GROUND TECHNOLOGIES

Geotechnical Testing Services

Ground Technologies Pty Ltd
ABN 25 089 213 294
55 Fifteenth Avenue, West Hoxton NSW 2171
PO Box 1121 Green Valley NSW 2168
Ph: (02) 8783 8200 Fax: (02) 8783 8210
Email: lab@groundtech.com.au

Dear Sir,

RE: STAGE 1 CONTAMINATION ASSESSMENT at **Panthers North Precinct, Mulgoa Road, Penrith**

This letter presents a Stage 1 Contamination report on the inspection and testing services associated with the contamination assessment undertaken at the above project.

Should you have any questions related to this report please do not hesitate to contact the undersigned.

For and on behalf of

Ground Technologies Pty Ltd

Reviewed By

J. Harendran
Geotechnical Engineer

A. Bennett
Senior Geotechnical Engineer

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EXECUTIVE SUMMARY

This executive summary presents a synopsis of the Stage 2 Contamination Report for the site; Panthers North Precinct, Mulgoa Road, Penrith NSW. It is understood that the site is to be re-developed with eleven mixed use commercial/residential towers. Significant excavation will be undertaken within the south-western corner of the site to allow basement level car parking within the development.

The conclusions of this Contamination Report are as follows:

- The site was used previously for rural residential purposes with light agriculture / grazing.
- A review of aerial photography suggests that the neighbouring properties are residential and not considered to have posed a risk for potential contamination to the site.
- A search of the NSW EPA Contaminated Land Management record of notices revealed that there were no notices issued to the subject site. No history of dangerous manufacturing utilizing heavy chemicals or metals was documented.
- No industrial facilities undertaking heavy manufacturing are located within 500m of the subject site. Therefore the risk of contamination migration caused by surface run-off from adjoining sites is minimal.

Evidence of possible market gardening or light agriculture was observed within the desktop study. Given that over 30 years had lapsed since the termination of these activities the risk of residual contamination was low. Ten (10) samples were collected and analysed for screening purposes in order to assess the nature, location and likely distribution of any contamination present at the subject site, and also any potential risk posed to human health or the environment. Test results were compared to the relevant assessment criteria, Hils B, and were well below the assessment criteria and therefore, indicate a low risk of contamination due to market gardening and agriculture.

Filling was observed during the field investigation. Twenty seven (27) boreholes were undertaken as a part of this initial investigation with thirty (30) samples collected and analysed in order to assess the nature, location and likely distribution of any contamination within the fill material. Test results were compared to the relevant assessment criteria, Hils B, and were well below the assessment criteria and as such, indicate a low risk of contamination due to filling within the site. The laboratory results were also analysed against the Waste Classification Guidelines (2014) prepared by the NSW EPA which indicated the fill to be classified as General Solid Waste. The material was also analysed against the ENM guidelines prepared by the EPA for reference only and indicated that the material complies with the ENM guidelines although additional sampling and testing is required to meet the frequency of testing in the guideline.

The site is suitable for development for “residential” use. No remediation action plan is required.

1. INTRODUCTION

Ground Technologies Pty Ltd have undertaken a Stage 1 Contamination Report with screening testing and analysis as at Panthers North Precinct, Mulgoa Road, Penrith NSW. It is understood that the site is to be re-developed with eleven mixed use commercial/residential towers. Excavations of between 0 to 6.0m will be undertaken within the south-western corner of the site to allow basement level car parking within the development.

2. SCOPE OF WORK

The following scope of work was conducted:

- Desktop Study of the following to assist in identification of potential contamination issues:
  - Data from Environment Protection Authority
  - Historical and current aerial photographs
  - Data from the Protection of the Environment Operations Public Register (POEO)
- Review of soils and geological maps.
- Site Inspection by a Geotechnical Engineer to ascertain current activities, and any visible signs of contamination.
- Collection of soil samples by a Geotechnical Engineer according to a sampling plan.
- Chemical analysis by a NATA accredited laboratory.
- Assessment of the results of the chemical analysis against the appropriate guidelines.
- Preparation of the Stage 1 Contamination Report.

3. SITE DESCRIPTION

The following information, presented in Table 1, describes the site.

Table 1: Summary of Site Details

Site Address	Panthers North Precinct, Mulgoa Road, Penrith
Lot / DP	Part Lot 1 DP1043008 Lot 1 DP1064526 Lot 1021 DP812335
Council Area	Penrith Council
Owner/Developer	ESQ1818 Panthers Pty Ltd

The site is located on the western side of Mulgoa Road in Penrith, and is a part of the larger Penrith Panthers complex. The site proposed for development, the Panther North Precinct is irregular in shape, measuring approximately 280m in the east-west dimension and 240m in the north-south dimension. The site is bounded to west by a lake which we understand is man-made, to the west by Mulgoa Road, to the south by existing car parks and to the north by an electrical power supply corridor and drainage channel.

Gradients in the site are generally flat, rising locally to an elevated platform in the north-west quadrant and near the boundary with the man-made lake.

Figure 3.1 – Location of Site

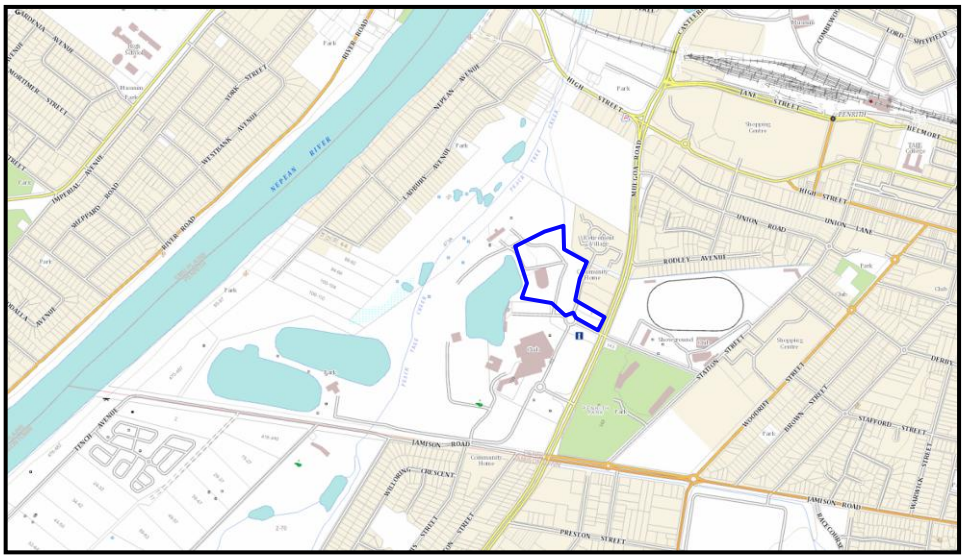
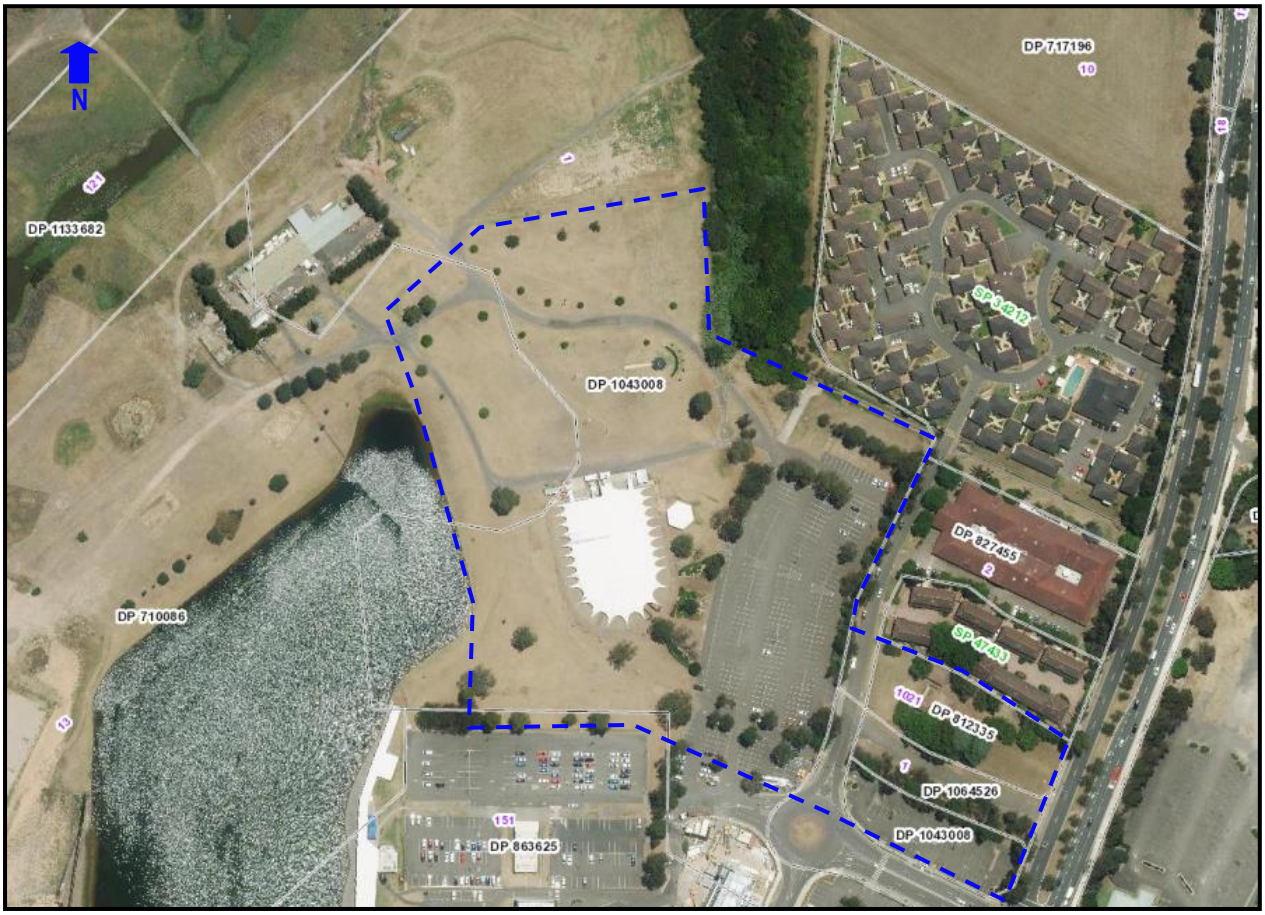


Figure 3.2 – Lot and DP Boundaries

(Excerpted from https://maps.six.nsw.gov.au/)



Lot 1 of DP812335 contains contains a brick veneer residential house and a detached garage. The remainder of this lot comprises a brick paved driveway, grassed areas, bushy vegetation and trees.

Photograph 1 – Residential House and Detached Double Garage

Lot 1 of DP1064526 contains a residential street and vegetated vacant land.

Photograph 2 – Residential street and vegetated vacant land.

DP1043008 represents most of the overall subject site. The south-eastern corner and central-eastern part of DP1043008 comprise thin asphaltic concrete paved car parking areas.

Photograph 3 – Car Park

Photograph 4 – Car Park

The central southern portion of DP1043008 contains a large permanent marquee type structure with a concreted floor, and a smaller detached toilet block. An elevated platform comprised of filled ground encorporates the central south-eastern corner of this DP area; this filled material is inferred to have been placed as part of the development of the aqua-golf man-made lake located adjacent to the western boundary of the site.

Photograph 5 – Permanent Marquee

Photograph 6 – Detached toilet block

Photograph 5 – Permanent Marquee and Aqua-golf Lake

4. SITE HISTORY

In order to ascertain the site history, a documentary review of past and present land use at the subject site and the surrounding area has been undertaken as follows:

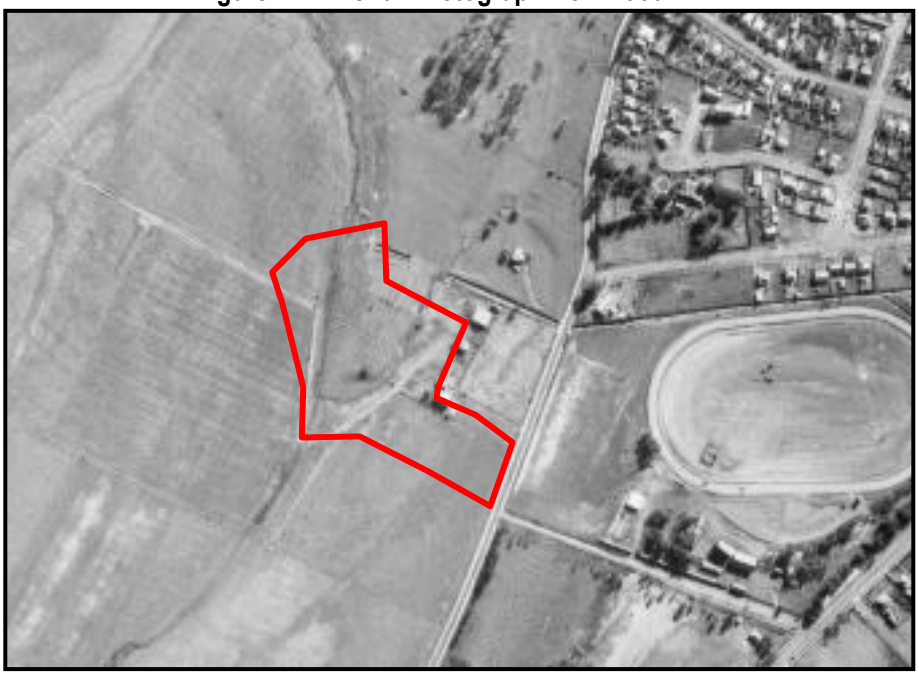
4.1 Land Use: Previous, Present and Proposed:

The site is currently being used for commercial purposes, as a car parking area and entertainment venue. Anecdotal evidence suggests that the Penrith area was utilized for various agricultural purposes. During the course of the site walk over and drilling investigation, it was observed that filling of the ground had been conducted over larger areas of the site.

