 1 - First digit is number of visits and second digit is number of months, e.g. 9/6 means nine visits in total over a period of 6 months 2 - At least two sets of readings should ideally be undertaken during low and falling atmospheric pressure <1000mB 3 - High sensitivity development on high gas hazard land is not normally acceptable unless the source is removed or otherwise treated.						

12.3 Monitoring Data

BS8485:2015 categorises sites into one of six characteristic situations based on gas concentrations, flow rates and a calculated gas screening value, as summarised on the following table:

CS	Hazard Potential	CH ₄	CO ₂	Flow	Gas Screening Value (GSV)
1	Very low	<1.0%	<5.0%	-	<0.07l/hr
2	Low	-	-	<70l/hr	<0.7l/hr
3	Moderate	-	-	-	<3.5l/hr
4	Moderate to high	-	-	-	<15l/hr
5	High	-	-	-	<70l/hr
6	Very high	-	-	-	>70l/hr

12.4 End Users

In terms of potential ground gas source, no deep Made Ground or visual hydrocarbon impacted soils were encountered in the boreholes and the underlying Alluvium was noted to be fully saturated and the test results indicated a very low organic content (FOC/ TOC results) which would indicate that the material has a very low gas generating potential.

Very low concentrations of Carbon Dioxide (Maximum 2.3% v/v) and no Methane levels were detected within any of the monitoring installations during the three rounds of monitoring. Highly variable flow rates were noted within the monitoring which are likely to be influenced by changing water levels than an actual gas flow situation.

The results obtained to date have been assessed as corresponding to a gas Characteristic Situation 1 and no gas protection measures are deemed to be required.

12.5 Adjacent Land Users

Land uses around the site of the site were identified to comprise commercial and residential land uses. With reference to section 12.3, the source of gases was identified as not posing a significant risk to the on-site development. Therefore, no significant risk is posed to adjacent land users.

12.6 Conclusions

On the basis that no ground gas contamination risks were identified, it was concluded that no remediation was necessary with respect to ground gases. However, it should be noted that recommendations for the use of a vapour resistant membrane have been made in section 9.10 due to the presence of elevated hydrocarbons below the footprint of the proposed building.

13 PRELIMINARY WASTE ASSESSMENT

13.1 General

Waste may be defined as any substance or object in Annex 1 of the Waste Framework Directive¹ which the holder discards, intends to discard, or is required to discard. Subject to certain provisions, soils may either be handled as either:

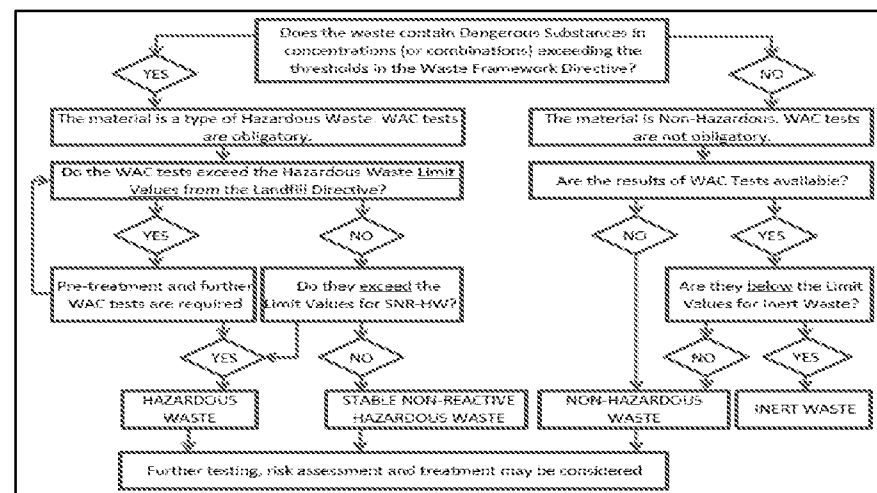
- Non-Waste, and re-used (on or off-site), or
- Waste, and disposed of (to a waste management facility).

Given the confines of the site, it was anticipated that all materials would be disposed of from site as waste.

The waste producer has a legal duty of care to ensure that waste materials are handled properly and sent to the appropriate licenced facility. Further inspection, testing, segregation etc will be required on site, and the advice of a suitably qualified consultant sought wherever necessary. Substantial tax penalties and fines are being levied by the regulators. The advice contained in this section is preliminary only.

13.2 Waste Disposal

Where materials are not re-used they must be handled as Waste, and must be sent to a licenced waste management facility. The classification of waste is prescribed under the Waste Framework Directive² and the Landfill Directive³, as summarised below. Different waste management facilities may also have specific acceptance criteria, and their advice should be sought.



The results of the soil analysis have been classified as follows:

Soil	Hazardous		Non Hazardous		Details
	Hazardous	Stable Non-Reactive	Non-Hazardous	Inert	
Made Ground BH1 0.50m DS2 0.30m DS4 0.30m DS6 0.30m DS8 0.30m			✓		Non Hazardous – No WAC test carried out
Made Ground DS3 0.50m				✓	The soil analysis was not identified as Non hazardous and the WAC test met the requirements for Inert Waste
Made Ground BH2 0.50m	✓				The soil analysis was identified as Hazardous waste due to elevated TPH. No WAC test carried out.

Soil	Hazardous		Non Hazardous		Details
	Hazardous	Stable Non-Reactive	Non-Hazardous	Inert	
Made Ground DS1 0.30m DS5 0.30m DS7 0.30m		✓			The soil analysis was identified as Hazardous waste due to elevated TPH. The WAC test met the criteria for Stable Non reactive Hazardous Waste .
Alluvium DS6 1.00m			✓		The soil analysis was identified as Non-Hazardous . The WAC test did not meet the requirements for Inert waste. The tests failed the criteria for: Total Dissolved Solids
Alluvium BH1 4.00m BH1 6.00m BH2 3.00m BH2 4.00m BH2 5.00m BH2 6.50m DS1 1.00m DS1 3.50m DS2 4.00m DS4 1.50m DS4 4.00m DS4 5.00m DS5 5.00m DS6 3.50m DS7 4.50m DS7 5.00m			✓		Non Hazardous – No WAC test carried out
Chalk BH2 10.00m BH2 14.00m			✓		Non Hazardous – No WAC test carried out

Asbestos was identified in in samples of the shallow Made Ground at DS3 (0.50m) and DS5 (0.30m) as free fibres at at/or below the limit of detection (0.001%). The threshold of free fibres in Hazardous Waste is 0.1% and therefore the samples were classified as non-hazardous etc.

Further WAC testing may be considered for soils identified as Non-Hazardous, as the tests may enable those materials to be re-classified as Inert and therefore represent a potential saving on disposal costs.

With reference to the current List of Wastes (formerly European Waste Catalogue), waste soils and stone derived from construction and demolition sites may be disposed of under either of the following codes as appropriate:

Waste	Code	Description
Hazardous	17 05 03*	soil and stones containing dangerous substances
Non-Hazardous	17 05 04	soil and stones other than those mentioned in 17 05 03

(Note, the asterix is a Mirror Entry, as defined in the List of Wastes, conferring the relationship with the non-hazardous code 17-05-04).

14 SUMMARY AND CONCLUSIONS

This summary is a brief precis of the main findings and conclusions of the investigation. For detailed information, the reader is referred to the main report.

14.1 General

The area under investigation comprised a series of industrial buildings with areas of hardstanding.

The proposed development was understood to comprise the demolition of the existing buildings and the construction of a three-storey building (commercial units at ground level and residential units on the first and second floors).

The intrusive investigation included the following:

- 8no. Dynamic (windowless) sampler boreholes
- 2no. 15m deep cable percussive borehole
- 5no. standpipe installations, to be monitored on three return visits

14.2 Soils Encountered

The investigation encountered the following ground conditions: -

Strata	Depth	Summary
Hardstanding	0.10 to 0.20m	Concrete
Made Ground	0.40 to 1.30m	Brown silty sandy Gravel with abundant fragments of concrete and brick
Alluvium – Peat	4.00 to 4.80m	Very soft to soft grey slightly gravelly, peaty, sandy CLAY with chalk fragments, flint gravel, shell and carboniferous deposits.
Alluvium - Sand	5.40 to 6.40m	Dark brown gravelly clayey SAND
Sub Alluvial Gravels	9.10 to 9.20m	Dense sandy gravel
White Chalk Subgroup	15.00m+	Off white putty chalk with occasional flint gravel. These materials were classified as Grade C (or better)

14.3 Groundwater

Groundwater was recorded during the site work and return monitoring standing at levels of between 0.30 to 2.00m bgl.

14.4 Foundations

A piled foundation design has been recommended due to a combination of soft alluvial soils and a shallow groundwater table. Parameters for a pile design have been given.

14.5 Excavations

Generally likely to remain be unstable. Excavations below the water table may become highly unstable. Risk assessments should be prepared and appropriate safety measures provided.

14.6 Pavements

The investigation identified Made Ground at depths to around 0.60 to 1.30m, This material is only suitable for pavements with low performance requirements. A CBR value for these materials will not reflect the possible settlements that may occur. The materials will be frost susceptible so a minimum pavement thickness of 450mm will be required, and the formation will need to be adequately proof-rolled and treated.

14.7 Building Materials

DS2 and AC2s in accordance with BS8500. Water supply pipe work will require protection from aggressive soil contaminants.

14.8 Soakaways

Given the confines of the site and the shallow groundwater table, it is concluded that soakaways are therefore unlikely to be acceptable. Consideration might be given other means of disposal such as discharge to surface water sewer.

14.9 Radon Protection

No issues with respect to Radon gas have been identified.

14.10 Contamination

The assessment identified three separate potential sources of Contamination at the site, in the form of soil, groundwater and ground gases.

Soil

In terms of potential risk to Human Health, the results of the chemical analysis indicated that elevated PAHs and heavy metals within the Made Ground at the site. Based on a preliminary remediation options appraisal, it was considered that the risks would most cost effectively mitigated by provision of a 600mm 'clean' capping (certified imported subsoil and topsoil) within the two areas of soft landscaping.

Elevated concentrations of Zinc were noted in the shallow soils at DS8, these may pose a risk of phytotoxic effects on plant growth and they should be removed and replaced with 'clean' capping.

Elevated hydrocarbons were noted at the site that may pose a potential vapour risk to end users and as such a vapour resistant is recommended.

Groundwater

Some slight exceedances were noted within the water analysis, however the risks to controlled waters are considered likely to be acceptable as the majority were only just above the screening criteria and there will be a reduced potential for water to infiltrate through the soils as the majority of the site will be hard landscaped.

It is recommended that a piling method statement is undertaken and submitted to the relevant regulatory bodies.

In addition, it is recommended that surface water is disposed offsite via a sewer rather than the use of soakaways to limit and potential leaching and migration of contaminants

Ground gases

No significant sources of ground gases were identified, and the site has been assessed as corresponding to a gas Characteristic Situation 1 and no gas protection measures are deemed to be required, however, a vapour membrane should be incorporated in the building design.

14.11 Waste Disposal

Generally the chemical results confirmed that the Made Ground should be handled as Non Hazardous Waste for disposal purposes. However, the Made Ground at BH2, DS1, DS5 And DS7 were noted as possibly being Hazardous due to elevated hydrocarbons. It is likely that natural soils could be handled as Inert Waste.

14.12 Further Action

Remediation has been recommended in terms of potential risk to end users and a Remediation Method Statement should be prepared.

This report should be submitted to relevant regulatory bodies and warranty providers in good time for approval.

15 REPORT CONDITIONS

15.1 General

Interpretation of ground conditions inherently depends on the conditions revealed by a limited data set. Land Science takes all reasonable professional care in preparation of this report, using current standards and industry best practice. However, we accept no liability whatsoever expressed or implied in respect of:

- The scope, extent or design of an investigation.
- Any conditions not directly revealed by the investigation.
- Published standards or methodologies used or adopted in this report.
- The opinion of any other party including any regulator, authority or stakeholder.
- Any dispute, claim or consequential loss arising from this report.
- Any matter other than ground conditions.

Land Science does not accept any risk or any direct or consequential liability relating to ground conditions. The client should understand their risks and liabilities and seek further professional advice.

No aspect of this report constitutes a design. Where this information is used in design, the designer should verify that the information has been used appropriately.

No aspect of this report constitutes the supply of Goods.

Our appointment is covered under our Terms and Conditions, agreed and accepted by the Client.

15.2 Confidentiality

This report may only be relied upon by the Client and their design team, and should only be read and used in full. No responsibility will be accepted where this report is used, by any other party, who do so at their peril. The report may not be relied upon or transferred to any other parties without the express written agreement of Land Science.

15.3 Third Party Information

Third party information used in the production of this report has been relied upon as being accurate. Land Science cannot warrant or accept any liability for errors and/or omissions in third party information.

15.4 Regulators and Approvals

It is recommended that this report is submitted to any relevant authorities for their own assessments and to provide their approval or comments accordingly. This should be in good time before commencing on site in case additional work is to be carried out.

Standards, technical guidance and regulatory positions change over time and which may therefore affect the findings and recommendations made in this report. This should be verified by the client prior to any critical contractual points or commencing on site.

15.5 Variations with time

The report relates to conditions revealed at the time of the investigation and any monitoring visits. A number of parameters may vary over time or seasonally. Groundwater levels, ground gas compositions, or concentrations of contaminants are particularly variable in this respect. Further monitoring or verification should be considered as appropriate.

15.6 Other Matters

This report makes no representation on other matters such as ecology, agronomy, arboriculture, structural condition, building materials, boundaries and planning etc.

This report and findings may not be valid if the proposals for the site e.g. design of the development (if relevant) are changed. This must be checked.

No aspect of this report should be taken as a guarantee whatsoever that a site is free of pollution, contamination or hazardous materials.

GLOSSARY OF TERMS

ACM	Asbestos Containing Material
BGS	British Geological Survey
BRE	Building Research Establishment
BS	British Standard
CBR	California Bearing Ratio
CDM	Construction Design and Management regulations
CIRIA	Construction Industry Research and Information Association
CL:AIRE	Contaminated Land: Applications in Real Environments
CLEA	Contaminated Land Exposure Assessment model
CoC	Chemical of Concern
CSM	Conceptual Site Model
EA	Environment Agency
EQS	Environmental Quality Standards
FOC	Fraction of Organic Carbon
GAC	Generic Assessment Criterion
mbgl	Meters Below Ground Level
NHBC	National House Building Council
mod	Metres above Ordnance Datum
PAH's	Polycyclic Aromatic Hydrocarbons
PCoC	Potential Contaminant of Concern
PBET	Physiological Based Extraction Testing
PHE	Public Health England
PID	Photo-Ionisation Detector

PQRA	Preliminary Quantitative Risk Assessment
PSD	Particle Size Distribution Test
RMS	Remediation Method Statement
SGV	Soil Guideline Value
SOM	Soil Organic Matter
SPZ	Source Protection Zone
SPT	Standard Penetration Test
SSSI	Sites of Special Scientific Interest
ST-WEL	Short Term Workplace Exposure Limit
SVOC's	Semi-Volatile Organic Compounds
TPH	Total Petroleum Hydrocarbons
TRRL	Transport Road Research Laboratory
TWA-WEL	Time Weighted Average Workplace Exposure Limit
UK HBF	United Kingdom House Building Federation
VOC's	Volatile Organic Compounds
WAC	Waste Acceptance Criteria

ACCOMPANYING NOTES – SOIL CONTAMINATION

LS1 routine screening suite

The LS1 suite is based broadly upon determinands listed within the former ICRL guidance note 59/83 2nd edition 1987, CLR publication CLR8, and Environment Agency R&D66 publication. Stone and moisture content, fraction of organic carbon ('foc'), and pH value, are also undertaken. Total Sulphate is not a priority in terms of human health, so water soluble Sulphate is analysed instead to assess the risks to buried concrete.

