Public Works
NSW Water Solutions

Rowland Hassall School Relocation
49 Woodville Road, Chester Hill

Contamination Investigation

Report number: 15-GS91B

August 2015

Prepared for **NSW Department of Education**

NSW Education

A division of the Department of Finance, Services and Innovation

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1 Executive Summary

Any party relying on this report is advised that this executive summary must be read in conjunction with the attached report of which this summary forms a part.

Introduction

Government Architects Office (GAO - NSW Public Works), on behalf of the NSW Department of Education (DoE), commissioned the Specialist Services Section (NSW Public Works, NSW Water Solutions) to undertake a Contamination Investigation for the proposed new Rowland Hassall School at 49 Woodville Road, Chester Hill. The Site is currently a vacant block of land owned by DoE that has been used in the past as a sports field by the adjacent primary school.

A concurrent report titled "*Rowland Hassall School Relocation – 49 Woodville Road, Chester Hill – Geotechnical Investigation*" has been prepared by our Section (Rep No: *15-GS91A*). The geotechnical investigation report should be read in conjunction with this contamination report.

The objectives of the investigation were to:

- Identify any past and present potentially contaminating activities;
- Identify potential contamination types;
- Discuss the site conditions;
- Undertake environmental soil sampling and analysis;
- Provide a qualitative risk assessment of any identified contamination on the human health and the environment; and
- Assess the need for further investigation and/or remediation.

Summary of Investigation Results and Site Characteristics

Site History

Pursuant to Section 149(2) of the Environmental Planning and Assessment Act 1979 ('Act') and under the Bankstown Local Environmental Plan (LEP) 2015, the land is zoned *SP2 Infrastructure: Educational Establishment.* There are no matters arising under the Contaminated Land Management Act 1997 for the land noted in the Certificate.

A search of the NSW OEH website indicated that there are no notices or licenses under the Protection of the Environment Operations Act 1997 for the Site. Also, there are no declarations or orders under the Contaminated Land Management Act 1997.

Based on the title search information, the land has been owned by the Minster for Education since 1989. From 1944 to 1989, the land was Crown Land. Between 1892 and 1944, the land was privately owned.

A review of ten (10) historical aerial photographs (years 1930, 1951, 1961, 1970, 1978, 1986, 1994, 2002, 2005 and 2014) indicated that the Site has remained vacant and generally open space over the years. Some minor levelling (filling of the drainage channel/ depression) occurred between 1961 and 1970. The construction of the terraces that make up the current Site layout appears to have occurred

between 1970 and 1978. Based on the historical aerial photographs, there is no evidence of any former intensive land cultivation or industrial activities occurring within the Site.

Potential Environmental Concern

Based on the current historical information and site observations, there is no strong evidence of any present or former industrial or intensive land cultivation activities occurring within the Site.

The identified area of potential environmental concern within the Site is mainly the existing fill (including topsoil). The source of the fill is not precisely known, but likely to be associated with former levelling earthworks to create the sports field.

No obvious visible signs of discolouration or staining of the exposed ground surface, which may indicate contamination, was observed within the Site. Also there was no olfactory indication of hydrocarbon contamination within the soil or groundwater encountered within the boreholes at the time of fieldwork.

The selected topsoil/fill samples from the Site were screened for the common contaminants of potential concern - heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury), TRH, BTEX, PAHs, OCPs, PCBs and asbestos, where appropriate.

Subsurface Conditions

Generally, the subsurface profiles comprise a sequence of fill (including topsoil), followed by residual deposits (silty clay to sandy silty clay) and then sedimentary bedrock (sandstone/ siltstone/ shale) of the Bringelly Shale unit.

Groundwater

Groundwater inflows were encountered in boreholes B11, B12 and B18 to B22. There was no olfactory indication of hydrocarbon contamination within the groundwater encountered in the boreholes, at the time of fieldwork. It is interpreted that the groundwater encountered in these boreholes is associated with preferential drainage across the Site along a filled drainage channel/ depression that diagonally intersected the Site. Evidence of this drainage channel can be seen in the historical aerial photographs; particularly the 1930, 1951 and 1961 aerial photographs (see **Appendix C**).

At the time of fieldwork, groundwater was not encountered in the remaining boreholes within the depth of investigation. It should also be noted that the presence of groundwater/seepage will depend on seasonal weather changes and prevailing weather conditions at the time of construction. It is expected that groundwater (if encountered) across the remainder of the Site is likely to be deeper than the investigated depths and within the weathered bedrock profile.

Analytical Results and Site Impacts

In the current investigation, in all of the samples analysed, the concentrations of heavy metals were either not detected above the laboratory Limits of Reporting (LoR) or were below the relevant health and ecological threshold levels.

Also, in all of the samples analysed, TRH, BTEX, PAHs, OCPs and total PCBs were either not detected above the LoRs or were below the relevant health and ecological threshold levels.

One (1) bonded fibre-cement fragment (F1) was collected from the ground surface near borehole B34. The fibre-cement fragment was found to contain chrysotile and amosite asbestos. No asbestos was detected in the surface soil sample from borehole B34 (B34-0.0-0.2). There were no other fibre-

cement fragments observed on the ground surface within the Site. However the possibility of encountering some ACM debris within the dumped debris/ rubbish in the north-eastern corner and south-western corner of the Site should not be discounted. This debris/ rubbish should be removed from the Site and properly disposed offsite to a licenced landfill.

It should be noted that groundwater testing was not part of the approved scope of work commissioned for this investigation; therefore, no groundwater testing has been undertaken.

In view of the findings from the current investigation, it is considered that the likelihood of widespread contamination of the Site is low.

Conclusion and Recommendations

Based on the findings from the current contamination investigation, it is considered that the Site is suitable for the proposed development, subject to the implementation of the following recommendations.

- The observed debris/ rubbish on the ground surface in the north-eastern and south-western parts of the Site should be removed and be properly disposed offsite to a licensed landfill. Any fibre-cement fragments found, unless proved otherwise, should be assumed to contain asbestos and be designated as asbestos waste. The Site should then be secured (if possible) to prevent any further illegal dumping of waste.

- As recommended in GHD's PSI report, it would be prudent to install three (3) groundwater monitoring wells within the Site to determine whether potentially contaminated groundwater from the nearby service stations is entering the Site. It should be noted that any groundwater encountered outside the alignment of the former drainage channel/ depression will be below the depths of any foundation excavations for the proposed buildings or general earthworks on Site.

- Any material that is to be excavated and disposed of in a NSW OEH licensed landfill should be assessed and classified (with TCLP testing, where appropriate) in accordance with the *Waste Classification Guidelines* (NSW DECC, 2009) and relevant legislation.

- Any imported material should be validated in accordance with National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM). The fill material should not contain asbestos, and not be acid sulfate soil or saline soil. The imported fill material should be 'virgin excavated natural material' (VENM) or 'excavated natural material' (ENM), as defined in the *Waste Classification Guidelines* (NSW DECC, 2009) because of their low risk of contamination.

An Environmental Site Management Plan should be prepared. This Plan should include a contingency plan for the assessment / management of any UNEXPECTED discovery of contamination during the course of earthworks.

2 Introduction

2.1 General

Government Architects Office (GAO - NSW Public Works), on behalf of the NSW Department of Education (DoE), commissioned the Specialist Services Section (NSW Public Works, NSW Water Solutions) to undertake a Contamination Investigation for the proposed new Rowland Hassall School at 49 Woodville Road, Chester Hill. The Site is currently a vacant block of land owned by DoE that has been used in the past as a sports field by the adjacent primary school.

A concurrent report titled "*Rowland Hassall School Relocation – 49 Woodville Road, Chester Hill – Geotechnical Investigation*" has been prepared by our Section (Rep No: *15-GS91A*). The geotechnical investigation report should be read in conjunction with this contamination report.

2.2 Data Quality Objectives

The data quality objectives (DQOs) of the Environmental Site Investigation have been developed to define the type and quality of data in order to meet the project objectives. The DQOs were based generally in accordance with the seven step DQO process, as defined in Australian Standard AS 4482.1-1997 *Guide to the Sampling and Investigation of Potentially Contaminated Soil Part 1 : Non-volatile and Semi-volatile Compounds*.

The DQOs developed for the investigation are tabulated below.

	Data Quality Objectives	**Report Section where DQOs addressed**	
Step 1	State the Problem	2 4	Introduction Site History
Step 2	Identify the Decision	10 11 12	Assessment Criteria Results and Site Characteristics Conclusion and Recommendations
Step 3	Identify Inputs to the Decision	5 6 7 11	Site Conditions and Surrounding Environment Geology, Hydrogeology and Acid Sulfate Soil Potential Environmental Concern Results and Site Characteristics
Step 4	Define the Study Boundaries	3 5	Site Identification Site Conditions & Surrounding Environment
Step 5	Develop a Decision Rule	10	Assessment Criteria
Step 6	Specify Limits on Decision Errors	8 9 11	Field Investigation Laboratory Investigation Results and Site Characteristics
Step 7	Optimize the Design for Obtaining Data	8	Field Investigation

2.3 Objectives

The objectives of the investigation were to:

- Identify any past and present potentially contaminating activities;
- Identify potential contamination types;
- Discuss the site conditions;
- Undertake environmental soil sampling and analysis;
- Provide a qualitative risk assessment of any identified contamination on the human health and the environment; and
- Assess the need for further investigation and/or remediation.

2.4 Scope of Work

The scope of work for the investigation is summarised below.

- Conduct a site inspection.
- Obtain information on geology, hydrogeology and acid sulfate soil.
- Review a planning certificate under Section 149 of the Environmental Planning and Assessment Act 1979.
- Review the NSW Office of Environment and Heritage (OEH) public register for notices or licenses under the Protection of the Environment Operation Act 1997, and for declarations or orders under the Contaminated Land Management Act 1997.
- Review title information from a land title search of the NSW Land and Property Information (a division of the Department of Finance, Services and Innovation DFSI) records.
- Review historical aerial photographs provided by the NSW Land and Property Information (a division of DFSI).
- Conduct soil sampling and laboratory analysis.
- Presentation of the data obtained from the fieldwork and laboratory analysis, preliminary risk assessment, conclusion and recommendations.

The investigation report is prepared generally in accordance with the *Guidelines for Consultants Reporting on Contaminated Sites* (NSW OEH, 2011).

2.5 Proposed Development

The Rowland Hassall School Relocation Masterplan Study (dated March 2015), prepared by GAO, outlines a number of options for the proposed site layouts. It is understood that Option A (Central Open Space) is the preferred option.

Option A comprises:

- Five GLS blocks (three 'northern' blocks and two 'southern' blocks).
- A Hall/Library/Admin/Special Programs building.
- Vehicle circulation/carpark area.
- Active recreation area.
- Passive recreation area.
- Outdoor learning space.

All buildings will be single storey structures; however, the proposed finished floor levels are not known at this stage. The scope of work for this investigation was based on the Option A site layout, which is shown in **Figure 2**.

2.6 Limitations

The Geotechnical and Environmental Section has conducted an investigation and prepared this report in response to specific instructions from the client to whom this report is addressed.

This report is intended for the sole use of the client, and only for the purpose which it was prepared. Any third party who relies on the report or any representation contained in it does so at their own risk.

3 Site Identification

The Site is located at 49 Woodville Road, Chester Hill (see **Figure 1**). Parkham Street is located near the south-eastern corner of the Site. Vehicle access is available from Parkham Street.

The general site topography is shown on **Figure 3**.

The Site is identified as Lot 1 DP 794709. The coordinates of the Site are 6250700 N and 313975 E.

4 Site History

A review of the site history included the following information sources :

- Section 149 planning certificate.
- WorkCover NSW – Dangerous Goods.
- NSW Office of Environment and Heritage records.
- Land title records.
- Historical aerial photographs.
- Other documentation.

4.1 Section 149 Planning Certificate

Pursuant to Section 149(2) of the Environmental Planning and Assessment Act 1979 ('Act') and under the Bankstown Local Environmental Plan (LEP) 2015, the land is zoned *SP2 Infrastructure: Educational Establishment.*

A review of the Certificate indicated the following:

- The land does not include or comprise critical habitat, is not in a conservation area and has no environmental heritage item on the land.
- The land is not affected by the operation of Section 38 or 39 of the Coastal Protection Act 1979.
- The land is not affected by Section 15 of the Mine Subsidence Compensation Act 1961, proclaiming land to be a mine subsidence district.
- The land is not affected by any road widening or road realignment under (1) Division 2 of Part 3 of the Roads Act; or (2) any Environmental Planning Instrument; or (3) any resolution of Council. However, the property fronts an existing or proposed arterial/main road.
- The land is affected by a resolution of Council adopting a policy concerning the management of contaminated land. That policy applies to all land in the City of Bankstown and will restrict development of the land if the circumstances set out in the policy prevail.
- The land is not affected by policies adopted by Council or by any other public authority that restricts development of the land due to hazard risk restrictions (other than flooding).
- The land is a flood control lot. The property is affected by a policy known as Bankstown Development Control Plan 2015, which includes flood related development controls for properties based on the relevant flood risk precinct.
- The land is not bushfire prone.
- There are no matters arising under section 59 (2) of the Contaminated Land Management Amendment Act 1997 for the subject land.

In accordance with Section 149(5) of the Act, the Certificate also states that:

- The property is identified by the Miller Road Catchment Flood Study (March 2013) as being at a medium risk of flooding.

The planning certificate is presented in **Appendix A**.

Bankstown City Council provided a plan (dated 9th July 2015) showing the 100 year ARI flood extent. The Flood Extent Map is shown on **Figure 4**.

4.2 WorkCover NSW – Dangerous Goods

Based on site observations and historical information, there is no evidence of any bulk fuel storage on site; therefore, a WorkCover NSW Dangerous Goods licence search was not undertaken.

4.3 NSW Office of Environment and Heritage Records

A search of the NSW Office of Environment and Heritage (OEH) website indicated that there are no notices or licenses under the Protection of the Environment Operations Act 1997 for the Site.

Also, there are no declarations or orders under the Contaminated Land Management Act 1997.

4.4 Land Title Records

A land title search was conducted by Environmental Management Group P/L for the Site, identified as Lot 1 DP 794709.

A summary of historical proprietors of the land is as follows :

Year	**Proprietor**	**Source**
1989-To Date	Minister for Education	Current Certificate of Title
1944-1989	His Most Gracious Majesty King George VI	Book 1945 No. 420
1915-1944	Alfred Henry Pettifer (assistant manager)	Book 1945 No. 420 Book 1050 No. 179
1892-1915	John Sullivan (umbrella maker)	Book 1050 No. 179, Book 495 No. 298

Based on the title search information, the land has been owned by the Minster for Education since 1989. From 1944 to 1989, the land was Crown Land. Between 1892 and 1944, the land was privately owned.

Copies of the certificates of title are presented in **Appendix B**.

4.5 Historical Aerial Photographs

A review of ten (10) historical aerial photographs (years 1930, 1951, 1961, 1970, 1978, 1986, 1994, 2002, 2005 and 2014), provided by NSW Land and Property Information (Sydney Office), was conducted in order to assess the former site conditions.

Enlarged sections of the aerial photographs are presented in **Appendix C**.

The observations from the aerial photographs are summarised below:

- The 1930 photograph Site and its surrounding area is generally open space and mostly cleared of vegetation. There are some trees in the central, north-eastern and south-eastern parts of the Site. A track is visible traversing the Site from the north-west corner to the centre of the southern boundary. What appears to be a drainage channel/ depression also diagonally traverses the site from the north-east to the centre of the southern boundary. There are scattered residential properties in the surrounding area.

- The 1951 photograph show that the Site remains open space. Some trees are still present in the central and eastern parts of the Site. The track and drainage channel/ depression are still visible. Another dirt track is visible across the northern part of the Site. The number of residential properties has increased in the surrounding area since the 1930 aerial photograph.

- The 1961 photograph shows that most off the trees on the Site have been cleared and it remains open space. The number of dirt tracks has increased across the Site. The drainage channel/depression is still visible. The number of residential properties in the surrounding area has increased since the 1951 aerial photograph.

- The 1970 aerial photograph shows the Site completely cleared of vegetation. Only one dirt track is visible traversing the Site from near the north-west corner to the corner of Parkham Street in the centre of the eastern boundary. There appears to have been some levelling on Site as the drainage channel/ depression visible in the previous aerial photographs is not as pronounced. Residential properties have increased in the surrounding area and some commercial properties have been developed to the north-west and south-west of the Site. Some of the smaller buildings within Old Guildford Public School have been demolished since 1961 and new buildings and a playground have been constructed.

- The 1978 photograph shows that additional site levelling (involving cut and fill) has occurred on the Site since the 1970 aerial photograph. It appears that there may be an embankment separating the eastern quarter of the Site, similar to the terraces of the present day. Residential properties have increased in the surrounding area and there commercial properties have increased to the north-west and south-west.

- The 1986 and 1994 photographs show site features similar to the 1978 aerial photograph. The Site remains cleared with a dirt track traversing the Site from the north-west corner to the south-east corner. There are some additional tracks in the eastern part of the Site in the 1994 aerial photograph. There is an increase in the number of residential properties to the south of the Site. The commercial properties to the north-west and south-west appear to be similar to that shown in the 1978 photograph.