4.2 Aerial Photographs:

1960 – In 1960 the site appears to be utilized as pastoral land and residential housing. Residential houses appear to be present in the eastern side of the site. Neighbouring sites are rural / farming properties. No industrial or manufacturing plants could be identified within the aerial photograph. The subject site is highlighted approximately in the figure below.

Figure 4.1 – Aerial Photograph from 1960



1970 – In 1970 the site still appears to be utilized as market gardening, pastoral land and residential housing. Residential houses appear to be present in the eastern side of the site. Neighbouring sites are rural / farming properties. No industrial or manufacturing plants could be identified within the aerial photograph. The subject site is highlighted approximately in the figure below.

Figure 4.2 – Aerial Photograph from 1970

1986 – In 1986, Some changes can be observed. The area to the south of the site has been developed to include a large building and car parking areas. A sporting facility such as a tennis court complex appears to have been built on the south-western corner of the subject site. The residential structure in Lot 1 of DP812335 has been built. Disturbing of the ground, possibly light earthworks, appears to have been conducted with some stockpiled material apparent at the north-western corner of the site. No industrial or manufacturing plants could be identified within the aerial photograph. The subject site is highlighted approximately in the figure below.

Figure 4.3 – Aerial Photograph from 1986

1994 – In 1994, Further changes can be observed. The area to the south of the site has been developed to include additional car parking, the area north-east of the site has developed, or is under development of residential type structures. Within the subject site, the made-made lake, marquee, car parking areas and internal tracks have been constructed. No industrial or manufacturing plants could be identified within the aerial photograph. The subject site is highlighted approximately in the figure below.

Figure 4.4 – Aerial Photograph from 1994

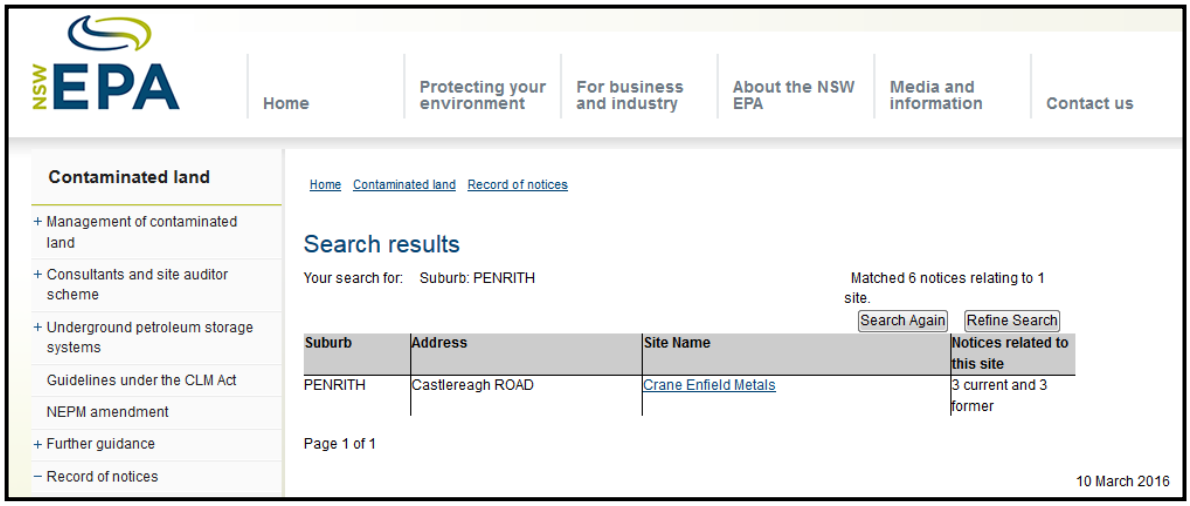
2004 – In 2004, Further changes can be observed. The subject site appears largely unchanged, however the sporting "courts" adjacent to the south-west corner of the site have been converted to additional asphalt paved car parking areas. No industrial or manufacturing plants could be identified within the aerial photograph. The subject site is highlighted approximately in the figure below.

Figure 4.5 – Aerial Photograph from 2004

4.3 Search of Contaminated Land Management Register (NSW EPA):

A search of the NSW EPA Contaminated Land Management record of notices provided the details of 1 premises in the Penrith area. This subject site is not listed in the register.

A screen-capture from the search of the NSW EPA Contaminated Land Management record of notices is included below:



NSW EPA

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Contaminated land

+ Management of contaminated land
+ Consultants and site auditor scheme
+ Underground petroleum storage systems
Guidelines under the CLM Act
NEPM amendment
+ Further guidance
– Record of notices

Home Contaminated land Record of notices

Search results

Your search for: Suburb: PENRITH

Matched 6 notices relating to 1 site.

Search Again | Refine Search

Suburb	Address	Site Name	Notices related to this site
PENRITH	Castlereagh ROAD	Crane Enfield Metals	3 current and 3 former

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4.4 Search of Protection of the Environment Operations Public Register (POEO) of Licensed and Delicensed Premises:

A search of the POEO public register of licensed and delicensed premises (DECC) provided the details of 73 premises in the Penrith area. The subject site was not included in the search results. The results of the search of the POEO public register of licensed and delicensed premises is provided in Appendix B.

5. SITE CONDITION AND SURROUNDING ENVIRONMENT

A detailed walk-over of the site was conducted on 18th of February 2016. The field observations are summarised in the table below:

Table 2 – Summary of Field Observations

Parameter	Observation
Visible observations on soil contamination	No visible evidence of contamination was observed. No staining of the soils or odours were documented.
Signs of plant stress	None observed.
Presence of drums, fill or waste materials	No visible indicators of underground fuel tanks (bowsers or venting pipes).
Presence of fill	Filling was observed mainly on the western side of the site, and also sporadically at other locations within the site.
Quality of surface waters	No ponding was present.
Flood potential	None observed
Relevant sensitive environments	An unnamed tributary creek, leading to Peach Tree Creek, extends adjacent to the northern boundary of the site.

6. SITE GEOLOGY AND HYDROGEOLOGY

The 1:100,000 scale Geological Series Map of the Penrith region indicates that the subject site is underlain by alluvial gravel, sand, silt and clay of the Cranebrook Formation.

Twenty six (26) boreholes were drilled as a part of the geotechnical investigation, see Ground Technologies Report GTE774-R01 Geotechnical Report. A generalised description and summary of encountered depths is provided in Tables 3 and 4 with full borehole logs supplied in Appendix A.

Table 3 – Summary of Field Observations

UNIT	SOIL TYPE
Unit A	FILL; Asphaltic concrete, other paving or topsoil
Unit B	FILL; Admixed Silty SAND or Admixed Silty CLAY,
Unit C	Natural Silty SAND / Sandy Silt, sometimes Silty CLAY / Clayey SILT, at depth becoming Clayey SAND or Silty SAND
Unit D	GRAVEL, medium grained to cobble sized, sub-rounded. Larger clasts up to boulder sized are inferred from drilling resistance and local experience.

Table 4: Depth of each Geological Unit

UNIT	BOREHOLE INTERCEPT DEPTHS (m)									
	BH1	BH2	BH3	BH4	BH5	BH6	BH7	BH8	BH9	BH10
Unit A	0.0-0.1	0.0-0.1	0.0-0.2	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-1.0
Unit B	0.1-1.5	-	-	0.1-0.4	-	-	0.1-1.0	0.1-0.5	0.1-1.0	-
Unit C	1.5-3.4	0.1-2.8	0.2-2.0	3.5-4.6	0.1-2.5	0.1-2.0	1.0-5.8	0.5-4.5	1.0-5.9	1.0-5.0
Unit D	3.4+	2.8+	2.0+	4.6+	2.5+	2.0+	6.0+	4.6+	5.9+	5.0+

Table 4: Depth of each Geological Unit (continued)

UNIT	BOREHOLE INTERCEPT DEPTHS (m)									
	BH11	BH12	BH13	BH14	BH16	BH17	BH18	BH19	BH20	BH21
Unit A	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Unit B	0.1-0.6	-	0.1-0.5	0.1-2.0	0.1-1.0	0.1-2.0	0.1-1.5	0.1-3.0	0.1-1.7	0.1-2.0
Unit C	0.6-1.0	1.0-4.5	0.5-3.5	2.0-7.0	1.0-6.1	2.0-9.4	1.5-9.5	3.0-6.0	1.7-10.6	2.0-9.0
Unit D	1.0+	4.5+	3.7+	-	-	9.4+	9.5+	6.0+	10.6+	9.0+

Table 4: Depth of each Geological Unit (continued)

UNIT	BOREHOLE INTERCEPT DEPTHS (m)						
	BH22	BH23	BH24	BH25	BH26	BH27	BH28
Unit A	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Unit D	0.1-1.6	0.1-2.0	0.1-1.8	0.1-2.0	0.1-2.2	0.1-2.8	0.1-1.5
Unit F	1.6-9.2	2.0-9.0	1.8-9.0	2.0-9.7	2.2-7.4	2.8-10.5	1.5-8.6
Unit L	9.2+	9.0-10.0+	9.0+	9.7-10.0+	-	10.5+	8.6+

Groundwater was observed in one borehole (BH9) on the eastern part of the site. Groundwater was observed in all boreholes in the western and north-western part of the site, at depths ranging from 5.0 to 6.5m below existing ground surface levels.

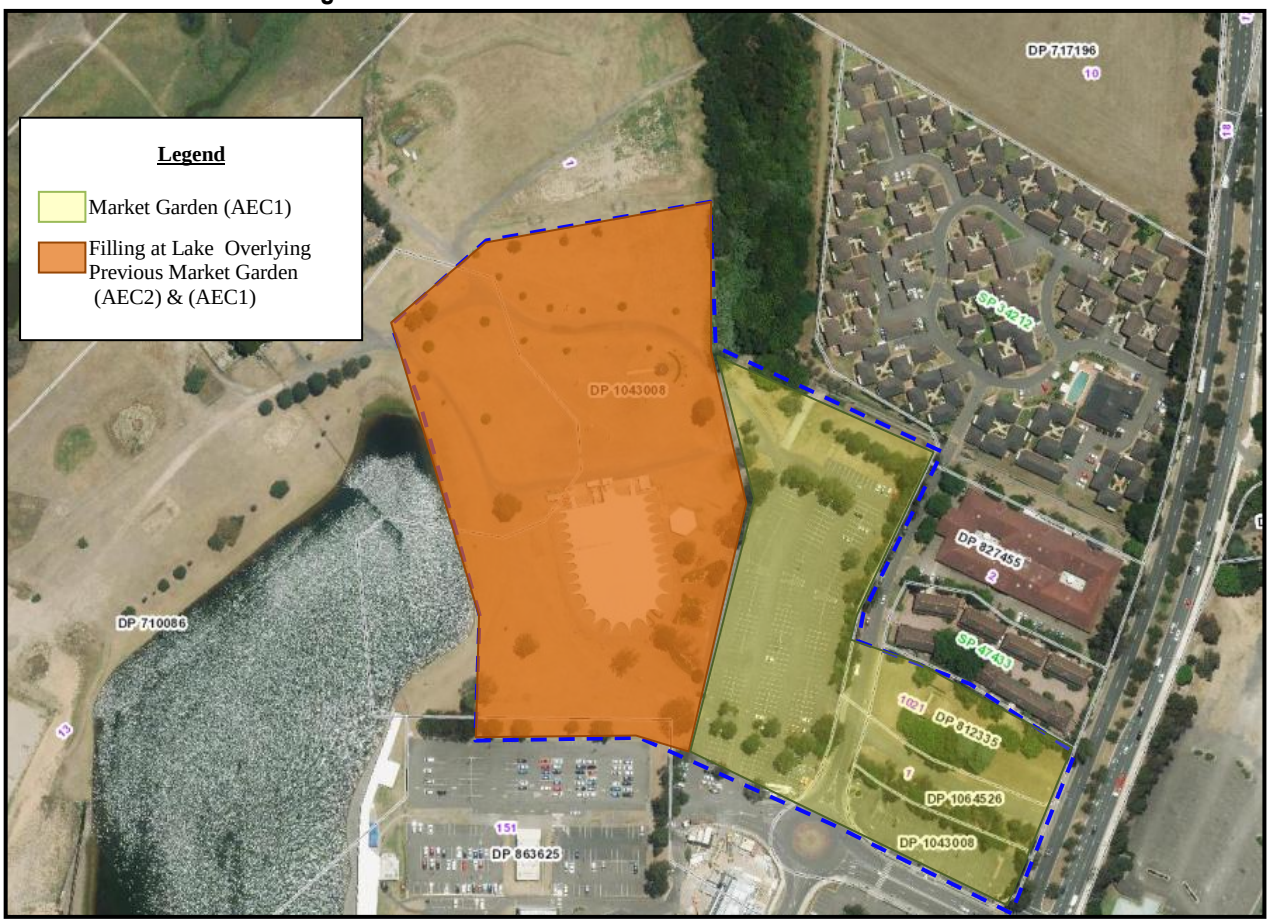
7. SUMMARY OF POTENTIAL SOURCES OF CONTAMINATION

A search of the NSW EPA Contaminated Land Management record of notices revealed that there were no notices issued to the subject site. No history of dangerous manufacturing utilizing heavy chemicals or metals was documented. No history of heavy chemicals or metals storage was documented. No industrial facilities undertaking heavy manufacturing are located within 500m of the subject site. The surrounding sites are residential or commercial entertainment facilities. Therefore, the risk of contamination migration caused by surface run-off from adjoining sites is minimal. The neighbouring properties are residential or commercial entertainment facilities and not considered to have posed a risk for potential contamination to the site.