Site Workers

Site managers are responsible for the safety of persons in their employ under a variety of instruments including the CDM regulations and Health & Safety at Work Act. In terms of working on contaminated sites, guidance can be sought from the CIRIA publication entitled "A Guide for Safe Working on Contaminated Sites". Any work in confined spaces confined spaces should only be carried out following appropriate risk assessment. Detailed risk assessment for workers is outside the scope of this report.

Discovery Strategy

Unexpected soil conditions may be encountered during the process of site demolition and construction. Examples may include oily pockets within the soil, pockets of cement boarding or fibrous materials within the soil, black ashy materials, soils exhibiting strong odours, brightly coloured materials, and former structures or brickwork.

Should previously undiscovered contamination be encountered during construction by the ground worker's, this should be reported to the Geo-Environmental Consultant immediately in order that any necessary inspection may be made. All site workers should be made aware of their responsibility to observe, report, and act on any potentially suspicious or contaminated materials they may encounter.

General

Contamination may be identified as the occurrence of a substance in or on the ground which has a potential to cause significant harm (humans, ecological systems, or property) or pollution of a controlled water.

Sources – Pathways – Receptors

Primary Source – the point at which contamination starts to occur e.g. a leaking tank

Secondary source – the media affected by contamination, including soil, groundwater and ground gases, as summarised below

Receptor – Persons, living organisms, ecological systems, controlled water, atmosphere, structures and property, and utilities.

Secondary source	Summary
Soil	Contaminants bound into or entrained with the soil matrix, for instance ashes, clinkers, bituminous materials, asbestos containing materials, etc. Also, soils may become contaminated by other activities, such as leaking chemical storage, drainage and the like, becoming bound into the soil mineralogy or organic matter. Soils may also generate soil-borne dusts and volatile organic compounds may generate organic vapours.
Volatile vapours	Many organic compounds are either volatile or semi volatile (at different temperatures and pressures) which mean they will volatilise and generate vapours. In an enclosed system, the ratio of vapours to other compartments will come into equilibrium, but in open systems the process may continue until the source has been depleted.
Ground gases	Organic matter, including wastes, hydrocarbons and other compounds, will decay through microbial action. This will primarily release Carbon Dioxide but may also release Methane under anaerobic conditions. This may be an issue in natural soils (e.g. alluvium and dock silt) in man-made soils (e.g. landfill sites and filled ground) and other environments (e.g. mine workings).
Groundwater	Contaminants may dissolve into pore water which in turn can percolate downwards into the groundwater table. Rapid discharge of fluids may also enter groundwater directly. Organic compounds may form separate light or dense non-aqueous phase liquids upon or at the base of the water column. Organic contaminants may generate organic vapours.

REFERENCES

- | | |
|---|--|
| <p>¹ Revised EU Waste Framework Directive 2008 2008/98/EC [transposed into English law under The Waste (England and Wales) Regulations 2011]</p> | <p>² Revised EU Waste Framework Directive 2008 2008/98/EC [transposed into English law under The Waste (England and Wales) Regulations 2011]</p> <p>³ European Community (EC) Directive 1999/31/EC [transposed into English law under the Landfill (England and Wales) Regulations 2002]</p> |
|---|--|



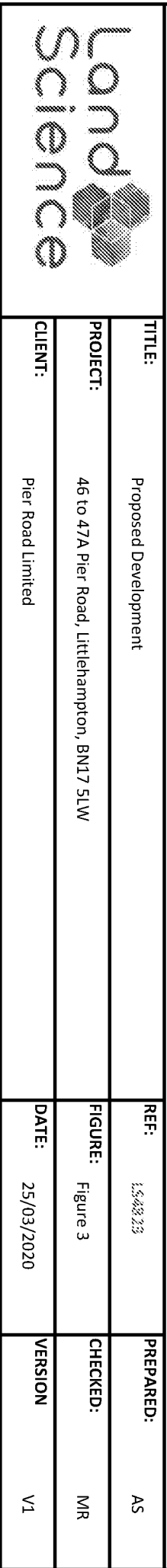
	Title: Site Location			Reference: LS4823
	Project: 46A to 47 Pier Road, Littlehampton, BN17 5LW			Figure: 1
	Client: Pier Road Limited			Date: 07/02/2020
	Prepared by: JT	Checked by: MR	Version: 01	Sheet: 1 of 1



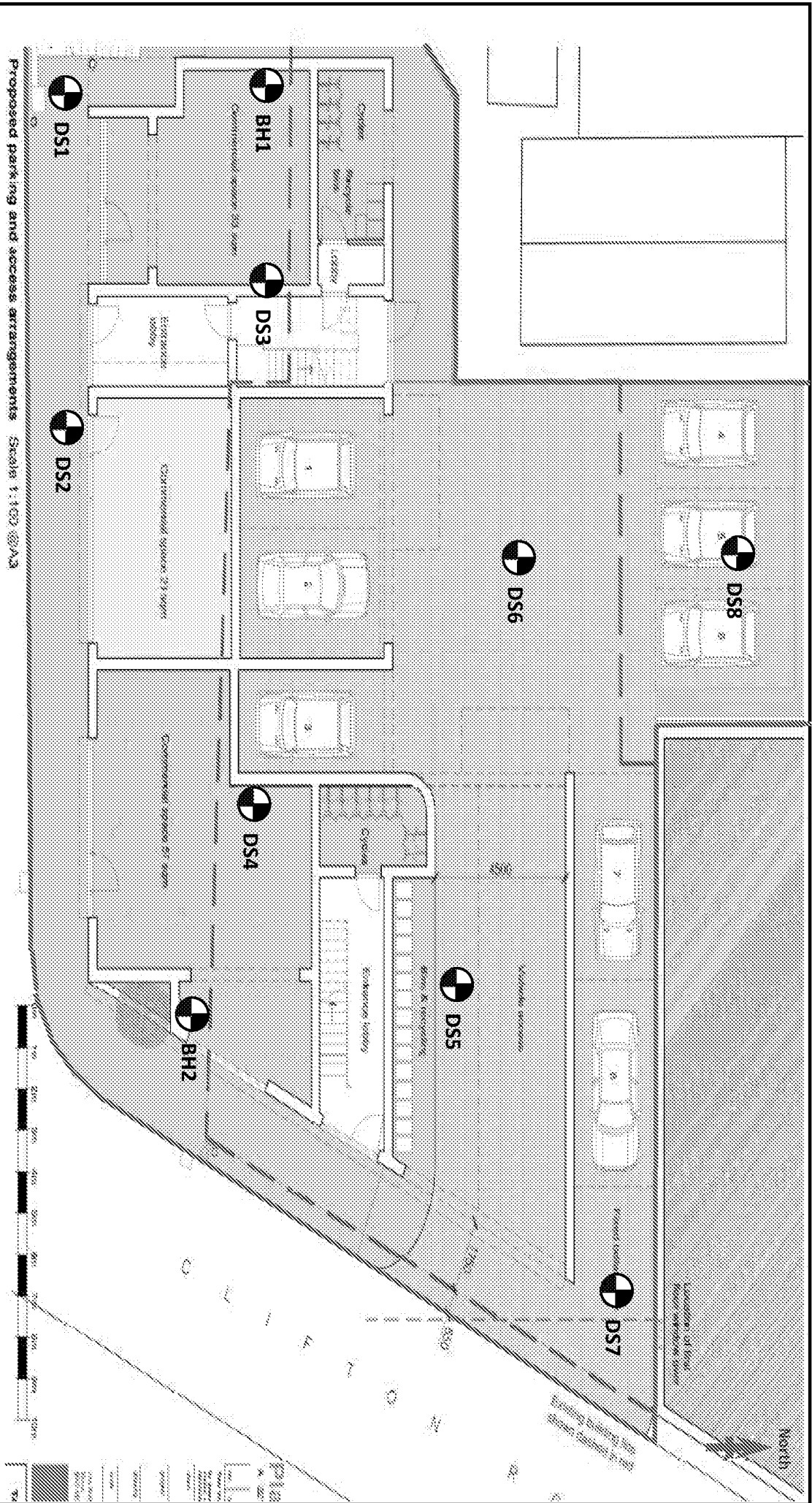
Legend

-  Site Boundary
-  Cable Percussive Investigation
-  Dynamic Sampler Investigation

	Title: Investigation Layout			Reference: LS4823
	Project: 46A to 47 Pier Road, Littlehampton, BN17 5LW			Figure: 2
	Client: Pier Road Limited			Date: 07/02/2020
	Prepared by: JT	Checked by: MR	Version: 01	Sheet: 1 of 1



Proposed parking and access arrangements: Scale 1:100 @ A3



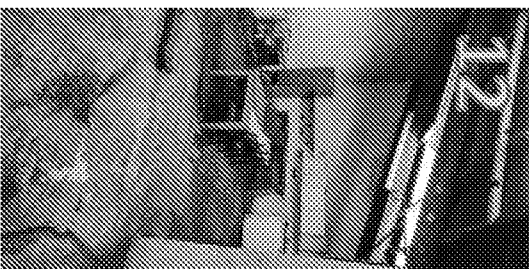
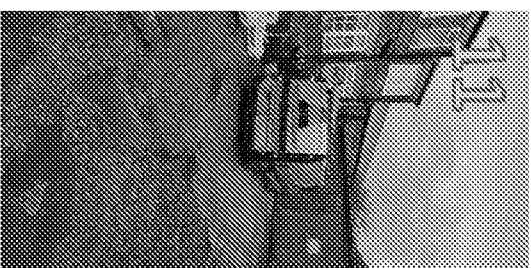
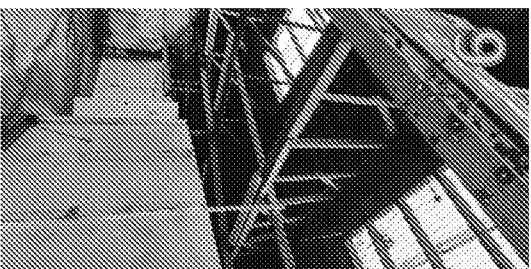
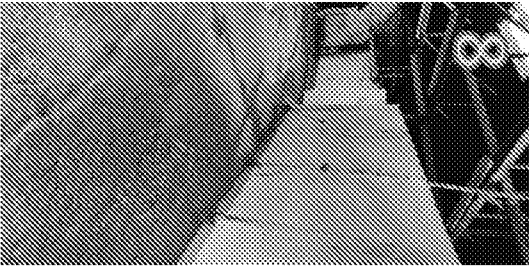
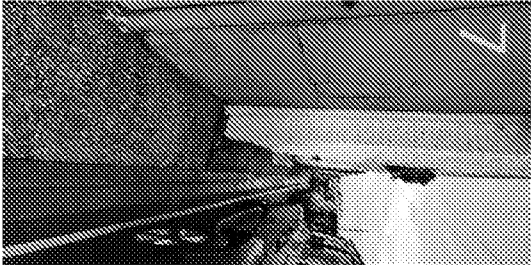
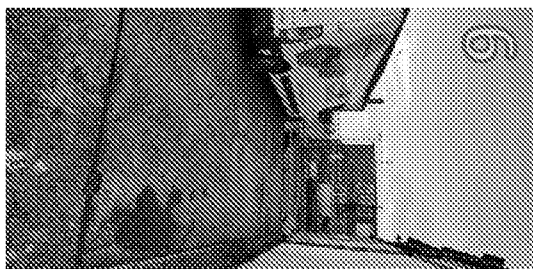
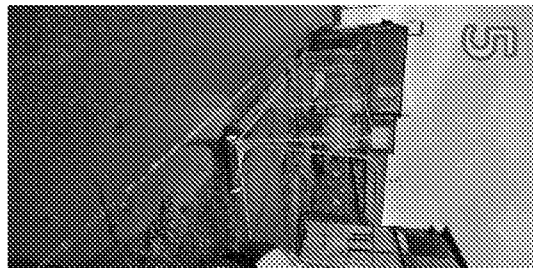
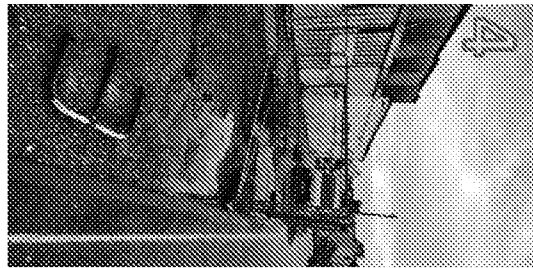
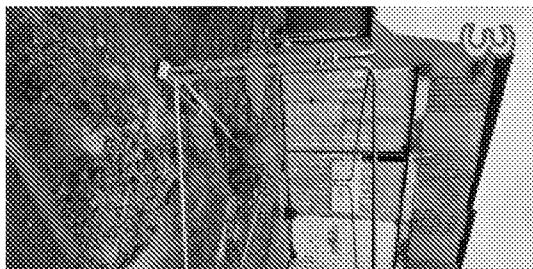
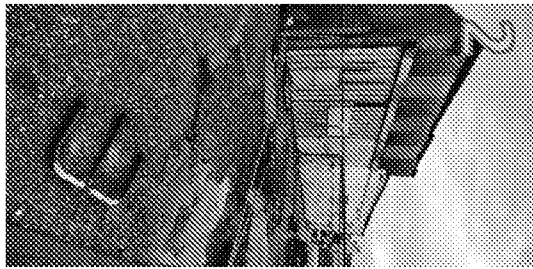
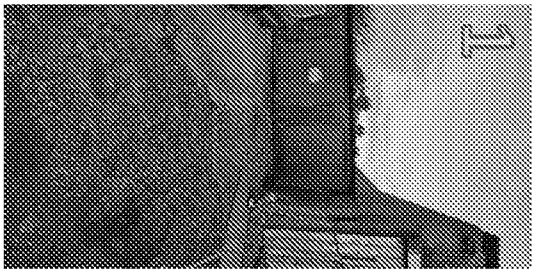
100

100

10

1000

APPENDIX A



	
TITLE:	Site Photographs
PROJECT:	Pier Road, Littlehampton
CLIENT:	Robert Davies John West Ltd
REF:	154823
FIGURE:	V1
DATE:	16/03/1900
PREPARED:	JZ
CHECKED:	MR
VERSION	V1

APPENDIX B

 Brighton London Bristol 						Site 46A to 47 Pier Road, Littlehampton, BN17 5LW			Borehole Number BH1	
Boring Method Cable Percussion		Casing Diameter		Ground Level (mOD)		Client Pier Road Limited			Job Number LS4823	
		Location		Dates 16/02/2020		Engineer			Sheet 1/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	D			PID - 0.10		0.10 (0.50)	Concrete (HARDSTANDING) Soft light brown-grey slightly clayey very gravely clayey peat. Sand is fine to coarse. Gravel is fine to medium angular to sub-rounded flints, brick and concrete. (MADE GROUND)			
1.00	D			PID - 0.20		0.60 (0.50)	Concrete base (HARDSTANDING)			
1.20-1.65	SPT N=2	1.00	DRY	1,0/1,0,0,1		1.10	Light brown mottled grey soft slightly sandy gravely CLAY. Sand is fine to medium. (ALLUVIUM - PEAT)			
2.00	D			PID - 0.10		(2.90)				
2.00-2.45	SPT N=4	1.00	DRY	1,1/1,1,1,1						
3.00	D			PID - 0.30						
3.00-3.45	SPT N=5	3.00	DRY	1,2/1,1,2,1						
4.00	D			PID - 0.10		4.00	Light brown-grey slightly clayey SAND. Sand is fine to medium. Gravel is fine to medium angular to sub-rounded flints. (ALLUVIUM - SAND)			
4.00-4.45	SPT N=7	4.00	DRY	1,2/1,2,2,2		(1.40)				
5.00	D			PID - 0.10		5.40	Light brown-grey very sandy slightly clayey GRAVEL. Sand is fine-medium. Gravel is fine to coarse angular to sub-rounded flints. (SUB ALLUVIAL GRAVELS)			
5.00-5.45	SPT N=10	5.00	4.90	1,2/2,3,2,3						
6.00-6.30	D			PID - 0.10						
6.50-6.95	SPT N=13	6.00	5.40	1,2/3,4,3,3		(3.80)				
8.00-8.30	D			PID - 0.20						
8.00-8.45	SPT N=18	8.00	7.10	1,2/3,4,5,6						
9.50-9.95	SPT N=39	9.50	6.00	5,5/7,8,12,12 PID - 0.10		9.20	Structureless CHALK composed of cream off-white slightly clayey, sub angular to rounded gravel. Gravel is medium to coarse flints. (Grade C recovered as putty - WHITE CHALK SUBGROUP)			
Remarks GROUNDWATER: No groundwater encountered. NOTES: Borehole complete at 15.00m. CASING: Casing to 15.00m. BACKFILL: Backfilled with arisings, bentonite clay and gravel. SLOW PROGRESS: None. INSTALLATION: Two 50mm diameter HDPE standpipes. One to 7.50m - plain to 5.50m and slotted to 7.50m. One to 11.00m - plain to 10.00m and slotted to 12.00m.								Scale (approx) 1:50	Logged By AS	Figure No. LS4823.BH01

Boring Method

Cable Percussion

Casing Diameter

Ground Level (mOD)

Client

Pier Road Limited

Job Number

LS4823

Location

Dates

16/02/2020

Engineer

Sheet

2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00	D									
11.00-11.45	SPT N=49	11.00	4.50	5,9/12,9,14,14						
12.00	D			PID - 0.20		(5.80)				
12.50-12.95	SPT N=50	12.50	5.60	4,7/13,16,16,5						
14.50-14.95 14.50	SPT N=50 D	14.50	4.20	4,14/50		15.00				
				PID - 0.10						
							Complete at 15.00m			

Remarks

NOTES: Borehole complete at 15.00m.