- The 2002, 2005 and 2014 photographs shows site features essentially similar to that of the present day. The Site is grass covered with a dirt track traversing the Site from the north-west corner to the south-east corner. There are some trees along the western boundary fronting Woodville Road. The surrounding area is also similar to that of the present day. The Caltex (Woolworths) service station to the north of the car dealership was constructed

between 2005 and 2014. Development has also occurred within the Caltex service station (diagonally opposite the Site) between 2005 and 2014; however, it is unclear from the aerial photographs as to whether the property was used as a service station prior to 2005.

A review of the above aerial photographs shows that the Site has remained vacant and generally open space over the years. Some minor levelling (filling of the drainage channel/ depression) occurred between 1961 and 1970. The construction of the terraces that make up the current Site layout appears to have occurred between 1970 and 1978. Based on the historical aerial photographs, there is no evidence of any former intensive land cultivation or industrial activities occurring within the Site.

4.6 Other Documentation

Preliminary Site Investigation – Old Guildford Public School Oval, 49 Woodville Road, Chester Hill (GHD, March 2015)

A preliminary site investigation (PSI) was prepared by GHD in March 2015 for NSW Department of Education and Communities. The PSI was essentially a desktop study of the available site history information in order to assess the need for further contamination assessment.

This report was provided to our Section on 13.7.2015 after the submission and approval of our proposal and scope of work. Part of our approved scope of work included a desktop site history study, which was essentially also covered by GHD.

Some of GHD's recommendations are included below.

- GHD recommends that a further contamination investigation is undertaken. The further investigation would include Phase 2 soil and groundwater sampling and analysis program across the site for identified contaminants of concern. Based on the requirements of the *Contaminated Sites: Sampling Design Guidelines* (NSW EPA, 1995) and the site area, approximately 21 to 24 soil sample locations would be investigated with groundwater monitoring bores installed at three of these locations.

- Based on the findings of the PSI, the probability/ likelihood of occurrence of large scale contamination is low, however the potential contamination within fill material cannot be discounted.

- GHD also recommends that the site be secured (if possible) to avoid any further illegal dumping which may contribute to potential contamination issues.

For full details of the findings, conclusions and recommendations, the reader is referred to GHD's PSI report.

5 Site Conditions and Surrounding Environment

5.1 Zoning and Current Land Use

The Site is zoned *SP2 Infrastructure: Educational Establishment.* The Site is currently a vacant block of land that has been used in the past as a sports field by the adjacent primary school (Old Guildford Public School).

5.2 Topography and Drainage

The Site topography is shown on **Figure 3**. In general, the eastern part of the Site slopes very gently towards the south-west and west, while the western part of the school site slopes very gently to the south-east. Surface water within the Site is expected to flow generally towards the existing stormwater drainage system in the southern part of the Site.

5.3 Site Inspection

A site inspection was conducted by an engineering geologist from our Section at the time of fieldwork (21st to 23rd July 2015). The observations made at the time of the site inspection are briefly summarised below.

The Site is currently a grass-covered vacant block of land, which has been used in the past as sports fields. Broadly, the topography slopes at gentle gradients to the west/south-west; however, in the past, the natural contours have been modified by cutting and filling to create the sports fields. Currently, there are two relatively flat terraces, with differences in elevation in the order of 1m.

The eastern terrace has been constructed in cut-and-fill and occupies approximately one quarter of the Site. A general view of the eastern terrace is shown in **Plate 1**.

The top of the cut along the eastern boundary of the terrace ranges from RL 39.45m (AHD) in the northern part of the cut to RL37.1m (AHD) in the southern part of the cut. The cut is in the order of 1.4m to 2.0m in height and the cut batter is typically gentle to moderate (1(V):4(H) or 14^0 to 1(V):5(H) or 11^0). The cut batter is shown in **Plate 2**.

The top of the filled batter along the western boundary of the terrace ranges from approximate RL 37m (AHD) in the northern part of the filled area to RL36m (AHD) at the southern end. The filled embankment height ranges from approximately 0.7m with a gradient of 1(V):10(H) or 6^0 at the northern end, to 1.2m with a gradient of 1(V):4(H) or 14^0, at the southern end (see **Plate 3**).

The relatively flat part of the eastern terrace slopes very gently to the south-west ranging from RL 37.7m (AHD) in the north-eastern part to RL35.9m (AHD) in the south-western corner of the terrace.

The cut slopes along the north-western, western and southern boundaries of the eastern terrace, are mostly overgrown with weeds and grasses, with some shrubs close to the boundary fence. The fill batter and the terrace are grassed. There is also some debris and rubbish along the northern boundary fence and in the vicinity of the concrete dish drain, which runs parallel to the fenceline, in the north-western corner of the terrace (see **Plate 4**). Furthermore, a concrete kerb and stormwater pit is located in the south-western corner of the terrace (see **Plate 5**).

At the time of fieldwork, the middle and southern parts of the terrace were very soft, water logged and boggy (see **Plate 6**).

The lower, western terrace is an unused sports field which occupies approximately three quarters of the Site. The western terrace is separated from the eastern terrace by a concrete kerb which is located in close proximity to and along the toe of the filled batter of the eastern terrace.

The western terrace appears to have been constructed mainly in fill with some minor cutting along the northern boundary (see **Plate 7**). The cutting is relatively shallow (less than 1m) with a gentle batter (1(V):7(H) or 8^0 to 1(V):5(H) or 11^0).

The top of the filled batter along the western boundary of the terrace ranges from approximate RL 37m (AHD) in the northern part of the filled area to RL35.5m (AHD) at the southern end. The toe of the fill is not readily distinguishable; in general, the fill thicknesses appear to be less than 1m and the

slopes leading to Woodville Road are very gentle (see **Plate 8**). Along the southern boundary, the top of the filled batter ranges from approximate RL35.6m (AHD) at the western end to RL34.8m (AHD) at the eastern end. The filled embankment heights have been estimated to range from approximately 0.8m to 1.4m with very gentle to moderate gradients (up to 1(V):5(H) or 11^0).

The relatively flat part of the terrace slopes very gently to the south-east ranging from RL 37.0m (AHD) in the north-western part to RL34.7m (AHD) in the south-eastern corner of the terrace (see **Plate 9**).

Goal posts are located at the eastern and western ends of the sports field. There are some small trees and shrubs between the sports field and the western Site boundary fence (Woodville Road). Rubbish and debris has been dumped near the south-western corner of the Site (see **Plate 10**). Some shrubs and small trees are also located along part of the northern perimeter of the Site.

As indicated above, a concrete kerb runs along the eastern perimeter of the terrace and it continues for some distance along the southern perimeter. The kerb channels surface water towards the stormwater pit in the south-eastern corner of the terrace (see **Plate 11**). To the south of the terrace, there is a low (0.2m to 0.5m) concrete retaining wall approximately 1.5m from the boundary fence and at the base of the fill embankment batter (see **Plate 12**).

At the time of fieldwork, the middle and south-eastern parts of this terrace were also very soft, water logged and boggy.

No obvious visible signs of discolouration or staining of the exposed ground surface, which may indicate contamination, was observed within the Site. Also, no olfactory indications of potential hydrocarbon contamination were noted.

5.4 Surrounding Land Use

The Site is currently surrounded by the following environment:

East	=	Low density residential properties and Parkham Street.
South	=	Low to medium density residential properties.
West	=	Woodville Road and Old Guildford Public School.
North	=	Low density residential properties and commercial car dealership.

A Caltex (Woolworths) service station is located to the north of the car dealership and another Caltex service station is located to the north of Old Guildford Public School, diagonally opposite the Site on Woodville Road.

5.5 Local Sensitive Environment

The closest identified sensitive receptor is a reserve off Barbers Road, which is located approximately 500m to the east of the Site.

6 Geology, Hydrogeology and Acid Sulfate Soil

6.1 Geology

The Penrith 1:100,000 Geological Series Sheet 9030 (1991) shows that the Site is underlain by Bringelly Shale of the Wianamatta Group, which is Triassic in age. The unit comprises shale, carbonaceous claystone, claystone, laminite, fine to medium grained lithic sandstone, rare coal and tuff.

The Penrith 1:100,000 Soil Landscape Series Sheet 9030 (1989) shows that the Site is underlain by the Blacktown soil landscape grouping, which comprises gently undulating rises on Wianamatta Group shales. The soils within this landscape group are: shallow to moderately deep, hard setting, mottled texture contrast soils; red and brown podzolic soils on crests; grading to yellow podzolic soils on lower slopes and in drainage lines. The limitations of the soils in this group are moderately reactive, highly plastic subsoil with low soil fertility and poor soil drainage.

The field investigation revealed that the subsurface profile generally comprises a layer of fill, underlain by residual soil and weathered sandstone with some minor siltstone/shale.

6.2 Hydrogeology

In boreholes B11 and B12, groundwater inflows were encountered at 3.0m and 2.7m, respectively, within thin, highly weathered sandstone zones. At the completion of each hole, the water level had risen to 2.0m and 1.4m, respectively.

In boreholes B18 to B22, groundwater inflows were encountered at depths of 1.4m to 4.2m, generally along highly weathered zones or zones of higher gravel concentration. At the completion of each hole, the water level had risen to 0.1m (B20) to 3.3m (B22). In boreholes B18 and B20, approximately one hour after the completion of the holes, the groundwater level had then risen to the ground surface.

It is interpreted that the groundwater encountered in these boreholes is associated with preferential drainage across the Site along a filled drainage channel/ depression that diagonally intersected the Site. Evidence of this drainage channel can be seen in the historical aerial photographs; particularly the 1930, 1951 and 1961 aerial photographs (see **Appendix C**).

At the time of fieldwork, groundwater was not encountered in the remaining boreholes within the depth of investigation. It should also be noted that the presence of groundwater/seepage will depend on seasonal weather changes and prevailing weather conditions at the time of construction. It is expected that groundwater (if encountered) across the remainder of the Site is likely to be deeper than the investigated depths and within the weathered bedrock profile.

6.3 Acid Sulfate Soil

The Prospect/ Parramatta River Acid Sulfate Soil Risk Map (2nd Edition, December 1997) designates the site as having no known occurrence of acid sulfate soil. This map class designation means that acid sulfate soils are not known or expected to occur in these environments.

7 Potential Environmental Concern

A complete pathway must exist between the source of contamination and the receptors for exposure to contamination to occur. If the exposure pathway is incomplete, then there will be no exposure, and hence no risk.

In the proposed future school development, including regrading and landscaping of the Site, the primary pathways by which the future land users (receptors) could be exposed to any source of contamination are as follows :

- Direct contact (including accidental ingestion) with contaminated soil
- Inhalation of dust from contaminated soil
- Inhalation of indoor or outdoor vapour from volatilisation of hydrocarbons from contaminated soil
- Migration through soil medium to groundwater (if encountered).

For the proposed school development, there is potential health and/or environmental effects from exposure to contaminated land. The main receptors are as follows :

- School staff and students
- School visitors
- Intrusive construction / maintenance workers
- Neighbouring property uses
- Soil and groundwater within/around the Site

Considering the above, it was deemed appropriate that as part of the future development, assessment (including sampling and analysis) be undertaken in order to determine the contamination status within the Site and its impacts on the continued future land use as a school.

Based on the current historical information and site observations, there is no strong evidence of any present or former industrial or intensive land cultivation activities occurring within the Site.

The identified area of potential environmental concern within the Site is mainly the existing fill (including topsoil). The source of the fill is not precisely known, but likely to be associated with former levelling earthworks to create the sports field.

No obvious visible signs of discolouration or staining of the exposed ground surface, which may indicate contamination, was observed within the Site. Also there was no olfactory indication of hydrocarbon contamination within the soil or groundwater encountered within the boreholes at the time of fieldwork.

The selected topsoil/fill samples from the Site were screened for the common contaminants of potential concern - heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury), TRH, BTEX, PAHs, OCPs, PCBs and asbestos, where appropriate.

8 Field Investigation

8.1 Investigation Rationale

The total area of the school site is approximately 1.5ha. In accordance with the NSW EPA *Sampling Design Guidelines* (1995), the minimum number of sampling points required for site characterisation based on detecting circular hot spots by using a systematic sampling pattern is twenty-five (25). In light of the historical information that there is no evidence of any former industrial or intensive land cultivation activities occurring within the school site, the adopted number of sampling points (42) in the current investigation is considered to be appropriate. In consideration of the site conditions, a judgmental sampling strategy which targeted mainly the fill material was considered to be the practical approach.

8.2 Fieldwork

Fieldwork was carried during the period from 21.7.2015 to 23.7.2015, and comprised drilling a total of thirty-six (36) boreholes (B1 to B36).

Boreholes B1 to B24 were drilled within the proposed building areas to depths ranging from 0.8m to 4.5m. The boreholes were terminated upon reaching either the push tube refusal depth or the nominal target depth of 4.5m.

Boreholes B25 to B36 were drilled within the proposed vehicle circulation, active recreation, passive recreation and outdoor learning areas and external works/landscaping zones to depths of 0.7m to 1.5m. The boreholes were terminated upon reaching either the push tube refusal depth or nominal target depth of 1.5m.

The boreholes were drilled by Terratest Pty Ltd using a Geoprobe drill rig. Each borehole was advanced using a continuous push tube sampler.

The fieldwork was supervised full-time by an engineering geologist from the Section, who carried out field logging and soil sampling.

Borehole locations are shown on **Figure 3**.

The borehole logs are presented in **Appendix E**. Geotechnical Terminology and Technical Aids are presented in **Appendix D**.

One (1) fibre-cement fragment (F1) was collected from the ground surface for subsequent laboratory asbestos identification.

8.3 Field QA/QC

In the current investigation, soil samples were taken using either a continuous push tube sampler or a stainless steel bowl and trowel. All sampling equipment was decontaminated between sampling points by washing in water containing Decon 90 (a suitable surfactant) and then rinsing with de-ionised water.

Samples were placed in pre-cleaned glass containers with Teflon lined closures, and were transported to the contracted laboratory, ALS Environmental, in a portable cooler. The new acid washed glass containers were provided by ALS. Sample containers were labelled and identified with the project number, unique sample number and date of collection.

Four (4) field duplicate samples were taken from sampling points B10-0.0-0.4, B1-0.0-0.2, B30-0.0-0.15 and B35-0.0-0.1 and sent to the laboratory for analysis. This was done as part of quality control to assess the variation in analyte concentration between samples collected from the same sampling point, and repeatability of the laboratory's analysis.

A rinsate (or equipment) blank (RB) was taken during the fieldwork and analysed for heavy metals (As, Cd, Cr, Cu, Ni, Pb, Zn and Hg). The rinsate blank was taken to determine whether the sampling equipment was adequately decontaminated between sampling points.

Samples were recorded on a chain of custody form. The chain of custody record sheets accompanied the soil samples to the laboratory are presented in **Appendix F**.

9 Laboratory Investigation

9.1 Laboratory Analysis

Chemical analysis was performed by ALS Environmental (Australian Laboratory Services Pty. Ltd.). The laboratory is registered by the National Association of Testing Authorities (NATA) for the analyses requested.

The soil analysis was conducted in accordance with the methods tabulated below.

Analytes	ALS Analytical Suite Code	Method Description
Metals (As, Cd, Cr, Cu, Ni, Pb, Zn)	S–8 Code S–26 is for 8 metals, TRH (C6-C40), BTEXN and PAHs. Code S-2 is for 8 metals.	APHA 21st ed., 3120; USEPA SW846 - 6010 (ICP/AES)
Mercury (Hg)		AS 3550, APHA 21st ed., 3112 Hg – B FIM-ASS
Total Petroleum Hydrocarbons (TPH) - Volatile		USEPA SW846 – 8260B GC/MS
Total Petroleum Hydrocarbons (TPH) - Semivolatile		USEPA SW846 – 8015A GC/FID
Benzene Toluene, Ethylbenzene and Total Xylene (BTEX)		USEPA SW846 – 8270B GC/MS
Polycyclic Aromatic Hydrocarbons (PAHs)		USEPA SW846 – 8270B GC/MS
Pesticides		USEPA SW846 – 8270B GC/MS
Polychlorinated Biphenyls (PCBs)		USEPA SW846 – 8270B GC/MS
pH (1:5)	EA002	APHA 21st ed., 4500H+
Electrical Conductivity (1:5)	EA010	APHA 21st ed., 2510
Exchangeable Cations with pre-treatment	ED008	Raymond & Lyons (2011) Method 15A2
Total Organic Carbon	EP003	In-house
Asbestos	EA200	AS 4964-2004

The samples were analysed for the parameters indicated above, and summarised in the following table :

Borehole Location	Sample ID	Sample Depth (m)	Material Type	Heavy Metals	TRH	BTEX	PAHs	OCPs	PCBs	Asbestos	pH/CEC/TOC
B1	B1-0.0-0.2 & QC2	0.0-0.2	Sandy Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B2	B2-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	●	●	●	●				●
B3	B3-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	●	●	●	●				●
B4	B4-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B5	B5-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B6	B6-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	●	●	●	●				●
B7	B7-0.0-0.3	0.0-0.3	Clayey Silt (Topsoil)	●	●	●	●				●
B8	B8-0.0-0.15	0.0-0.15	Clayey Silt (Fill)	●	●	●	●	●	●		●
B9	B9-0.0-0.2	0.0-0.2	Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B10	B10-0.0-0.4 & QC1	0.0-0.4	Clayey Silt (Topsoil)	●	●	●	●				●
B11	B11-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	●	●	●	●				●
	B11-0.5-0.65	0.5-0.65	Clayey Silt (Old Topsoil)	●	●	●	●	●	●		●
B12	B12-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	●	●	●	●	●	●		●
	B12-0.55-0.8	0.55-0.8	Clayey Silt (Old Topsoil)	●							
B13	B13-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	●	●	●	●	●	●		●
	B13-0.5-0.7	0.5-0.7	Sandy Clayey Silt (Old Topsoil)	●	●	●	●				●
B14	B14-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	●	●	●	●				●
B15	B15-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B16	B16-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B17	B17-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	●	●	●	●				●
B18	B18-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B19	B19-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B20	B20-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	●	●	●	●				●
B21	B21-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	●	●	●	●				●
	B21-1.3-1.5	1.3-1.5	Clayey Silt (Old Topsoil)	●	●	●	●	●	●		●
B22	B22-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	●	●	●	●	●	●		●
	B22-0.15-0.5	0.15-0.5	Clayey Silt (Fill)	●	●	●	●				●
B23	B23-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B24	B24-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	●	●	●	●				●
B25	B25-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	●	●	●	●	●	●		●
	B25-0.5-0.7	0.5-0.7	Sandy Clayey Silt (Old Topsoil)	●							
B26	B26-0.0-0.25	0.0-0.25	Sandy Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B27	B27-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B28	B28-0.0-0.25	0.0-0.25	Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B29	B29-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B30	B30-0.0-0.15 & QC3	0.0-0.15	Sandy Silt with Clay (Topsoil)	●	●	●	●	●	●		●
B31	B31-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B32	B32-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B33	B33-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B34	B34-0.0-0.2	0.0-0.2	Clayey Silt (Topsoil)	●	●	●	●	●	●	●	●

Borehole Location	Sample ID	Sample Depth (m)	Material Type	Heavy Metals	TRH	BTEX	PAHs	OCPs	PCBs	Asbestos	pH/CEC/TOC
B35	B35-0.0-0.1 & QC4	0.0-0.1	Sandy Clayey Silt (Topsoil)	●	●	●	●	●	●		●
B36	B36-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	●	●	●	●	●	●		●
F1	F1	0.0	Fibrous Fragment							●	

The analytical results are presented in **Appendix F**.