The subject site appears to have been used for significant market gardening / agriculture, although these operations appeared to have ceased prior to 1986. With reference to "Contaminated Sites – Guidelines for Assessing Former Orchards and Market Gardens" prepared by the Department of Environment and Conservation (2005), the contaminants of concern within site used for market gardening are Metals (Arsenic, Copper, Lead) and Organochlorine Pesticides (OCP). This area is denoted as Area of Environmental Concern 1 (AEC1). It should be noted that given the amount of time that has passed (>30years) since the agriculture has ceased, there is a low risk of residual contamination within the natural soils from this activity.

Filling was observed within the western and north-western portion of the site, directly adjacent to the man made Aqua-golf lake. Given the composition of the fill it would appear that it is most likely that some if this fill is site derived from the lake excavation, however validation of this material is still required. This area is denoted as Area of Environmental Concern 2 (AEC2) and a sequence of screening tests was undertaken as a part of this investigation. Filling is also sporadically located within the eastern part of the site.

Figure 7.1 – Location of Areas of Environmental Concern



8. LABORATORY QUALITY ASSESSMENT AND QUALITY CONTROL

8.1 Laboratory Accreditation

ALS are accredited by the National Association of Testing Authorities (NATA) for the analyses carried out and are also accredited for compliance with ISO/IEC 17025.

8.2 Sample Holding Times

The holding times for samples at ALS are presented in the table below, along with the allowable holding time, detailed in Schedule B (3) of the National Environment Protection (Assessment of Site Contamination) Measure (NEPM, 1999):

Table 5 – Sample Holding Times – Work Order ES1603952

Laboratory	Analyte	Date Sampled	Date Received	Date of Extraction/ Analysis	Holding Time	Allowable Holding Time
ALS	Metals	18/02/2016	22/02/2015	1/03/2016	13 days	6 months*
	Pesticides	18/02/2016	22/02/2015	1/03/2016	13 days	14 days
	Hydrocarbons	18/02/2016	22/02/2015	1/03/2016	13 days	14 days

Note (*) Metals excludes Mercury which has a holding time of 28 days.

8.3 Analytical Methods Used and Practical Quantitation Limits

The analytical methods and practical quantitation limits (PQL)/ level of reporting (LOR) used by ALS are indicated on the test certificates located in Appendix C.

8.4 Laboratory Blank Results

During each analytical method reagents are carried through the preparation / extraction / digestion procedure. A reagent blank is prepared and analysed with every batch of samples plus with each new batch of solvent prior to use to ensure that there are no interferences with the test results.Blank samples were analysed by ALS for metals hydrocarbons and pesticides. The reported blank concentrations were below the relevant PQL/LOR.

8.5 Laboratory Control Standards

A known matrix spiked with compound(s) representative of the target analytes is used to document the laboratories performance. This is known as the Laboratory Control Standard (LCS). The LCS is analysed with the sample batch and the resultant concentrations reported as a percentage recovery of the expected concentration.At ALS, the LCS was analysed for the same suite of analytes as the submitted samples (heavy metals, hydrocarbons and pesticides) and the results are summarised in the table 6.

Table 6 – Quality Control Spikes Summary– Work Order ES1603952

Laboratory	Analyte	Recovery (%)	Acceptance Criteria	Comments
ALS	Metals	97-104%	70-130%	Achieved
	Pesticides / Hydrocarbons	82-111%	60-140%	Achieved

9. BASIS FOR ASSESMENT CRITERIA

The Assessment criteria used in this investigation have been obtained from the National Environment Protection (Assessment of Site Contamination) Measure (NEPM, 2013). This document presents risk-based Health Investigation Levels based on a variety of exposure settings for a number of organic and inorganic contaminants. To assess the risk to human health the results of the laboratory analysis are compared against the Health Investigation Levels (HIL) for the exposure setting; 'residential with minimal opportunity for soil access such as high rise buildings and apartments' ('B'). The selected assessment criteria used in this assessment are summarized on table 6 below:

Table 7: Site Assessment Criteria

Chemicals and other attributes		Health Based Investigation Level (HIL'B')
Heavy Metals	Arsenic	500
	Cadmium	150
	Chromium (total)	500
	Copper	30,000
	Lead	1200
	Nickel	1200
	Zinc	60,000
	Mercury	120
Pesticides	Aldrin + Dieldrin	10
	Chlordane	90
	Endosulfan	400
	Endrin	20
	Heptachlor	10
	Methoxychlor	500
	DDD+DDE+DDT	600
Hydrocarbons	C6-C10	180
	C10-C16	120
	C16-C34	1,300
	C34-C40	2,800
	Benzene	50
	Toulene	85
	Ethylbenzene	70
	Xylenes	45
	Total PAH	400
	Benzo(a)pyrene	0.7
	Carcinogenic PAH	4

10. AREA OF ENVIRONMENTAL CONCERN AEC1

Market Gardening / Agriculture was observed within the subject site (see figure 7.1) and is denoted as Area of Environmental Concern 1 (AEC1). With reference to "Contaminated Sites – Guidelines for Assessing Former Orchards and Market Gardens" prepared by the Department of Environment and Conservation (2005), the contaminants of concern within site used for market gardening are Metals (Arsenic, Copper, Lead) and Organochlorine Pesticides (OCP). It should be noted that given the amount of time that has passed (>30years) since the agriculture has ceased, there is a low risk of residual contamination within the natural soil profile from this activity.

10.1 Sampling and Analysis

Sampling and analysis was undertaken in order to assess the nature, location and likely distribution of any contamination present at the subject site, and also any potential risk posed to human health or the environment. Given the low risk of residual contamination, ten (10) screening tests were recovered and submitted for laboratory analysis. The samples were collected from the auger using a stainless steel trowel which was decontaminated prior to each use to prevent cross contamination occurring. Full borehole logs and borehole location plan are attached in Appendix A detailing the location of each sampling location and material profile.

The samples were placed in 250g laboratory prepared glass jars which were capped using Teflon-sealed screw caps and then placed in a chilled container. The sample jars were transported to our Hoxton Park office and placed in a refrigerator. The following day the samples were forwarded to ALS Pty Ltd (ALS) for analysis along with a Chain of Custody which was subsequently returned to confirm the receipt of all samples.

10.2 Laboratory Test Results

Test results obtained from Australian Laboratory Services (ALS), Certificate Reference number ES1603952, are tabulated and presented in Table 8 (following page) along with the relevant assessment criteria. Full laboratory test certificates are located in Appendix C.

The laboratory results revealed levels of heavy metals and pesticides were well below the adopted assessment criteria. Therefore the results of the chemical analyses indicate that the Area of Environmental Concern 1 (AEC1) does not present a risk to human health or the environment in the exposure setting; 'residential with minimal opportunity for soil access such as high rise buildings and apartments' ('HIL B').

Table 8 - Laboratory Test Results for Natural Soils

Location			Metals								Pesticides						
Borehole	Sample No.	Depth	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Aldrin + Dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	Mothoxychlor	DDD+DDE+DDT
BH04	BH04-B	0.4 - 1.0	<5	<1	13	8	10	<0.1	5	15	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
BH08	BH08-B	0.5-1.5	7	<1	20	13	20	<0.1	17	34	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
BH09	BH09-B	1.0 - 2.0	<5	<1	8	6	11	<0.1	5	16	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
BH12	BH12-B	1.0 - 2.0	7	<1	16	10	15	<0.1	10	24	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
BH18	BH18-C	1.5 - 2.5	<5	<1	15	6	8	<0.1	5	14	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
BH20	BH20-C	1.7 - 2.7	6	<1	14	11	20	<0.1	12	74	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
BH21	BH21-C	2.0 - 3.0	6	<1	17	10	16	<0.1	9	29	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
BH22	BH22-B	1.6 - 2.6	5	<1	15	11	18	<0.1	12	34	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
BH23	BH23-C	2.0 - 3.0	6	<1	16	12	23	<0.1	13	43	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
BH24	BH24-C	1.8 - 2.8	<5	<1	17	13	19	<0.1	8	28	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
NEPM Health Investigation Level (B)			**500**	**150**	**500**	**30,000**	**1200**	**120**	**1200**	**60,000**	**10**	**90**	**400**	**20**	**10**	**500**	**600**

11. AREA OF ENVIRONMENTAL CONCERN AEC2

Filling was observed within the western and north-western portion of the site, directly adjacent to the man made Aqua-golf lake. Given the composition of the fill it would appear that it is most likely that some if this fill is site derived from the lake excavation, however validation of this material is still required. This area is denoted as Area of Environmental Concern 2 (AEC2) and a sequence of screening tests was undertaken as a part of this investigation. Filling is also sporadically located within the eastern part of the site.

11.1 Sampling and Analysis

Sampling and analysis was undertaken in order to assess the nature, location and likely distribution of any contamination present at the subject site, and also any potential risk posed to human health or the environment.

Thirty (30) screening tests were recovered and submitted for laboratory analysis. The samples were collected from the auger using a stainless steel trowel which was decontaminated prior to each use to prevent cross contamination occurring. Full borehole logs and borehole location plan are attached in Appendix A detailing the location of each sampling location and material profile.

The samples were placed in 250g laboratory prepared glass jars which were capped using Teflon-sealed screw caps and then placed in a chilled container. The sample jars were transported to our Hoxton Park office and placed in a refrigerator. The following day the samples were forwarded to ALS Pty Ltd (ALS) for analysis along with a Chain of Custody which was subsequently returned to confirm the receipt of all samples.

11.2 Laboratory Test Results

Test results obtained from Australian Laboratory Services (ALS), Certificate Reference number ES1603952, are tabulated and presented in Table 9 (following page) along with the relevant assessment criteria. Laboratory test certificates are located in Appendix C.

The laboratory results revealed levels of heavy metals and hydrocarbons were well below the adopted assessment criteria. Therefore the results of the chemical analyses indicate that the Area of Environmental Concern 1 (AEC1) does not present a risk to human health or the environment in the exposure setting; ‘residential with minimal opportunity for soil access such as high rise buildings and apartments’ (‘HIL B’). ‘

Table 9 - Laboratory Test Results for Fill Soils

Location			Metals								Hydrocarbons										
Borehole	Sample No.	Depth	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAH	Carcinogenic PAH	Benzo(a)pyrene	Benzene	Toluene	Ethyl-Benzene	Xylenes	TPH - C6-C10	TPH - C10-C16	TPH - C16-C34	TPH - C34-C40
BH1	BH1-A	0.2-1.0	<5	<1	10	9	7	<0.1	3	12	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH4	BH4-A	0.1-0.4	5	<1	16	9	12	<0.1	6	16	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH7	BH7-A	0.1-1.0	<5	<1	12	13	16	<0.1	8	24	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH8	BH8-A	0.1-0.5	<5	<1	7	21	9	<0.1	29	32	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH9	BH9-A	0.1-1.0	<5	<1	13	11	16	<0.1	8	27	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH11	BH11-A	0.1-0.6	<5	<1	11	7	10	<0.1	7	27	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH12	BH12-A	0.1-1.0	7	<1	8	37	17	<0.1	17	71	0.7	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH13	BH13-A	0.1-0.5	<5	<1	11	12	24	<0.1	8	41	1.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH14	BH14-A	0.1-1.0	<5	<1	15	11	13	<0.1	11	32	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH14	BH14-B	1.0-2.0	<5	<1	9	10	20	<0.1	6	27	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH16	BH16-A	0.1-1.0	<5	<1	15	11	14	<0.1	10	32	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH16	BH16-B	1.0-1.3	<5	<1	12	6	8	<0.1	5	14	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH17	BH17-A	0.1-1.0	6	<1	18	14	17	<0.1	14	43	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH18	BH18-A	0.1-1.0	<5	<1	15	12	15	<0.1	14	40	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH18	BH18-B	1.0-1.5	<5	<1	15	10	13	<0.1	12	34	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
NEPM Health Investigation Level (B)			**500**	**150**	**500**	**30,000**	**1200**	**120**	**1200**	**60,000**	**400**	**4**	**0.7**	**50**	**85**	**70**	**45**	**180**	**120**	**1300**	**2800**

Table 9 - Laboratory Test Results for Fill Soils (contd)