Scale (approx)

1:50

Logged By

AS

Figure No.

LS4823.BH01

Boring Method

Cable Percussion

Casing Diameter

Ground Level (mOD)

Client

Pier Road Limited

Job Number

LS4823

Location

Dates

16/02/2020

Engineer

Sheet

1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	D			Water strike(1) at 0.50m, rose to 0.20m in 20 mins.		0.10 (0.20) 0.30	Concrete (HARDSTANDINGS)		▼1	
1.00 1.00-1.45	D SPT N=2			PID: 3.00ppm 1,0/1,0,0,1		(1.00)	Dark brown, slightly silty, very sandy GRAVEL. Sand is fine to medium. Gravels are fine to coarse, subangular to subrounded concrete and brick fragments (MADE GROUND)		Σ1	
2.00-2.30 2.00-2.45	B SPT N=8			PID: 3.50ppm 1,0/0,1,1,6		1.30	Soft, dark grey, slightly gravelly CLAY. Gravels are fine to medium, sub-angular to subrounded flints and rare brick (MADE GROUND)			
3.00 3.00-3.45	D SPT N=4			PID: 6.50ppm 1,0/1,1,1,1		(3.20)	Soft, dark grey, slightly gravelly CLAY. Gravels are fine to medium, sub-angular to subrounded flints (ALLUVIUM - PEAT)			
4.00 4.00-4.45	D SPT N=4			PID: 7.20ppm 1,1/1,1,1,1		4.50	Light brown-grey slightly clayey SAND. Sand is fine to medium. Gravel is fine to medium angular to sub-rounded flints. (ALLUVIUM - SAND)			
5.00 5.00-5.45	D SPT N=6			PID: 7.60ppm 1,2/1,2,1,2		(1.90)				
6.50-6.95 6.50	SPT N=16 B			1,2/3,4,3,6		6.40	Light brown, sandy GRAVEL. Sand is fine to medium. Gravels are fine to coarse, sa,-sr flints (SUB ALLUVIAL GRAVELS)			
8.00-8.45	SPT N=16			2,4/4,4,4,4		(2.70)				
9.50-9.95	SPT N=23			4,5/5,6,6,6		9.10	Orangey, off-white structured, medium density CHALK with rare, fine to coarse, subrounded to angular flints, recovered as a gravelly silt (WHITE CHALK SUBGROUP)			

Remarks

NOTES: Hand excavated to 1.20m
GROUNDWATER: Struck at 0.50m, rose to 0.20m in 20 minutes
INSTALLATION: 50mm HDPE standpipes installed to 8.50 and 12.00m. Plain pipes from ground level to 6.50 and 10.00m. Slotted response zones from 6.50 to 8.50m and 10.00 to 12.00m
BACKFILL: Backfilled with bentonite sealing pellets from ground level to 6.50m and 8.50m to 10.00m. 10mm pea shingle pack from 6.50 to 8.50 and 10.00 to 12.00m
CASING: 150mm casing used to 15.00m

Scale (approx)

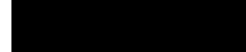
1:50

Logged By

SW

Figure No.

LS4823.BH2



Boring Method
Cable Percussion

Casing Diameter

Ground Level (mOD)

Client

Pier Road Limited

Job Number
LS4823

Location

Dates

16/02/2020

Engineer

Sheet
2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.50	B									
11.00-11.45	SPT N=46			4,3/8,10,14,14		(5.90)				
12.50-12.95	SPT N=48			7,9/12,16,15,5						
14.00-14.50	B									
14.50-14.95	SPT N=15			16,19/15		15.00	Complete at 15.00m			

Remarks

Scale (approx)

1:50

Logged By

SW

Figure No.

LS4823.BH2

Machine : Archway Dart

Method : Drive-in Windowless
Sampler

Dimensions

Ground Level (mOD)

Client

Pier Road Limited

Job
Number
LS4823

Location

Dates

13/02/2020

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D1		PID - 0.10		(0.20)	Concrete (HARDSTANDING)		
0.30	E1				0.20	Dark brown slightly silty, very sandy GRAVEL with abundant concrete and brick fragments. (MADE GROUND)		
0.50	D2		PID - 0.30		(0.40)			
					0.60	Soft dark grey slightly gravelly, slightly sandy PEAT with rare chalk fragment. Sand is fine. Gravels are fine to medium, subangular to angular flints. (ALLUVIUM - PEAT)		
1.00	D3		PID - 0.30		(1.20)			
1.50	D4		PID - 6.40		1.80	Very soft dark grey slightly sandy PEAT with fine shell and carboniferous fragments. Sand is fine. (ALLUVIUM - PEAT)		
2.00	D5		PID - 6.20					
2.50	D6		PID - 7.10					
3.00	D7		PID - 7.60		(2.50)			
3.50	D8		PID - 8.50					
4.00	D9		PID - 8.40		4.30	Dark brown slightly gravelly, very clayey SAND. Sand is fine. Gravels are fine, angular to subrounded flints. (ALLUVIUM - SAND)		
4.50	D10		PID - 8.20		(0.70)			
5.00	D11		PID - 8.10		5.00			

Remarks

GROUNDWATER: No groundwater was struck.
CASING: Casing to 3.00m.
BACKFILL: Backfilled with arisings.
SLOW PROGRESS: None.
NOTES: Hand excavated inspection pit to 1.20mbgl. Borehole terminated at target depth .

Scale
(approx)

1:25

Logged
By

JZ

Figure No.

LS4823.DS1

 Brighton London Bristol					Site 46A to 47 Pier Road, Littlehampton, BN17 5LW			Number DS2	
Machine : Archway Dart Method : Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Client Pier Road Limited		Job Number LS4823	
		Location		Dates 13/02/2020		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					(0.20)	Concrete (HARDSTANDING)			
0.30	D1		PID - 0.00		0.20	Dark brown slightly silty, very sandy GRAVEL with abundant concrete and brick fragments. (MADE GROUND)			
0.30	E1				(0.40)				
0.50	D2		Water strike(1) at 0.50m, rose to 0.00m in 20 mins. PID - 0.20		0.60	Soft dark grey slightly gravelly, slightly sandy PEAT with rare chalk fragment. Sand is fine. Gravels are fine to medium, subangular to angular flints. (ALLUVIUM - PEAT)			
1.00	D3		PID - 0.20		(1.10)				
1.50	D4		PID - 4.20		1.70	Very soft dark grey slightly sandy PEAT with fine shell and carboniferous fragments. Sand is fine. (ALLUVIUM - PEAT)			
2.00	D5		PID - 5.10						
2.50	D6		PID - 6.50						
3.00	D7		PID - 6.80		(3.00)				
3.50	D8		PID - 7.40						
4.00	D9		PID - 7.90						
4.50	D10		PID - 7.80		4.70	Dark brown slightly gravelly, very clayey SAND. Sand is fine. Gravels are fine, angular to subrounded flints. (ALLUVIUM - SAND)			
5.00	D11		PID - 7.60		(0.30)				
					5.00				
Remarks GROUNDWATER: Groundwater was struck at 0.50m, and rose to GL after 20mins. CASING: Casing to 3.00m. INSTALLATION: 50mm diameter HDPE standpipe to 4m; plain casing to 1.00m, slotted response zone 1.00m to 4.00m. BACKFILL: Backfilled with arisings. SLOW PROGRESS: None. NOTES: Hand excavated inspection pit to 1.20mbgl. Borehole terminated at target depth .							Scale (approx) 1:25	Logged By JZ	Figure No. LS4823.DS2

Machine : Archway Dart

Method : Drive-in Windowless
Sampler

Dimensions

Ground Level (mOD)

Client

Pier Road Limited

Job
Number
LS4823

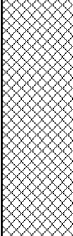
Location

Dates

13/02/2020

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D1		Water strike(1) at 0.30m.		(0.20)	Concrete (HARDSTANDING)		
0.30	ES1		PID - 0.10		0.20	Dark brown slightly silty, very sandy GRAVEL with abundant concrete and brick fragments. (MADE GROUND)		▽1
0.50	D2		PID - 0.40		(0.80)			
1.00	D3		PID - 0.30		1.00	Refused at 1.00m		

Remarks

GROUNDWATER: Groundwater was struck at 0.30m.

BACKFILL: Backfilled with arisings.

SLOW PROGRESS: None.

NOTES: Hand excavated inspection pit to 1.20mbgl. Borehole terminated at 1.00m due to dense ground conditions.

Scale
(approx)

1:25

Logged
By

JZ

Figure No.

LS4823.DS3

Machine : Archway Dart

Method : Drive-in Windowless
Sampler

Dimensions

Ground Level (mOD)

Client

Pier Road Limited

Job
Number
LS4823

Location

Dates

13/02/2020

Engineer

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D1		PID - 0.00		(0.20)	Concrete (HARDSTANDING)		
0.30	E1				0.20	Dark brown slightly silty, very sandy GRAVEL with abundant concrete and brick fragments. (MADE GROUND)		
0.50	D2		PID - 0.00		(0.40)			
					0.60	Soft dark grey slightly gravelly, slightly sandy PEAT with rare chalk fragment. Sand is fine. Gravels are fine to medium, subangular to angular flints. (ALLUVIUM - PEAT)		
1.00	D3		PID - 0.20		(1.20)			
1.50	D4		PID - 3.40		1.80	Very soft dark grey slightly sandy PEAT with fine shell and carboniferous fragments. Sand is fine. (ALLUVIUM - PEAT)		
2.00	D5		PID - 3.20					
2.50	D6		PID - 4.60					
3.00	D7		PID - 9.20		(2.60)			
3.50	D8		PID - 9.00					
4.00	D9		PID - 9.40					
4.50	D10		PID - 9.20		4.40	Dark brown slightly gravelly, very clayey SAND. Sand is fine. Gravels are fine, angular to subrounded flints. (ALLUVIUM - SAND)		
					(0.60)			
5.00	D11		PID - 9.50		5.00			

Remarks

GROUNDWATER: No groundwater was struck.
CASING: Casing to 3.00m.
BACKFILL: Backfilled with arisings.
SLOW PROGRESS: None.
NOTES: Hand excavated inspection pit to 1.20mbgl. Borehole terminated at target depth .

Scale
(approx)

1:25

Logged
By

JZ

Figure No.

LS4823.DS4

Land Science				Brighton London Bristol		Site 46A to 47 Pier Road, Littlehampton, BN17 5LW		Number DS5	
Machine : Archway Dart Method : Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Client Pier Road Limited		Job Number LS4823	
		Location		Dates 13/02/2020		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30	D1		PID - 0.10		(0.10)	Concrete (HARDSTANDING)			
0.30	E1				0.10	Dark brown slightly silty, very sandy GRAVEL with abundant concrete and brick fragments. (MADE GROUND)			
0.50	D2		PID - 0.60		(0.60)				
					0.70	Soft dark grey slightly gravelly, slightly sandy PEAT with rare chalk fragment. Sand is fine. Gravels are fine to medium, subangular to angular flints. (ALLUVIUM - PEAT)			
1.00	D3		PID - 0.50		(1.10)				
1.50	D4		PID - 4.40						
					1.80	Very soft dark grey slightly sandy PEAT with fine shell and carboniferous fragments. Sand is fine. (ALLUVIUM - PEAT)			
2.00	D5		PID - 5.10						
2.50	D6		PID - 6.20						
3.00	D7		PID - 7.40						
					(3.00)				
3.50	D8		PID - 8.20						
4.00	D9		PID - 8.40						
4.50	D10		PID - 8.20						
5.00	D11		PID - 8.50		4.80	Dark brown slightly gravelly, very clayey SAND. Sand is fine. Gravels are fine, angular to subrounded flints. (ALLUVIUM - SAND)			
					(0.20)				
					5.00				
Remarks GROUNDWATER: No groundwater was struck. CASING: Casing to 3.00m. BACKFILL: Backfilled with arisings. SLOW PROGRESS: None. NOTES: Hand excavated inspection pit to 1.20mbgl. Borehole terminated at target depth .								Scale (approx)	Logged By
								1:25	JZ
								Figure No. LS4823.DS5	

Machine : Archway Dart

Method : Drive-in Windowless
Sampler

Dimensions

Ground Level (mOD)

Client

Pier Road Limited

Job
Number
LS4823

Location

Dates

13/02/2020

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30	D1		PID - 0.10		(0.20)	Concrete (HARDSTANDING)			
0.30	E1				0.20	Dark brown slightly silty, very sandy GRAVEL with abundant concrete and brick fragments. (MADE GROUND)			
0.50	D2		PID - 0.10		(0.40)				
					0.60	Dark brown slightly silty, sandy GRAVEL with rare chalk fragment. Sand is fine. Gravels are fine to medium subangular to subrounded flint. (ALLUVIUM - PEAT)			
1.00	D3		PID - 0.80		(1.30)				
1.50	D4		PID - 1.80		1.90	Soft dark grey slightly gravelly, slightly sandy PEAT with rare chalk fragment. Sand is fine. Gravels are fine to medium, subangular to angular flints. (ALLUVIUM - PEAT)			
2.00	D5		PID - 2.70		(0.50)				
2.50	D6		PID - 3.40		2.40	Very soft dark grey slightly sandy PEAT with fine shell and carboniferous fragments. Sand is fine. (ALLUVIUM - PEAT)			
3.00	D7		PID - 3.60		(1.60)				
3.50	D8		PID - 9.20						
4.00	D9		PID - 9.00		4.00	Complete at 4.00m			

Remarks

GROUNDWATER: No groundwater was struck.
CASING: Casing to 3.00m.
INSTALLATION: 50mm diameter HDPE standpipe to 4m; plain casing to 1.00m, slotted response zone 1.00m to 4.00m.
BACKFILL: Backfilled with arisings.
SLOW PROGRESS: None.
NOTES: Hand excavated inspection pit to 1.20mbgl. Borehole terminated at target depth .

Scale
(approx)

1:25

Logged
By

JZ

Figure No.