9.2 Laboratory QA/QC

The laboratory QA/QC reports from ALS are presented with the analytical results (see **Appendix F**).

The laboratory internal quality control measures included analysis of surrogates, matrix spike recovery samples, laboratory control samples, laboratory duplicate samples and method blanks.

10 Assessment Criteria

The analytical results have been assessed in accordance with the National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM), National Environment Protection Council (NEPC). The ASC NEPM is the leading national guidelines governing the assessment of contaminated sites. The ASC NEPM was originally released in 1999. Following an extensive review, the ASC NEPM was subsequently amended, taking into account amendments up to National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1). The ASC NEPM has been endorsed by the NSW EPA under Section 105 of the Contaminated Land Management Act 1997 (CLM Act). These guidelines do not include occupational health and safety procedures and WorkCover NSW should be consulted on these aspects.

Schedule B1 of ASC NEPM provides a framework for the use of investigation and screening levels. The selection of the most appropriate investigation and screening levels for use in a range of environmental settings and land use scenarios should consider factors including the protection of human health, ecosystems, groundwater resources and aesthetics.

Investigation levels and screening levels are applicable to the first stage (Tier 1 or 'screening') of site assessment, and are the concentrations of a contaminant above which further appropriate investigation and evaluation will be required.

Health Investigation Levels

Health Investigation Levels (HILs) are scientifically-based generic assessment criteria and designed to be used for the first stage of an assessment of potential risks to human health from chronic exposure to contaminants.

HILs have been developed for a broad range of metals and organic substances. The HILs are applicable for assessing human health risk via all relevant pathways of exposure. The HILs are generic to all soil types and apply generally to a depth of 3m below the surface for residential use. Site-specific conditions should determine the depth to which HILs apply for other land uses.

They are intentionally conservative and are based on a reasonable worst-case scenario for four generic land use settings, as briefly described below :

- HIL A – Low density residential (including primary school)
- HIL B – High density residential
- HIL C – Recreational / open space
- HIL D – Commercial / industrial

Health Screening Levels

Health Screening Levels (HSLs) have been developed for selected petroleum compounds and fractions in order to assess the human health risk via the inhalation and direct contact pathways. The HSLs are applicable for various land uses, soil types (sand / silt / clay), and depths below the surface to > 4m.

They are based on three generic land use settings (HSL-A / HSL-B, HSL-C and HSL-D), which are equivalent to those land use settings adopted for HILs.

In view of the fact that the Site's proposed for future use is to be a school (primary and high school), it is considered that the HILs and HSLs applicable to the generic land use setting of HIL A are appropriate. Land use setting of HIL A is defined as "residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and **primary schools**". The soil criteria (HIL-A / HSL-A) are presented in tables 1A(1) to 1A(3) of ASC NEPM – Schedule B1.

Ecological Investigation Levels

Ecological Investigation Levels (EILs) have been developed for selected metals and organic substances (Zn, Cu, Cr III, Ni, Pb, As, DDT and naphthalene) and are applicable for assessing risk to terrestrial ecosystems. EILs depend on specific soil physiochemical properties, land use scenarios, and generally apply to the top 2m of soil, which corresponds to the root zone and habitation of many species. EILs for these contaminants can be calculated using ASC NEPM Toolbox available on the Standing Council on Environment and Water (SCEW) website.

The EILs are determined for a contaminant based on the sum of the ambient background concentration (ABC) and an added contaminant limit (ACL). The ACL is the added concentration (above the ABC) of a contaminant above which further appropriate investigation and evaluation of the impact on ecological values is required.

Because EILs for cadmium and mercury have not been provided in ASC NEPM, the available Provisional Phytotoxicity Based Investigation Levels (PPILs) published in the NSW EPA Guidelines for the NSW Site Auditor Scheme (2nd Ed, 2006) are adopted.

EILs are not applicable to agricultural soils, which need evaluation in relation to crop toxicity, plant contaminant uptake and detailed consideration of soil type.

Ecological Screening Levels

Ecological Screening Levels (ESLs) have been developed for selected petroleum hydrocarbon compounds (BTEX and benzo[a]pyrene) and total petroleum hydrocarbon (TPH) fractions and are applicable for assessing risk to terrestrial ecosystems. ESLs broadly apply to coarse- and fine-grained soils and various land uses. They are generally applicable to the top 2m of soil.

EILs and ESLs have been developed for three generic land use settings, as below :

- Areas of ecological significance
- Urban residential areas and public open space
- Commercial and industrial land uses

“Urban residential / public open space” is broadly equivalent to the HIL-A, HIL-B and HIL-C land use scenarios.

In view of the fact that the Site’s proposed future use is to be a school, it is considered that the EILs and ESLs applicable to the generic land use setting “urban residential areas and public open space” are appropriate. The soil criteria are presented in tables 1B(1) to 1B(6) of ASC NEPM – Schedule B1.

Based on the current investigation, the clay content, pH, cation exchange level (CEC) and organic carbon content (TOC) assumed are as follows.

Soil Material	Assumed Clay Content
Clayey silt	40%
Sandy clayey silt	30%
Sandy silt with clay	10%

Soil Type	pH	CEC (cmo_c/kg)	Total Organic Carbon (% w/w)
Topsoil (Fill)	6.5	12.2	1.95
Fill	6.7	13.7	1.20
Old Topsoil (Fill)	6.7	8.7	1.02

Management Levels

Management Limits (MLs) have been developed for petroleum hydrocarbon compounds after appropriate consideration and application of the ESLs and HSLs.

MLs are relevant for operating sites where significant sub-surface leakage of petroleum compounds has occurred and when decommissioning industrial and commercial sites. The soil criteria are presented in table 1B(7) of ASC NEPM – Schedule B1.

Asbestos

The ASC NEPM provides guidance on the assessment of known and suspected asbestos contamination in soil and addresses both friable and non-friable forms of asbestos.

The ASC NEPM emphasises that the assessment and management of asbestos contamination should take into account the condition of the asbestos materials and the potential for damage and resulting release of asbestos fibres. For the purpose of assessing the significance of asbestos in soil contamination, the following three terms are used :

- Bonded asbestos containing material (bonded ACM)

Bonded ACM comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and the asbestos is bound in a matrix such as cement or resin. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve.

- Fibrous asbestos (FA)

  FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined as asbestos material that is in a degraded condition such that it can be broken or crumbed by hand pressure.

- Asbestos fines (AF)

  AF includes free fibres, small fibre bundles and also small fragments of bounded ACM that pass through a 7 mm x 7 mm sieve.

From a risk to human health perspective, FA and AF are considered to be equivalent to 'friable' asbestos in Safe Work Australia (2011), which is defined as 'material that is in a powder form or that can be crumbled, pulverised or reduced to a powder by hand pressure when dry, and contains asbestos'. FA and AF materials have the potential to generate, or be associated with, free asbestos fibres. Hence, FA and AF must be carefully managed to prevent the release of asbestos fibres into the air. Bonded ACM in sound condition represents a low human health risk. However, if the bonded material is damaged or crumbling, it may represent a significant human health risk if disturbed and fibres are made airborne.

The health screening levels for asbestos in soil, which are based on scenario-specific likely exposure levels, are adopted from the Western Australian Department of Health (WA DoH) Guidelines for Remediation and Management of Asbestos Contaminated Sites in Western Australia (WA DoH, 2009).

The health screening levels for asbestos in soil for various land use settings are tabulated below.

	Health Screening Level (w/w)			
Form of asbestos	**Residential A**	**Residential B**	**Recreational C**	**Commercial/ Industrial D**
Bonded ACM	0.01%	0.04%	0.02%	0.05%
FA and AF* (friable asbestos)	0.001%			
All forms of asbestos	No visible asbestos for surface soil			

* The screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres.

If the above health screening levels are not exceeded, then no contamination management actions are required except for ensuring the surface soil (minimum thickness of 100mm) is free of visible asbestos. This may be achieved by multidirectional raking or tilling and hand-picking of exposed fragments of bonded ACM.

In view of the fact that the Site's proposed future use is to be a school, it is considered that the health screening level applicable to the "Residential A" land use setting is appropriate.

11 Results and Site Characteristics

11.1 General

The subsurface conditions within the Site are given in the logs of boreholes B1 to B36 (see **Appendix B**) and are summarised in the following sections. Generally, the subsurface profiles comprise a sequence of fill, followed by residual deposits and then sedimentary bedrock of the Bringelly Shale. Please note that in the following discussions any thicknesses of what is inferred to be the original topsoil is included in total thickness of the fill unit.

11.2 Ground Conditions

A summary of the encountered subsurface profile and units are presented in the following table.

Table 1: Summary of encountered subsurface profiles

Borehole	Borehole Depth (m)	Depth of the Unit (m)			Comments
		Fill	Residual Soil	Bedrock	
B1	0.8	0.0 – 0.2	0.2 – 0.5	0.5 – 0.8	Push tube refusal at 0.8m.
B2	1.3	0.0 – 0.2	0.2 – 0.55	0.55 – 1.3	Push tube refusal at 1.3m.
B3	1.6	0.0 – 0.1	0.1 – 0.9	0.9 – 1.6	Push tube refusal at 1.6m.
B4	2.0	0.0 – 0.1	0.1 – 0.9	0.9 – 2.0	Push tube refusal at 2.0m.
B5	1.0	0.0 – 0.1	0.1 – 0.75	0.75 – 1.0	Push tube refusal at 1.0m.
B6	1.9	0.0 – 0.1	0.1 – 1.5	1.5 – 1.9	Push tube refusal at 1.9m.
B7	3.0	0.0 – 0.3	0.3 – 2.6	2.6 – 3.0	Push tube refusal at 3.0m.
B8	3.2	0.0 – 0.65	0.65 – 3.0	3.0 – 3.2	Push tube refusal at 3.2m.
B9	2.0	0.0 – 0.5	0.5 – 1.4	1.4 – 2.0	Push tube refusal at 2.0m.
B10	3.1	0.0 – 0.6	0.6 – 2.8	2.8 – 3.1	Push tube refusal at 3.1m.
B11	3.4	0.0 – 0.85	0.85 – 2.7	2.7 – 3.4	Push tube refusal at 3.4m. Water inflow at 3.0m. Water level at 2.0m at EOH.
B12	3.0	0.0 – 0.85	0.85 – 2.4	2.4 – 3.0	Push tube refusal at 3.0m. Water inflow at 2.7m. Water level at 1.4m at EOH.
B13	2.6	0.0 – 0.7	0.7 – 2.4	2.4 – 2.6	Push tube refusal at 2.6m.
B14	1.3	0.0 – 0.15	0.15 – 0.8	0.8 – 1.3	Push tube refusal at 1.3m.
B15	2.4	0.0 – 0.1	0.1 – 0.5	0.5 – 2.4	Push tube refusal at 2.4m.
B16	2.5	0.0 – 0.05	0.05 – 1.8	1.8 – 2.5	Push tube refusal at 2.5m.
B17	4.2	0.0 – 0.2	0.2 – 2.8	2.8 – 4.2	Push tube refusal at 4.2m.
B18	4.5	0.0 – 0.2	0.2 – 2.4	2.4 – 4.5	Groundwater inflow at 1.4m. Water level at 2.2m at EOH (09:50). Water level at surface (0.0m) at 10:40.
B19	4.5	0.0 – 0.45	0.45 – 4.2	4.2 – 4.5	Groundwater inflow at 3.5m depth. Water level at 0.9m

Borehole	Borehole Depth (m)	Depth of the Unit (m)			Comments
		Fill	Residual Soil	Bedrock	
					at EOH.
B20	4.5	0.0 – 0.95	0.95 – 2.9	2.9 – 4.5	Groundwater inflow at 4.2m. Water level at 0.1m at EOH (10:40). Water level at surface (0.0m) at (11:00).
B21	4.2	0.0 – 2.3	2.3 – 4.2	-	Push tube refusal at 4.2m. Groundwater inflows at 3.0m and 3.7m. Water level at 2.7m at EOH.
B22	4.5	0.0 – 1.3	1.3 – 2.95	2.95 – 4.5	Groundwater inflows at 3.55m and 4.35m. Water level at 3.3m at EOH.
B23	4.4	0.0 – 1.4	1.4 – 3.4	3.4 – 4.4	Push tube refusal at 4.4m.
B24	4.0	0.0 – 1.95	1.95 – 2.8	2.8 – 4.0	Push tube refusal at 4.0m.
B25	1.5	0.0 – 0.7	0.7 – 1.5	-	-
B26	1.5	0.0 – 1.1	1.1 – 1.5	-	-
B27	1.5	0.0 – 0.35	0.35 – 1.5	-	-
B28	1.5	0.0 – 0.35	0.35 – 1.2	1.2 – 1.5	-
B29	1.5	0.0 – 1.3	1.3 – 1.5	-	-
B30	1.5	0.0 – 0.6	0.6 – 1.5	-	-
B31	1.5	0.0 – 0.05	0.05 – 1.5	-	-
B32	1.5	0.0 – 0.15	0.15 – 1.5	-	-
B33	1.5	0.0 – 0.15	0.15 – 1.5	-	-
B34	0.7	0.0 – 0.2	0.2 – 0.4	0.4 – 0.7	Push tube refusal at 0.7m.
B35	1.5	0.0 – 0.1	0.1 – 0.5	0.5 – 1.5	-
B36	1.3	0.0 – 0.15	-	0.15 – 1.3	Push tube refusal at 1.3m.

Eastern Terrace

Boreholes B11 to B16, B25 and B34 to B36 were drilled within the eastern terrace part of the Site. Based on current layouts, the proposed hall/admin/library building will be located in the western half of this terrace; the north-eastern GLS building will span the filled batter (partially located in the eastern terrace and partially in the western terrace); while the proposed carpark will occupy the eastern part of this area.

As previously indicated, the terrace has been constructed by cut and fill. This is reflected in subsurface conditions encountered at discrete borehole locations as detailed below.

Boreholes B34 to B36 were drilled to depths of between 0.7m and 1.5m, along the eastern extremity of the terrace and in close proximity to the toe of the cut batter. Along this line of boreholes there is a very shallow (0.1m to 0.2m thick) cover of topsoil which is possibly re-worked original topsoil. The residual deposits, comprising firm silty clay and sandy silty clay, are also thinly developed (0m to 0.4m thick), indicating that the bulk of the residual profile has been stripped during prior earthworks. Bedrock was encountered at very shallow depths of between 0.15m (B36) and 0.5m (B35). Within the

depths penetrated by the push tube, the sandstone bedrock is assessed as extremely weathered with extremely weak rock substance strength. Push tube refusal at 0.7m (B34) and 1.3m (B36) is inferred to have occurred on at least highly weathered bedrock.

In the central part of the terrace (line of boreholes B14 and B15), the encountered conditions are not too dissimilar to the above with marginal increase in residual clay thicknesses. At these two locations, the topsoil cover is also very shallow (0.1m and 0.15m thick) and residual, firm to stiff, sandy silty clay extends to depths of 0.8m (B14) and 0.5m (B15) with thicknesses of 0.65m and 0.4m, respectively. The residual clay is underlain by extremely weathered sandstone to push tube refusals at 1.3m and 2.4m depths.