Location			Metals								Hydrocarbons										
Borehole	Sample No.	Depth	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAH	Carcinogenic PAH	Benzo(a)pyrene	Benzene	Toluene	Ethyl-Benzene	Xylenes	TPH - C6-C10	TPH - C10-C16	TPH - C16-C34	TPH - C34-C40
BH19	BH19-A	0.1-1.0	<5	<1	14	12	14	<0.1	14	43	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH20	BH20-A	0.1-1.0	<5	<1	15	11	16	<0.1	12	36	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH20	BH20-B	1.0-1.7	6	<1	16	13	16	<0.1	14	39	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH21	BH21-A	0.1-1.0	11	<1	10	20	21	<0.1	16	74	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH21	BH21-B	1.0-2.0	<5	<1	22	13	35	<0.1	20	74	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	60	110	<100
BH22	BH22-A	0.1-1.0	11	<1	8	21	14	<0.1	24	82	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH23	BH23-A	0.1-1.0	8	<1	12	17	19	<0.1	10	38	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH23	BH23-B	1.0-2.0	<5	<1	11	16	14	<0.1	7	31	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH24	BH24-A	0.0-1.0	<5	<1	16	14	13	<0.1	22	39	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH24	BH24-B	1.0-1.8	11	<1	14	20	15	<0.1	24	74	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH25	BH25-A	0.1-1.0	6	<1	12	15	14	<0.1	16	34	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH26	BH26-A	0.1-1.0	15	<1	19	25	40	<0.1	10	58	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH26	BH26-B	1.0-2.2	<5	<1	15	16	36	<0.1	10	54	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH27	BH27-A	0.1-1.0	6	<1	13	17	25	<0.1	10	98	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH28	BH28-A	0.1-1.0	<5	<1	13	15	32	<0.1	9	52	4.2	0.6	0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
NEPM Health Investigation Level (B)			**500**	**150**	**500**	**30,000**	**1200**	**120**	**1200**	**60,000**	**400**	**4**	**0.7**	**50**	**85**	**70**	**45**	**180**	**120**	**1300**	**2800**

12. WASTE CLASSIFICATION OF EXCAVATED SOILS

It is understood that the proposed development will require basement excavations of up to 6.0m in depth with the spoil requiring classification for off site disposal.

Test results obtained from ALS (Certificate Reference number 1603952) are summarised in Table 10 with the Specific Contaminant Concentrations from Table 1 of Part 1: Classifying Waste, Waste Classification Guidelines published by the NSW EPA (2014). The test values are highlighted in bold if they exceed the values for General Solid Waste obtained from the guidelines.

For reference only, the laboratory test results were compared against the contaminant threshold values set forth in the The Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – "The Excavated Natural Material Order 2014" prepared by the NSW EPA. Please note that the testing frequency is well below the frequency required in the ENM guidelines and does not include testing for pH, eC, cadmium and foreign materials.

12.1 Laboratory Test Results

Test results obtained from Australian Laboratory Services (ALS), Certificate Reference number ES1533457 and ES1536973, are tabulated and presented in Table 10 (following page) along with the relevant assessment criteria. Laboratory test certificates are located in Appendix C.

After analyzing the soil samples recovered from the subject site, the spoil material is classified as **General Solid Waste** (non putrescible) for landfill disposal purposes since the results are in accordance with the values in Table 1 and 2 of the Part 1: Classifying Waste, Waste Classification Guidelines published by the Waste Classification Guidelines published by the NSW EPA (2014).

The material also meets the contaminant threshold values set forth in the Excavated Natural Material (ENM) Order 2014". However, note that the testing frequency is well below the frequency required in the ENM guidelines and does not include testing for pH, eC, cadmium and foreign materials. For ENM classification to be achieved, full sampling and testing will need to be undertaken at the frequencies detailed in Tables 2 and 3 of the Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – "The Excavated Natural Material Order 2014" prepared by the NSW EPA.

GROUND TECHNOLOGIES

Table 10 - Laboratory Test Results for Fill Soils

Location			Metals								Hydrocarbons										
Borehole	Sample No.	Depth	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAH	Carcinogenic PAH	Benzo(a)pyrene	Benzene	Toluene	Ethyl-Benzene	Xylenes	TPH - C6-C10	TPH - C10-C16	TPH - C16-C34	TPH - C34-C40
BH1	BH1-A	0.2-1.0	<5	<1	10	9	7	<0.1	3	12	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH4	BH4-A	0.1-0.4	5	<1	16	9	12	<0.1	6	16	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH7	BH7-A	0.1-1.0	<5	<1	12	13	16	<0.1	8	24	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH8	BH8-A	0.1-0.5	<5	<1	7	21	9	<0.1	29	32	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH9	BH9-A	0.1-1.0	<5	<1	13	11	16	<0.1	8	27	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH11	BH11-A	0.1-0.6	<5	<1	11	7	10	<0.1	7	27	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH12	BH12-A	0.1-1.0	7	<1	8	37	17	<0.1	17	71	0.7	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH13	BH13-A	0.1-0.5	<5	<1	11	12	24	<0.1	8	41	1.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH14	BH14-A	0.1-1.0	<5	<1	15	11	13	<0.1	11	32	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH14	BH14-B	1.0-2.0	<5	<1	9	10	20	<0.1	6	27	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH16	BH16-A	0.1-1.0	<5	<1	15	11	14	<0.1	10	32	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH16	BH16-B	1.0-1.3	<5	<1	12	6	8	<0.1	5	14	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH17	BH17-A	0.1-1.0	6	<1	18	14	17	<0.1	14	43	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH18	BH18-A	0.1-1.0	<5	<1	15	12	15	<0.1	14	40	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH18	BH18-B	1.0-1.5	<5	<1	15	10	13	<0.1	12	34	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
General Solid Waste Threshold			**100**	**20**	**100**	**-**	**100**	**4**	**40**	**-**	**200**	**-**	**0.8**	**10**	**288**	**600**	**1000**	**650**	**1000**		
Maximum Average Concentration (ENM)			**20**	**0.5**	**75**	**100**	**50**	**0.5**	**30**	**150**	**20**	**-**	**0.5**	**0.5**	**65**	**25**	**15**	**500**			**-**

Table 10 - Laboratory Test Results for Fill Soils (contd)

Location			Metals								Hydrocarbons										
Borehole	Sample No.	Depth	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAH	Carcinogenic PAH	Benzo(a)pyrene	Benzene	Toluene	Ethyl-Benzene	Xylenes	TPH - C6-C10	TPH - C10-C16	TPH - C16-C34	TPH - C34-C40
BH19	BH19-A	0.1-1.0	<5	<1	14	12	14	<0.1	14	43	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH20	BH20-A	0.1-1.0	<5	<1	15	11	16	<0.1	12	36	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH20	BH20-B	1.0-1.7	6	<1	16	13	16	<0.1	14	39	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH21	BH21-A	0.1-1.0	11	<1	10	20	21	<0.1	16	74	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH21	BH21-B	1.0-2.0	<5	<1	22	13	35	<0.1	20	74	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	60	110	<100
BH22	BH22-A	0.1-1.0	11	<1	8	21	14	<0.1	24	82	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH23	BH23-A	0.1-1.0	8	<1	12	17	19	<0.1	10	38	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH23	BH23-B	1.0-2.0	<5	<1	11	16	14	<0.1	7	31	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH24	BH24-A	0.0-1.0	<5	<1	16	14	13	<0.1	22	39	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH24	BH24-B	1.0-1.8	11	<1	14	20	15	<0.1	24	74	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH25	BH25-A	0.1-1.0	6	<1	12	15	14	<0.1	16	34	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH26	BH26-A	0.1-1.0	15	<1	19	25	40	<0.1	10	58	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH26	BH26-B	1.0-2.2	<5	<1	15	16	36	<0.1	10	54	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH27	BH27-A	0.1-1.0	6	<1	13	17	25	<0.1	10	98	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH28	BH28-A	0.1-1.0	<5	<1	13	15	32	<0.1	9	52	4.2	0.6	0.5	<0.2	<0.5	<0.5	<0.5	<10	<50	<100	<100
General Solid Waste Threshold			**100**	**20**	**100**	**-**	**100**	**4**	**40**	**-**	**200**	**-**	**0.8**	**10**	**288**	**600**	**1000**	**650**	**1000**		
Maximum Average Concentration (ENM)			**20**	**0.5**	**75**	**100**	**50**	**0.5**	**30**	**150**	**20**	**-**	**0.5**	**0.5**	**65**	**25**	**15**	**500**			**-**

13. CONCLUSIONS AND RECOMMENDATIONS

The conclusions of this Contamination Report are as follows:

- The site was used previously for residential dwelling and market gardening / light agriculture.
- A review of aerial photography suggests that the neighbouring properties are residential and not considered to have posed a risk for potential contamination to the site.
- A search of the NSW EPA Contaminated Land Management record of notices revealed that there were no notices issued to the subject site. No history of dangerous manufacturing utilizing heavy chemicals or metals was documented.
- No industrial facilities undertaking heavy manufacturing are located within 500m of the subject site. Therefore the risk of contamination migration caused by surface run-off from adjoining sites is minimal.

Evidence of possible market gardening or light agriculture was observed within the desktop study. Given that over 30 years had lapsed since the termination of these activities the risk of residual contamination was low. Ten (10) samples were collected and analysed for screening purposes in order to assess the nature, location and likely distribution of any contamination present at the subject site, and also any potential risk posed to human health or the environment. Test results were compared to the relevant assessment criteria, Hils B, indicating a low risk of contamination due to market gardening and agriculture.

Filling was observed during the field investigation. Twenty seven (27) boreholes were undertaken as a part of this initial investigation with thirty (30) samples collected and analysed in order to assess the nature, location and likely distribution of any contamination within the fill material. Test results were compared to the relevant assessment criteria, Hils B, and were well below the assessment criteria and as such, indicate a low risk of contamination due to filling within the site. The laboratory results were also analysed against the Waste Classification Guidelines (2014) prepared by the NSW EPA which indicated the fill to be classified as General Solid Waste. The material was also analysed against the ENM guidelines prepared by the EPA for reference only and indicated that the material complies with the ENM guidelines although additional sampling and testing is required to meet the frequency of testing in the guideline.

The site is suitable for development for “residential” use. No remediation action plan is required.

14. REFERENCES

Contaminated Sites – Guidelines for Assessing Former Orchards and Market Gardens. Department of Environment and Conservation (NSW) 2005.

Contaminated Sites – Guidelines for Assessing Service Stations. NSW Environment Protection Authority (EPA) 1994

Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites. NSW Environment Protection Authority (EPA) 2000.

Contaminated Sites – Sampling Design Guidelines. NSW Environment Protection Authority (EPA) 1995

Geology of Wollongong – Port Hacking 1:100000 Geological Series Sheet 9029-9199, 1st Edition. Geological Survey of NSW Department of Minerals and Energy 1985.

Managing Land Contamination: Planning Guidelines SEPP55 – Remediation of Land - Department of Urban Affairs and Planning and Environment Protection Authority (DUAP and EPA) 1998.

National Environment Protection (Assessment of Site Contamination) Measure – National Environmental Protection Council 1999.

APPENDIX A

FIGURES AND BOREHOLE LOGS

GROUND TECHNOLOGIES

Geotechnical Testing Services

Ground Technologies Pty Ltd
ABN 25 089 213 294
PO Box 1121 Green Valley NSW 2168
Ph: (02) 8783 8200
Fax: (02) 8783 8210
Email: lab@groundtech.com.au

DATA SHOWN IS APPROXIMATE & INTENDED TO ILLUSTRATE TEST LOCATIONS, SUBJECT TO DETAILED SURVEY.