LS4823.DS6

					Brighton London Bristol 		Site 46A to 47 Pier Road, Littlehampton, BN17 5LW		Number DS7
Machine : Archway Dart Method : Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Client Pier Road Limited		Job Number LS4823	
		Location		Dates 13/02/2020		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30	D1		PID: 0.2		(0.20)	Concrete (HARDSTANDING)			
0.30	E1				0.20				
0.50	D2		PID: 0.7		(0.20)	Dark brown slightly silty, very sandy GRAVEL with abundant concrete and brick fragments. (MADE GROUND)			
					0.40				
1.00	D3		PID: 0.7		(1.50)	Soft dark grey slightly gravelly, slightly sandy PEAT with rare chalk fragment. Sand is fine. Gravels are fine to medium, subangular to angular flints. (ALLUVIUM - PEAT)			
1.50	D4		PID: 1.8						
2.00	D5		PID: 2.7		1.90	Very soft dark grey slightly sandy PEAT with fine shell and carboniferous fragments. Sand is fine. (ALLUVIUM - PEAT)			
2.50	D6		PID: 3.4						
3.00	D7		PID: 3.6		(2.50)				
3.50	D8		PID: 9.2						
4.00	D9		PID: 9.2						
4.50	D10		PID: 9.4		4.40	Dark brown slightly gravelly, very clayey SAND. Sand is fine. Gravels are fine, angular to subrounded flints. (ALLUVIUM - SAND)			
					(0.60)				
5.00	D11		PID: 9.4		5.00				
Remarks GROUNDWATER: Groundwater was struck at 0.40m, and rose to 0.30m after 20mins. CASING: Casing to 3.00m. INSTALLATION: 50mm diameter HDPE standpipe to 4m; plain casing to 1.00m, slotted response zone 1.00m to 4.00m. BACKFILL: Backfilled with arisings. SLOW PROGRESS: None. NOTES: Hand excavated inspection pit to 1.20mbgl. Borehole terminated at target depth .							Scale (approx) 1:25	Logged By JZ	Figure No. LS4823.DS7

Excavation Method

Trial Pit

Dimensions

Ground Level (MOD)

Client

Pier Road Limited

Job
Number
LS4823

Location

Dates

13/02/2020

Engineer

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (MOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D1		PID - 0.10		(0.20)	Concrete (HARDSTANDING)		
0.30	E1				0.20	Dark brown slightly silty, very sandy GRAVEL with abundant concrete and brick fragments. (MADE GROUND)		
0.50	D2		PID - 0.20		(0.60)			
			Water strike(1) at 0.70m.					
0.80	D3		PID - 0.10		0.80	Complete at 0.80m		

Plan

.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.

Remarks

GROUNDWATER: Groundwater was struck at 0.70m.
BACKFILL: Backfilled with arisings.
SLOW PROGRESS: None.

Scale (approx)

1:25

Logged By

JZ

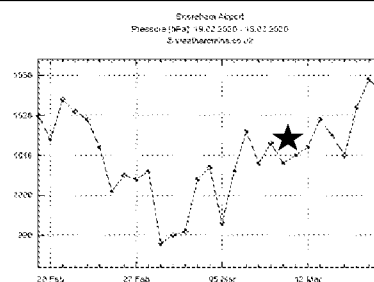
Figure No.

LS4823.DS8

APPENDIX C

GROUND GAS AND GROUNDWATER MONITORING

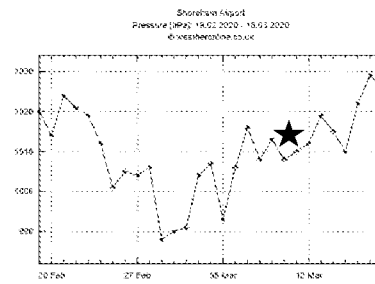
Project:	Pier Road, Littlehampton	Ref:	LS4823
Date:	11/03/2020	Visit:	2 of 3
Engineer:	AS	Check:	MR
Weather:	Overcast	Page:	1
Atmospheric Pressure	before:	1013 mB	
	after:	1013 mB	
Published pressure trend:	Fluctuating high pressure		
Remarks:	Equipment used: GFX 430, Phocheck PID, Dipmeter		



Position	Flow (l/hr)		Common Gases (%)				VOC's (ppm)	Groundwater (m)				Remarks
	High	Low	Time	CO2	CH4	O2		LNAPL	Water	DNAPL	Base	
Calibration Check	0.0	0.0	15s	0.0	0.0	20.7	0.0	-	-	-	-	Calibration check passed
			30s	0.0	0.0	20.6						
			60s	0.0	0.0	20.6						
BH2D	24.3	0.0	15s	0.6	0.0	14.4	0.5	-	1.28	-	10.54	Water bailed out to 1.90m. Levels rose to 1.84m after 20 mins
			30s	0.5	0.0	14.7						
			60s	0.5	0.0	14.9						
			120s	0.5	0.0	14.9						
			180s	0.5	0.0	14.9						
			240s	0.5	0.0	14.9						
BH2S	20.9	-3.0	15s	0.0	0.0	20.0	0.6	-	1.31	-	5.94	
			30s	0.0	0.0	20.2						
			60s	0.0	0.0	20.2						
			120s	0.0	0.0	20.2						
			180s	0.0	0.0	20.2						
			240s	0.0	0.0	20.2						
DS2	113.4	0.0	15s	0.9	0.0	15.1	0.1		0.83		3.41	Water bailed out to 2.70m. Levels rose to 3.10m after 20 mins
			30s	0.9	0.0	14.5						
			60s	0.9	0.0	14.4						
			120s	0.9	0.0	14.4						
			180s	0.9	0.0	14.4						
			240s	1.4	0.0	10.6						
BH1S	1.8	0.0	15s	0.0	0.0	20.7	0.2		1.47		7.08	
			30s	0.0	0.0	20.5						
			60s	0.0	0.0	20.4						
			120s	0.0	0.0	20.4						
			180s	0.0	0.0	20.4						
			240s	0.0	0.0	20.4						
BH1D	3.4	0.0	15s	0.0	0.0	20.8	0.1		1.44		10.92	Water bailed out to 2.70m. Levels rose to 3.10m after 20 mins
			30s	0.0	0.0	20.6						
			60s	0.0	0.0	20.5						
			120s	0.0	0.0	20.5						
			180s	0.0	0.0	20.3						
			240s	0.0	0.0	20.3						
DS6	0.0	0.0	15s	0.0	0.0	20.4	0.7		0.76		3.50	Water bailed out to 2.78m. Levels rose to 0.87m after 20 mins
			30s	0.0	0.0	20.4						
			60s	0.0	0.0	20.4						
			120s	0.0	0.0	20.4						
			180s	0.0	0.0	20.4						

GROUND GAS AND GROUNDWATER MONITORING

Project:	Pier Road, Littlehampton	Ref:	LS4823
Date:	11/03/2020	Visit:	2 of 3
Engineer:	AS	Check:	MR
Weather:	Overcast	Page:	1
Atmospheric Pressure	before: 1013 mB		
	after: 1013 mB		
Published pressure trend:	Fluctuating high pressure		
Remarks:	Equipment used: GFX 430, Phocheck PID, Dipmeter		

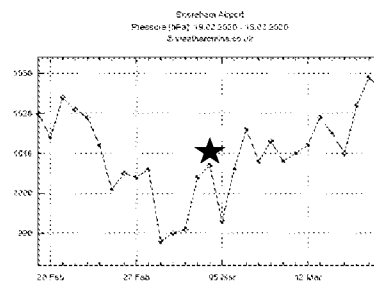


Position	Flow (l/hr)		Common Gases (%)				VOC's (ppm)	Groundwater (m)				Remarks
	High	Low	Time	CO2	CH4	O2		LNAPL	Water	DNAPL	Base	
DS7	41.4	0.0	240s	0.0	0.0	20.4	0.2		0.35		3.62	Gas monitoring stopped early due to water being sucked up towards the GFX.
			300s	0.0	0.0	20.1						
			15s	0.0	0.0	18.5						
			30s	0.0	0.0	18.2						Water bailed out to 3.25m, levels rose to 0.60m after 20 mins.
			60s	0.0	0.0	18.0						
			120s									
			180s									
			240s									
			300s									

Calibration Check	0.0	0.0	15s	0.0	0.0	20.2	0.0	-	-	-	-	Calibration check passed
			30s	0.0	0.0	20.2						
			60s	0.0	0.0	20.2						

GROUND GAS AND GROUNDWATER MONITORING

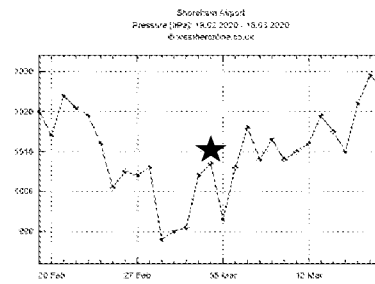
Project:	Pier Road, Littlehampton	Ref:	LS4823
Date:	04/03/2020	Visit:	1 of 3
Engineer:	AS	Check:	MR
Weather:	Overcast	Page:	1
Atmospheric Pressure	before:	1010 mB	
	after:	1007 mB	
Published pressure trend:	Rising high pressure		
Remarks: Equipment used: GFX 430, Phocheck PID, Dipmeter			



Position	Flow (l/hr)		Common Gases (%)				VOC's (ppm)	Groundwater (m)				Remarks
	High	Low	Time	CO2	CH4	O2		LNAPL	Water	DNAPL	Base	
Calibration Check	0.0	0.0	15s	0.0	0.0	20.2	0.0	-	-	-	-	Calibration check passed
			30s	0.0	0.0	20.2						
			60s	0.0	0.0	20.2						
BH2D	-65.0	0.0	15s	0.0	0.0	19.4	0.0	-	1.76	-	10.70	
			30s	0.0	0.0	18.7						
			60s	0.0	0.0	18.6						
			120s	0.0	0.0	18.7						
			180s	0.0	0.0	18.9						
			240s	0.0	0.0	19.0						
BH2S	-27.6	-3.0	15s	0.0	0.0	19.8	0.0	-	1.56	-	6.15	
			30s	0.0	0.0	20.0						
			60s	0.0	0.0	20.0						
			120s	0.0	0.0	20.0						
			180s	0.0	0.0	20.0						
			240s	0.0	0.0	20.0						
DS2	0.0	0.0	15s	0.0	0.0	20.1	0.0		0.65		3.62	
			30s	0.0	0.0	20.1						
			60s	0.0	0.0	20.1						
			120s	0.0	0.0	20.1						
			180s	0.0	0.0	20.1						
			240s	0.0	0.0	20.1						
BH1S	0.0	0.0	15s	0.0	0.0	20.2						
			30s	0.0	0.0	20.1						
			60s	0.0	0.0	20.1						
			120s	0.0	0.0	20.1						
			180s	0.0	0.0	20.1						
			240s	0.0	0.0	20.1						
BH1D	0.0	0.0	15s	0.0	0.0	20.3	0.0		1.91		10.91	
			30s	0.0	0.0	20.2						
			60s	0.0	0.0	20.2						
			120s	0.0	0.0	20.2						
			180s	0.0	0.0	20.2						
			240s	0.0	0.0	20.2						
DS6	0.0	0.0	15s	0.0	0.0	20.3	0.1		0.80		3.40	
			30s	0.0	0.0	20.2						
			60s	0.0	0.0	20.1						
			120s	0.0	0.0	20.1						
			180s	0.0	0.0	20.1						

GROUND GAS AND GROUNDWATER MONITORING

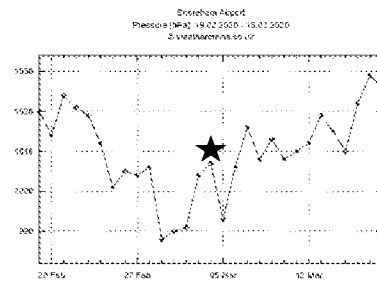
Project: Pier Road, Littlehampton	Ref: LS4823
Date: 04/03/2020	Visit: 1 of 3
Engineer: AS	Check: MR
Weather: Overcast	Page: 1
Atmospheric Pressure	before: 1010 mB
	after: 1007 mB
Published pressure trend:	Rising high pressure
Remarks: Equipment used: GFX 430, Phocheck PID, Dipmeter	



Position	Flow (l/hr)		Common Gases (%)				VOC's (ppm)	Groundwater (m)				Remarks
	High	Low	Time	CO2	CH4	O2		LNAPL	Water	DNAPL	Base	
DS7	-47.4	0.0	240s	0.0	0.0	20.1	0.2		0.35		3.62	Gas monitoring stopped early due to water being sucked up towards the GFX.
			300s	0.0	0.0	20.1						
			15s	0.0	0.0	16.2						
			30s	0.0	0.0	15.0						
			60s	0.0	0.0	14.7						
			120s	0.0	0.0	14.7						
			180s	0.0	0.0	14.8						
			240s									
			300s									
Calibration Check	0.0	0.0	15s	0.0	0.0	20.2	0.0	-	-	-	-	Calibration check passed
			30s	0.0	0.0	20.2						
			60s	0.0	0.0	20.2						

GROUND GAS AND GROUNDWATER MONITORING

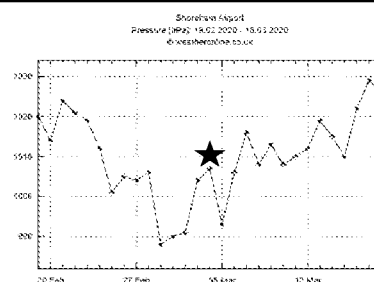
Project:	Pier Road, Littlehampton	Ref:	LS4823
Date:	18/03/2020	Visit:	3 of 3
Engineer:	AS	Check:	MR
Weather:	Overcast	Page:	1
Atmospheric Pressure	before:	1027 mB	
	after:	1027 mB	
Published pressure trend:	Fluctuating high pressure		
Remarks: Equipment used: GFX 430, Phocheck PID, Dipmeter			



Position	Flow (l/hr)		Common Gases (%)				VOC's (ppm)	Groundwater (m)				Remarks
	High	Low	Time	CO2	CH4	O2		LNAPL	Water	DNAPL	Base	
Calibration Check	0.0	0.0	15s	0.0	0.0	20.6	0.0	-	-	-	-	Calibration check passed
			30s	0.0	0.0	20.5						
			60s	0.0	0.0	20.5						
BH2D	0.0	0.0	15s	0.8	0.0	14.5	0.1	-	1.93	-	10.14	
			30s	0.8	0.0	13.7						
			60s	0.9	0.0	13.5						
			120s	0.9	0.0	13.4						
			180s	0.9	0.0	13.4						
			240s	0.9	0.0	13.3						
BH2S	-1.2	0.0	300s	1.0	0.0	13.2						
			15s	0.0	0.0	20.4	0.0	-	1.82	-	5.80	
			30s	0.0	0.0	20.1						
			60s	0.0	0.0	20.1						
			120s	0.0	0.0	20.1						
			180s	0.0	0.0	20.0						
DS2	56.0	0.0	240s	0.0	0.0	20.0						
			300s	0.0	0.0	20.0						
			15s	1.2	0.0	16.2	0.0		0.79		3.32	
			30s	1.3	0.0	15.5						
			60s	1.3	0.0	15.3						
			120s	1.3	0.0	15.3						
BH1S	0.0	0.0	180s	1.3	0.0	15.2						
			240s	2.0	0.0	10.0						
			300s	2.5	0.0	6.1						
			15s	0.0	0.0	20.3						
			30s	0.0	0.0	20.2						
			60s	0.0	0.0	20.2						
BH1D	-7.5	0.0	120s	0.0	0.0	20.2						
			180s	0.0	0.0	20.2						
			240s	0.0	0.0	20.2						
			300s	0.0	0.0	20.2						
			15s	0.0	0.0	20.4	0.4		2.00		10.76	
			30s	0.0	0.0	20.3						
DS6			60s	0.0	0.0	20.3						
			120s	0.0	0.0	20.3						
			180s	0.0	0.0	20.3						
			15s									
			30s									
			60s									
			120s									
			180s									

GROUND GAS AND GROUNDWATER MONITORING

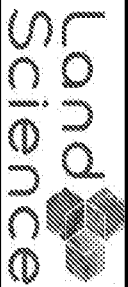
Project:	Pier Road, Littlehampton	Ref:	LS4823
Date:	18/03/2020	Visit:	3 of 3
Engineer:	AS	Check:	MR
Weather:	Overcast	Page:	1
Atmospheric Pressure	before: 1027 mB		
	after: 1027 mB		
Published pressure trend:	Fluctuating high pressure		
Remarks:	Equipment used: GFX 430, Phocheck PID, Dipmeter		



Position	Flow (l/hr)		Common Gases (%)				VOC's (ppm)	Groundwater (m)				Remarks
	High	Low	Time	CO2	CH4	O2		LNAPL	Water	DNAPL	Base	
DS7	-32.0	0.0	240s				0.1		0.42		3.61	Gas monitoring stopped early due to water being sucked up towards the GFX.
			300s									
			15s	0.0	0.0	19.2						
			30s	0.0	0.0	18.4						
			60s	0.0	0.0	18.0						
			120s									
			180s									
			240s									
			300s									

Calibration Check	0.0	0.0	15s	0.0	0.0	20.4	0.0	-	-	-	-	Calibration check passed
			30s	0.0	0.0	20.4						
			60s	0.0	0.0	20.4						

APPENDIX D



Summary of determination of saturated moisture content - Immersion in water method

Site name:	Pier Road	Samples received:	03/03/2020
Reference:	LS4823	Reported:	09/03/2020

[illegible]

Density of water (kg/m ³)	1000	Density of the paraffin wax (g/cm ³)	0.8583
---------------------------------------	------	--	--------

Test Method:	BS 1377-2:1990: 3.3	Prepared:	
Comments:		T Curtis	
		Checked:	
		E Toms	

Test Results relate only to the sample numbers shown above.