Based on the above, it is inferred that the cutting/stripping extended to the central part of the eastern terrace. The conditions described above may be expected within the proposed carpark area and along the eastern edge of the hall/admin/library building.

The remaining boreholes B11 to B13, B16 and B25 were drilled in the western part of the terrace and outside the cut areas from prior earthworks, as suggested by the presence of the original topsoil within the profile.

At the discrete borehole locations, the fill unit ranges in thickness of between 0.7m and 0.85m and comprises a sequence of a 0.1m to 0.15m cover of silty topsoil, followed by a 0.35m to 0.45m horizon of silty clay/clayey silt fill, and then a 0.2m to 0.35m horizon of original topsoil. The fill is poorly to moderately compact (firm consistency). The exception to the above was encountered in borehole B16 where only a veneer (0.05m thick) of topsoil was detected.

The fill is underlain by residual sandy silty clay to depths of between 1.8m (B16) and 2.7m (B11) with thicknesses of between 1.55m and 1.85m. The residual clay is typically of stiff consistency with SPT values in the range of N=8 to N=18. Borehole B25 was terminated at 1.5m depth within the residual clay stratum and prior to reaching the next stratigraphic succession; consequently, at this location the total thickness of residual clay is not known.

The residual clay is underlain by sandstone bedrock to push tube refusal depths of between 2.5m (B16) and 3.4m (B11). Within these depths, the bedrock is extremely weathered with extremely weak rock substance strength, locally with thin highly weathered interbeds and clay seams.

However, as indicated in **Section 1.3**, the embankment fill heights along the western edge of the terrace are typically in the order of 1m to 1.2m; consequently, to the west of the above line of boreholes fill thicknesses in excess of those indicated above may be expected.

Western Terrace

Boreholes B1 to B10, B17 to B24 and B26 to B33 were drilled within the western terrace part of the Site. Based on current layouts, the proposed GLS blocks will be located in the northern and southern parts of this terrace with the remaining parts being active and passive recreation areas. As previously indicated, the north-eastern GLS block will span the filled batter (partially located in the eastern terrace and partially in the western terrace).

The western terrace has been constructed mainly by filling along the western and southern boundaries with minor cutting along the central northern boundary. The greater fill thicknesses generally occur in the south-eastern part of the terrace (within the footprint of the south-western GLS block). This part of the site is inferred to be a former, north-east/south-west trending drainage depression/shallow gully that has been infilled. This is supported by diminishing fill thicknesses to the east and north-west of this area and the presence of groundwater.

Again, this is reflected in subsurface conditions encountered at discrete borehole locations as detailed below.

In the northern part of the terrace, within the footprint of the north-western and central-north GLS blocks (B1 to B8), the area is within the influence of former stripping/cutting. In boreholes B1 to B5, there is a veneer (0.1m to 0.2m thick) of silty topsoil fill overlying residual, firm to very stiff sandy silty clay which extends to depths of between 0.5m and 0.9m, with thicknesses of between 0.3m and 0.8m. Locally, the sandy silty clay contains thin laminations/interbeds of extremely weathered sandstone which generally behaves as medium dense clayey silty sand. Sandstone bedrock underlies the residual clay to the termination depths (push tube refusal) of between 0.8m (B1) and 2m (B4).

To the west and away from the influence of prior stripping/cutting (B7 to B10), the soil profile becomes more thickly developed. At discrete borehole locations, silty topsoil fill was encountered to depths of between 0.3m (B7) to 0.65m (B8), followed by residual clay, locally with extremely weathered sandstone interbeds/laminations, to depths of between 1.4m (B9) and 3m (B8). The residual soil is underlain by extremely weathered (extremely weak) sandstone, to the borehole termination depths of between 2m to 3.2m, where push tube refusal was registered.

In the south-western part of terrace, within the footprint of the southern GLS blocks (B17 to B24), the area has been extensively filled. All boreholes were drilled to depths of 4m to 4.5m

The subsurface profile comprises fill (including topsoil) to depths of 0.2m to 2.3m. The fill material comprises a layer of soft clayey silt to sandy clayey silt topsoil to depths of 0.05m to 0.2m. The fill deposits are thicker within the central and western parts of the proposed southern GLS blocks area. The topsoil layer in boreholes B19 to B24 is underlain by uncontrolled (soft to firm consistency) clayey silt to sandy clayey silt fill with varying concentrations of gravel, to depths of 0.45m to 1.4m. In boreholes B21, B23 and B24, the fill is underlain by what is inferred to be an old topsoil layer to depths of 1.4m to 1.95m. In borehole B21, the old topsoil layer is underlain by sandy clayey silt fill to 2.3m depth.

The fill is underlain by residual silty clay to sandy silty clay with varying concentrations of ironstone gravel to depths of 2.4m to 4.2m. The residual soil ranges in consistency from soft to very stiff and is moist.

The residual soil is underlain by extremely weathered (extremely weak) bedrock to the borehole termination depths of between 4.0m and 4.5m. The bedrock encountered is generally sandstone; however, siltstone was encountered from 3.4m to 4.4m in borehole B23, and siltstone/ shale was encountered from 3.8m to 4.0m in borehole B24. Push tube refusal was registered at the borehole terminations depths (4.0m to 4.5m) in boreholes B17, B21, B23 and B24. The remaining boreholes were terminated upon reaching the nominal target depth of 4.5m. Some minor thin (0.05m to 0.15m) highly weathered zones were encountered within the extremely weathered bedrock.

In the central and western parts of the terrace, within the footprint of the active and passive recreation areas (B26 to B33), relatively thick deposits of fill were encountered along the western and southern boundaries (B29), which have been built up. In the central portion (B27 and B28), only a veneer (0.35m) of fill was encountered, which suggests that in this part of the terrace only minor levelling has been undertaken in the past.

At discrete borehole locations, the subsurface profile generally comprises fill (including some topsoil) to depths of 0.05m (B31) to 1.3m (B29). The surficial layer is generally soft to firm, clayey silt/ sandy clayey silt to sandy silt topsoil to depths of 0.05m to 0.25m. In boreholes B26 to B29, the topsoil is underlain by mottled, soft to firm, clayey silt to sandy clayey silt fill with varying concentrations of gravel to depths of 0.35m to 0.9m. In boreholes B26 and B29, the mottled clayey silt/ sandy clayey silt fill is underlain by what is inferred to be an old topsoil layer of 1.1m and 1.3m.

The fill material is underlain by residual, firm to stiff silty clay with sand to sandy silty clay to depths of 1.2m (B28) to 1.5m. The residual soil is moist and ranges in consistency from firm to stiff. The majority of the boreholes were terminated within the residual deposits, apart from borehole B28.

In borehole B28, the residual soil is underlain by extremely weathered (extremely weak) sandstone from 1.2m to the borehole termination depth of 1.5m.

11.3 Groundwater Conditions

In boreholes B11 and B12, groundwater inflows were encountered at 3.0m and 2.7m, respectively, within thin, highly weathered sandstone zones. At the completion of each hole, the water level had risen to 2.0m and 1.4m, respectively.

In boreholes B18 to B22, groundwater inflows were encountered at depths of 1.4m to 4.2m, generally along highly weathered zones or zones of higher gravel concentration. At the completion of each hole, the water level had risen to 0.1m (B20) to 3.3m (B22). In boreholes B18 and B20, approximately 1 hour after the completion of the holes, the groundwater level had then risen to the ground surface.

It is interpreted that the groundwater encountered in these boreholes is associated with preferential drainage across the Site along a filled drainage channel/ depression that diagonally intersected the Site. Evidence of this drainage channel can be seen in the historical aerial photographs; particularly the 1930, 1951 and 1961 aerial photographs (see **Appendix C**).

At the time of fieldwork, groundwater was not encountered in the remaining boreholes within the depth of investigation. It should also be noted that the presence of groundwater/seepage will depend on seasonal weather changes and prevailing weather conditions at the time of construction. It is expected that groundwater (if encountered) across the remainder of the Site is likely to be deeper than the investigated depths and within the weathered bedrock profile.

11.4 Soil Analytical Results

All results, unless otherwise specified, are expressed as mg/kg.

11.4.1 Heavy Metals

A summary of analytical results is presented in **Table 1**.

The detected levels of various heavy metals are summarised below.

Analytes	Detected Concentration (mg/kg)			ASC NEPM	
	Topsoil	Fill	Old Topsoil	HIL-A	EIL / PPIL
Arsenic	6 - 24	11 - 12	8 - 12	100	100
Cadmium	<1	<1	<1	20	3
Chromium (total)	15 - 26	16 - 18	15 - 19	100 (Cr VI)	410 / 580 / 640 for Cr III
Copper	14 - 33	26 - 30	12 - 26	6000	220 (topsoil) / 220 (fill) / 180 (old topsoil)
Lead	17 - 119	20 - 41	14 - 68	300	1100
Nickel	8 - 22	19 - 22	13 - 14	400	200 (topsoil) / 210 (fill) / 130 (old topsoil)
Zinc	34 - 201	67 - 78	24 - 175	7400	550 (topsoil) / 590 (fill) / 440 (old topsoil)
Mercury	<0.1 to 0.1	<0.1	<0.1	10 / 40	1

It is considered that the chromium detected in the samples is essentially chromium III. Chromium VI is generally unstable in the environment and would usually be expected to transform readily to chromium III.

In all of the samples analysed, the concentrations of heavy metals were either not detected above the Limits of Reporting (LoRs) or were below both of the HIL-A and EIL/PPIL.

11.4.2 Total Recoverable Hydrocarbons (TRH) and Benzene, Toluene, Ethylbenzene and Total Xylene (BTEX)

A summary of analytical results is presented in **Table 2**. In all of the samples analysed, TRH and BTEX were not detected above the LoRs.

11.4.3 Polynuclear (Polycyclic) Aromatic Hydrocarbons (PAHs)

A summary of analytical results is presented in **Table 3**. In all of the samples analysed, PAHs were either not detected above the LoRs, or were below the threshold level (HIL-A / HSL-A / EIL / ESL).

11.4.4 Organochlorine Pesticides (OCPs) and Polychlorinated Biphenyls (PCBs)

A summary of analytical results is presented in **Table 4**. In all of the samples analysed, OCs and total PCBs were not detected above the LoRs.

11.4.5 Asbestos

A summary of analytical results is presented in **Table 5**. Chrysotile and amosite asbestos was detected in the bonded fibre-cement fragment (F1) collected from the ground surface near borehole B34. No asbestos was detected in the surface soil sample from borehole B34 (B34-0.0-0.2).

11.5 Field and Laboratory QA/QC

11.5.1 Field QA/QC

As mentioned in **Section 8.2**, four (4) duplicate sample pairs were sent to the laboratory for analysis. The results of the heavy metal analysis are compared below:

Analytes	B10-0.0-0.4	QC1	RPD	B1-0.0-0.2	QC2	RPD
Arsenic	12	9	29%	13	15	14%
Cadmium	<1	<1	-	<1	<1	-
Chromium	20	20	0%	22	19	15%
Copper	22	23	4%	33	38	14%
Lead	35	55	44%	74	65	13%
Nickel	14	14	0%	16	20	22%
Zinc	100	201	67%	79	101	24%
Mercury	<0.1	<0.1	-	<0.1	<0.1	-

Analytes	B30-0.0-0.15	QC3	RPD	B35-0.0-0.1	QC4	RPD
Arsenic	8	9	12%	10	10	0%
Cadmium	<1	<1	-	<1	<1	-
Chromium	22	19	15%	15	16	6%
Copper	26	27	4%	20	23	14%
Lead	119	111	7%	59	63	7%
Nickel	12	13	8%	11	12	9%
Zinc	84	88	5%	108	114	5%
Mercury	<0.1	<0.1	-	<0.1	<0.1	-

The Relative Percent Differences (RPD) for heavy metals were in the range 0% to 67%. The acceptable range of typical RPD for quality control samples (less than 30% – 50%). RPDs outside this acceptable range could be accounted for by sample heterogeneity.

11.5.2 Laboratory QA/QC

All samples were received at the laboratory (ALS) in good order, with the correct documentation and were properly chilled. All samples were analysed within the recommended holding times. The signed sample receipt advice for all samples is included on the chain of custody record sheet. The laboratory QA/QC reports from ALS are presented with the analytical results.

The laboratory QA/QC reports, presented in **Appendix F,** indicate that the analytical laboratory maintained appropriate QA/QC procedures.

11.6 Qualitative Assessment of Risk

Based on the current historical information and site observations, there is no strong evidence of any present or former industrial or intensive land cultivation activities occurring within the Site. The identified area of potential environmental concern within the Site is mainly the existing fill (including topsoil).The source of the fill is not precisely known, but likely to be associated with former levelling earthworks to create the sports field.

No obvious visible signs of discolouration or staining of the exposed ground surface, which may indicate contamination, was observed within the Site. Also there was no olfactory indication of hydrocarbon contamination within the soil or groundwater encountered within the boreholes, at the time of fieldwork.

In the current investigation, in all of the samples analysed, the concentrations of heavy metals were either not detected above the laboratory Limits of Reporting (LoR) or were below the relevant health and ecological threshold levels.

Also, in all of the samples analysed, TRH, BTEX, PAHs, OCPs and total PCBs were either not detected above the LoRs or were below the relevant health and ecological threshold levels.

One (1) bonded fibre-cement fragment (F1) was collected from the ground surface near borehole B34. The fibre-cement fragment was found to contain chrysotile and amosite asbestos. No asbestos was detected in the surface soil sample from borehole B34 (B34-0.0-0.2).

There were no other fibre-cement fragments observed on the ground surface within the Site. However the possibility of encountering some ACM debris within the dumped debris/ rubbish in the north-eastern corner and south-western corner of the Site should not be discounted. This debris/ rubbish should be removed from the Site and properly disposed offsite to a licenced landfill.

Groundwater inflows were encountered in boreholes B11, B12 and B18 to B22. It is interpreted that the groundwater encountered in these boreholes is associated with preferential drainage across the Site along a filled drainage channel/ depression that diagonally intersected the Site. Evidence of this drainage channel can be seen in the historical aerial photographs; particularly the 1930, 1951 and 1961 aerial photographs (see **Appendix C**). As mentioned above, there was no olfactory indication of hydrocarbon contamination within the groundwater encountered in the boreholes, at the time of fieldwork.

At the time of fieldwork, groundwater was not encountered in the remaining boreholes within the depth of investigation. It should also be noted that the presence of groundwater/seepage will depend on seasonal weather changes and prevailing weather conditions at the time of construction. It is expected that groundwater (if encountered) across the remainder of the Site is likely to be deeper than the investigated depths and within the weathered bedrock profile.

It should be noted that groundwater testing was not part of the approved scope of work commissioned for this investigation; therefore, no groundwater testing has been undertaken.

In view of the findings from the current investigation, it is considered that the likelihood of widespread contamination of the Site is low.

12 Conclusion and Recommendations

Based on the findings from the current contamination investigation, it is considered that the Site is suitable for the proposed development, subject to the implementation of the following recommendations.

- The observed debris/ rubbish on the ground surface in the north-eastern and south-western parts of the Site should be removed and be properly disposed offsite to a licensed landfill. Any fibre-cement fragments found, unless proved otherwise, should be assumed to contain asbestos and be designated as asbestos waste. The Site should then be secured (if possible) to prevent any further illegal dumping of waste.

- As recommended in GHD's PSI report, it would be prudent to install three (3) groundwater monitoring wells within the Site to determine whether potentially contaminated groundwater from the nearby service stations is entering the Site. It should be noted that any groundwater encountered outside the alignment of the former drainage channel/ depression will be below the depths of any foundation excavations for the proposed buildings or general earthworks on Site.

- Any material that is to be excavated and disposed of in a NSW OEH licensed landfill should be assessed and classified (with TCLP testing, where appropriate) in accordance with the *Waste Classification Guidelines* (NSW DECC, 2009) and relevant legislation.

- Any imported material should be validated in accordance with National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM). The fill material should not contain asbestos, and not be acid sulfate soil or saline soil. The imported fill material should be 'virgin excavated natural material' (VENM) or 'excavated natural material' (ENM), as defined in the *Waste Classification Guidelines* (NSW DECC, 2009) because of their low risk of contamination.

- An Environmental Site Management Plan should be prepared. This Plan should include a contingency plan for the assessment / management of any UNEXPECTED discovery of contamination during the course of earthworks.

13 References

GHD 2015, *Old Guildford Public School Oval, 49 Woodville Road, Chester Hill – Preliminary Site Investigation*.

NPEC 2013, *National Environment Protection (Assessment of Site Contamination) Measure 1999*, National Environment Protection Council, Canberra.

NSW DECC 2009, *Waste Classification Guidelines*, NSW Department of Environment and Climate Change, Sydney.

NSW DEC 2006, *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd Edition)*, NSW Department of Environment and Conservation, Sydney.

NSW DFSI 2015, *Rowland Hassall School Relocation – 49 Woodville Road, Chester Hill - Geotechnical Investigation*, NSW Department of Finance, Services and Innovation, Sydney.

NSW EPA 1995, *Contaminated Sites: Sampling Design Guidelines*, NSW Environment Protection Authority, Sydney.

NSW EPA 1994, *Contaminated Sites: Guidelines for Assessing Service Station Sites*, NSW Environment Protection Authority, Sydney.

NSW OEH 2011, *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*, NSW Environment Protection Authority, Sydney.