N W E S

REV	DATE	COMMENT				
					PROJECT:	GTE774
					TITLE:	SAMPLE LOCATIONS
					FIGURE No:	1
					REV:	A
					DATE:	11/3/2016
					DRAWN:	JH
SCALE:	APPROX SCALE, SEE SCALE BAR		PLOT SIZE:	A3	CHECKED:	AB

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH1**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 27.0m
Sheet 1 of 1
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
NIL	0	-	ASPHALTIC CONCRETE (20mm)	D	-			PAVEMENT
			Silty SAND, fine grained, yellow-brown, brown, with gravel					FILL
	0.5						DS BH1-A	
	1							
	1.5	ML	Sandy SILT, low plasticity, red-brown, with clay	SM <Wp	St			ALLUVIUM
	2							
	2.5							
	3							
	3.5		Borehole terminated at 3.4m					Auger refusal on GRAVEL
	4							
	4.5							
	5							
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH2**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH

Method: Track Mounted Hanjin D&B
Sheet 1 of 1

Surface RL: 27.0m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
NIL		-	ASPHALTIC CONCRETE (50mm) and Sand fill.	-	-			PAVEMENT
		ML	Sandy SILT / SILT with sand, low plasticity, dark red-brown	VSM <<Wp	St/ VSt		DS BH2-A	ALLUVIUM
	0.5							
	1		As above, becoming Sandy SILT, red-brown.	SM				SPT 1.0-1.45m, N=12
	1.5							
	2							
		SM	Silty SAND, very fine grained, red.	D	MD			SPT 2.4-2.86m, N=R
	2.5							
	3		Borehole terminated at 2.86m					SPT refusal on GRAVEL.
	3.5							
	4							
	4.5							
	5							
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH3**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 27.0m
Sheet 1 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
N I L		-	ASPHALTIC CONCRETE (20mm)	D	-			PAVEMENT
			Silty SAND, fine grained, yellow-brown, brown, with gravel				BH3-A	FILL
		ML	Sandy SILT, low plasticity, red-brown, with clay	SM <Wp	St			ALLUVIUM
	0.5						DS BH3-B	
	1							
	1.5							
	2		Borehole terminated at 2.0m					Auger refusal on GRAVEL
	2.5							
	3							
	3.5							
	4							
	4.5							
	5							
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH4**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 17/02/2016
Logged by: JH/SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 26.75m
Sheet 1 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
N I L		-	Sandy SILT, brown, with clay and organic content.	Dry	-			TOPSOIL
			Silty CLAY, medium plasticity, yellow-brown, with sand.	SM	St		DS BH4-A	FILL
	0.5	CL-CH	Silty CLAY, medium plasticity, yellow-brown, with sand.				DS BH4-B	ALLUVIUM pp. 140 kPA
	1							
	1.5							
	2	ML	Clayey SAND, low plasticity, red and grey, with silt.		MD			
	2.5						DS L4	
	3							
	3.5		Silty SAND, fine grained, red.					
	4		As above, pale grey.					
	4.5		Borehole terminated at 4.6m					Auger refusal on GRAVEL.
	5							
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH5**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH/SM

Method: Track Mounted Hanjin D&B
Sheet 1 of 2

Surface RL: 27.0m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
N I L		-	Sandy SILT, brown, with clay and organic content.	Dry	-			TOPSOIL
		SM	Silty SAND, fine grained, red-brown, brown.		VL-L		DS BH5-A & L1	ALLUVIUM
	0.5							
	1			SM				SPT 1-1.45m, N=4
			As above, with clay.					
	1.5							
	2							
			As above, pale brown.					SPT 2.5-2.53m, N=R
	2.5	GP	GRAVEL, medium grained to boulder sized, sub-rounded.					SPT Bouncing
			Borehole terminated at 2.53m					SPT refusal on GRAVEL
	3							
	3.5							
	4							
	4.5							
	5							
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH6**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH

Method: Track Mounted Hanjin D&B
Sheet 1 of 2

Surface RL: 26.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
NIL		-	Sandy SILT, brown, with clay and organic content.	Dry	-			TOPSOIL
		ML	Sandy SILT, low plasticity, red.	SM	St			ALLUVIUM
	0.5							
			SILT, low plasticity, trace of fine sand and clay.					
	1							
	1.5							
	2		Borehole terminated at 2.0m					Auger refusal on GRAVEL.
	2.5							
	3							
	3.5							
	4							
	4.5							
	5							
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH7**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 17/02/2016
Logged by: JH/SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 26.25m
Sheet 1 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
N I L		-	ASPHALTIC CONCRETE (50mm) and Roadbase Gravel.	Dry <Wp	-			PAVEMENT
			Adixed Silty CLAY and Sandy SILT, medium plasticity, brown, red-brown.					FILL Appears compacted.
	0.5						DS BH7-A	
	1	ML	Sandy SILT / Silty SAND, very fine grained, brown, yellow-brown.		MD-D			ALLUVIUM
	1.5						DS BH7-B	
	2							
	2.5							
	3							
	3.5							
	4		SILT, low plasticity, pale grey, with some to trace of fine sand.		VD			Medium drilling resistance typical for weathered bedrock.
	4.5							
	5		Interbedded SILT with sand, Clayey SAND and Silty CLAY, pale grey and yellow-brown.					
	5.5							
		SC	Clayey SAND, fine grained, pale grey		MD-D			
	6	GP	GRAVEL, medium grained to cobble sized, sub-rounded.		D			

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH7**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 17/02/2016
Logged by: JH/SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 26.25m
Sheet 2 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
		GP	GRAVEL, medium grained to boulder sized, sub-rounded.		D			
			Borehole terminated at 6.2m					Auger refusal on GRAVEL.
	6.5							
	7							
	7.5							
	8							
	8.5							
	9							
	9.5							
	10							
	10.5							
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH8**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH

Method: Track Mounted Hanjin D&B
Sheet 1 of 1

Surface RL: 26.0m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
NIL		-	ASPHALTIC CONCRETE (50mm) and Road base	D	-			PAVEMENT
			Admixed Silty Clay, medium plasticity, brown, red-brown.	<<Wp			DS BH8-A	FILL
	0.5	ML	Sandy SILT, low plasticity, red-brown.		H			ALLUVIUM
	1						DS BH8-B	
	1.5							
	2							
	2.5							SPT 2.5-2.95m, N=32
	3							
	3.5							
	4		As above, pale grey.		VSt			SPT 4.0-4.45m, N=29
	4.5	GP	GRAVEL, medium grained to boulder sized, sub-rounded.		D			
			Borehole terminated at 4.6m					Auger refusal on GRAVEL.
	5							
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH9**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 17/02/2016
Logged by: JH/SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 25.25m
Sheet 1 of 1
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	ASPHALTIC CONCRETE (50mm) and Sand fill	Dry	-			PAVEMENT
			Adixed Silty CLAY and Sandy SILT, medium plasticity, red.	<Wp				FILL Appears compacted.
	0.5						DS BH9-A	
	1	ML	SILT, low plasticity, grey, dark grey, with fine sand.		St			ALLUVIUM
	1.5						DS BH9-B	
			Clayey SILT, low plasticity, brown-yellow.	D-SM <Wp				
	2							
	2.5	CL	Silty CLAY, low to medium plasticity, brown, red, grey.		VSt			pp. 400 kPa
	3							
	3.5							
	4		As above, becoming more pale grey.					pp. 250 kPa
	4.5							
▽	5	SM	Silty SAND, very fine grained, pale grey, with clay.	Wet	MD			
	5.5							
		GP	GRAVEL, medium grained to cobble sized, sub-rounded.		D			
	6		Borehole terminated at 6.0m					Auger refusal on GRAVEL

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH10**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 17/02/2016
Logged by: JH/SM

Method: 4WD Mounted rig, solid flight spiral augers
Sheet 1 of 1

Surface RL: 25.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
N I L		-	ASPHALTIC CONCRETE (50mm) and Sand fill	Dry	-			PAVEMENT
		ML/ SM	Silty SAND / Sandy SILT, very fine grained, red, with clay.	<Wp	MD			ALLUVIUM
	0.5						BH10-A	
	1		Sandy SILT, low plasticity, brown-yellow.		St			
	1.5							
	2							
	2.5							
		CL-CH	Silty CLAY, low to medium plasticity, red, brown, grey, with fine interbeds of Clayey SILT and SAND.	SM	VSt			
	3							pp. 250 kPA
	3.5							
	4							
	4.5	ML	Silty SAND, very fine grained, pale grey, with clay.					
	5	GP	GRAVEL, medium grained to cobble sized, sub-rounded.		D			
			Borehole terminated at 5.1m					Auger refusal on GRAVEL
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH11**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH/SM

Method: 4WD Mounted rig, solid flight spiral augers
Sheet 1 of 1

Surface RL: 25.0m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
NIL	0.5	-	ASPHALTIC CONCRETE (50mm) and Sand fill Admixed Silty CLAY and SILT, medium plasticity, brown.	Dry <Wp	-			PAVEMENT FILL
	1	SW/ ML	Silty SAND / Sandy SILT, very fine grained, yellow-brown, dark brown		St			ALLUVIUM
			Borehole terminated at 1.0m					Auger refusal on GRAVEL.

1.5
2
2.5
3
3.5
4
4.5
5
5.5
6

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH12**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 17/02/2016
Logged by: JH/SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 25.75m
Sheet 1 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
NIL	0	-	Sandy SILT, brown, with clay and organic content.	Dry	-			TOPSOIL
			Gravelly SAND, medium grained, grey, fine gravel.					FILL Appears compacted.
	0.5		Admixed Sandy SILT, brown, red-brown.				DS BH12-A	
	1	ML	SILT, low plasticity, red, with very fine sand.		St			ALLUVIUM
	1.5						DS BH12-B	
	2							
	2.5		becoming orange-brown.					
	3							
	3.5	SM	Silty SAND, fine grained, red.		MD			
	4							
	4.5		Borehole terminated at 4.5m					Auger refusal on GRAVEL
	5							
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH13**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH/SM

Method: Track Mounted Hanjin D&B
Sheet 1 of 1

Surface RL: 25.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
NIL		-	Sandy SILT, brown, with clay and organic content.	Dry	-			TOPSOIL
			Admixed Silty Clay, medium to high plasticity, brown, red-brown.				DS BH13-A	FILL
	0.5	ML	Sandy SILT, low plasticity, red, red-brown.		VSt		DS BH13-B	ALLUVIUM
	1							SPT 1.0-1.45m, N=15
	1.5							
	2							
	2.5	SP	SAND, fine grained, pale brown.		MD			
	3							
	3.5	GP	GRAVEL, medium grained to cobble sized, sub-rounded.		D			
			Borehole terminated at 3.7m					Auger refusal on GRAVEL.
	4							
	4.5							
	5							
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH14**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 10/02/2016
Logged by: JH/SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 26.0m
Sheet 1 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	Sandy SILT, brown, with clay and organic content.	Dry <Wp	-			TOPSOIL
			Admixed Silty Clay, medium to high plasticity, brown, red-brown.				DS BH14-A	FILL Appears compacted.
	0.5							
	1						DS BH14-B	
	1.5							
	2	SM	Sandy SILT, low plasticity, red, red-brown, with clay.		VSt-H			
	2.5							
		CL-CH	Silty CLAY, medium plasticity, brown, dark-brown, with fine sand.					
	3							
		SM	Silty SAND, very fine to fine grained, yellow-brown, grey-brown.					
	3.5							
		CL-CH	Silty CLAY, medium plasticity, brown, dark-brown, with fine sand.	SM =Wp	St-VSt			pp. 150 kPa
	4							
		SM	Silty SAND, very fine grained, grey, with interbeds of clay.					
	4.5							
		CL-CH	Sandy CLAY, medium plasticity, pale grey and yellow, with silt.					pp. 80 - 100 kPa
	5							
	5.5	SC	Clayey SAND, very fine grained, pale grey, with silt.					
	6	SC/CL		M	F-St			

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH14**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 10/02/2016
Logged by: JH/SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 26.0m
Sheet 2 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
▽	6.5	SC/CL	Interbedded Sandy CLAY and Silty CLAY, medium plasticity, brown, red-brown, yellow-brown, grey.	M >Wp	F-St			pp. 100 kPa
	7		Borehole terminated at 7.0m					
	7.5							
	8							
	8.5							
	9							
	9.5							
	10							
	10.5							
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH16**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 10/02/2016
Logged by: JH/SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 25.5m
Sheet 1 of 1
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	Sandy SILT, brown, with clay and organic content.	Dry	-			TOPSOIL
			Admixed Silty Clay, medium to high plasticity, brown, red-brown.	<Wp			DS BH16-A & L2	FILL
	0.5							
	1	ML	Clayey SAND, very fine grained, red, red-brown, with silt.		MD		DS BH16-B	ALLUVIUM
	1.5						DS BH16-C & L5	
		CL	Silty CLAY, medium plasticity, brown, grey-brown.	SM =Wp	H			
	2							
			Sandy Silty CLAY, medium plasticity, yellow-brown with grey.					pp. 400 kPa
	2.5						DS L6	
	3							
			As above, yellow-brown and pale grey.					
	3.5		Becoming more clayey.					
	4							pp. 200 - 250 kPa
	4.5							
	5	SM	Silty SAND, very fine to fine grained, yellow-brown, grey-brown.	M				
	5.5							
▽	6		Borehole terminated at 6.1m	W				

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH17**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 12/02/2016
Logged by: SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 26.0m
Sheet 1 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	Sandy SILT, brown, with clay and organic content.	D	-			TOPSOIL
			Admixed Silty Clay, medium plasticity, brown, pale-yellow red-brown.	D-SM <Wp				FILL Appears compacted.
	0.5						DS BH17-A	
	1							
	1.5							
	2	ML	Sandy SILT, low plasticity, red, red-brown.	SM <Wp	St			ALLUVIUM
	2.5						DS BH17-B	
	3		As above, becoming brown, yellow-brown.		VSt - H			
	3.5							
	4							
	4.5	CL	Sandy CLAY, medium plasticity, yellow-brown, pale grey.		St			
	5							
	5.5							
▽	6	SM	Silty SAND, very fine to fine grained, yellow-brown, brown.	W	L			

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH17**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 12/02/2016
Logged by: SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 26.0m
Sheet 2 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	6.5	SM	Silty SAND, very fine to fine grained, yellow-brown, brown. (contd.)	W	L			
	7							
	7.5							
	8							
	8.5							
	9							
	9.5		Borehole terminated at 9.4m					Auger refusal on GRAVEL.
	10							
	10.5							
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH18**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 10/02/2016
Logged by: JH/SM