SUMMARY OF MOISTURE CONTENT AND
ATTERBERG LIMIT DETERMINATIONS

Site Name:	Pier Road	Samples Received:	03/02/2020
Reference:	LS4823	Reported:	09/03/2020

Position	Depth m	Sample Description	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing 425µm %	Modified PI %
BH1	2.00	Mottled brown grey silty CLAY	45.4	57.4	23.6	33.8	99.0	33.5
BH1	5.00	Grey very silty GRAVEL	16.3	28.2	13.8	14.3	54.0	7.7
BH1	8.30	Grey very silty GRAVEL	28.0	37.3	15.0	22.3	43.0	9.6



SUMMARY OF DETERMINATION OF DENSITY - IMMERSION IN WATER METHOD

Site name:	Pier Road	Samples received:	03/03/2020
Reference:	LS4823	Reported:	09/03/2020

Sample	Tin weight (g)	Wet weight with tin(g)	Dry weight with tin (g)	Weight of water (g)	Dry weight (g)	Initial Wet Weight, Ms (g)	Filled outer voids weight, Mf (g)	Waxed sample Weight, Mw (g)	Weight in water, Mg (g)	Moisture content, w (%)	Test specimen volume, Vs (cm3)
BH1-10.00	144	570	494	76	350	431		439	223	22	206.68

Sample	Sample Description	Specific gravity, Gs	Bulk Density, pb (Mg/m3)	Dry Density, pd (Mg/m3)	Void ratio
BH1-10.00	CHALK	4.61	2.09	1.71	1.69

Density of water (kg/m3)	1000	Density of the parrafin wax (g/cm3)	0.8583
--------------------------	------	-------------------------------------	--------

Test Method:	BS 1377-2:1990:7.3	Prepared:	T Curtis
Comments:		Checked:	E Toms
Test Results relate only to the sample numbers shown above.			

APPENDIX E



Michael Rose
Land Science
The Old Police Station
Jobs Lane
Sayers Common
West Sussex
BN6 9HE

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 0845 604 6494

e: mike.rose@landscience.co.uk

Analytical Report Number : 20-87600

Replaces Analytical Report Number : 20-87600, issue no. 1

Additional analysis undertaken.

Project / Site name:	Pier Road Limited	Samples received on:	18/02/2020
Your job number:	LS4823	Samples instructed on:	18/02/2020
Your order number:		Analysis completed by:	06/03/2020
Report Issue Number:	2	Report issued on:	10/03/2020
Samples Analysed:	5 leachate samples - 24 soil samples		

Signed: 

Zina Abdul Razzak
Senior Quality Specialist

For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 1 of 31



Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number	1446044	1446045	1446046	1446047	1446048
Sample Reference	BH2	BH2	BH2	BH2	BH2
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	3.00	4.00	5.00	6.50	10.00
Date Sampled	16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	13
Total mass of sample received	kg	0.001	NONE	2.0	2.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-

General Inorganics

pH - Manual	pH Units	N/A	MCERTS	-	-	-	-	-
pH - Automated	pH Units	N/A	MCERTS	-	-	-	8.3	7.8
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	0.25	0.33
Sulphide	mg/kg	1	MCERTS	-	-	-	-	-
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	-	-
Loss on Ignition @ 450°C	%	0.2	MCERTS	-	-	-	-	-
Acid Neutralisation Capacity	+/- mol/kg	-999	NONE	-	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-
----------------------------	-------	---	--------	---	---	---	---	---

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Coronene	mg/kg	0.05	NONE	-	-	-	-	-

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	-	-	-	-	-
-------------------	-------	------	------	---	---	---	---	---

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 2 of 31



Environmental Science

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number	1446044	1446045	1446046	1446047	1446048
Sample Reference	BH2	BH2	BH2	BH2	BH2
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	3.00	4.00	5.00	6.50	10.00
Date Sampled	16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	-
Chromium (hexavalent)	mg/kg	1.2	MCERTS	-	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Total BTEX	µg/kg	10	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

Mineral Oil (C10 - C40)	mg/kg	10	NONE	-	-	-	-	-
TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	12	-	-
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	31	-	-
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	34	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	76	-	-
TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	18	-	-
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	48	-	-
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	55	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	120	-	-

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 3 of 31



Environmental Science

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

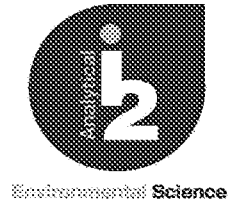
Lab Sample Number				1446044	1446045	1446046	1446047	1446048
Sample Reference				BH2	BH2	BH2	BH2	BH2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.00	4.00	5.00	6.50	10.00
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	-	-
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	-	-
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	-	-
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	-	-
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	-	-
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 4 of 31



Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446044	1446045	1446046	1446047	1446048
Sample Reference				BH2	BH2	BH2	BH2	BH2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.00	4.00	5.00	6.50	10.00
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	-	-
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
Phenanthrene	mg/kg	0.05	MCERTS	0.29	< 0.05	0.72	-	-
Anthracene	mg/kg	0.05	MCERTS	0.11	< 0.05	0.25	-	-
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
Fluoranthene	mg/kg	0.05	MCERTS	0.65	0.31	1.6	-	-
Pyrene	mg/kg	0.05	MCERTS	0.55	0.23	1.4	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.41	< 0.05	0.91	-	-
Chrysene	mg/kg	0.05	MCERTS	0.22	< 0.05	0.76	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.33	< 0.05	1.1	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.12	< 0.05	0.37	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.24	< 0.05	0.70	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.38	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.38	-	-

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 5 of 31

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446044	1446045	1446046	1446047	1446048
Sample Reference				BH2	BH2	BH2	BH2	BH2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.00	4.00	5.00	6.50	10.00
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-



Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446049	1446050	1446051	1446052	1446053
Sample Reference				BH2	DS1	DS1	DS1	DS2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				14.00	0.30	1.00	3.50	0.30
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	16	11	22	24	17
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	1.3	1.7

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	-	-	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-

General Inorganics

pH - Manual	pH Units	N/A	MCERTS	-	8.5	-	-	-
pH - Automated	pH Units	N/A	MCERTS	7.8	9.3	8.1	9.0	8.2
Total Cyanide	mg/kg	1	MCERTS	-	< 1	< 1	-	52
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.23	0.094	0.062	0.49	0.12
Sulphide	mg/kg	1	MCERTS	-	3.8	3.4	-	63
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	0.011	0.0045	-	0.014
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	1.1	-	-	-
Loss on Ignition @ 450°C	%	0.2	MCERTS	-	3.3	-	-	-
Acid Neutralisation Capacity	+/- mol/kg	-999	NONE	-	26	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
----------------------------	-------	---	--------	---	-------	-------	---	-------

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	0.78	< 0.05	-	1.9
Acenaphthylene	mg/kg	0.05	MCERTS	-	1.1	< 0.05	-	1.7
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	1.2
Fluorene	mg/kg	0.05	MCERTS	-	0.75	0.51	-	2.2
Phenanthrene	mg/kg	0.05	MCERTS	-	7.2	1.5	-	15
Anthracene	mg/kg	0.05	MCERTS	-	2.9	0.30	-	5.4
Fluoranthene	mg/kg	0.05	MCERTS	-	23	1.9	-	33
Pyrene	mg/kg	0.05	MCERTS	-	19	1.6	-	30
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	18	1.4	-	31
Chrysene	mg/kg	0.05	MCERTS	-	10	1.9	-	22
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	17	2.1	-	47
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	7.3	0.62	-	14
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	11	0.60	-	31
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	5.6	0.32	-	18
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	2.2	< 0.05	-	6.3
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	5.6	0.35	-	19
Coronene	mg/kg	0.05	NONE	-	2.4	< 0.05	-	11

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	-	130	13	-	290
-------------------	-------	------	------	---	-----	----	---	-----

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 7 of 31



Environmental Science

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446049	1446050	1446051	1446052	1446053
Sample Reference				BH2	DS1	DS1	DS1	DS2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				14.00	0.30	1.00	3.50	0.30
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	13	25	-	26
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	82	23	-	130
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.67	1.3	-	0.69
Boron (water soluble)	mg/kg	0.2	MCERTS	-	0.5	7.0	-	2.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	-	< 1.2	< 1.2	-	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	14	38	-	14
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	25	9.1	-	42
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	220	23	-	300
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	0.8	< 0.3	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	14	26	-	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	32	67	-	30
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	71	64	-	170

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Total BTEX	µg/kg	10	MCERTS	-	< 10	-	-	-

Petroleum Hydrocarbons

Mineral Oil (C10 - C40)	mg/kg	10	NONE	-	170	-	-	-
TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	-	3.1	-	< 1.0	-
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	-	22	-	< 2.0	-
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	-	69	-	< 8.0	-
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	-	67	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	160	-	< 10	-
TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	-	1.8	-	1.1	-
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	-	33	-	10	-
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	-	280	-	37	-
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	-	440	-	49	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	760	-	97	-

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 8 of 31



Environmental Science

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446049	1446050	1446051	1446052	1446053
Sample Reference				BH2	DS1	DS1	DS1	DS2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				14.00	0.30	1.00	3.50	0.30
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Chloroethane	µg/kg	1	NONE	-	-	-	< 1.0	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	< 1.0	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	< 1.0	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	< 1.0	-
Benzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	< 1.0	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Styrene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Tribromomethane	µg/kg	1	NONE	-	-	-	< 1.0	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 9 of 31



Analytical Science

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446049	1446050	1446051	1446052	1446053
Sample Reference				BH2	DS1	DS1	DS1	DS2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				14.00	0.30	1.00	3.50	0.30
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
Dimethyl phthalate	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	1.1	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	0.38	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	2.2	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	2.0	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	1.5	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	1.2	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	2.1	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	0.74	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	1.6	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	1.0	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	0.35	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	1.1	-

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 10 of 31



Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446049	1446050	1446051	1446052	1446053
Sample Reference				BH2	DS1	DS1	DS1	DS2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				14.00	0.30	1.00	3.50	0.30
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	< 0.007	-	-	-

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 11 of 31



Environmental Science

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number	1446054	1446055	1446056	1446057	1446058
Sample Reference	DS2	DS3	DS4	DS4	DS4
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	4.00	0.50	0.30	1.50	4.00
Date Sampled	16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	30	16
Total mass of sample received	kg	0.001	NONE	1.1	2.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Detected	Not-detected	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	0.001	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	0.001	-	-	-

General Inorganics

pH - Manual	pH Units	N/A	MCERTS	-	8.5	-	-	-
pH - Automated	pH Units	N/A	MCERTS	-	9.8	10.4	8.1	-
Total Cyanide	mg/kg	1	MCERTS	-	< 1	< 1	< 1	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.16	0.17	0.12	-
Sulphide	mg/kg	1	MCERTS	-	7.0	4.8	1.2	-
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	0.0093	0.021	0.0026	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	0.9	-	-	-
Loss on Ignition @ 450°C	%	0.2	MCERTS	-	2.5	-	-	-
Acid Neutralisation Capacity	+/- mol/kg	-999	NONE	-	10	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
----------------------------	-------	---	--------	---	-------	-------	-------	---

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	0.27	4.5	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	0.89	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	5.2	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	-	1.1	42	0.39	-
Anthracene	mg/kg	0.05	MCERTS	-	0.39	14	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	-	3.0	52	0.57	-
Pyrene	mg/kg	0.05	MCERTS	-	2.8	43	0.47	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	1.8	26	0.26	-
Chrysene	mg/kg	0.05	MCERTS	-	1.7	18	0.21	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	1.7	16	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	1.2	11	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	1.8	16	< 0.05	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.74	6.0	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	2.7	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.86	6.1	< 0.05	-
Coronene	mg/kg	0.05	NONE	-	< 0.05	< 0.05	< 0.05	-

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	-	17	260	1.9	-
-------------------	-------	------	------	---	----	-----	-----	---

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 12 of 31



Environmental Science

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446054	1446055	1446056	1446057	1446058
Sample Reference				DS2	DS3	DS4	DS4	DS4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.00	0.50	0.30	1.50	4.00
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	32	14	28	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	250	230	24	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.46	0.81	1.2	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	2.7	2.3	9.8	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	1.2	MCERTS	-	< 1.2	< 1.2	< 1.2	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	19	18	38	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	34	67	11	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	260	390	20	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	18	17	28	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	21	32	69	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	160	95	60	-

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Total BTEX	µg/kg	10	MCERTS	-	< 10	-	-	-

Petroleum Hydrocarbons

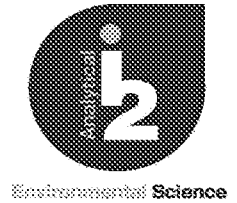
Mineral Oil (C10 - C40)	mg/kg	10	NONE	-	490	-	-	-
TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	1.1
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	2.3	-	-	1.4
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0	88	-	-	3.7
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	< 8.0	180	-	-	11
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	< 8.0	190	-	-	76
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	460	-	-	94
TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	0.10
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	9.6	12	-	-	7.2
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	41	51	-	-	20
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	52	79	-	-	44
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	100	140	-	-	71

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 13 of 31



Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446054	1446055	1446056	1446057	1446058
Sample Reference				DS2	DS3	DS4	DS4	DS4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.00	0.50	0.30	1.50	4.00
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	14
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	58
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	31
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	11
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	-	-	14
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 14 of 31



Analytical Science

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446054	1446055	1446056	1446057	1446058
Sample Reference				DS2	DS3	DS4	DS4	DS4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.00	0.50	0.30	1.50	4.00
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	-	-	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	-	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	-	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	-	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	-	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	-	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	0.43	-	-	-	0.20
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	-	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Fluorene	mg/kg	0.05	MCERTS	0.48	-	-	-	0.26
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	4.3	-	-	-	2.2
Anthracene	mg/kg	0.05	MCERTS	1.2	-	-	-	0.60
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	4.9	-	-	-	3.3
Pyrene	mg/kg	0.05	MCERTS	3.9	-	-	-	2.7
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	-	-	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.3	-	-	-	1.4
Chrysene	mg/kg	0.05	MCERTS	1.7	-	-	-	1.1
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.1	-	-	-	1.4
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.64	-	-	-	0.44
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.4	-	-	-	0.91
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.66	-	-	-	0.39
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.66	-	-	-	0.43