TABLES

TABLE 1 : Summary of Analytical Results - Heavy Metals, Cation Exchange Capacity (CEC), pH and Total Organic Carbon (TOC)

Borehole	Sample ID	Depth (m)	Main Material Type	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc	Mercury	CEC	pH	TOC
B1	B1-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	**13**	<1	**22**	**33**	**74**	**16**	**79**	<0.1	**12.8**	**6.6**	**2.55**
B2	B2-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	**12**	<1	**20**	**22**	**63**	**16**	**84**	<0.1	**12.8**	**6.7**	**3.42**
B3	B3-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	**11**	<1	**18**	**30**	**52**	**12**	**69**	<0.1	**13.7**	**6.4**	**2.83**
B4	B4-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	**13**	<1	**23**	**27**	**63**	**21**	**98**	<0.1	**12.4**	**6.4**	**2.52**
B5	B5-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	**8**	<1	**18**	**30**	**49**	**14**	**81**	<0.1	**11.7**	**6.4**	**3.46**
B6	B6-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	**11**	<1	**18**	**27**	**60**	**19**	**131**	<0.1	**14.4**	**6.3**	**3.12**
B7	B7-0.0-0.3	0.0-0.3	Clayey Silt (Topsoil)	**9**	<1	**16**	**18**	**17**	**22**	**40**	<0.1	**11.4**	**6.9**	**1.63**
B8	B8-0.0-0.15	0.0-0.15	Clayey Silt (Fill)	**11**	<1	**18**	**30**	**41**	**22**	**78**	<0.1	**13.0**	**6.9**	**1.63**
B9	B9-0.0-0.2	0.0-0.2	Clayey Silt (Topsoil)	**8**	<1	**16**	**19**	**31**	**13**	**63**	<0.1	**13.8**	**6.9**	**1.48**
B10	B10-0.0-0.4	0.0-0.4	Clayey Silt (Topsoil)	**12**	<1	**20**	**22**	**35**	**14**	**100**	<0.1	**13.2**	**7.1**	**1.56**
B11	B11-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	**9**	<1	**20**	**15**	**25**	**12**	**46**	<0.1	**9.9**	**6.7**	**1.08**
B11	B11-0.5-0.65	0.5-0.65	Clayey Silt (Old Topsoil)	**9**	<1	**16**	**13**	**24**	**13**	**41**	<0.1	**9.2**	**6.8**	**1.19**
B12	B12-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	**10**	<1	**18**	**14**	**19**	**11**	**34**	<0.1	**9.9**	**6.7**	**0.84**
B12	B12-0.55-0.8	0.55-0.8	Clayey Silt (Old Topsoil)	**8**	<1	**17**	**13**	**21**	**13**	**36**	<0.1	**-**	**-**	-
B13	B13-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	**8**	<1	**20**	**27**	**49**	**17**	**115**	<0.1	**12.0**	**6.6**	**1.26**
B13	B13-0.5-0.7	0.5-0.7	Sandy Clayey Silt (Old Topsoil)	**9**	<1	**15**	**12**	**14**	**13**	**31**	<0.1	**8.9**	**6.9**	**1.17**
B14	B14-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	**10**	<1	**20**	**25**	**41**	**11**	**75**	<0.1	**13.1**	**6.5**	**0.62**
B15	B15-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	**14**	<1	**18**	**28**	**38**	**11**	**64**	<0.1	**11.3**	**6.0**	**2.31**
B16	B16-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	**11**	<1	**18**	**17**	**27**	**12**	**43**	<0.1	**12.1**	**6.6**	**2.33**
B17	B17-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	**9**	<1	**17**	**18**	**33**	**13**	**59**	<0.1	**14.8**	**6.5**	**0.78**
B18	B18-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	**10**	<1	**18**	**18**	**39**	**12**	**61**	<0.1	**12.2**	**7.4**	**1.25**
B19	B19-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	**21**	<1	**20**	**26**	**21**	**8**	**46**	<0.1	**8.6**	**5.7**	**2.24**
B20	B20-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	**12**	<1	**15**	**26**	**44**	**14**	**81**	<0.1	**12.6**	**6.0**	**0.66**
B21	B21-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	**24**	<1	**17**	**21**	**22**	**9**	**47**	<0.1	**13.8**	**6.2**	**2.84**
B21	B21-1.3-1.5	1.3-1.5	Clayey Silt (Old Topsoil)	**12**	<1	**19**	**26**	**68**	**14**	**175**	<0.1	**7.9**	**6.3**	**0.69**
B22	B22-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	**10**	<1	**21**	**23**	**42**	**14**	**72**	<0.1	**10.4**	**6.4**	**3.70**
B22	B22-0.15-0.5	0.15-0.5	Clayey Silt (Fill)	**12**	<1	**16**	**26**	**20**	**19**	**67**	<0.1	**14.4**	**6.4**	**0.70**
B23	B23-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	**10**	<1	**26**	**22**	**41**	**14**	**59**	**0.1**	**12.2**	**6.6**	**0.86**
B24	B24-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	**11**	<1	**22**	**16**	**33**	**9**	**40**	<0.1	**9.0**	**6.5**	**2.00**
B25	B25-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	**14**	<1	**19**	**18**	**27**	**10**	**98**	<0.1	**14.3**	**6.7**	**1.31**
B25	B25-0.5-0.7	0.5-0.7	Sandy Clayey Silt (Old Topsoil)	**9**	<1	**18**	**12**	**15**	**13**	**24**	<0.1	**-**	**-**	-
B26	B26-0.0-0.25	0.0-0.25	Sandy Clayey Silt (Topsoil)	**10**	<1	**18**	**20**	**33**	**13**	**52**	<0.1	**8.4**	**6.2**	**1.87**
B27	B27-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	**12**	<1	**16**	**22**	**45**	**13**	**70**	<0.1	**12.1**	**6.2**	**0.44**
B28	B28-0.0-0.25	0.0-0.25	Clayey Silt (Topsoil)	**9**	<1	**19**	**15**	**41**	**12**	**77**	<0.1	**10.5**	**6.8**	**2.02**
B29	B29-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	**10**	<1	**20**	**23**	**47**	**15**	**76**	<0.1	**14.3**	**6.3**	**1.44**
B30	B30-0.0-0.15	0.0-0.15	Sandy Silt with Clay (Topsoil)	**8**	<1	**22**	**26**	**119**	**12**	**84**	<0.1	**9.8**	**5.6**	**3.55**
B31	B31-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	**8**	<1	**18**	**26**	**67**	**13**	**81**	<0.1	**11.1**	**5.9**	**2.94**
B32	B32-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	**7**	<1	**17**	**22**	**51**	**12**	**57**	<0.1	**11.7**	**6.7**	**1.27**
B33	B33-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	**13**	<1	**16**	**28**	**33**	**20**	**83**	<0.1	**15.8**	**6.9**	**2.62**
B34	B34-0.0-0.2	0.0-0.2	Clayey Silt (Topsoil)	**10**	<1	**16**	**26**	**30**	**18**	**85**	<0.1	**21.2**	**7.7**	**0.48**
B35	B35-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	**10**	<1	**15**	**20**	**59**	**11**	**108**	<0.1	**12.6**	**6.3**	**2.66**
B36	B36-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	**6**	<1	**17**	**23**	**44**	**16**	**67**	<0.1	**8.3**	**6.4**	**2.15**
Duplicate Sample														
Dup-B10-0.0-0.4	QC1	0.0-0.4	Clayey Silt (Topsoil)	**9**	<1	**20**	**23**	**55**	**14**	**201**	<0.1	-	-	-
Dup-B1-0.0-0.2	QC2	0.0-0.2	Sandy Clayey Silt (Topsoil)	**15**	<1	**19**	**38**	**65**	**20**	**101**	<0.1	-	-	-
Dup-B30-0.0-0.15	QC3	0.0-0.15	Sandy Silt with Clay (Topsoil)	**9**	<1	**19**	**27**	**111**	**13**	**88**	<0.1	-	-	-
Dup-B35-0.0-0.1	QC4	0.0-0.1	Sandy Clayey Silt (Topsoil)	**10**	<1	**16**	**23**	**63**	**12**	**114**	<0.1	-	-	-
Limit of Reporting (LOR)				5	1	2	5	5	2	5	0.1	0.1	0.1	0.02
Minimum				6	<1	15	12	14	8	24	<0.1	8.3	5.6	0.44
Maximum				24	<1	26	33	119	22	201	0.1	21.2	7.7	3.70
National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013 (ASC NEPM)			**HIL-A**	100	20	100 [a]	6000	300	400	7400	10 [b] / 40 [c]			
			EIL	100	-	580/640/690 [d]	220(topsoil & fill) /180 (old topsoil) [e]	1100	200(topsoil) /210(fill) /130 (old topsoil) [e]	550(topsoil) /590(fill) /440 (old topsoil) [e]	-			
Guidelines for the NSW Site Auditor Scheme (2nd Ed 2006)			**PPIL**	-	3	-	-	-	-	-	1 [e]			

All results are expressed as mg/kg, unless otherwise stated.
CEC = Cation Exchange Capacity (cmo_c/kg)
TOC = Total Organic Carbon (% w/w)

HIL-A = Health Investigation Level for land use "Residential A" (Schedule B1)

EIL = Ecological Investigation Level for land use "Urban Residential & Public Open Space" (Schedule B1)

PPIL = Provisional Phytotoxicity-based Investigation Level

Values highlighted exceeds HIL-A

Values highlighted exceeds EIL / PPIL

a: Chromium VI
b: Methyl mercury
c: Mercury (inorganic)
d: EIL for aged Chromium III based on % of clay = 40% (clayey silt), 30% (sandy clayey silt) & 50% (sandy silty clay).
e: EIL for aged Cu, Ni & Zn based on = topsoil (pH= 6.5, CEC= 12.2cmo_c/kg and total organic carbon= 1.95%); fill (pH= 6.7, CEC= 13.7cmoc/kg and total organic carbon= 1.2%); old topsoil (pH= 6.7, CEC= 8.7cmoc/kg and total organic carbon=

TABLE 2 : Summary of Analytical Results - Total Recoverable Hydrocarbons (TRH) and Benzene, Toluene, Ethylbenzene and Total Xylene (BTEX)

Borehole	Sample ID	Depth (m)	Material Type	Analytical Results									Health Screening Level (HSL) A - Low Density Residential								Ecological Screening Level (ESL) - Urban Residential & Public Open Space															
				TRH					BTEX												Coarse-grained Soil								Fine-grained Soil							
				F1	F2	F2*	F3	F4	B	T	E	X	F1	F2	F3	F4	B	T	E	X	F1	F2*	F3	F4	B	T	E	X	F1	F2*	F3	F4	B	T	E	X
B1	B1-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B2	B2-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B3	B3-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B4	B4-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B5	B5-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B6	B6-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B7	B7-0.0-0.3	0.0-0.3	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B8	B8-0.0-0.15	0.0-0.15	Clayey Silt (Fill)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B9	B9-0.0-0.2	0.0-0.2	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B10	B10-0.0-0.4	0.0-0.4	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B11	B11-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B11	B11-0.0.5-0.65	0.5-0.65	Clayey Silt (Old Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B12	B12-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B12	B12-0.55-0.8	0.55-0.8	Clayey Silt (Old Topsoil)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13	B13-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B13	B13-0.5-0.7	0.5-0.7	Sandy Clayey Silt (Old Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B14	B14-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B15	B15-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B16	B16-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B17	B17-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B18	B18-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B19	B19-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B20	B20-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B21	B21-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B21	B21-1.3-1.5	1.3-1.5	Clayey Silt (Old Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B22	B22-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B22	B22-0.15-0.5	0.15-0.5	Clayey Silt (Fill)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B23	B23-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B24	B24-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B25	B25-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B25	B25-0.5-0.7	0.5-0.7	Sandy Clayey Silt (Old Topsoil)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-															
B26	B26-0.0-0.25	0.0-0.25	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B27	B27-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B28	B28-0.0-0.25	0.0-0.25	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B29	B29-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B30	B30-0.0-0.15	0.0-0.15	Sandy Silt with Clay (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B31	B31-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B32	B32-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B33	B33-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B34	B34-0.0-0.2	0.0-0.2	Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B35	B35-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
B36	B36-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	40	230	-	-	0.6	390	-	95	-	-	-	-	-	-	-	-	180	120	1300	5600	65	105	125	45
Limit of Reporting (LOR)				10	50	50	100	100	0.2	0.5	0.5	0.5																								
Minimum				<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5																								
Maximum				<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5																								

All results are expressed as mg/kg

BTEX = Benzene (B), Toluene (T), Ethylbenzene (E) and Xylenes (X)

HSL-A = Health Screening Level for land use "Residential A" (Schedule B1)

ESL = Ecological Screening Level for land use "Urban Residential & Public Open Space" (Schedule B1)

F1 = C_6 - C_{10} less BTEX

F2 = >C_{10}- C_{16} less Naphthalene

F2* = >C_{10}- C_{16}

F3 = >C_{16} - C_{34}

F4 = >C_{34} - C_{40}

Values highlighted exceeds HSL-A

Values highlighted exceeds ESL

TABLE 3 : Summary of Analytical Results - Polynuclear (Polycyclic) Aromatic Hydrocarbons (PAHs)

Borehole	Sample ID	Depth (m)	Material Type	BaP	BaP (TEQ)	Naphthalene	Total PAHs
B1	B1-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B2	B2-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B3	B3-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B4	B4-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B5	B5-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B6	B6-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B7	B7-0.0-0.3	0.0-0.3	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B8	B8-0.0-0.15	0.0-0.15	Clayey Silt (Fill)	<0.5	**1.2**	<0.5	<0.5
B9	B9-0.0-0.2	0.0-0.2	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B10	B10-0.0-0.4	0.0-0.4	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B11	B11-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B11	B11-0.0.5-0.65	0.5-0.65	Clayey Silt (Old Topsoil)	<0.5	**1.2**	<0.5	<0.5
B12	B12-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B12	B12-0.55-0.8	0.55-0.8	Clayey Silt (Old Topsoil)	-	-	-	-
B13	B13-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B13	B13-0.5-0.7	0.5-0.7	Sandy Clayey Silt (Old Topsoil)	<0.5	**1.2**	<0.5	<0.5
B14	B14-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B15	B15-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B16	B16-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B17	B17-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B18	B18-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B19	B19-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B20	B20-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B21	B21-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B21	B21-1.3-1.5	1.3-1.5	Clayey Silt (Old Topsoil)	<0.5	**1.2**	<0.5	<0.5
B22	B22-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B22	B22-0.15-0.5	0.15-0.5	Clayey Silt (Fill)	<0.5	**1.2**	<0.5	<0.5
B23	B23-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B24	B24-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B25	B25-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B25	B25-0.5-0.7	0.5-0.7	Sandy Clayey Silt (Old Topsoil)	-	-	-	-
B26	B26-0.0-0.25	0.0-0.25	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B27	B27-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B28	B28-0.0-0.25	0.0-0.25	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B29	B29-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B30	B30-0.0-0.15	0.0-0.15	Sandy Silt with Clay (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B31	B31-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B32	B32-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B33	B33-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B34	B34-0.0-0.2	0.0-0.2	Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B35	B35-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
B36	B36-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	<0.5	**1.2**	<0.5	<0.5
Limit of Reporting (LOR)				0.5	0.5	0.5	0.5
Minimum				<0.5	1.2	<0.5	<0.5
Maximum				<0.5	1.2	<0.5	<0.5
National Environment Protection (Assessment of Site Contamination) Measure 1999, amended 2013 (ASC NEPM)			**HIL-A**	-	3	-	300
			HSL-A	-	-	3 (sand) / 4 (silt) / 5 (clay)	-
			EIL	-	-	170	-
			ESL	0.7 (coarse & fine)	-	-	-

All results are expressed as mg/kg, unless otherwise stated.