Method: Track Mounted Hanjin D&B
Sheet 1 of 2

Surface RL: 25.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	Sandy SILT, brown, with clay and organic content.	D	-			TOPSOIL
			Admixed Silty Clay, medium to high plasticity, brown, red-brown.				DS BH18-A	FILL Appears compacted.
	0.5		Admixed Silty Clay, medium to high plasticity, brown.					
	1						DS BH18-B	
	1.5	ML	Sandy SILT, red-brown / yellow-brown, trace of clay, with occasional interbeds of Clayey SILT, low plasticity, pale grey.		St/MD		DS BH18-C	ALLUVIUM
	2							
	2.5							SPT 2.5-2.95m, N=19
	3							
	3.5							
	4							SPT 4.0-4.45m, N=16 pp. 100 kPa
	4.5	SM	Silty SAND, very fine grained, red-brown / yellow-brown.	M	MD			
	5							
	5.5			W				SPT 5.5-5.95m, N=12
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH18**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 10/02/2016
Logged by: JH/SM

Method: Track Mounted Hanjin D&B
Sheet 2 of 2

Surface RL: 25.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
▽	6.5		SAND, very fine to fine grained, red-brown / yellow-brown, with silt.	W	L			
	7							SPT 7.0-7.45m, N=7
	7.5							
	8							
	8.5	SP	SAND, fine to medium grained, angular to sub-angular, pale grey and yellow-brown, with silt.		MD			SPT 8.5-8.95m, N=13
	9							
	9.5		Borehole terminated at 9.5m					Auger refusal on GRAVEL.
	10							
	10.5							
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH19**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: SM

Method: Track Mounted Hanjin D&B
Sheet 1 of 2

Surface RL: 25.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	Sandy SILT, brown, with clay and organic content.	Dry	-			TOPSOIL
			Admixed Silty Clay, medium to high plasticity, brown, red-brown.	<Wp			DS BH19-A	FILL Appears compacted.
	0.5							
	1						DS BH19-B	
	1.5							
	2						DS BH19-C	
	2.5							SPT 2.5-2.95m, N=31
	3	ML	Sandy SILT, brown, pale grey.	SM	St/MD		DS BH19-D	ALLUVIUM
	3.5							
	4	SC	Clayey SAND, very fine grained, brown, pale grey.		MD			SPT 4.0-4.45m, N=18
	4.5							
	5							
	5.5		Becoming brown, yellow-brown and pale grey.		L/MD			SPT 5.5-5.95m, N=10
▽	6			W				

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH19**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH/SM

Method: Track Mounted Hanjin D&B
Sheet 2 of 2

Surface RL: 25.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	6.5			W	L-MD			
	7							Could not conduct SPT due to collapse of saturated sand.
	7.5							
	8							
	8.5							SPT 8.5-8.6m, N=R
			Borehole terminated at 8.6m					SPT refusal on gravel.
	9							
	9.5							
	10							
	10.5							
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH20**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 10/02/2016
Logged by: JH/SM

Method: Track Mounted Hanjin D&B
Sheet 1 of 2

Surface RL: 26.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	Sandy SILT, brown, with clay and organic content.	D	-			TOPSOIL
			Admixed Silty Clay, medium to high plasticity, brown, red-brown.	<Wp			DS BH20-A	FILL Appears compacted.
	0.5							
	1						DS BH20-B	SPT 1.0-1.45m: N=12 pp. 600+ kPa
	1.5							
		ML/ SM	Sandy SILT / Silty SAND, very fine grained, yellow-brown, with clay.		MD			ALLUVIUM
	2	CL-CH	Silty CLAY, medium plasticity, dark grey to grey with yellow-brown, with clay.				DS BH20-C	
	2.5							SPT 2.5-2.95m: N=24 pp. 600+ kPa
	3	ML/ SM	Sandy SILT, low plasticity, red-brown / yellow-brown, trace of clay.					
	3.5							
	4						SPT BH20-D	SPT 4.0-4.45m: N=22 pp. 350 kPa
	4.5							
	5		Silty SAND, very fine grained, orange, yellow-brown and pale grey,					
	5.5			SM - M				SPT 5.5-5.95m: N=20
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH20**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 10/02/2016
Logged by: JH/SM

Method: Track Mounted Hanjin D&B
Sheet 2 of 2

Surface RL: 26.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
		ML/ SM	Silty SAND, very fine grained, orange, yellow-brown and pale grey,					
▽	6.5			W	L			
	7							SPT 7.0-7.45m, N=8 pp. 50kPa
	7.5							
	8	SP	SAND, fine to medium grained, angular to sub-angular, pale grey and yellow-brown, with silt.					
	8.5	CL	Silty CLAY / Clayey SILT, low plasticity, pale grey and yellow-brown.	VM >>Wp	St			SPT 8.5-8.95, N=15 pp. 150 kPa
	9	SP	SAND, fine to medium grained, angular to sub-angular, pale grey and yellow-brown, with silt.	W	L			
	9.5							
	10							
	10.5	GP	GRAVEL, medium grained to boulder sized, sub-rounded.		D			
	11							
	11.5		Borehole terminated at 11.5m					Auger refusal on cobbles.
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH21**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH

Method: Track Mounted Hanjin D&B
Sheet 1 of 2

Surface RL: 26.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	Sandy SILT, brown, with clay and organic content.	D	-			TOPSOIL
			Admixed Silty Clay, medium to high plasticity, brown, red-brown.	<Wp			DS BH21-A	FILL Appears compacted.
	0.5							
	1							
							DS BH21-B	
	1.5							
	2	CL-CH	Silty CLAY, medium plasticity, grey, dark grey	SM <Wp	St			ALLUVIUM
	2.5						DS BH21-C	SPT 2.5-5.95m, N=9 pp. 200 kPa
	3							
	3.5							
	4							SPT 4.0-4.45m, N=13 pp. 250 - 350 kPa
	4.5							
	5							
	5.5							SPT 5.5-5.95m, N=19
		SM	Silty SAND, very fine grained, pale brown, pale grey.	SM	MD			
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH21**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH

Method: Track Mounted Hanjin D&B
Sheet 2 of 2

Surface RL: 26.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
		SM	Silty SAND, very fine grained, pale brown, pale grey (contd.)	SM	MD			
▽	6.5		As above, becoming more sandy.	W	L-MD			
	7							SPT 7.0-7.45m, N=10
	7.5							
	8							
	8.5							
	9							
	9.5	GP	GRAVEL, medium grained to cobble sized, sub-rounded.		D			
	10							
	10.5		Borehole terminated at 10.5m					Auger refusal on GRAVEL
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH22**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 12/02/2016
Logged by: SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 26.5m
Sheet 1 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
		-	Sandy SILT, brown, with clay and organic content.	D	-			TOPSOIL
			Admixed Silty Clay, medium plasticity, brown, yellow-brown.	SM				FILL Appears compacted.
	0.5		As above, brown, grey-brown, pale yellow.				DS BH22-A & L3	
	1							
	1.5	ML	Clayey SILT, low plasticity, dark brown, pale grey.	M >Wp	F			ALLUVIUM
	2						DS BH22-B	
	2.5	CL	Silty CLAY, medium plasticity, brown, red-brown.	SM <Wp	St			pp. 200 kPa
		ML	Sandy SILT, low plasticity, brown, yellow-brown.					
	3							
	3.5							
	4							
	4.5	CL	Sandy CLAY, medium plasticity, yellow-brown, pale grey.					
	5							
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH22**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 12/02/2016
Logged by: SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 26.5m
Sheet 2 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
			Sandy CLAY, medium plasticity, yellow-brown, pale grey. (contd.)	SM <Wp	St			
▽	6.5	SM	Silty SAND, very fine to fine grained, yellow-brown, brown.	W	L			
	7							
	7.5							
	8							
	8.5							
	9							
			Borehole terminated at 9.2m					Auger refusal on GRAVEL
	9.5							
	10							
	10.5							
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH23**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH

Method: Track Mounted Hanjin D&B
Sheet 1 of 2

Surface RL: 26.25m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
		-	Sandy SILT, brown, with clay and organic content.	D	-			TOPSOIL
			Admixed Silty Clay, medium plasticity, brown, red-brown.	SM			DS BH23-A	FILL
	0.5							
	1			D				SPT 1.0-1.45m N=17
							DS BH23-B	
	1.5							
	2		Silty CLAY, low to medium plasticity, grey and yellow-grey.	SM <Wp	St			
	2.5						DS BH23-C	SPT 2.5-2.95m, N=14
	3							
	3.5		As above, orange-brown and pale-brown.					
	4							SPT 4.0-4.45m, N=15 pp. 300 kPa
	4.5							
	5		Silty SAND, very fine grained, interbeds of pale grey and orange-brown.		MD			
	5.5							SPT 5.5-5.95m, N=12
▽	6			W	L			

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH23**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH

Method: Track Mounted Hanjin D&B
Sheet 2 of 2

Surface RL: 26.25m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	6.5		Silty SAND, very fine grained, interbeds of pale grey and orange-brown (contd.)	W	L			
	7		As above, becoming more sandy.					SPT 7.0-7.45m, N=9
	7.5							
	8							
	8.5							
	9		GRAVEL, medium grained to cobble sized, sub-rounded.		D			
	9.5							
	10		Borehole terminated at 10m					Auger refusal on GRAVEL
	10.5							
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH24**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 24.0m
Sheet 1 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	Sandy SILT, brown, with clay and organic content.	D	-			TOPSOIL
			Admixed Silty Clay, medium plasticity, brown, red-brown, yellow-brown.					FILL Appears compacted.
	0.5							
	1							
	1.5							
	2	CL/ CH	Silty CLAY, medium plasticity, yellow-brown, brown, pale yellow pale grey.	SM	St			pp. 100 kPA
	2.5							
	3	ML	Clayey SILT, low plasticity, yellow-brown.	M >Wp				
	3.5							
	4							
	4.5	SM	Silty SAND, very fine grained to fine grained, brown, yellow-brown.		L			
▽	5			W				
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH24**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 24.0m
Sheet 2 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	6.5	SM	Silty SAND, very fine grained to fine grained, brown, yellow-brown. (contd.)	W	L			
	7							
	7.5							
	8							
	8.5							
	9		Borehole terminated at 9.0m					Auger refusal on GRAVEL
	9.5							
	10							
	10.5							
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH25**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH

Method: Track Mounted Hanjin D&B
Sheet 1 of 2

Surface RL: 25.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	Sandy SILT, brown, with clay and organic content.	Dry	-			TOPSOIL
			Admixed Silty Clay and fine gravel, medium to high plasticity red-brown, brown.				DS BH25-A	FILL
	0.5							
	1		Admixed Silty Clay, medium to high plasticity, brown, red-brown.				DS BH25-B	
	1.5							
	2	ML	SILT, low plasticity, brown, pale brownm red-brown, with fine sand, trace of clay.	D-SM	VSt		DS BH25-C	SPT 2.5-2.95m, N=14
	2.5							
	3							
	3.5							
	4	SM	Sandy SILT / Silty SAND, low plasticity, very fine grained, pale grey.	SM				SPT 4.0-4.45m, N=14
	4.5							
▽	5		Silty SAND, very fine grained, interbeds of pale grey and orange-brown.	W	L			
	5.5							SPT 5.5-5.95m, N=9
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH25**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: JH

Method: Track Mounted Hanjin D&B
Sheet 2 of 2

Surface RL: 25.5m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
		SP		W				
	6.5	SM-SP	As above, becoming more sandy		MD			
	7							SPT 7.0-7.45m, N=15
	7.5							
	8							
	8.5							Could not conduct SPT at 8.5m due to collape of saturated sand.
	9							
	9.5							
		GP	GRAVEL, medium grained to cobble sized, sub-rounded.		D			
	10		Borehole terminated at 10m					Auger refusal on GRAVEL.
	10.5							
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH26**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 10/02/2016
Logged by: JH/SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 26.5m
Sheet 1 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	Sandy SILT, brown, with clay and organic content.	Dry <Wp	-			TOPSOIL
			Admixed Silty Clay, medium plasticity, brown, red-brown.					FILL Appears compacted.
	0.5						DS BH26-A	
	1							
	1.5						DS BH26-B	
	2							
		SC	Sandy CLAY, medium plasticity, pale grey, grey, brown.		VSt			ALLUVIUM
	2.5							
	3		As above, dark grey.					
	3.5							
			As above, medium to high plasticity, pale grey, yellow-brown.	SM <Wp				
	4	SP/ SM	Silty SAND / Clayey SAND, very fine grained, interbeds of pale grey and orange-brown.		MD			
	4.5							
	5							
▽	5.5			W				
			Silty SAND, very fine grained, pale grey, yellow-brown					
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH26**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 10/02/2016
Logged by: JH/SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 26.5m
Sheet 2 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	6.5			W	MD			
	7		Clayey SAND / Sandy CLAY, very fine grained, pale grey.					
	7.5		Borehole terminated at 7.5m					
	8							
	8.5							
	9							
	9.5							
	10							
	10.5							
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH27**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 26.25m
Sheet 1 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	Sandy SILT, brown, with clay and organic content.	D	-			TOPSOIL
			Admixed Silty Clay, medium plasticity, brown, red-brown.	SM			DS BH27-A	FILL
	0.5							
	1							
							DS BH27-B	
	1.5							
	2							
	2.5							
		ML	Sandy SILT, low plasticity, dark brown, brown.		St			ALLUVIUM
	3							
	3.5							
	4	CL	Silty CLAY, medium plasticity, yellow-brown, pale grey, with fine sand.					
	4.5							
	5							
	5.5		As above, pale grey, brown, yellow-brown.	M				
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH27**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: SM