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 15 of 31



Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446054	1446055	1446056	1446057	1446058
Sample Reference				DS2	DS3	DS4	DS4	DS4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.00	0.50	0.30	1.50	4.00
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	< 0.007	-	-	-

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 16 of 31



Environmental Science

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446059	1446060	1446061	1446062	1446063
Sample Reference				DS4	DS5	DS6	DS6	DS6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				5.00	0.30	0.30	1.00	3.50
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	11	9.2	14	28
Total mass of sample received	kg	0.001	NONE	1.1	2.0	1.3	2.0	1.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Detected	Not-detected	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	-	-

General Inorganics

pH - Manual	pH Units	N/A	MCERTS	-	9.1	-	11.5	-
pH - Automated	pH Units	N/A	MCERTS	8.7	9.9	9.1	10.0	-
Total Cyanide	mg/kg	1	MCERTS	-	< 1	3	< 1	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.061	0.15	0.28	0.42	-
Sulphide	mg/kg	1	MCERTS	-	71	4.4	18	-
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	0.015	0.020	0.0086	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	1.5	-	0.9	-
Loss on Ignition @ 450°C	%	0.2	MCERTS	-	2.6	-	2.1	-
Acid Neutralisation Capacity	+/- mol/kg	-999	NONE	-	29	-	320	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
----------------------------	-------	---	--------	---	-------	-------	-------	---

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	3.1	< 0.05	0.34	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	5.7	3.0	0.48	-
Acenaphthene	mg/kg	0.05	MCERTS	-	4.3	1.0	0.23	-
Fluorene	mg/kg	0.05	MCERTS	-	13	2.8	0.64	-
Phenanthrene	mg/kg	0.05	MCERTS	-	92	29	8.3	-
Anthracene	mg/kg	0.05	MCERTS	-	27	7.4	1.2	-
Fluoranthene	mg/kg	0.05	MCERTS	-	130	56	13	-
Pyrene	mg/kg	0.05	MCERTS	-	120	49	11	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	60	28	11	-
Chrysene	mg/kg	0.05	MCERTS	-	42	22	8.3	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	47	28	12	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	19	9.2	5.0	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	41	23	8.7	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	20	12	4.2	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	6.5	4.1	1.6	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	21	13	4.6	-
Coronene	mg/kg	0.05	NONE	-	< 0.05	< 0.05	< 0.05	-

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	-	650	290	90	-
-------------------	-------	------	------	---	-----	-----	----	---

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 17 of 31



Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446059	1446060	1446061	1446062	1446063
Sample Reference				DS4	DS5	DS6	DS6	DS6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				5.00	0.30	0.30	1.00	3.50
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	23	14	13	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	230	460	59	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.78	0.42	0.28	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	1.9	1.8	4.1	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2	2.5	< 0.2	-
Chromium (hexavalent)	mg/kg	1.2	MCERTS	-	< 1.2	< 1.2	< 1.2	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	18	15	13	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	84	120	26	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	520	710	100	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3	1.1	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	16	13	12	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	32	26	23	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	230	640	62	-

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Total BTEX	µg/kg	10	MCERTS	-	< 10	-	< 10	-

Petroleum Hydrocarbons

Mineral Oil (C10 - C40)	mg/kg	10	NONE	-	510	-	< 10	-
TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	0.52
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	4.1	-	-	< 1.0
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0	17	-	-	< 2.0
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	< 8.0	66	-	-	< 8.0
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	< 8.0	370	-	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	450	-	-	< 10
TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	0.13
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	16	-	-	< 1.0
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	2.1	180	-	-	< 2.0
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	12	1200	-	-	< 10
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	16	1500	-	-	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	29	2800	-	-	< 10

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 18 of 31



Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

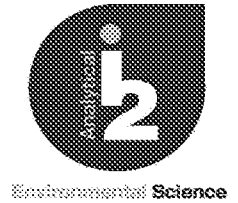
Lab Sample Number				1446059	1446060	1446061	1446062	1446063
Sample Reference				DS4	DS5	DS6	DS6	DS6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				5.00	0.30	0.30	1.00	3.50
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	-	-	-	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	11
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	32
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	84
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	8.7
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	-	-	9.3
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	< 1.0

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 19 of 31



Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446059	1446060	1446061	1446062	1446063
Sample Reference				DS4	DS5	DS6	DS6	DS6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				5.00	0.30	0.30	1.00	3.50
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	-	-	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	-	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	-	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	-	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	-	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	-	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	-	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	0.77	-	-	-	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.18	-	-	-	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	1.2	-	-	-	< 0.05
Pyrene	mg/kg	0.05	MCERTS	1.1	-	-	-	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	-	-	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.58	-	-	-	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.50	-	-	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.59	-	-	-	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.19	-	-	-	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.39	-	-	-	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.21	-	-	-	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.21	-	-	-	< 0.05

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 20 of 31

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446059	1446060	1446061	1446062	1446063
Sample Reference				DS4	DS5	DS6	DS6	DS6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				5.00	0.30	0.30	1.00	3.50
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	0.010	-	< 0.001	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	0.045	-	< 0.001	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	0.037	-	< 0.001	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	0.030	-	< 0.001	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	0.12	-	< 0.007	-

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 21 of 31



Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446064	1446065	1446066	1446067	
Sample Reference				DS7	DS7	DS7	DS8	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.30	4.50	5.00	0.30	
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	13	17	9.9	14	
Total mass of sample received	kg	0.001	NONE	2.0	2.0	0.45	1.4	

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	Not-detected	
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	

General Inorganics

pH - Manual	pH Units	N/A	MCERTS	11.1	-	-	-	
pH - Automated	pH Units	N/A	MCERTS	11.0	-	-	8.9	
Total Cyanide	mg/kg	1	MCERTS	< 1	-	-	< 1	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.13	-	-	0.12	
Sulphide	mg/kg	1	MCERTS	6.3	-	-	43	
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.016	-	-	0.017	
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.6	-	-	-	
Loss on Ignition @ 450°C	%	0.2	MCERTS	3.3	-	-	-	
Acid Neutralisation Capacity	+/- mol/kg	-999	NONE	75	-	-	-	

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	
----------------------------	-------	---	--------	-------	---	---	-------	--

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1.7	-	-	0.25	
Acenaphthylene	mg/kg	0.05	MCERTS	1.0	-	-	1.3	
Acenaphthene	mg/kg	0.05	MCERTS	0.39	-	-	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	0.98	-	-	1.4	
Phenanthrene	mg/kg	0.05	MCERTS	9.9	-	-	7.2	
Anthracene	mg/kg	0.05	MCERTS	1.8	-	-	2.7	
Fluoranthene	mg/kg	0.05	MCERTS	16	-	-	23	
Pyrene	mg/kg	0.05	MCERTS	13	-	-	21	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	6.7	-	-	14	
Chrysene	mg/kg	0.05	MCERTS	6.3	-	-	11	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	8.9	-	-	19	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	2.6	-	-	5.1	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.2	-	-	11	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.8	-	-	6.5	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	2.2	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	3.2	-	-	7.3	
Coronene	mg/kg	0.05	NONE	< 0.05	-	-	< 0.05	

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	80	-	-	130	
-------------------	-------	------	------	----	---	---	-----	--

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 22 of 31



Environmental Science

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446064	1446065	1446066	1446067	
Sample Reference				DS7	DS7	DS7	DS8	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.30	4.50	5.00	0.30	
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	28	-	-	120	
Barium (aqua regia extractable)	mg/kg	1	MCERTS	300	-	-	170	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.62	-	-	1.9	
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	-	-	0.8	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	2.1	
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	-	-	< 1.2	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	-	-	21	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	97	-	-	150	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	570	-	-	540	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	-	-	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	-	-	26	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	30	-	-	57	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	220	-	-	360	

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	
Total BTEX	µg/kg	10	MCERTS	< 10	-	-	-	

Petroleum Hydrocarbons

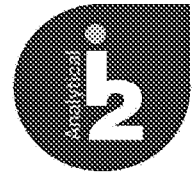
Mineral Oil (C10 - C40)	mg/kg	10	NONE	1800	-	-	-	
TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	2.6	< 1.0	< 1.0	-	
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	12	< 2.0	< 2.0	-	
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	150	< 8.0	< 8.0	-	
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	1300	< 8.0	< 8.0	-	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	1500	< 10	< 10	-	
TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	2.1	< 1.0	< 1.0	-	
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	16	< 2.0	< 2.0	-	
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	160	< 10	< 10	-	
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	650	< 10	< 10	-	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	830	< 10	< 10	-	

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 23 of 31



Environmental Science

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

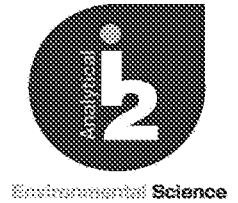
Lab Sample Number				1446064	1446065	1446066	1446067	
Sample Reference				DS7	DS7	DS7	DS8	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.30	4.50	5.00	0.30	
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
Chloroethane	µg/kg	1	NONE	-	< 1.0	< 1.0	-	
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	< 1.0	-	
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	< 1.0	-	
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0	-	
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0	-	
Benzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0	-	
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Styrene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Tribromomethane	µg/kg	1	NONE	-	< 1.0	< 1.0	-	
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 24 of 31



Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446064	1446065	1446066	1446067	
Sample Reference				DS7	DS7	DS7	DS8	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.30	4.50	5.00	0.30	
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	< 0.2	-	
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	< 0.2	-	
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	
Dimethyl phthalate	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3	-	
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3	-	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 25 of 31

Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number				1446064	1446065	1446066	1446067	
Sample Reference				DS7	DS7	DS7	DS8	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.30	4.50	5.00	0.30	
Date Sampled				16/02/2020	16/02/2020	16/02/2020	16/02/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	-	-	-	

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 26 of 31



Analytical Report Number: **20-87600**
Project / Site name: **Pier Road Limited**
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1446055	DS3	0.50	129	Loose Fibrous Debris	Chrysotile	0.001	0.001
1446060	DS5	0.30	153	Loose Fibrous Debris	Chrysotile	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Page 27 of 31



Analytical Report Number: 20-87600

Project / Site name: Pier Road Limited

Lab Sample Number					1446068	1446069	1446070	1446071	1446072
Sample Reference					DS1	DS3	DS5	DS6	DS7
Sample Number					None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)					0.30	0.50	0.30	1.00	0.30
Date Sampled					16/02/2020	16/02/2020	16/02/2020	16/02/2020	16/02/2020
Time Taken					None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status						

10:1 WAC Leachate

Arsenic	mg/l	0.0011	ISO 17025	0.0098	0.0412	0.0366	< 0.0011	0.0296
Barium	mg/l	0.00005	ISO 17025	0.0123	0.0201	0.0200	0.0518	0.0148
Cadmium	mg/l	0.0001	ISO 17025	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Chromium	mg/l	0.0004	ISO 17025	0.0037	0.0027	0.0048	0.0013	0.0082
Copper	mg/l	0.0007	ISO 17025	0.0099	0.0083	0.029	0.011	0.037
Mercury	mg/l	0.0005	ISO 17025	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Molybdenum	mg/l	0.0004	ISO 17025	0.0132	0.0030	0.0092	0.0043	0.0016
Nickel	mg/l	0.0003	ISO 17025	0.0012	< 0.0003	0.0011	0.0046	< 0.0003
Lead	mg/l	0.001	ISO 17025	0.021	0.011	0.021	0.0019	0.0071
Antimony	mg/l	0.0017	ISO 17025	< 0.0017	< 0.0017	0.011	< 0.0017	< 0.0017
Selenium	mg/l	0.004	ISO 17025	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
Zinc	mg/l	0.0004	ISO 17025	0.011	0.011	0.0087	0.0030	0.0041
Chloride	mg/l	0.15	ISO 17025	2.3	2.7	22	140	14
Fluoride	mg/l	0.05	ISO 17025	0.43	0.23	0.93	0.29	0.25
Sulphate	mg/l	0.1	ISO 17025	5.9	16	32	18	12
Total dissolved solids	mg/l	4	ISO 17025	72	54	200	690	250
Total monohydric phenols	mg/l	0.01	ISO 17025	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Dissolved organic carbon	mg/l	0.1	NONE	6.58	4.92	12.0	6.47	14.4

10:1 WAC Leachate

Arsenic	mg/kg	0.011	NONE	0.0840	0.367	0.316	< 0.0110	0.269
Barium	mg/kg	0.0005	NONE	0.106	0.179	0.172	0.452	0.134
Cadmium	mg/kg	0.0008	NONE	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Chromium	mg/kg	0.004	NONE	0.032	0.024	0.041	0.011	0.075
Copper	mg/kg	0.007	NONE	0.085	0.074	0.25	0.095	0.34
Mercury	mg/kg	0.005	NONE	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Molybdenum	mg/kg	0.004	NONE	0.113	0.0264	0.0793	0.0377	0.0148
Nickel	mg/kg	0.003	NONE	0.010	< 0.0030	0.0091	0.040	< 0.0030
Lead	mg/kg	0.01	NONE	0.18	0.094	0.18	0.016	0.065
Antimony	mg/kg	0.017	NONE	< 0.017	< 0.017	0.098	< 0.017	< 0.017
Selenium	mg/kg	0.04	NONE	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Zinc	mg/kg	0.004	NONE	0.094	0.099	0.075	0.026	0.038
Chloride	mg/kg	1.5	NONE	20	24	190	1200	130
Fluoride	mg/kg	0.5	NONE	3.7	2.0	8.0	2.5	2.3
Sulphate	mg/kg	1	NONE	51	140	270	160	110
Total dissolved solids	mg/kg	40	ISO 17025	620	480	1700	6000	2300
Total monohydric phenols	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dissolved organic carbon	mg/kg	1	NONE	56.6	43.9	104	56.4	131

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 28 of 31



4842



Environmental Science

Analytical Report Number : 20-87600**Project / Site name: Pier Road Limited**

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1446044	BH2	None Supplied	3.00	Grey clay.
1446045	BH2	None Supplied	4.00	Brown clay and sand with gravel.
1446046	BH2	None Supplied	5.00	Brown clay and sand.
1446047	BH2	None Supplied	6.50	Light brown clay and sand.
1446048	BH2	None Supplied	10.00	Light brown clay and sand.
1446049	BH2	None Supplied	14.00	Light brown clay and sand.
1446050	DS1	None Supplied	0.30	Brown loam and clay with gravel and rubble.
1446051	DS1	None Supplied	1.00	Brown clay and sand.
1446052	DS1	None Supplied	3.50	Grey clay.
1446053	DS2	None Supplied	0.30	Brown loam and clay with vegetation and rubble.
1446054	DS2	None Supplied	4.00	Grey clay.
1446055	DS3	None Supplied	0.50	Brown clay and gravel.
1446056	DS4	None Supplied	0.30	Brown loam and sand with gravel and rubble.
1446057	DS4	None Supplied	1.50	Brown clay and sand.
1446058	DS4	None Supplied	4.00	Grey clay.
1446059	DS4	None Supplied	5.00	Brown loam and clay with gravel.
1446060	DS5	None Supplied	0.30	Brown loam and clay with gravel.
1446061	DS6	None Supplied	0.30	Brown loam and clay with rubble.
1446062	DS6	None Supplied	1.00	Grey clay and gravel.
1446063	DS6	None Supplied	3.50	Brown clay.
1446064	DS7	None Supplied	0.30	Brown clay and gravel.
1446065	DS7	None Supplied	4.50	Brown clay and sand with gravel.
1446066	DS7	None Supplied	5.00	Brown clay and sand with gravel.
1446067	DS8	None Supplied	0.30	Brown clay and gravel with vegetation.