HIL-A = Health Investigation Level for land use "Residential A" (Schedule B1)
HSL-A = Health Screening Level for land use "Residential A"
EIL = Ecological Investigation Level for land use "Urban Residential & Public Open Space" (Schedule B1)
ESL = Ecological Screening Level for land use "Urban Residential & Public Open Space" (Schedule B1)

Values highlighted exceeds HIL-A / HSL-A

Values highlighted exceeds EIL / ESL

TABLE 4 : Summary of Analytical Results - Organochlorine Pesticides (OCPs) and Polychlorinated Biphenyls (PCBs)

Borehole	Sample ID	Depth (m)	Material Type	Organochlorine Pesticides									PCBs
				Hexachlorobenzene	Heptachlor	Chlordane	Endrin	Endosulfan	Methoxychlor	Aldrin + Dieldrin	DDD + DDE + DDT	DDT	
B1	B1-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B2	B2-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	-	-	-	-	-	-	-	-	-	-
B3	B3-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	-	-	-	-	-	-	-	-	-	-
B4	B4-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B5	B5-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B6	B6-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	-	-	-	-	-	-	-	-	-	-
B7	B7-0.0-0.3	0.0-0.3	Clayey Silt (Topsoil)	-	-	-	-	-	-	-	-	-	-
B8	B8-0.0-0.15	0.0-0.15	Clayey Silt (Fill)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B9	B9-0.0-0.2	0.0-0.2	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B10	B10-0.0-0.4	0.0-0.4	Clayey Silt (Topsoil)	-	-	-	-	-	-	-	-	-	-
B11	B11-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	-	-	-	-	-	-	-	-	-	-
B11	B11-0.0.5-0.65	0.5-0.65	Clayey Silt (Old Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B12	B12-0.0-0.1	0.0-0.1	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B12	B12-0.55-0.8	0.55-0.8	Clayey Silt (Old Topsoil)	-	-	-	-	-	-	-	-	-	-
B13	B13-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B13	B13-0.5-0.7	0.5-0.7	Sandy Clayey Silt (Old Topsoil)	-	-	-	-	-	-	-	-	-	-
B14	B14-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	-	-	-	-	-	-	-	-	-	-
B15	B15-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B16	B16-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B17	B17-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	-	-	-	-	-	-	-	-	-	-
B18	B18-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B19	B19-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B20	B20-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	-	-	-	-	-	-	-	-	-	-
B21	B21-0.0-0.2	0.0-0.2	Sandy Clayey Silt (Topsoil)	-	-	-	-	-	-	-	-	-	-
B21	B21-1.3-1.5	1.3-1.5	Clayey Silt (Old Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B22	B22-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B22	B22-0.15-0.5	0.15-0.5	Clayey Silt (Fill)	-	-	-	-	-	-	-	-	-	-
B23	B23-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B24	B24-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	-	-	-	-	-	-	-	-	-	-
B25	B25-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B25	B25-0.5-0.7	0.5-0.7	Sandy Clayey Silt (Old Topsoil)	-	-	-	-	-	-	-	-	-	-
B26	B26-0.0-0.25	0.0-0.25	Sandy Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B27	B27-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B28	B28-0.0-0.25	0.0-0.25	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B29	B29-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B30	B30-0.0-0.15	0.0-0.15	Sandy Silt with Clay (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B31	B31-0.0-0.05	0.0-0.05	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B32	B32-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B33	B33-0.0-0.15	0.0-0.15	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B34	B34-0.0-0.2	0.0-0.2	Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B35	B35-0.0-0.1	0.0-0.1	Sandy Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
B36	B36-0.0-0.15	0.0-0.15	Sandy Clayey Silt (Topsoil)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
Limit of Reporting (LOR)				0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.05	0.2	0.1
Minimum				<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
Maximum				<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.2	<0.1
National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013 (ASC NEPM)			**HIL-A**	10	6	50	10	270	300	6	240	-	1
			EIL	-	-	-	-	-	-	-	-	180	-

All results are expressed as mg/kg, unless otherwise stated.

HIL-A = Health Investigation Level for land use "Residential A" (Schedule B1)

EIL = Ecological Investigation Level for land use "Urban Residential & Public Open Space" (Schedule B1)

Values highlighted exceeds HIL-A

Values highlighted exceeds EIL

TABLE 5 : Summary of Analytical Results - Asbestos

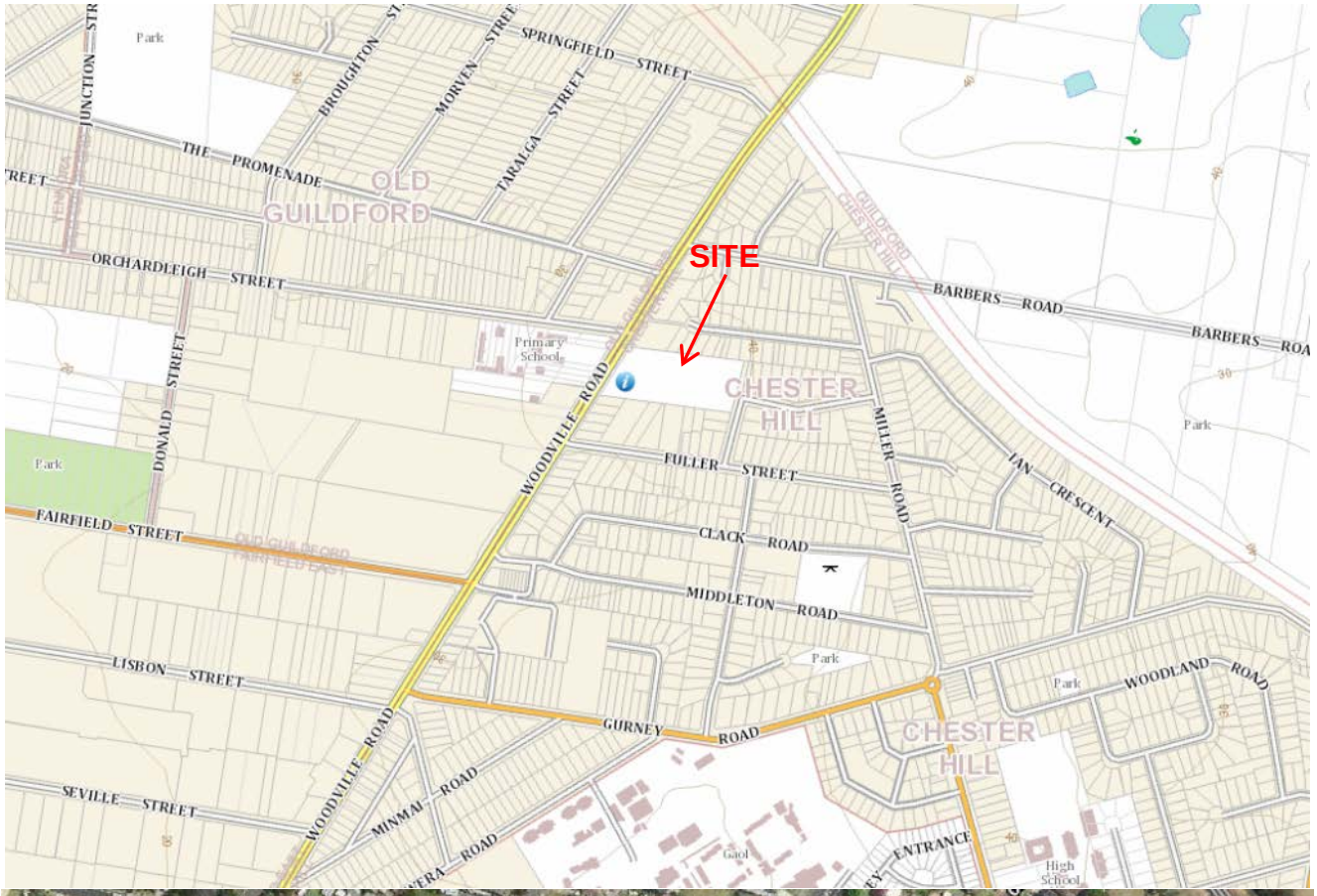
Borehole	Sample ID	Depth (m)	Laboratory Description		Health screening level (w/w)		
					Bonded ACM	FA and AF (friable asbestos)	All forms of Asbestos
-	F1	Ground surface	Four pieces of bonded asbestos fibre board approx. 145 x 100 x 5mm.				**Chrysotile / Amosite**
B34	B34-0.0-0.2	0.0-0.2	Mid brown clay soil with grey rocks.				**No**
National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013 (ASC NEPM)				**Residential A**	**0.01% w/w**	**0.001% w/w**	**No visible asbestos for surface soil**

All results are expressed as % w/w, unless otherwise stated.

HSL-A = Health screening level for land use setting "Residential A" (Schedule B1)

Values highlighted exceeds health screening level

FIGURES



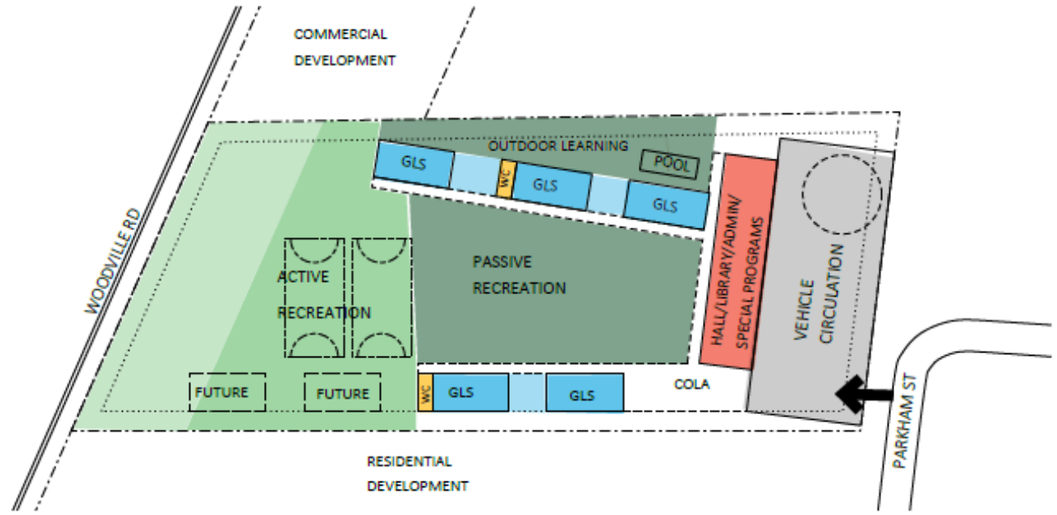
MARTIN HOFFMAN – Secretary Department of Finance, Services and Innovation	Public Works NSW Water Solutions	NEW ROWLAND HASSALL SCHOOL SITE LOCATION PLAN	JOB No. GS91B
SPECIALIST SERVICES NEW SOUTH WALES PUBLIC WORKS LEVEL 14, McKELL BUILDING 2-24 RAWSON PLACE SYDNEY 2000 PHONE (02)9372 7834 FAX (02)9372 7877	PROJECT ENGINEER P. ANDERSON DRAFTED K.PARMETER CHECKED P. ANDERSON DATE AUGUST 2015		FIGURE No. 1

5. MASTERPLAN OPTIONS

INTRODUCTION: Four masterplan options were provided by the Government Architect's Office for consideration by the PAG. The options were based on a schedule of accommodation provided by DEC. Factors such as vehicle and pedestrian access to the site, solar access, potential neighbour's concerns such as overshadowing, privacy and noise, and local planning constraints were also taken into consideration.

Advice from the PAG was also taken into account covering:

- operational requirements
-the school cohort and behavioural issues
-safety and maintenance considerations



EXISTING SCHOOL SITE: 0.8 HA

NEW SCHOOL SITE: 1.5ha

OPTION A - CENTRAL OPEN SPACE

MAXIMISE EXTERNAL AREA & PROVIDE VISUAL LINK TO PARKHAM ST

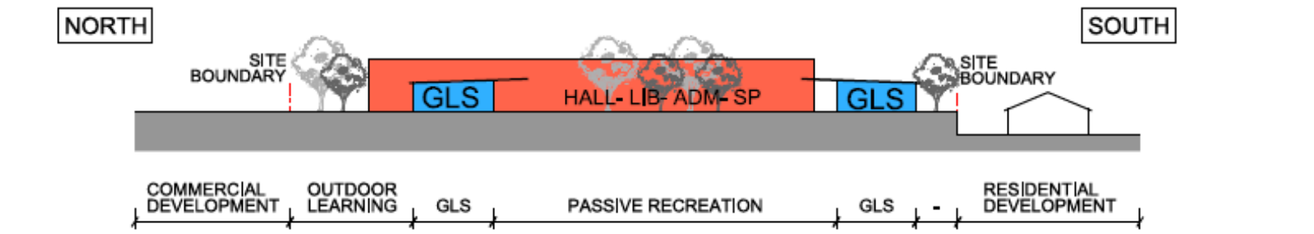
OPPORTUNITIES

- Footprint allows for future growth (4 future GLSs shown)
- Large external space
- Northerly aspect optimised
- Library, Admin & Hall located for ease of community access
- Potential for a variety of open spaces
- Outdoor learning spaces between GLS

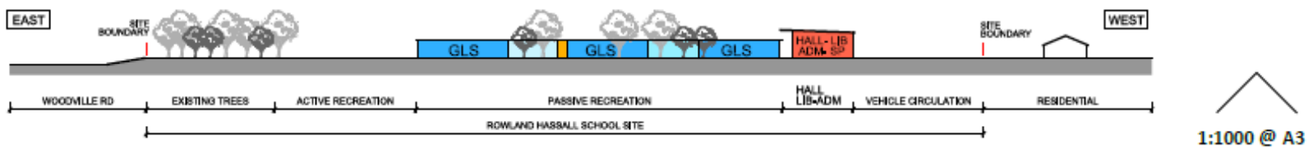
CHALLENGES

- Some spaces facing east & west
- Potential exposure to noise fromWoodville Rd
- Potential privacy issues for northern neighbours

Note: A location for a pool is shown, however it is not included in the costing



N-S SECTION 1:500@A3



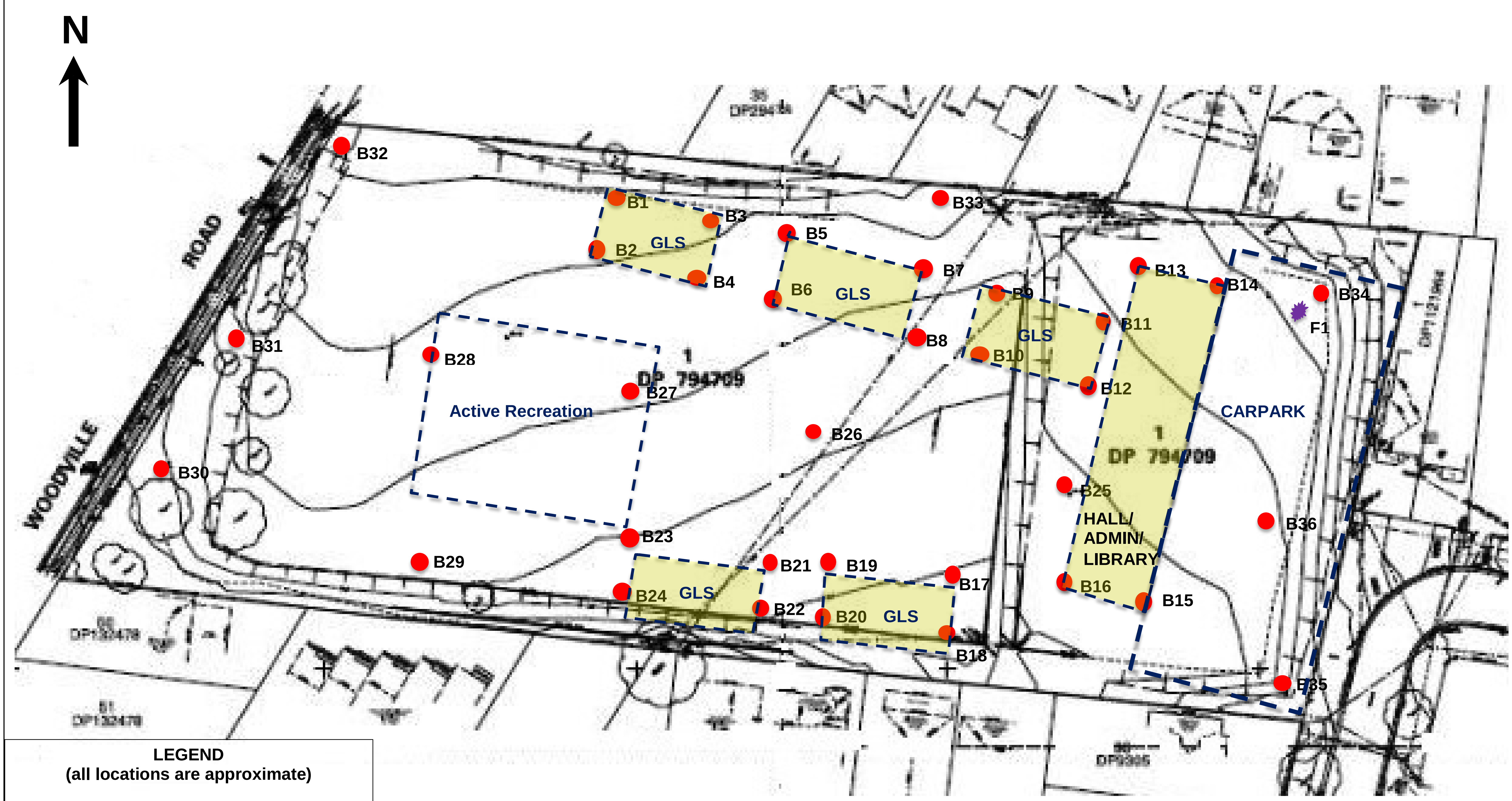
E-W SECTION

1:1000 @ A3

MARTIN HOFFMAN – Secretary Department of Finance, Services and Innovation SPECIALIST SERVICES NEW SOUTH WALES PUBLIC WORKS LEVEL 14, McKELL BUILDING 2-24 RAWSON PLACE SYDNEY 2000 PHONE (02)9372 7834 FAX (02)9372 7877	NSW GOVERNMENT Public Works NSW Water Solution PROJECT ENGINEER P. ANDERSON DRAFTED K. PARMETER CHECKED P. ANDERSON / DATE AUGUST 2015	**NEW ROWLAND HASSALL SCHOOL** **SITE PLAN – OPTION A**

JOB No. GS91B

FIGURE No. 2



LEGEND
(all locations are approximate)

- BOREHOLE LOCATION
- FIBRE-CEMENT FRAGMENT
- PROPOSED BUILDING LOCATION

MARTIN HOFFMAN – Secretary Department of Finance, Services and Innovation	NSW Public Works NSW Water Solutions	
SPECIALIST SERVICES NEW SOUTH WALES PUBLIC WORKS LEVEL 14, McKELL BUILDING 2-24 RAWSON PLACE SYDNEY 2000 PHONE (02)9372 7834 FAX (02)9372 7877	PROJECT ENGINEER P. ANDERSON	
	DRAFTED K. PARMETER	
	CHECKED P. ANDERSON	DATE AUGUST 2015

NEW ROWLAND HASSALL SCHOOL
BOREHOLE LOCATION PLAN

JOB No. GS91B

FIGURE No. 3

N

1:1,655
9 July 2015

49 Woodville Road, Chester Hill

100 year ARI Flood Extent Map

DISCLAIMER: COUNCIL EXPRESSLY DISCLAIMS ALL LIABILITY FOR ERRORS OR OMISSIONS.
THIS PLAN HAS NO LEGAL STANDING

BANKSTOWN
City of Progress

MARTIN HOFFMAN – Secretary
Department of Finance, Services and Innovation

SPECIALIST SERVICES
NEW SOUTH WALES PUBLIC WORKS
LEVEL 14, McKELL BUILDING
2-24 RAWSON PLACE SYDNEY 2000
PHONE (02)9372 7834 FAX (02)9372 7877

NSW GOVERNMENT Public Works NSW Water Solutions

PROJECT ENGINEER	P. ANDERSON
DRAFTED	K.PARMETER
CHECKED	P. ANDERSON
DATE	AUGUST 2015

NEW ROWLAND HASSALL SCHOOL

100 year ARI Flood Extent Map

JOB No. GS91B

FIGURE No. 4

PLATES

PLATE 1: General view of the eastern terrace, looking towards the south-west.