Method: 4WD Mounted rig, solid flight spiral augers
Sheet 2 of 2

Surface RL: 26.25m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
			Silty CLAY, medium plasticity, pale grey, brown, yellow-brown, with fine sand. (contd.)	M	St			
▽	6.5	SM	Silty SAND, fine grained, yellow-brown, brown.	W	L			
	7							
	7.5							
	8							
	8.5							
	9							
	9.5							
	10							
	10.5		Borehole terminated at 10.5m					Auger refusal on GRAVEL.
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH28**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: SM

Method: 4WD Mounted rig, solid flight spiral augers
Surface RL: 24.25m
Sheet 1 of 2
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	0	-	Sandy SILT, brown, with clay and organic content.	D	-			TOPSOIL
			Clayey SILT, low plasticity, dark brown, brown.					FILL
			Admixed Silty CLAY, medium plasticity, brown, pale brown, pale yellow.				DS BH28-A	
	0.5							
	1						DS BH28-B	
	1.5	ML	SILT, low plasticity, dark brown, brown, with sand.	SM	S-F			ALLUVIUM
	2		Clayey SILT, low plasticity, pale grey, brown.	M				
	2.5							
	3							
	3.5							
	4							
	4.5		Sandy SILT, low plasticity, pale grey, pale yellow.					
▽	5			VM - W >>Wp				
	5.5							
	6							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

GROUND TECHNOLOGIES

BOREHOLE ENGINEERING LOG

Test Site / BH No.: **BH28**

Project: No.: GTE774
Location: Mulgoa Road, Penrith

Date of Drilling: 18/02/2016
Logged by: SM

Method: 4WD Mounted rig, solid flight spiral augers
Sheet 2 of 2

Surface RL: 24.25m
Co-ords: -

WATER	DEPTH (m)	USCS	SOIL/ROCK DESCRIPTION	MOISTURE	DENSITY / CONSISTENCY	GRAPHIC LOG	SAMPLES	REMARKS
	6.5		Sandy SILT, low plasticity, pale grey, pale yellow. (contd.)	VM - W >>Wp	S-F			
	7							
	7.5							
	8							
	8.5		Borehole terminated at 8.6m					Auger refusal on GRAVEL
	9							
	9.5							
	10							
	10.5							
	11							
	11.5							
	12							

Explanatory Notes

Density / Consistency: Very Loose: VL, Loose: L, Medium Dense: MD, Dense: D, Very Dense: VD ,Very Soft: VS, Soft: S, Firm: F, Stiff: St, Very Stiff: VSt, Hard: H

Moisture Condition: Dry: D, Slightly Moist: SM, Moist: M, Very Moist: VM, Wet: W. For Cohesive Soils moisture is related to Atterberg limits: Plastic limit: Wp, Liquid Limit: Wl

APPENDIX B

SEARCH OF POEO REGISTER OF LICENSED AND DELICENSED PREMISES

POEO PUBLIC REGISTER SEARCH RESULTS FOR PENRITH, MARCH 2016

Number	Name	Location	Type	Status	Issued date
6357	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	POEO licence	Issued	7-Jun-00
1007008	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	5-Jul-02
1020003	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	9-Sep-02
1072516	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20-Aug-07
1085783	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	21-Oct-08
1104746	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	6-Aug-09
1109805	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26-Feb-10
1512576	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	12-Aug-14
247	BORAL RESOURCES (NSW) PTY LTD	PEACHTREE ROAD, PENRITH, NSW 2750	POEO licence	No longer in force	22-Aug-00
12405	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	9-Mar-06
1070974	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	30-Jul-07
1077652	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31-Aug-07
1109988	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19-Apr-10
1525967	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31-Oct-14
1526072	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	11-Nov-14
1098	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	26-Jun-00
1017498	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	24-Nov-03
1072470	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20-Sep-07
1104995	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	4-Nov-09
1512789	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	Compliance Audit	Complete	13-Mar-13
1512775	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19-Mar-13
1515690	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26-Jul-13
1525217	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26-Sep-14
10945	CUMMINS SOUTH PACIFIC PTY. LTD.	7 Andrews Road, PENRITH, NSW 2750	POEO licence	Surrendered	19-Jun-00
1035208	CUMMINS SOUTH PACIFIC PTY. LTD.	7 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	8-Mar-04
308	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	17-Jan-00
1024084	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	6-Jan-03
1044228	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	8-Feb-05
11290	ENDEAVOUR ENERGY	96-120 Blaikie Road, PENRITH, NSW 2750	POEO licence	No longer in force	8-Jan-01
1035197	ENDEAVOUR ENERGY	96-120 Blaikie Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	8-Mar-04
20381	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	POEO licence	Pending	
12132	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	POEO licence	Surrendered	1-Oct-04
1097227	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	2-Feb-09
1104874	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	17-Aug-09
6472	JAMES KEITH COSGROVE	8 HOYLE PLACE, PENRITH, NSW 2750	POEO licence	Surrendered	21-Jun-00
1044521	JAMES KEITH COSGROVE	8 HOYLE PLACE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	16-Feb-05
7019	JAMISON PRIVATE HOSPITAL PROPERTY PTY LTD	366 JAMISON ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	20-Mar-01
2869	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	5-Jun-00

POEO PUBLIC REGISTER SEARCH RESULTS FOR PENRITH, MARCH 2016

Number	Name	Location	Type	Status	Issued date
1012903	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	18-Feb-02
1525246	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	2-Oct-14
3741	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	31-Jan-01
1007235	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10-May-01
1008444	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20-Aug-01
2818	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750	POEO licence	Surrendered	24-Mar-00
1048338	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31-May-05
10349	SYDNEY OLYMPIC PARK AUTHORITY	CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	6-Jan-00
1409	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	25-May-00
1005313	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	22-Oct-01
1017898	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26-Jun-02
1018895	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23-Dec-02
1028330	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	8-Jul-03
1032690	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	25-Nov-03
1032982	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19-Mar-04
1047700	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	30-Jun-05
1061410	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	29-Jun-06
1074754	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	27-Jun-07
1116048	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	2-Jul-10
1129012	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	27-Jun-11
1504851	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	28-Jun-12
1528922	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23-Mar-15
1538189	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19-Feb-16
11461	TOTAL CONCRETE SOLUTIONS PTY LIMITED	261 COOMBES DRIVE, PENRITH, NSW 2750	POEO licence	No longer in force	19-Oct-01
1294	VICARY CORPORATION PTY LIMITED	60-62 REGENTVILLE ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	22-Aug-00
12106	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	POEO licence	Surrendered	28-Apr-04
1042219	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10-Nov-04
1065654	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	25-Oct-06
1093267	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10-Nov-08
1127751	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	3-Jun-11
5269	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	10-Aug-00
1066270	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	15-Dec-06
1072508	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23-Jul-07
1100623	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	7-Oct-09
1526064	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	11-Nov-14

APPENDIX C

LABORATORY TEST CERTIFICATES

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1603952**	Page	: 1 of 34
Client	: **GROUND TECHNOLOGIES**	Laboratory	: Environmental Division Sydney
Contact	: JOSHUA HARENDRAN	Contact	:
Address	: PO BOX 1121 GREEN VALLEY NSW,AUSTRALIA 2168	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
		E-mail	:
		Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: GTE774	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 22-Feb-2016 18:15
C-O-C number	: ----	Date Analysis Commenced	: 23-Feb-2016
Sampler	: JOSHUA HARENDRAN	Issue Date	: 01-Mar-2016 14:51
Site	: ----		
		No. of samples received	: 40
Quote number	: ----	No. of samples analysed	: 40

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

WORLD RECOGNISED ACCREDITATION

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Pabi Subba	Senior Organic Chemist	Sydney Inorganics, Smithfield, NSW
Pabi Subba	Senior Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1-A	BH4-A	BH4-B	BH7-A	BH8-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-001	ES1603952-002	ES1603952-003	ES1603952-004	ES1603952-005
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		10.1	12.6	11.5	18.4	2.7
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		10	16	13	12	7
Copper	7440-50-8	5	mg/kg		9	9	8	13	21
Lead	7439-92-1	5	mg/kg		7	12	10	16	9
Nickel	7440-02-0	2	mg/kg		3	6	5	8	29
Zinc	7440-66-6	5	mg/kg		12	16	15	24	32
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	----	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg		----	----	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	<0.05	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg		----	----	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	<0.05	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	<0.05	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1-A	BH4-A	BH4-B	BH7-A	BH8-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-001	ES1603952-002	ES1603952-003	ES1603952-004	ES1603952-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg		----	----	<0.2	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	<0.05	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		----	----	<0.05	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	----	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	----	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	----	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	----	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	----	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	----	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1-A	BH4-A	BH4-B	BH7-A	BH8-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-001	ES1603952-002	ES1603952-003	ES1603952-004	ES1603952-005
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	----	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	----	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	----	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	----	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	----	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	----	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	----	<0.2	<0.2
^ **Total Xylenes**	1330-20-7	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	----	**100.0**	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	**101**	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	**62.2**	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**97.1**	**90.3**	----	**100**	**99.5**
2-Chlorophenol-D4	93951-73-6	0.5	%		**103**	**92.0**	----	**103**	**101**
2.4.6-Tribromophenol	118-79-6	0.5	%		**74.8**	**53.1**	----	**68.3**	**59.9**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**109**	**107**	----	**105**	**102**
Anthracene-d10	1719-06-8	0.5	%		**103**	**97.1**	----	**107**	**104**
4-Terphenyl-d14	1718-51-0	0.5	%		**89.6**	**90.2**	----	**79.5**	**88.1**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**87.6**	**87.1**	----	**87.9**	**87.9**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1-A	BH4-A	BH4-B	BH7-A	BH8-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-001	ES1603952-002	ES1603952-003	ES1603952-004	ES1603952-005
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%		**92.7**	**88.3**	**----**	**91.0**	**88.3**
4-Bromofluorobenzene	460-00-4	0.2	%		**91.1**	**86.0**	**----**	**87.1**	**88.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH8-B	BH9-A	BH9-B	BH11-A	BH12-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-006	ES1603952-007	ES1603952-008	ES1603952-009	ES1603952-010
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		11.5	10.0	8.6	11.0	6.6
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		7	<5	<5	<5	7
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		20	13	8	11	8
Copper	7440-50-8	5	mg/kg		13	11	6	7	37
Lead	7439-92-1	5	mg/kg		20	16	11	10	17
Nickel	7440-02-0	2	mg/kg		17	8	5	7	17
Zinc	7440-66-6	5	mg/kg		34	27	16	27	71
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	----	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	----	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	----	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	----	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	----	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	----	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	----	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	----	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	----	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	----	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	----	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	<0.05	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	----	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg		<0.05	----	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	<0.05	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	----	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	----	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	<0.05	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH8-B	BH9-A	BH9-B	BH11-A	BH12-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-006	ES1603952-007	ES1603952-008	ES1603952-009	ES1603952-010
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	<0.2	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	<0.05	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	<0.05	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		----	<0.5	----	<0.5	**0.7**
Anthracene	120-12-7	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	<0.5	----	<0.5	**0.7**
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	**0.6**	----	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	**1.2**	----	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	<10	----	<10	<10
C10 - C14 Fraction	----	50	mg/kg		----	<50	----	<50	<50
C15 - C28 Fraction	----	100	mg/kg		----	<100	----	<100	<100
C29 - C36 Fraction	----	100	mg/kg		----	<100	----	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	<50	----	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH8-B	BH9-A	BH9-B	BH11-A	BH12-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-006	ES1603952-007	ES1603952-008	ES1603952-009	ES1603952-010
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	<10	----	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	<10	----	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		----	<50	----	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		----	<100	----	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		----	<100	----	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	<50	----	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	<50	----	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	<0.2	----	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		----	<0.2	----	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		----	<0.5	----	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		----	<1	----	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**87.0**	----	**102**	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**90.8**	----	**101**	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**61.1**	----	**91.0**	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	**100.0**	----	**97.8**	**100**
2-Chlorophenol-D4	93951-73-6	0.5	%		----	**98.5**	----	**98.1**	**101**
2.4.6-Tribromophenol	118-79-6	0.5	%		----	**55.0**	----	**63.5**	**62.5**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	**104**	----	**99.4**	**104**
Anthracene-d10	1719-06-8	0.5	%		----	**108**	----	**103**	**108**
4-Terphenyl-d14	1718-51-0	0.5	%		----	**91.7**	----	**85.8**	**89.3**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	**87.0**	----	**89.2**	**84.2**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH8-B	BH9-A	BH9-B	BH11-A	BH12-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-006	ES1603952-007	ES1603952-008	ES1603952-009	ES1603952-010
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%		----	**87.9**	----	**91.6**	**88.4**
4-Bromofluorobenzene	460-00-4	0.2	%		----	**83.7**	----	**88.7**	**85.3**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH12-B	BH13-A	BH14-A	BH14-B	BH16-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-011	ES1603952-012	ES1603952-013	ES1603952-014	ES1603952-015
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		8.5	7.6	10.1	10.4	10.7
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		7	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		16	11	15	9	15
Copper	7440-50-8	5	mg/kg		10	12	11	10	11
Lead	7439-92-1	5	mg/kg		15	24	13	20	14
Nickel	7440-02-0	2	mg/kg		10	8	11	6	10
Zinc	7440-66-6	5	mg/kg		24	41	32	27	32
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg		<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH12-B	BH13-A	BH14-A	BH14-B	BH16-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-011	ES1603952-012	ES1603952-013	ES1603952-014	ES1603952-015
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		----	**0.6**	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		----	**0.6**	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	**1.2**	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		----	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		----	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		----	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH12-B	BH13-A	BH14-A	BH14-B	BH16-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-011	ES1603952-012	ES1603952-013	ES1603952-014	ES1603952-015
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		----	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		----	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		----	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		----	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		----	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**113**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**96.0**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**63.4**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	**100**	**114**	**112**	**110**
2-Chlorophenol-D4	93951-73-6	0.5	%		----	**99.3**	**104**	**102**	**96.3**
2.4.6-Tribromophenol	118-79-6	0.5	%		----	**58.6**	**90.5**	**87.9**	**71.0**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	**106**	**105**	**104**	**103**
Anthracene-d10	1719-06-8	0.5	%		----	**110**	**120**	**117**	**116**
4-Terphenyl-d14	1718-51-0	0.5	%		----	**91.2**	**105**	**102**	**102**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	**85.6**	**101**	**101**	**98.9**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH12-B	BH13-A	BH14-A	BH14-B	BH16-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-011	ES1603952-012	ES1603952-013	ES1603952-014	ES1603952-015
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%		**----**	**84.3**	**98.9**	**102**	**90.3**
4-Bromofluorobenzene	460-00-4	0.2	%		**----**	**81.1**	**90.8**	**97.7**	**84.2**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH16-B	BH17-A	BH18-A	BH18-B	BH18-C
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-016	ES1603952-017	ES1603952-018	ES1603952-019	ES1603952-020
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		4.8	13.0	11.7	10.6	7.9
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	6	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		12	18	15	15	15
Copper	7440-50-8	5	mg/kg		6	14	12	10	9
Lead	7439-92-1	5	mg/kg		8	17	15	13	11
Nickel	7440-02-0	2	mg/kg		5	14	14	12	11
Zinc	7440-66-6	5	mg/kg		14	43	40	34	29
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	----	----	----	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg		----	----	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		----	----	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg		----	----	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg		----	----	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg		----	----	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg		----	----	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	----	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	----	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH16-B	BH17-A	BH18-A	BH18-B	BH18-C
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-016	ES1603952-017	ES1603952-018	ES1603952-019	ES1603952-020
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	----	----	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		----	----	----	----	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH16-B	BH17-A	BH18-A	BH18-B	BH18-C
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-016	ES1603952-017	ES1603952-018	ES1603952-019	ES1603952-020
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	<50	<50	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
^ **Total Xylenes**	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	----	----	----	**109**
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	----	**84.8**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	----	**67.3**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**110**	**105**	**108**	**103**	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**102**	**95.6**	**97.1**	**95.2**	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**80.1**	**71.5**	**73.2**	**66.0**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**99.4**	**99.8**	**100**	**99.4**	----
Anthracene-d10	1719-06-8	0.5	%		**119**	**121**	**118**	**123**	----
4-Terphenyl-d14	1718-51-0	0.5	%		**99.5**	**101**	**101**	**101**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**107**	**110**	**110**	**115**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH16-B	BH17-A	BH18-A	BH18-B	BH18-C
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-016	ES1603952-017	ES1603952-018	ES1603952-019	ES1603952-020
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%		**100.0**	**91.7**	**102**	**103**	**----**
4-Bromofluorobenzene	460-00-4	0.2	%		**94.2**	**84.2**	**98.2**	**95.7**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH19-A	BH20-A	BH20-B	BH20-C	BH21-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-021	ES1603952-022	ES1603952-023	ES1603952-024	ES1603952-025
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		10.0	11.3	13.3	13.9	8.8
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	6	6	11
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		14	15	16	14	10
Copper	7440-50-8	5	mg/kg		12	11	13	11	20
Lead	7439-92-1	5	mg/kg		14	16	16	20	21
Nickel	7440-02-0	2	mg/kg		14	12	14	12	16
Zinc	7440-66-6	5	mg/kg		43	36	39	38	74
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	----	----	<0.1	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	----	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg		----	----	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	<0.05	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	----	<0.05	----
Endrin	72-20-8	0.05	mg/kg		----	----	----	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	----	<0.05	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH19-A	BH20-A	BH20-B	BH20-C	BH21-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-021	ES1603952-022	ES1603952-023	ES1603952-024	ES1603952-025
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	<0.2	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	----	<0.05	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		----	----	----	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	----	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	----	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	----	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH19-A	BH20-A	BH20-B	BH20-C	BH21-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-021	ES1603952-022	ES1603952-023	ES1603952-024	ES1603952-025
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	----	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	----	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	----	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	----	----	102	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	95.0	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	82.7	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		112	112	114	----	123
2-Chlorophenol-D4	93951-73-6	0.5	%		97.7	100	102	----	110
2.4.6-Tribromophenol	118-79-6	0.5	%		68.3	68.4	84.6	----	96.2
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		103	106	108	----	108
Anthracene-d10	1719-06-8	0.5	%		116	120	129	----	123
4-Terphenyl-d14	1718-51-0	0.5	%		105	104	108	----	108
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		111	113	124	----	123