Analytical Report Number : 20-87600

Project / Site name: Pier Road Limited

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance on Sampling and Testing of Wastes to Meet Landfill Waste Acceptance"	L046-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as received, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BS EN 12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1 ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 30 of 31



Analytical Report Number : 20-87600

Project / Site name: Pier Road Limited

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCBs By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Iss No 20-87600-2 Pier Road Limited LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 31 of 31



Michael Rose

Land Science
The Old Police Station
Jobs Lane
Sayers Common
West Sussex
BN6 9HE

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 0845 604 6494

e: mike.rose@landscience.co.uk



Analytical Report Number : 20-88643

Project / Site name:	46A to 47 Pier Road, Littlehampton, BN17 5LW	Samples received on:	24/02/2020
Your job number:	LS4823	Samples instructed on:	24/02/2020
Your order number:		Analysis completed by:	04/03/2020
Report Issue Number:	1	Report issued on:	04/03/2020
Samples Analysed:	1 soil sample		

Signed:

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Iss No 20-88643-1 46A to 47 Pier Road, Littlehampton, BN17 5LW LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 1 of 6

Analytical Report Number: 20-88643

Project / Site name: 46A to 47 Pier Road, Littlehampton, BN17 5LW

Lab Sample Number	1451417						
Sample Reference	D55						
Sample Number	D11						
Depth (m)	5.00						
Date Sampled	13/02/2020						
Time Taken	None Supplied						
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1			
Moisture Content	%	N/A	NONE	14			
Total mass of sample received	kg	0.001	NONE	0.64			

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001			
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001			
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001			
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0			
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0			
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	< 8.0			
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10			

TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001			
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001			
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001			
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0			
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0			
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	< 10			
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10			

Iss No 20-88643-1 46A to 47 Pier Road, Littlehampton, BN17 5LW LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 2 of 6



Environmental Science

Analytical Report Number: 20-88643

Project / Site name: 46A to 47 Pier Road, Littlehampton, BN17 5LW

Lab Sample Number				1451417					
Sample Reference				D55					
Sample Number				D11					
Depth (m)				5.00					
Date Sampled				13/02/2020					
Time Taken				None Supplied					
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						
VOCs									
Chloromethane	µg/kg	1	ISO 17025	< 1.0					
Chloroethane	µg/kg	1	NONE	< 1.0					
Bromomethane	µg/kg	1	ISO 17025	< 1.0					
Vinyl Chloride	µg/kg	1	NONE	< 1.0					
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0					
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0					
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0					
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0					
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0					
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0					
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0					
Trichloromethane	µg/kg	1	MCERTS	< 1.0					
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0					
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0					
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0					
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0					
Benzene	µg/kg	1	MCERTS	< 1.0					
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0					
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0					
Trichloroethene	µg/kg	1	MCERTS	< 1.0					
Dibromomethane	µg/kg	1	MCERTS	< 1.0					
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0					
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0					
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0					
Toluene	µg/kg	1	MCERTS	< 1.0					
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0					
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0					
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0					
Tetrachloroethene	µg/kg	1	NONE	< 1.0					
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0					
Chlorobenzene	µg/kg	1	MCERTS	< 1.0					
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0					
Ethylbenzene	µg/kg	1	MCERTS	< 1.0					
p & m-Xylene	µg/kg	1	MCERTS	< 1.0					
Styrene	µg/kg	1	MCERTS	< 1.0					
Tribromomethane	µg/kg	1	NONE	< 1.0					
o-Xylene	µg/kg	1	MCERTS	< 1.0					
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0					
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0					
Bromobenzene	µg/kg	1	MCERTS	< 1.0					
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0					
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0					
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0					
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0					
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0					
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0					
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0					
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0					
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0					
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0					
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0					
Butylbenzene	µg/kg	1	MCERTS	< 1.0					
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0					
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0					
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0					
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0					

Iss No 20-88643-1 46A to 47 Pier Road, Littlehampton, BN17 5LW LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 3 of 6



Analytical Report Number: 20-88643

Project / Site name: 46A to 47 Pier Road, Littlehampton, BN17 5LW

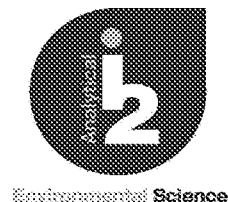
Lab Sample Number				1451417				
Sample Reference				D55				
Sample Number				D11				
Depth (m)				5.00				
Date Sampled				13/02/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1				
Phenol	mg/kg	0.2	ISO 17025	< 0.2				
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1				
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2				
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2				
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1				
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2				
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1				
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3				
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05				
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3				
4-Methylphenol	mg/kg	0.2	NONE	< 0.2				
Isophorone	mg/kg	0.2	MCERTS	< 0.2				
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3				
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3				
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3				
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3				
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3				
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1				
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1				
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1				
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1				
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2				
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1				
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1				
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1				
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2				
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2				
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3				
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2				
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Azobenzene	mg/kg	0.3	MCERTS	< 0.3				
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2				
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Carbazole	mg/kg	0.3	MCERTS	< 0.3				
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2				
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3				
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	< 0.05				
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				

Iss No 20-88643-1 46A to 47 Pier Road, Littlehampton, BN17 5LW LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 4 of 6



Analytical Report Number : 20-88643

Project / Site name: 46A to 47 Pier Road, Littlehampton, BN17 5LW

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1451417	D55	D11	5.00	Brown clay and sand with gravel.

Iss No 20-88643-1 46A to 47 Pier Road, Littlehampton, BN17 5LW LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 5 of 6

Analytical Report Number : 20-88643

Project / Site name: 46A to 47 Pier Road, Littlehampton, BN17 5LW

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



Michael Rose
Land Science
The Old Police Station
Jobs Lane
Sayers Common
West Sussex
BN6 9HE

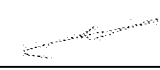
i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

Analytical Report Number : 20-89813

Replaces Analytical Report Number : 20-89813, issue no. 1

Client references/information amended.

Project / Site name:	Pier Road, Lottehampton	Samples received on:	28/02/2020
Your job number:	LS4823	Samples instructed on:	28/02/2020
Your order number:		Analysis completed by:	11/03/2020
Report Issue Number:	2	Report issued on:	11/03/2020
Samples Analysed:	1 leachate sample - 3 soil samples		

Signed: 

Zina Abdul Razzak
Senior Quality Specialist

For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.



4841



Environmental Science

Analytical Report Number: 20-89813

Project / Site name: Pier Road, Lottehampton

Lab Sample Number				1457756	1457757	1457758		
Sample Reference				BH1	BH1	BH1		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50	4.00	6.00-6.45		
Date Sampled				26/02/2020	26/02/2020	26/02/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	13	29	27		
Total mass of sample received	kg	0.001	NONE	1.3	0.54	0.63		

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-		
------------------	------	-----	-----------	--------------	---	---	--	--

General Inorganics

pH - Manual	pH Units	N/A	MCERTS	11.7	-	-		
pH - Automated	pH Units	N/A	MCERTS	10.1	9.1	8.4		
Total Cyanide	mg/kg	1	MCERTS	< 1	-	-		
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.38	1.0	0.40		
Sulphide	mg/kg	1	MCERTS	6.1	-	-		
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.0026	-	-		
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.3	-	-		
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.6	-	-		
Acid Neutralisation Capacity	+/- mol/kg	-999	NONE	480	-	-		

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-		
----------------------------	-------	---	--------	-------	---	---	--	--

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.43	-	-		
Acenaphthylene	mg/kg	0.05	MCERTS	0.61	-	-		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-		
Fluorene	mg/kg	0.05	MCERTS	0.59	-	-		
Phenanthrene	mg/kg	0.05	MCERTS	6.2	-	-		
Anthracene	mg/kg	0.05	MCERTS	1.7	-	-		
Fluoranthene	mg/kg	0.05	MCERTS	12	-	-		
Pyrene	mg/kg	0.05	MCERTS	9.8	-	-		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	7.9	-	-		
Chrysene	mg/kg	0.05	MCERTS	6.3	-	-		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	7.3	-	-		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.4	-	-		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.4	-	-		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.4	-	-		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.90	-	-		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.4	-	-		
Coronene	mg/kg	0.05	NONE	< 0.05	-	-		

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	67	-	-		
-------------------	-------	------	------	----	---	---	--	--

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	-	-		
Barium (aqua regia extractable)	mg/kg	1	MCERTS	54	-	-		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.35	-	-		
Boron (water soluble)	mg/kg	0.2	MCERTS	3.0	-	-		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-		
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	-	-		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	11	-	-		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	29	-	-		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	50	-	-		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	9.0	-	-		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	20	-	-		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	39	-	-		



4841



Environmental Science

Analytical Report Number: 20-89813

Project / Site name: Pier Road, Lottehampton

Lab Sample Number				1457756	1457757	1457758		
Sample Reference				BH1	BH1	BH1		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50	4.00	6.00-6.45		
Date Sampled				26/02/2020	26/02/2020	26/02/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-		

Total BTEX	µg/kg	10	MCERTS	< 10	-	-		
------------	-------	----	--------	------	---	---	--	--

Petroleum Hydrocarbons

Mineral Oil (C10 - C40)	mg/kg	10	NONE	77	-	-		
-------------------------	-------	----	------	----	---	---	--	--

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	8.3	< 1.0	-		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	14	< 2.0	-		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	29	< 8.0	-		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	22	< 8.0	-		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	73	< 10	-		

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	11	< 1.0	-		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	16	< 2.0	-		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	72	< 10	-		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	87	< 10	-		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	190	< 10	-		



4841



Environmental Science

Analytical Report Number: 20-89813

Project / Site name: Pier Road, Lottehampton

Lab Sample Number				1457756	1457757	1457758		
Sample Reference				BH1	BH1	BH1		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50	4.00	6.00-6.45		
Date Sampled				26/02/2020	26/02/2020	26/02/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	-		
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	-		
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	-		
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	-		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	-		
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	-		
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	-		
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		



4841



Environmental Science

Analytical Report Number: 20-89813

Project / Site name: Pier Road, Lottehampton

Lab Sample Number				1457756	1457757	1457758		
Sample Reference				BH1	BH1	BH1		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50	4.00	6.00-6.45		
Date Sampled				26/02/2020	26/02/2020	26/02/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-		
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	-		
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Naphthalene	mg/kg	0.05	MCERTS	0.43	< 0.05	-		
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Acenaphthylene	mg/kg	0.05	MCERTS	0.61	< 0.05	-		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	-		
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Fluorene	mg/kg	0.05	MCERTS	0.59	< 0.05	-		
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Phenanthrene	mg/kg	0.05	MCERTS	6.2	< 0.05	-		
Anthracene	mg/kg	0.05	MCERTS	1.7	< 0.05	-		
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Fluoranthene	mg/kg	0.05	MCERTS	12	< 0.05	-		
Pyrene	mg/kg	0.05	MCERTS	9.8	< 0.05	-		
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	-		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	7.9	< 0.05	-		
Chrysene	mg/kg	0.05	MCERTS	6.3	< 0.05	-		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	7.3	< 0.05	-		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.4	< 0.05	-		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.4	< 0.05	-		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.4	< 0.05	-		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.90	< 0.05	-		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.4	< 0.05	-		



4841



Environmental Science

Analytical Report Number: 20-89813

Project / Site name: Pier Road, Lottehampton

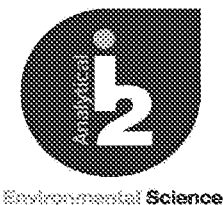
Lab Sample Number				1457756	1457757	1457758		
Sample Reference				BH1	BH1	BH1		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50	4.00	6.00-6.45		
Date Sampled				26/02/2020	26/02/2020	26/02/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	-	-		
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	-	-		
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	-	-		
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	-	-		
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	-	-		
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	-	-		
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	-	-		

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	< 0.007	-	-		
------------	-------	-------	--------	---------	---	---	--	--



Analytical Report Number: 20-89813

Project / Site name: Pier Road, Lottehampton

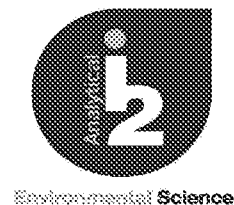
Lab Sample Number				1457759				
Sample Reference				BH1				
Sample Number				None Supplied				
Depth (m)				1.00				
Date Sampled				26/02/2020				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	units	Limit of detection	Accreditation Status					

10:1 WAC Leachate

Arsenic	mg/l	0.0011	ISO 17025	< 0.0011				
Barium	mg/l	0.00005	ISO 17025	0.0952				
Cadmium	mg/l	0.0001	ISO 17025	< 0.0001				
Chromium	mg/l	0.0004	ISO 17025	0.0029				
Copper	mg/l	0.0007	ISO 17025	0.0057				
Mercury	mg/l	0.0005	ISO 17025	< 0.0005				
Molybdenum	mg/l	0.0004	ISO 17025	0.0017				
Nickel	mg/l	0.0003	ISO 17025	0.0034				
Lead	mg/l	0.001	ISO 17025	0.0040				
Antimony	mg/l	0.0017	ISO 17025	< 0.0017				
Selenium	mg/l	0.004	ISO 17025	< 0.0040				
Zinc	mg/l	0.0004	ISO 17025	0.0059				
Chloride	mg/l	0.15	ISO 17025	63				
Fluoride	mg/l	0.05	ISO 17025	0.14				
Sulphate	mg/l	0.1	ISO 17025	18				
Total dissolved solids	mg/l	4	ISO 17025	760				
Total monohydric phenols	mg/l	0.01	ISO 17025	< 0.010				
Dissolved organic carbon	mg/l	0.1	NONE	9.45				

10:1 WAC Leachate

Arsenic	mg/kg	0.011	NONE	< 0.0110				
Barium	mg/kg	0.0005	NONE	0.841				
Cadmium	mg/kg	0.0008	NONE	< 0.0008				
Chromium	mg/kg	0.004	NONE	0.026				
Copper	mg/kg	0.007	NONE	0.050				
Mercury	mg/kg	0.005	NONE	< 0.0050				
Molybdenum	mg/kg	0.004	NONE	0.0149				
Nickel	mg/kg	0.003	NONE	0.030				
Lead	mg/kg	0.01	NONE	0.035				
Antimony	mg/kg	0.017	NONE	< 0.017				
Selenium	mg/kg	0.04	NONE	< 0.040				
Zinc	mg/kg	0.004	NONE	0.052				
Chloride	mg/kg	1.5	NONE	560				
Fluoride	mg/kg	0.5	NONE	1.3				
Sulphate	mg/kg	1	NONE	160				
Total dissolved solids	mg/kg	40	ISO 17025	6700				
Total monohydric phenols	mg/kg	0.1	NONE	< 0.10				
Dissolved organic carbon	mg/kg	1	NONE	83.5				



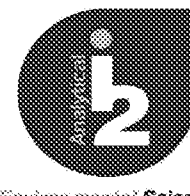
Analytical Report Number : 20-89813

Project / Site name: Pier Road, Lottehampton

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1457756	BH1	None Supplied	0.50	Brown loam and clay with gravel and vegetation.
1457757	BH1	None Supplied	4.00	Grey clay.
1457758	BH1	None Supplied	6.00-6.45	Light brown sandy clay.