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH19-A	BH20-A	BH20-B	BH20-C	BH21-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-021	ES1603952-022	ES1603952-023	ES1603952-024	ES1603952-025
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%		**102**	**98.9**	**103**	**----**	**112**
4-Bromofluorobenzene	460-00-4	0.2	%		**92.7**	**90.3**	**93.6**	**----**	**101**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH21-B	BH21-C	BH22-A	BH22-B	BH23-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-026	ES1603952-027	ES1603952-028	ES1603952-029	ES1603952-030
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		8.0	10.9	12.1	14.5	11.2
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	6	11	5	8
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		22	17	8	15	12
Copper	7440-50-8	5	mg/kg		13	10	21	11	17
Lead	7439-92-1	5	mg/kg		35	16	14	18	19
Nickel	7440-02-0	2	mg/kg		20	9	24	12	10
Zinc	7440-66-6	5	mg/kg		74	29	82	34	38
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	<0.1	----	<0.1	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	<0.05	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg		----	<0.05	----	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg		----	<0.05	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg		----	<0.05	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg		----	<0.05	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg		----	<0.05	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	<0.05	----	<0.05	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	<0.05	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	<0.05	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	<0.05	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	<0.05	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg		----	<0.05	----	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	<0.05	----	<0.05	----
Endrin	72-20-8	0.05	mg/kg		----	<0.05	----	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	<0.05	----	<0.05	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	<0.05	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	<0.05	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	<0.05	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	<0.05	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH21-B	BH21-C	BH22-A	BH22-B	BH23-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-026	ES1603952-027	ES1603952-028	ES1603952-029	ES1603952-030
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDT	50-29-3	0.2	mg/kg		----	<0.2	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	<0.05	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg		----	<0.2	----	<0.2	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	<0.05	----	<0.05	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		----	<0.05	----	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	----	**0.6**	----	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	----	**1.2**	----	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg		<50	----	<50	----	<50
C15 - C28 Fraction	----	100	mg/kg		**120**	----	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg		<100	----	<100	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**120**	----	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH21-B	BH21-C	BH22-A	BH22-B	BH23-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-026	ES1603952-027	ES1603952-028	ES1603952-029	ES1603952-030
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	<10	----	<10
>C10 - C16 Fraction	----	50	mg/kg		60	----	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg		110	----	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	----	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		170	----	<50	----	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		60	----	<50	----	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	----	<1	----	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	110	----	84.0	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	75.9	----	82.5	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	61.6	----	75.2	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		116	----	120	----	110
2-Chlorophenol-D4	93951-73-6	0.5	%		107	----	108	----	97.2
2.4.6-Tribromophenol	118-79-6	0.5	%		94.0	----	93.1	----	75.1
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		103	----	105	----	103
Anthracene-d10	1719-06-8	0.5	%		129	----	117	----	116
4-Terphenyl-d14	1718-51-0	0.5	%		105	----	105	----	102
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		116	----	113	----	116

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH21-B	BH21-C	BH22-A	BH22-B	BH23-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-026	ES1603952-027	ES1603952-028	ES1603952-029	ES1603952-030
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%		**106**	**----**	**106**	**----**	**96.3**
4-Bromofluorobenzene	460-00-4	0.2	%		**95.1**	**----**	**98.8**	**----**	**86.3**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH23-B	BH23-C	BH24-A	BH24-B	BH24-C
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-031	ES1603952-032	ES1603952-033	ES1603952-034	ES1603952-035
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		12.1	14.2	11.1	13.8	13.6
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	6	<5	11	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		11	16	16	14	17
Copper	7440-50-8	5	mg/kg		16	12	14	20	13
Lead	7439-92-1	5	mg/kg		14	23	13	15	19
Nickel	7440-02-0	2	mg/kg		7	13	22	24	8
Zinc	7440-66-6	5	mg/kg		31	43	39	74	28
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	<0.1	----	----	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	<0.05	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	<0.05	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg		----	<0.05	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		----	<0.05	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg		----	<0.05	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg		----	<0.05	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg		----	<0.05	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	<0.05	----	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		----	<0.05	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		----	<0.05	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	<0.05	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		----	<0.05	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg		----	<0.05	----	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		----	<0.05	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg		----	<0.05	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	<0.05	----	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	<0.05	----	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		----	<0.05	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	<0.05	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	<0.05	----	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH23-B	BH23-C	BH24-A	BH24-B	BH24-C
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-031	ES1603952-032	ES1603952-033	ES1603952-034	ES1603952-035
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDT	50-29-3	0.2	mg/kg		----	<0.2	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		----	<0.05	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		----	<0.2	----	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	<0.05	----	----	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		----	<0.05	----	----	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	----	**0.6**	**0.6**	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	----	**1.2**	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH23-B	BH23-C	BH24-A	BH24-B	BH24-C
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-031	ES1603952-032	ES1603952-033	ES1603952-034	ES1603952-035
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	<10	<10	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	----	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	<100	<100	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	----	<50	<50	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	----	<50	<50	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	----	<0.2	<0.2	----
^ **Total Xylenes**	1330-20-7	0.5	mg/kg		<0.5	----	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg		<1	----	<1	<1	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	**91.0**	----	----	**100.0**
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	**82.5**	----	----	**86.7**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	**68.1**	----	----	**70.0**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**111**	----	**111**	**111**	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**101**	----	**105**	**96.8**	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**82.2**	----	**87.7**	**71.7**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**104**	----	**102**	**104**	----
Anthracene-d10	1719-06-8	0.5	%		**120**	----	**124**	**115**	----
4-Terphenyl-d14	1718-51-0	0.5	%		**103**	----	**101**	**103**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**118**	----	**117**	**116**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH23-B	BH23-C	BH24-A	BH24-B	BH24-C
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-031	ES1603952-032	ES1603952-033	ES1603952-034	ES1603952-035
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%		**102**	**----**	**103**	**94.8**	**----**
4-Bromofluorobenzene	460-00-4	0.2	%		**89.2**	**----**	**90.7**	**87.0**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH25-A	BH26-A	BH26-B	BH27-A	BH28-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-036	ES1603952-037	ES1603952-038	ES1603952-039	ES1603952-040
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		10.0	15.3	11.1	7.1	9.7
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		6	15	<5	6	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		12	19	15	13	13
Copper	7440-50-8	5	mg/kg		15	25	16	17	15
Lead	7439-92-1	5	mg/kg		14	40	36	25	32
Nickel	7440-02-0	2	mg/kg		16	10	10	10	9
Zinc	7440-66-6	5	mg/kg		34	58	54	98	52
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg		----	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	----	----	----
Endrin	72-20-8	0.05	mg/kg		----	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH25-A	BH26-A	BH26-B	BH27-A	BH28-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-036	ES1603952-037	ES1603952-038	ES1603952-039	ES1603952-040
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	**0.7**
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	**1.2**
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	**1.2**
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	**0.6**
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	**0.5**
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	**4.2**
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	**0.6**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.9**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH25-A	BH26-A	BH26-B	BH27-A	BH28-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-036	ES1603952-037	ES1603952-038	ES1603952-039	ES1603952-040
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**111**	**115**	**108**	**110**	**108**
2-Chlorophenol-D4	93951-73-6	0.5	%		**104**	**104**	**97.9**	**95.1**	**95.0**
2.4.6-Tribromophenol	118-79-6	0.5	%		**83.1**	**88.3**	**83.3**	**112**	**110**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**106**	**102**	**99.3**	**109**	**111**
Anthracene-d10	1719-06-8	0.5	%		**119**	**115**	**124**	**106**	**110**
4-Terphenyl-d14	1718-51-0	0.5	%		**103**	**100**	**99.5**	**112**	**114**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**126**	**121**	**114**	**115**	**121**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH25-A	BH26-A	BH26-B	BH27-A	BH28-A
				Client sampling date / time	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]	[22-Feb-2016]
Compound	CAS Number	LOR	Unit		ES1603952-036	ES1603952-037	ES1603952-038	ES1603952-039	ES1603952-040
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%		**97.3**	**95.1**	**94.7**	**101**	**107**
4-Bromofluorobenzene	460-00-4	0.2	%		**91.5**	**84.0**	**82.9**	**89.1**	**95.0**