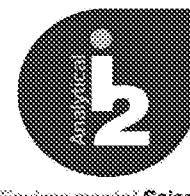
Analytical Report Number : 20-89813

Project / Site name: Pier Road, Lottehampton

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025

Iss No 20-89813-2 Pier Road, Lottehampton LS4823



Environmental Science

Analytical Report Number : 20-89813

Project / Site name: Pier Road, Lottehampton

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



Michael Rose
Land Science
The Old Police Station
Jobs Lane
Sayers Common
West Sussex
BN6 9HE

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

Analytical Report Number : 20-90659

Project / Site name: Pier Road, Littlehampton

Samples received on: 04/03/2020

Your job number: LS4823

Samples instructed on: 04/03/2020

Your order number:

Analysis completed by: 11/03/2020

Report Issue Number: 1

Report issued on: 11/03/2020

Samples Analysed: 1 soil sample

Signed: 

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Iss No 20-90659-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 1 of 8



Analytical Report Number: 20-90659

Project / Site name: Pier Road, Littlehampton

Lab Sample Number				1462171					
Sample Reference				BH2					
Sample Number				None Supplied					
Depth (m)				0.50					
Date Sampled				02/03/2020					
Time Taken				None Supplied					
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Acceptance Status						
Stone Content	%	0.1	NONE	< 0.1					
Moisture Content	%	N/A	NONE	14					
Total mass of sample received	kg	0.001	NONE	0.58					

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected					
------------------	------	-----	-----------	--------------	--	--	--	--	--

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.8					
Total Cyanide	mg/kg	1	MCERTS	< 1					
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.10					
Sulphide	mg/kg	1	MCERTS	11					
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.017					

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0					
----------------------------	-------	---	--------	-------	--	--	--	--	--

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05					
Acenaphthylene	mg/kg	0.05	MCERTS	4.3					
Acenaphthene	mg/kg	0.05	MCERTS	1.5					
Fluorene	mg/kg	0.05	MCERTS	5.0					
Phenanthrene	mg/kg	0.05	MCERTS	27					
Anthracene	mg/kg	0.05	MCERTS	11					
Fluoranthene	mg/kg	0.05	MCERTS	48					
Pyrene	mg/kg	0.05	MCERTS	42					
Benzo(a)anthracene	mg/kg	0.05	MCERTS	34					
Chrysene	mg/kg	0.05	MCERTS	21					
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	25					
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	14					
Benzo(a)pyrene	mg/kg	0.05	MCERTS	24					
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	8.6					
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	3.7					
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	9.3					
Coronene	mg/kg	0.05	NONE	< 0.05					

Total PAHs

Total WAC-17 PAHs	mg/kg	0.85	NONE	280					
-------------------	-------	------	------	-----	--	--	--	--	--

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.8					
Barium (aqua regia extractable)	mg/kg	1	MCERTS	37					
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.21					
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5					
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2					
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2					
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	6.9					
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13					
Lead (aqua regia extractable)	mg/kg	1	MCERTS	88					
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3					
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	5.5					
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0					
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	12					
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	28					

Iss No 20-90659-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 2 of 8

Analytical Report Number: 20-90659

Project / Site name: Pier Road, Littlehampton

Lab Sample Number	1462171					
Sample Reference	BH2					
Sample Number	None Supplied					
Depth (m)	0.50					
Date Sampled	02/03/2020					
Time Taken	None Supplied					
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.001	MCERTS	1.2				
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	25				
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	450				
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	620				
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	690				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	1800				

TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	15				
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	330				
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	740				
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	860				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	1900				

Iss No 20-90659-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 3 of 8



Environmental Science

Analytical Report Number: 20-90659

Project / Site name: Pier Road, Littlehampton

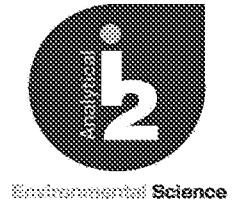
Lab Sample Number				1462171					
Sample Reference				BH2					
Sample Number				None Supplied					
Depth (m)				0.50					
Date Sampled				02/03/2020					
Time Taken				None Supplied					
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						
VOCs									
Chloromethane	µg/kg	1	ISO 17025	< 1.0					
Chloroethane	µg/kg	1	NONE	< 1.0					
Bromomethane	µg/kg	1	ISO 17025	< 1.0					
Vinyl Chloride	µg/kg	1	NONE	< 1.0					
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0					
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0					
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0					
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0					
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0					
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0					
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0					
Trichloromethane	µg/kg	1	MCERTS	< 1.0					
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0					
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0					
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0					
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0					
Benzene	µg/kg	1	MCERTS	< 1.0					
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0					
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0					
Trichloroethene	µg/kg	1	MCERTS	< 1.0					
Dibromomethane	µg/kg	1	MCERTS	< 1.0					
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0					
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0					
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0					
Toluene	µg/kg	1	MCERTS	< 1.0					
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0					
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0					
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0					
Tetrachloroethene	µg/kg	1	NONE	< 1.0					
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0					
Chlorobenzene	µg/kg	1	MCERTS	< 1.0					
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0					
Ethylbenzene	µg/kg	1	MCERTS	< 1.0					
p & m-Xylene	µg/kg	1	MCERTS	< 1.0					
Styrene	µg/kg	1	MCERTS	< 1.0					
Tribromomethane	µg/kg	1	NONE	< 1.0					
o-Xylene	µg/kg	1	MCERTS	< 1.0					
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0					
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0					
Bromobenzene	µg/kg	1	MCERTS	< 1.0					
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0					
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0					
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0					
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0					
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0					
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0					
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0					
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0					
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0					
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0					
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0					
Butylbenzene	µg/kg	1	MCERTS	< 1.0					
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0					
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0					
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0					
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0					

Iss No 20-90659-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 4 of 8



Analytical Report Number: 20-90659

Project / Site name: Pier Road, Littlehampton

Lab Sample Number				1462171				
Sample Reference				BH2				
Sample Number				None Supplied				
Depth (m)				0.50				
Date Sampled				02/03/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1				
Phenol	mg/kg	0.2	ISO 17025	< 0.2				
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1				
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2				
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2				
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1				
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2				
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1				
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3				
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05				
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3				
4-Methylphenol	mg/kg	0.2	NONE	< 0.2				
Isophorone	mg/kg	0.2	MCERTS	< 0.2				
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3				
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3				
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3				
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3				
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3				
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1				
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1				
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1				
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1				
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2				
2-Methylnaphthalene	mg/kg	0.1	NONE	12				
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1				
Dimethyl phthalate	mg/kg	0.1	MCERTS	< 0.1				
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1				
Acenaphthylene	mg/kg	0.05	MCERTS	4.3				
Acenaphthene	mg/kg	0.05	MCERTS	1.5				
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2				
Dibenzofuran	mg/kg	0.2	MCERTS	1.9				
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3				
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2				
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2				
Fluorene	mg/kg	0.05	MCERTS	5.0				
Azobenzene	mg/kg	0.3	MCERTS	< 0.3				
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2				
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3				
Phenanthrene	mg/kg	0.05	MCERTS	27				
Anthracene	mg/kg	0.05	MCERTS	11				
Carbazole	mg/kg	0.3	MCERTS	< 0.3				
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2				
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3				
Fluoranthene	mg/kg	0.05	MCERTS	48				
Pyrene	mg/kg	0.05	MCERTS	42				
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	34				
Chrysene	mg/kg	0.05	MCERTS	21				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	25				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	14				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	24				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	8.6				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	3.7				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	9.3				

Iss No 20-90659-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 5 of 8



Analytical Report Number : 20-90659

Project / Site name: Pier Road, Littlehampton

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1462171	BH2	None Supplied	0.50	Light grey sand with gravel.

Iss No 20-90659-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 6 of 8

Analytical Report Number : 20-90659

Project / Site name: Pier Road, Littlehampton

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

Iss No 20-90659-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 7 of 8



Analytical Report Number : 20-90659

Project / Site name: Pier Road, Littlehampton

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Iss No 20-90659-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 8 of 8



Michael Rose
Land Science
The Old Police Station
Jobs Lane
Sayers Common
West Sussex
BN6 9HE

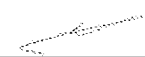
i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

Analytical Report Number : 20-90855

Replaces Analytical Report Number : 20-90855, issue no. 1

Client sampling date amended.

Project / Site name:	Pier Road, Littlehampton	Samples received on:	05/03/2020
Your job number:	LS4823	Samples instructed on:	05/03/2020
Your order number:		Analysis completed by:	12/03/2020
Report Issue Number:	2	Report issued on:	13/03/2020
Samples Analysed:	4 water samples		

Signed: 

Zina Abdul Razzak
Senior Quality Specialist

For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

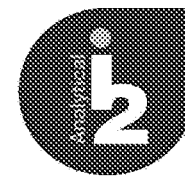
Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Iss No 20-90855-2 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 1 of 6



Analytical Report Number: 20-90855

Project / Site name: Pier Road, Littlehampton

Lab Sample Number				1463188	1463189	1463190	1463191	
Sample Reference				BH1	BH2	BH2	DS7	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				6.40	3.80	6.20	None Supplied	
Date Sampled				04/03/2020	04/03/2020	04/03/2020	04/03/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	7.9	9.5	8.1	8.7	
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	
Sulphate as SO ₄	µg/l	45	ISO 17025	217000	68500	122000	27800	
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	5.68	17.5	10.0	13.6	

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	
----------------------------	------	----	-----------	------	------	------	------	--

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Coronene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	
Total WAC-17 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.05	4.37	3.01	12.9	
Barium (dissolved)	µg/l	0.06	ISO 17025	36	8.8	20	22	
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	
Boron (dissolved)	µg/l	10	ISO 17025	240	96	160	110	
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	< 0.02	< 0.02	
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	
Chromium (dissolved)	µg/l	0.2	ISO 17025	1.5	5.6	2.7	3.8	
Copper (dissolved)	µg/l	0.5	ISO 17025	2.3	4.0	3.1	11	
Lead (dissolved)	µg/l	0.2	ISO 17025	0.5	0.5	0.5	5.7	
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.3	2.2	3.7	2.7	
Selenium (dissolved)	µg/l	0.6	ISO 17025	29	6.2	9.1	2.3	
Vanadium (dissolved)	µg/l	0.2	ISO 17025	1.6	8.0	4.3	6.3	
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.3	3.9	5.7	3.0	

Iss No 20-90855-2 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 2 of 6



Analytical Report Number: 20-90855

Project / Site name: Pier Road, Littlehampton

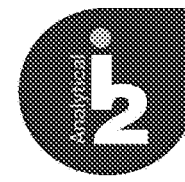
Lab Sample Number				1463188	1463189	1463190	1463191	
Sample Reference				BH1	BH2	BH2	DS7	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				6.40	3.80	6.20	None Supplied	
Date Sampled				04/03/2020	04/03/2020	04/03/2020	04/03/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	120	< 10	
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	60	< 10	
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	180	< 10	
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	

Iss No 20-90855-2 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 3 of 6



Analytical Report Number: 20-90855

Project / Site name: Pier Road, Littlehampton

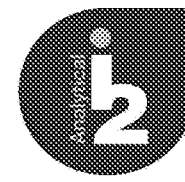
Lab Sample Number				1463188	1463189	1463190	1463191	
Sample Reference				BH1	BH2	BH2	DS7	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				6.40	3.80	6.20	None Supplied	
Date Sampled				04/03/2020	04/03/2020	04/03/2020	04/03/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
o-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	

Iss No 20-90855-2 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 4 of 6



Analytical Report Number: 20-90855

Project / Site name: Pier Road, Littlehampton

Lab Sample Number				1463188	1463189	1463190	1463191	
Sample Reference				BH1	BH2	BH2	DS7	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				6.40	3.80	6.20	None Supplied	
Date Sampled				04/03/2020	04/03/2020	04/03/2020	04/03/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	

U/S = Unsuitable Sample I/S = Insufficient Sample

Iss No 20-90855-2 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 5 of 6



Analytical Report Number : 20-90855

Project / Site name: Pier Road, Littlehampton

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated WAC-17 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

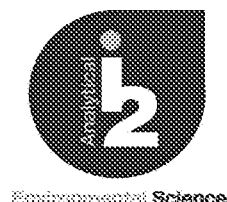
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Iss No 20-90855-2 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 6 of 6



Michael Rose
Land Science
The Old Police Station
Jobs Lane
Sayers Common
West Sussex
BN6 9HE

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

Analytical Report Number : 20-91088

Project / Site name: Pier Road, Littlehampton

Samples received on: 06/03/2020

Your job number: LS4823

Samples instructed on: 06/03/2020

Your order number:

Analysis completed by: 17/03/2020

Report Issue Number: 1

Report issued on: 17/03/2020

Samples Analysed: 2 water samples

Signed:

Rachel Bradley

Deputy Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

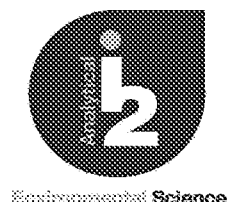
Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Iss No 20-91088-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 1 of 7



Analytical Report Number: 20-91088

Project / Site name: Pier Road, Littlehampton

Lab Sample Number				1464524	1464525			
Sample Reference				BH1	D56			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				05/03/2020	05/03/2020			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	7.6	8.8			
Total Cyanide	µg/l	10	ISO 17025	< 10	31			
Sulphate as SO ₄	µg/l	45	ISO 17025	2530000	366000			
Sulphide	µg/l	5	NONE	< 5.0	< 5.0			
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	1.14	10.9			

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	70	< 10			
----------------------------	------	----	-----------	----	------	--	--	--

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	0.65			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Coronene	µg/l	0.01	NONE	< 0.01	< 0.01			

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	0.7			
Total WAC-17 PAHs	µg/l	0.2	NONE	< 0.2	0.7			

Heavy Metals / Metalloids

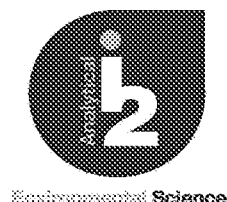
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	-			
Arsenic (dissolved)	µg/l	0.15	ISO 17025	< 0.15	8.47			
Barium (dissolved)	µg/l	0.06	ISO 17025	25	33			
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1	< 0.1			
Boron (dissolved)	µg/l	10	ISO 17025	2300	920			
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.02	< 0.02			
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0			
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2			
Copper (dissolved)	µg/l	0.5	ISO 17025	< 0.5	2.1			
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	1.0			
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05			
Nickel (dissolved)	µg/l	0.5	ISO 17025	< 0.5	2.3			
Selenium (dissolved)	µg/l	0.6	ISO 17025	U/S	17			
Vanadium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	2.8			
Zinc (dissolved)	µg/l	0.5	ISO 17025	< 0.5	3.3			

Iss No 20-91088-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 2 of 7



Analytical Report Number: 20-91088

Project / Site name: Pier Road, Littlehampton

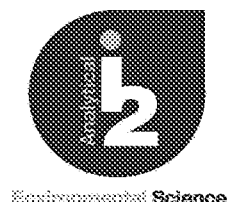
Lab Sample Number				1464524	1464525			
Sample Reference				BH1	D56			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				05/03/2020	05/03/2020			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			

Iss No 20-91088-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 3 of 7



Analytical Report Number: 20-91088

Project / Site name: Pier Road, Littlehampton

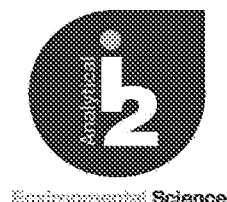
Lab Sample Number				1464524	1464525			
Sample Reference				BH1	D56			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				05/03/2020	05/03/2020			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0			
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0			
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
o-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			

Iss No 20-91088-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 4 of 7



Analytical Report Number: 20-91088

Project / Site name: Pier Road, Littlehampton

Lab Sample Number				1464524	1464525			
Sample Reference				BH1	D56			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				05/03/2020	05/03/2020			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	µg/l	0.05	NONE	< 0.05	< 0.05			
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05			
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05			
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	1.0			
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05			
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	0.65			
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05			
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05			
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05			
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05			
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05			
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05			
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			

U/S = Unsuitable Sample I/S = Insufficient Sample

Iss No 20-91088-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 5 of 7



Analytical Report Number : 20-91088

Project / Site name: Pier Road, Littlehampton

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated WAC-17 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Iss No 20-91088-1 Pier Road, Littlehampton LS4823

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 6 of 7



Sample ID	Other ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH1		W	20-91088	1464524	c	pH at 20oC in water (automated)	L099-PL	c
DS6		W	20-91088	1464525	c	pH at 20oC in water (automated)	L099-PL	c