PLATE 2: The cut batter along the eastern boundary of the eastern terrace is overgrown with grass, weeds and shrubs. Residential properties are located to the east and north of the Site.

PLATE 3: View looking north along the grass-covered fill batter between the eastern and western terraces.

PLATE 4: View looking east near the northern boundary fence. Rubbish and debris are located near the fenceline; however it's partially obscured by vegetation in this photograph.

PLATE 5: Concrete kerb and stormwater pit in the south-western corner of the eastern terrace.

PLATE 6: At the time of fieldwork, the middle and southern parts of the eastern terrace were very soft, water logged and boggy.

PLATE 7: View looking east showing the low cut embankment along the northern boundary of the western terrace.

PLATE 8: View looking south showing the fill embankment along the western boundary of the western terrace, near Woodville Road.

PLATE 9: View looking south-west showing the western terrace.

PLATE 10: Rubbish and debris dumped near the south-western corner of the Site.

PLATE 11: Concrete kerb and stormwater pit located in the south-eastern corner of the western terrace.

PLATE 12: View looking east showing the fill batter along the southern boundary. The low retaining wall is obscured by vegetation.

APPENDIX A

Section 149 Planning Certificate

PLANNING CERTIFICATE

UNDER SECTION 149 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

Kristen Parmeter
C/- NSW PUBLIC WORKS
Level 14W
McKell Building
2-24 Rawson Pl
SYDNEY NSW 2000

CERTIFICATE DETAILS

NUMBER	20153321	**DATE**	20-Jul-2015

RECEIPT AND REFERENCE DETAILS

FEE	$133.00		
RECEIPT NUMBER	3095661	**RECEIPT DATE**	13-Jul-2015
REFERENCE	ROWLAND HASSAL:17932		

PROPERTY DESCRIPTION

PROPERTY	49 Woodville Road, CHESTER HILL NSW 2162		
TITLE	Lot 1 DP 794709		
PARISH	Liberty Plains	**COUNTY**	CUMBERLAND

PLANNING INSTRUMENTS

In accordance with Section 149(2) and at the date of this certificate the following Environmental Planning Instruments apply to the land.

Bankstown Local Environmental Plan 2015 Gazetted on 05-Mar-2015

LAND ZONING

SP2 Infrastructure: Educational Establishment

BANKSTOWN CITY COUNCIL
PO Box 8, Bankstown NSW 1885 PH **02 9707 9999** FAX **02 9707 9957**

PLANNING CERTIFICATE

UNDER SECTION 149 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

SECTION 149(2) DETAILS

In accordance with section 149(2) of the Environmental Planning and Assessment Act 1979 (as amended) and at the date of this certificate, the following prescribed matters relate to the land.

1. NAMES OF RELEVANT PLANNING INSTRUMENTS AND DCPs

Affected by Planning Proposal_2013_BANKS_001 which makes various amendments to planning controls in the North West Local Area Plan; and Zone R4 High Density Residential, Zone B1 Neighbourhood Centre and Zone B2 Local Centre in the City of Bankstown.

Affected by Bankstown Local Environmental Plan 2015 Amendments and Planning Proposals in respect of general information as detailed in Appendix 1.

Affected by State Environmental Planning Policies (SEPP's), Proposed State Environmental Planning Policies and Deemed State Environmental Planning Policies as detailed in Appendix 2.

Affected by Bankstown Development Control Plan 2015 (refer to Appendix 3 which lists the contents chapters within the DCP).

2. ZONING AND LAND USE UNDER RELEVANT LEPs

Unless specified otherwise in this section of the certificate, the land does not include or comprise critical habitat, is not in a conservation area and has no environmental heritage item on the land.

The purposes for which the plan or instrument provides that development may be carried out within the zone without the need for development consent are specified in clause 3.1 of the LEP 2015 plan and the land use table as detailed in Appendix 4. Reference should be made to the LEP 2015 plan as a whole for details.

The purposes for which the plan or instrument provides that development may not be carried out within the zone except with development consent are specified in Part 2 and clause 3.2 of the LEP 2015 plan and detailed in Appendix 4. Reference should be made to the LEP 2015 plan as a whole for details.

The purposes for which the plan or instrument provides that development is prohibited within the zone are specified in Part 2 and clauses 4.1A-2(c), 4.1B-2(4), 6.6 and 6.8 of the LEP 2015 plan and detailed in Appendix 4. Reference should be made to the LEP 2015 plan as a whole for details.

2A. ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

Unless specified otherwise in this section of the certificate, the land is not within any zone or land use under a Precinct Plan, a proposed Precinct Plan or Part 3 of State Environmental Planning Policy (Sydney Region Growth Centres) 2006.

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3. COMPLYING DEVELOPMENT

General Housing Code

Complying development under the General Housing Code within "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may not** be carried out on the land.

The land is non complying because the land has been identified by an environmental planning instrument as being either one of the following zones:-

- B5 Business Development, B6 Enterprise Corridor, B7 Business Park
- IN1 General Industrial, IN2 Light Industrial
- SP1 Special Activities, SP2 Infrastructure
- RE1 Public Recreation, RE2 Private Recreation
- E1 National Park and Nature Reserves
- Land unzoned under LEP 2015……*refer to the Land Zoning of this certificate on page 1.*

OR

The land is affected by one or more of the following 4 exemptions:-

- A Heritage item …….. *refer to clause 2 of this certificate*,
- Land in the 25 or higher ANEF contour ……. *refer to clause 7 of this certificate,*

(Unless the development is only for the erection of ancillary development, the alteration of or an addition to ancillary development or the alteration of a dwelling house)

- Acid sulfate soils class 1 or 2 …….. *refer to clause 7 of this certificate*,
- Land in a vegetated buffer area …….. *refer to clause 7 of this certificate*.

Note: If the land has been rendered non complying due to an exemption listed above, you are advised to check with Council for the extent of the exemption. The Code may render the land complying for any land which is outside the extent of the exemption. Reference should be made to the "Planning Maps" on Council's website www.bankstown.nsw.gov.au which identifies the land exemptions.

Housing Alterations Code

Complying development under the Housing Alterations Code within the provisions of "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may not** be carried out on the land.

The land is non complying because the land has been identified by an environmental planning instrument as being either one of the following zones:-

- B5 Business Development, B6 Enterprise Corridor, B7 Business Park
- IN1 General Industrial, IN2 Light Industrial
- SP1 Special Activities, SP2 Infrastructure
- RE1 Public Recreation, RE2 Private Recreation
- E1 National Park and Nature Reserves
- Land unzoned under LEP 2015……*refer to the Land Zoning of this certificate on page 1*.

OR

The land is affected by the following exemption:-

- A Heritage item ……*refer to clause 2 of this certificate.*

Note: If the land has been rendered non complying due to an exemption listed above, you are advised to check with Council for the extent of the exemption. The Code may render the land complying for any land which is outside the extent of the exemption. Reference should be made to the "Planning Maps" on Council's website www.bankstown.nsw.gov.au which identifies the land exemptions.

Subdivisions Code (strata subdivision)

Complying development under the Subdivisions Code within "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may** be carried out on the land.

Rural Housing Code

Complying development under the Rural Housing Code within "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may not** be carried out on the land.

The land is non complying because the land has been identified by an environmental planning instrument as being either one of the following zones:-

- R2 Low Density Residential, R3 Medium Density Residential, R4 High Density Residential
- B1 Neighbourhood Centre, B2 Local Centre, B4 Mixed Use, B5 Business Development, B6 Enterprise Corridor, B7 Business Park
- IN1 General Industrial, IN2 Light Industrial
- SP1 Special Activities, SP2 Infrastructure

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- RE1 Public Recreation, RE2 Private Recreation
- E1 National Park and Nature Reserves
- Land unzoned under LEP 2015……*refer to the Land Zoning of this certificate on page 1*.

OR

The land is affected by one or more of the following 4 exemptions:-

- A Heritage item …….. *refer to clause 2 of this certificate*,
- Land in the 25 or higher ANEF contour…. ……. *refer to clause 7 of this certificate,*

(Unless the development is only for the erection of ancillary development, the alteration of or an addition to ancillary development or the alteration of a dwelling house)

- Acid sulfate soils class 1 or 2 …….. *refer to clause 7 of this certificate*,
- Land in a vegetated buffer area …….. *refer to clause 7 of this certificate*,

Note: If the land has been rendered non complying due to an exemption listed above, you are advised to check with Council for the extent of the exemption. The Code may render the land complying for any land which is outside the extent of the exemption. Reference should be made to the "Planning Maps" on Council's website www.bankstown.nsw.gov.au which identifies the land exemptions.

General Development Code

Complying development under the General Development Code within "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may** be carried out on the land.

Demolition Code

Complying development under the Demolition Code within "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may** be carried out on the land.

Fire Safety Code

Complying development under the Fire Safety Code within "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may** be carried out on the land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Alterations Code within the provisions of "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may not** be carried out on the land.

The land is non complying because the land has been identified by an environmental planning instrument as being either one of the following zones:-

- RU4 Primary Production Small Lots
- R2 Low Density Residential, R3 Medium Density Residential, R4 High Density Residential
- SP1 Special Activities, SP2 Infrastructure
- RE1 Public Recreation, RE2 Private Recreation
- E1 National Park and Nature Reserves
- Land unzoned under LEP 2015……*refer to the Land Zoning of this certificate on page 1*.

OR

The land is affected by one of the following exemptions:-

- A Heritage item …… *refer to clause 2 of this certificate.*
- A Flood Control Lot .....*refer to clause 7A of this certificate.*

Note: If the land has been rendered non complying due to an exemption listed above, you are advised to check with Council for the extent of the exemption. The Code may render the land complying for any land which is outside the extent of the exemption. Reference should be made to the "Planning Maps" on Council's website www.bankstown.nsw.gov.au which identifies the land exemptions.

Further: Although the land is non complying for Subdivisions 9 & 10, the Code may render the land complying for Subdivisions 1-8 and 11-12. Reference should be made to "Part 5 – Commercial and Industrial Alterations Code" of the SEPP for details.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under the Commercial and Industrial (New Buildings and Additions) Code within the provisions of "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may not** be carried out on the land.

The land is non complying because the land has been identified by an environmental planning instrument as being either one of the following zones:-

- RU4 Primary Production Small Lots

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- R2 Low Density Residential, R3 Medium Density Residential, R4 High Density Residential
- SP1 Special Activities, SP2 Infrastructure
- RE1 Public Recreation, RE2 Private Recreation
- E1 National Park and Nature Reserves
- Land unzoned under LEP 2015……*refer to the Land Zoning of this certificate on page 1*.

OR

The land is affected by one of the following exemptions:-

- A Heritage item …… *refer to clause 2 of this certificate.*
- Acid Sulfate Soils class 1 or 2 .....*refer to clause 7 of this certificate*
- A Vegetated Buffer Area.....*refer to clause 7 of this certificate*

Note: If the land has been rendered non complying due to an exemption listed above, you are advised to check with Council for the extent of the exemption. The Code may render the land complying for any land which is outside the extent of the exemption. Reference should be made to the "Planning Maps" on Council's website www.bankstown.nsw.gov.au which identifies the land exemptions.

4. COASTAL PROTECTION

Unless specified otherwise in this section of the certificate, the land is not affected by the operation of Section 38 or 39 of the Coastal Protection Act 1979.

4A. CERTAIN INFORMATION RELATING TO BEACHES AND COASTS

Unless specified otherwise in this section of the certificate, the land is not subject to an order under Part 4D of the Coastal Protection Act 1979 in relation to temporary coastal protection works (or on public land adjacent to the land) and, Council has not been notified under Section 55X of the Coastal Protection Act 1979 that temporary coastal protection works have been placed on the land (or on public land adjacent to the land).

4B. ANNUAL CHARGES UNDER LOCAL GOVERNMENT ACT 1993 FOR COASTAL PROTECTION SERVICES THAT RELATE TO EXISTING COASTAL PROTECTION WORKS

Unless specified otherwise in this section of the certificate, the owner (or any previous owner) has not consented in writing that the land is subject to annual charges under Section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works.

5. MINE SUBSIDENCE

Not affected by Section 15 of the Mine Subsidence Compensation Act 1961, proclaiming land to be a mine subsidence district.

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6. ROAD WIDENING AND REALIGNMENT

Not affected by any road widening or road realignment under (1) Division 2 of Part 3 of the Roads Act 1993; or (2) any Environmental Planning Instrument; or (3) any resolution of Council. However, the property fronts an existing or proposed arterial/main road. Please check with the Roads and Maritime Services for possible effects.

7. COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

Unless specified otherwise in this section of the certificate, the land is not affected by policies adopted by Council or by any other authority (that has notified Council of its adoption) that restricts development of the land. For bush fire prone land refer to section 11. For flood prone land refer to section 7A.

Affected by a resolution of Council adopting a policy concerning the management of contaminated land. That policy applies to all land in the City of Bankstown and will restrict development of the land if the circumstances set out in the policy prevail. A copy of the policy is available on Council's website at www.bankstown.nsw.gov.au or from the Customer Service Area.

Note: Additional information regarding contaminated land matters for this property may also be provided on part 5 of this section 149 planning certificate. For further information contact Council on Ph.97079999.

7A. FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

Unless specified otherwise in this section of the certificate, the land is not affected by flood related development controls.

A Flood control lot.
The property is affected by a policy known as Bankstown Development Control Plan 2015, Part B12 - Flood Risk Management and clause 6.3 – Flood planning of the LEP 2015, by reference to the Miller Road Catchment Flood Study, March 2013 (a copy of which is available for inspection at Council's Offices), which categorises land affected by the 100 year flood into two flood risk precincts:

- High flood risk precinct – Land below the 100 year flood that is either subject to a high hydraulic hazard or where there are significant evacuation difficulties; and
- Medium flood risk precinct - Land below the 100 year flood that is not subject to a high hydraulic hazard and where there are no evacuation difficulties.

Bankstown Development Control Plan 2015 includes flood related development controls for properties based on the relevant flood risk precinct. Contact Council for information about the flood risk precinct applying to this property.

8. LAND RESERVED FOR ACQUISITION

Not affected by either an Environmental Planning Instrument or proposed Environmental Planning Instrument referred to in clause 5.1 providing for the acquisition of the land or part of the land by a public authority, as referred to in Section 27 of the Environmental Planning & Assessment Act. Reference should be made to the LEP 2015 plan as a whole for details.

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9. CONTRIBUTION PLANS

Affected by Bankstown City Council Section 94A Development Contributions Plan 2009 which allows Council to impose a levy on development within the City of Bankstown in accordance with Directions issued by the Minister for Planning. The levy will be spent on the provision of public works and infrastructure. Date of commencement 8th June 2009. For further details on the plan contact Council on 9707 9999 or visit Council's website – www.bankstown.nsw.gov.au

9A. BIODIVERSITY CERTIFIED LAND

Unless specified otherwise in this section of the certificate, the land is not biodiversity certified land within the meaning of Part 7AA of the Threatened Species Conservation Act 1995.

10. BIOBANKING AGREEMENTS

Unless specified otherwise in this section of the certificate, the land is not subject to a Biobanking Agreement under Part 7A of the Threatened Species Conservation Act 1995, made by the Department of Environment, Climate Change and Water that has notified Council of the existence of the agreement.

11. BUSHFIRE PRONE LAND

Unless specified otherwise in this section of the certificate, the land is not bushfire prone.

12. PROPERTY VEGETATION PLANS

Unless specified otherwise in this section of the certificate, the land is not subject to a Property Vegetation Plan under the Native Vegetation Act 2003, as approved by any other authority that has notified Council of the existence of the plan.

13. ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

Unless specified otherwise in this section of the certificate, the land is not subject to a Tree Order under the Trees (Disputes Between Neighbours) Act 2006, made by an authority that has notified Council of the existence of the order.

14. DIRECTIONS UNDER PART 3A

Unless specified otherwise in this section of the certificate, the land is not subject to a Direction by the Minister under section 75P (2) (c1) of the Act that a provision of an EPI does not have an effect.

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15. SITE COMPATIBILITY CERTIFICATES & CONDITIONS FOR SENIORS HOUSING

Unless specified otherwise in this section of the certificate, the land is not subject to a development application granted after 12.10.2007 under SEPP (Housing for Seniors or People with a Disability) 2004 setting out the terms of any conditions imposed under clause 18(2) or a current site compatibility certificate issued under clause 25 of the SEPP.

16. SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

Unless specified otherwise in this section of the certificate, the land is not subject to a development application under clause 19 of SEPP (Infrastructure) 2007 where a valid site compatibility certificate has been issued.

17. SITE COMPATIBILITY CERTIFICATES & CONDITIONS FOR AFFORDABLE RENTAL HOUSING

Unless specified otherwise in this section of the certificate, the land is not subject to a development application under SEPP (Affordable Rental Housing) 2009 where a valid site compatibility certificate and conditions have been issued.

18. PAPER SUBDIVISION INFORMATION

Unless specified otherwise in this section of the certificate, the land is not subject to a paper subdivision or subdivision order.

19. SITE VERIFICATION CERTIFICATES

Unless specified otherwise in this section of the certificate, the land is not subject to a current site verification certificate of which the Council is aware in respect to Division 3 of Part 4AA of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

MATTERS ARISING UNDER THE CONTAMINATED LAND MANAGEMENT ACT, 1997

Unless specified otherwise in this section of the certificate, there are no matters arising under Section 59(2) of the Contaminated Land Management Act 1997.

MATTERS ARISING UNDER THE NATION BUILDING AND JOBS PLAN (STATE INFRASTRUCTURE DELIVERY) ACT, 2009

Unless specified otherwise in this section of the certificate, there are no matters arising under Section 26 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009.

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This completes the prescribed matters for the certificate under section 149(2) of the Environmental Planning and Assessment Act 1979, as amended. While this certificate indicates the zoning of the land, it is suggested that the relevant Planning Instrument be inspected on Council's website under Development – Planning Maps or at Council's Customer Service Centre to provide an overall view of the area and the site's surrounding zonings.

SECTION 149(5) DETAILS

At the date of this certificate, the following relevant matters are provided in good faith in accordance with the requirements of Section 149(5) of the Environmental Planning and Assessment Act 1979.

Council has selected the following matters for checking as those most likely to be of concern and do not comprise an exhaustive list. The absence of any reference to any matter affecting the land shall not imply that any matter not referred to in this certificate does not affect the land.

ADDITIONAL INFORMATION

Unless specified otherwise in this section of the certificate, there are no relevant matters arising under Section 149(5) of the Environmental Planning and Assessment Act 1979.

The property is identified by the Miller Road Catchment Flood Study (March 2013) as being at a medium risk of flooding. For further information on the flood risk and flood related development controls, contact Council on 9707 9999.

Please contact Council's general enquiries number listed at the bottom of this sheet for further information about any matter referred to in this certificate.

Paul Ratkun – Acting Team Leader
Land Information Management

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Appendix 1

Bankstown Local Environmental Plan 2015 Amendments & Planning Proposals.
(relating to general information only which may affect part or the whole of the City)

Note: As of 1 July 2009, Draft LEP's have been replaced with "Planning Proposals". A planning proposal is a document that explains the intended effect of, and justification for, a proposed LEP.

Nil

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Appendix 2

State Environmental Planning Policies (SEPP's), Proposed SEPP's and Deemed SEPP's

Note: The names of the relevant instrument's plus their gazettal dates are listed below. For further details please refer to the Department of Planning website www.planning.nsw.gov.au under the heading "Planning System – Legislation and Planning Instruments".

SEPP No.19 – Bushland in Urban Areas, gazetted 24.10.1986
SEPP No.21 – Caravan Parks, gazetted 24.4.1992
SEPP No.30 – Intensive Agriculture, gazetted 8.12.1989
SEPP No.32 – Urban Consolidation (Redevelopment of Urban Land), gazetted 15.11.1991
SEPP No.33 – Hazardous and Offensive Development, gazetted 13.3.1992
SEPP No.50 – Canal Estate Development, gazetted 10.11.1997
SEPP No.55 – Remediation of Land, gazetted 28.8.1998
SEPP No.62 – Sustainable Aquaculture, gazetted 25.8.2000
SEPP No.64 – Advertising and Signage, gazetted 16.3.2001
SEPP No.65 – Design Quality of Residential Flat Development, gazetted 26.7.2002
SEPP – (Housing for Seniors or People with a Disability) 2004, gazetted 31.3.2004
SEPP – (Building Sustainability Index: BASIX) 2004, gazetted 25.6.2004
SEPP – (Major Development) 2005, gazetted 1.8.2005
SEPP – (Mining, Petroleum Production and Extractive Industries) 2007, gazetted 16.2.2007
SEPP – (Miscellaneous Consent Provisions) 2007, gazetted 26.10.2007
SEPP – (Infrastructure) 2007, gazetted 21.12.2007
SEPP – (Exempt and Complying Development Codes) 2008, gazetted 12.12.2008
SEPP – (Affordable Rental Housing) 2009, gazetted 31.7.2009
SEPP – (Sydney Drinking Water Catchment) 2011, gazetted 21.1.2011

PROPOSED SEPP - Competition SEPP, 27.7.2010

Note: As of 1 July 2009, regional environmental plans (REPs) are no longer part of the hierarchy of environmental planning instruments in NSW. The removal of the REP layer is intended to simplify the State's planning system. All existing REPs (listed below) are now deemed State environmental planning policies (SEPPs).

Deemed SEPP – Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment, gazetted 5.2.1999

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Appendix 3

Bankstown Development Control Plan 2015

DATE OF COMMENCEMENT – 13th May 2015

The following is a list of the contents within Bankstown Development Control Plan 2015. If further information is required please contact Council on 9707 9999.

INTRODUCTION	
PART A	**PRECINCT CONTROLS**
A1	Centres
A2	Corridors
A3	Key infill development sites
PART B	**GENERAL CONTROLS**
B1	Residential development
B2	Commercial centres
B3	Industrial precincts
B4	Sustainable development
B5	Parking
B6	Child care centres
B7	Educational establishments
B8	Places of public worship
B9	Sex services premises
B10	Telecommunications facilities
B11	Tree preservation order
B12	Flood risk management

Please note: Council may from time to time exhibit draft changes to the development control plan that may affect your land. To find out more, please contact Council on 9707 9999 or view Council's website and refer to the Development Control Plan - www.bankstown.nsw.gov.au

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Appendix 4

Land Use Table

Note. A type of development referred to in the Land Use Table is a reference to that type of development only to the extent it is not regulated by an applicable State environmental planning policy. The following State environmental planning policies in particular may be relevant to development on land to which this Plan applies:
State Environmental Planning Policy (Affordable Rental Housing) 2009 (including provision for secondary dwellings)
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004
State Environmental Planning Policy (Infrastructure) 2007 (relating to public facilities such as those for air transport, correction, education, electricity generation, health services, ports, railways, roads, waste management and water supply systems)
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
State Environmental Planning Policy (Rural Lands) 2008
State Environmental Planning Policy No 33—Hazardous and Offensive Development
State Environmental Planning Policy No 50—Canal Estate Development
State Environmental Planning Policy No 62—Sustainable Aquaculture
State Environmental Planning Policy No 64—Advertising and Signage

Zone RU4 Primary Production Small Lots
Permitted without consent Home occupations
Permitted with consent Agriculture; Animal boarding or training establishments; Building identification signs; Business identification signs; Dwelling houses; Environmental facilities; Environmental protection works; Extensive agriculture; Farm buildings; Flood mitigation works; Intensive plant agriculture; Kiosks; Plant nurseries; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Roads; Roadside stalls; Water supply systems
Prohibited Any development not specified in item 2 or 3

Zone R2 Low Density Residential
Permitted without consent Home occupations
Permitted with consent Bed and breakfast accommodation; Boarding houses; Boat sheds; Building identification signs; Business identification signs; Car parks; Child care centres; Community facilities; Dual occupancies; Dwelling houses; Emergency services facilities; Environmental facilities; Environmental protection works; Exhibition homes; Flood mitigation works; Group homes; Health consulting rooms; Home-based child care; Hospitals; Information and education facilities; Jetties; Multi dwelling housing; Places of public worship; Public administration buildings; Recreation areas; Respite day care centres; Roads; Secondary dwellings; Semi-detached dwellings; Seniors housing; Water recreation structures; Water supply systems
Prohibited Any development not specified in item 2 or 3

Zone R3 Medium Density Residential
Permitted without consent Nil
Permitted with consent Attached dwellings; Bed and breakfast accommodation; Boarding houses; Building identification signs; Business identification signs; Car parks; Child care centres; Community facilities; Dwelling houses; Emergency services facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Group homes; Information and education facilities; Multi dwelling housing; Neighbourhood shops; Places of public worship; Public administration buildings; Recreation areas; Respite day care centres; Roads; Secondary dwellings; Seniors housing; Water supply systems
Prohibited Any development not specified in item 2 or 3

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Zone R4 High Density Residential
Permitted without consent Nil
Permitted with consent Attached dwellings; Bed and breakfast accommodation; Boarding houses; Building identification signs; Business identification signs; Car parks; Child care centres; Community facilities; Dwelling houses; Emergency services facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Information and education facilities; Multi dwelling housing; Neighbourhood shops; Places of public worship; Public administration buildings; Recreation areas; Residential flat buildings; Respite day care centres; Roads; Secondary dwellings; Seniors housing; Serviced apartments; Shop top housing; Water supply systems
Prohibited Any development not specified in item 2 or 3

Zone B1 Neighbourhood Centre
Permitted without consent Nil
Permitted with consent Boarding houses; Building identification signs; Bulky goods premises; Business identification signs; Business premises; Car parks; Child care centres; Community facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Garden centres; Hardware and building supplies; Health services facilities; Information and education facilities; Kiosks; Landscaping material supplies; Markets; Medical centres; Neighbourhood shops; Office premises; Places of public worship; Plant nurseries; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Registered clubs; Research stations; Residential flat buildings; Respite day care centres; Restaurants or cafes; Roads; Seniors housing; Service stations; Shop top housing; Shops; Take away food and drink premises; Timber yards; Tourist and visitor accommodation; Vehicle repair stations; Vehicle sales or hire premises; Veterinary hospitals; Water supply systems
Prohibited Any development not specified in item 2 or 3

Zone B2 Local Centre
Permitted without consent Nil
Permitted with consent Boarding houses; Building identification signs; Business identification signs; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Function centres; Information and education facilities; Medical centres; Passenger transport facilities; Recreation facilities (indoor); Registered clubs; Residential flat buildings; Respite day care centres; Restricted premises; Roads; Seniors housing; Service stations; Shop top housing; Tourist and visitor accommodation; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Port facilities; Residential accommodation; Rural industries; Sewage treatment plants; Sex services premises; Signage; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Waste or resource management facilities; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

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Zone B4 Mixed Use
Permitted without consent Nil
Permitted with consent Boarding houses; Building identification signs; Business identification signs; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Passenger transport facilities; Recreation facilities (indoor); Registered clubs; Residential flat buildings; Respite day care centres; Restricted premises; Roads; Seniors housing; Shop top housing; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Port facilities; Residential accommodation; Resource recovery facilities; Rural industries; Sewage treatment plants; Sex services premises; Signage; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Warehouse and distribution centres; Waste disposal facilities; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

Zone B5 Business Development
Permitted without consent Nil
Permitted with consent Building identification signs; Bulky goods premises; Business identification signs; Business premises; Child care centres; Food and drink premises; Garden centres; Hardware and building supplies; Hotel or motel accommodation; Kiosks; Landscaping material supplies; Markets; Neighbourhood shops; Office premises; Passenger transport facilities; Plant nurseries; Respite day care centres; Roads; Serviced apartments; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Helipads; Home occupations (sex services); Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Port facilities; Residential accommodation; Resource recovery facilities; Restricted premises; Rural industries; Sewage treatment plants; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Waste disposal facilities; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

Zone B6 Enterprise Corridor
Permitted without consent Nil
Permitted with consent Building identification signs; Bulky goods premises; Business identification signs; Business premises; Community facilities; Food and drink premises; Garden centres; Hardware and building supplies; Hotel or motel accommodation; Kiosks; Landscaping material supplies; Light industries; Markets; Multi dwelling housing; Neighbourhood shops; Office premises; Passenger transport facilities; Plant nurseries; Residential flat buildings; Roads; Seniors housing; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Helipads; Home occupations (sex services); Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Port facilities; Residential accommodation; Resource recovery facilities; Restricted premises; Rural industries; Sewage treatment plants; Sex services premises; Signage; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Waste disposal facilities; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

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PLANNING CERTIFICATE

UNDER SECTION 149 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

Zone B7 Business Park
Permitted without consent Nil
Permitted with consent Building identification signs; Business identification signs; Child care centres; Light industries; Neighbourhood shops; Office premises; Passenger transport facilities; Respite day care centres; Roads; Warehouse or distribution centres; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Places of public worship; Port facilities; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Residential accommodation; Resource recovery facilities; Restricted premises; Rural industries; Service stations; Sewage treatment plants; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Waste disposal facilities; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

Zone IN1 General Industrial
Permitted without consent Nil
Permitted with consent Agricultural produce industries; Building identification signs; Business identification signs; Depots; Food and drink premises; Freight transport facilities; Garden centres; General industries; Hardware and building supplies; Hospitals; Industrial training facilities; Kiosks; Landscaping material supplies; Light industries; Markets; Medical centres; Neighbourhood shops; Plant nurseries; Roads; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Amusement centres; Biosolids treatment facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Child care centres; Commercial premises; Eco-tourist facilities; Entertainment facilities; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Function centres; Health services facilities; Heavy industrial storage establishments; Home occupations (sex services); Industries; Jetties; Marinas; Mooring pens; Moorings; Open cut mining; Port facilities; Residential accommodation; Respite day care centres; Restricted premises; Rural industries; Schools; Sewage treatment plants; Signage; Tourist and visitor accommodation; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

Zone IN2 Light Industrial
Permitted without consent Nil
Permitted with consent Agricultural produce industries; Building identification signs; Business identification signs; Depots; Food and drink premises; Garden centres; Hardware and building supplies; Hospitals; Industrial training facilities; Kiosks; Landscaping material supplies; Light industries; Markets; Medical centres; Neighbourhood shops; Plant nurseries; Roads; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Amusement centres; Biosolids treatment facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Child care centres; Commercial premises; Correctional centres; Crematoria; Eco-tourist facilities; Entertainment facilities; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Health services facilities; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Port facilities; Recreation facilities (major); Residential accommodation; Resource recovery facilities; Respite day care centres; Restricted premises; Rural industries; Schools; Sewage treatment plants; Signage; Tourist and visitor accommodation; Transport depots; Truck depots; Waste disposal facilities; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

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PLANNING CERTIFICATE

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Zone SP1 Special Activities
Permitted without consent Nil
Permitted with consent The purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose
Prohibited Any development not specified in item 2 or 3

Zone SP2 Infrastructure
Permitted without consent Nil
Permitted with consent Roads; The purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose
Prohibited Any development not specified in item 2 or 3

Zone RE1 Public Recreation
Permitted without consent Nil
Permitted with consent Boat launching ramps; Boat sheds; Building identification signs; Business identification signs; Car parks; Caravan parks; Charter and tourism boating facilities; Child care centres; Community facilities; Eco-tourist facilities; Emergency services facilities; Entertainment facilities; Environmental facilities; Environmental protection works; Extensive agriculture; Flood mitigation works; Food and drink premises; Function centres; Information and education facilities; Intensive plant agriculture; Jetties; Kiosks; Marinas; Markets; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Respite day care centres; Roads; Water recreation structures; Water supply systems; Wharf or boating facilities
Prohibited Any development not specified in item 2 or 3

Zone RE2 Private Recreation
Permitted without consent Nil
Permitted with consent Building identification signs; Business identification signs; Car parks; Community facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Helipads; Kiosks; Marinas; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Registered clubs; Roads; Water supply systems
Prohibited Any development not specified in item 2 or 3

Zone E1 National Parks and Nature Reserves
Permitted without consent Uses authorised under the National Parks and Wildlife Act 1974
Permitted with consent Nil
Prohibited Any development not specified in item 2 or 3

Zone W1 Natural Waterways
Permitted without consent Nil
Permitted with consent Boat launching ramps; Boat sheds; Charter and tourism boating facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Jetties; Marinas; Mooring pens; Moorings; Water recreation structures; Wharf or boating facilities
Prohibited Business premises; Hotel or motel accommodation; Industries; Multi dwelling housing; Recreation facilities (major); Residential flat buildings; Restricted premises; Retail premises; Seniors housing; Service stations; Warehouse or distribution centres; Any other development not specified in item 2 or 3

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APPENDIX B

Land Title Record

Environmental Legal Searches
Environmental Management Group Pty Ltd
ACN 108 771 482
ABN 76 784 207 704

MOBILE: 0422 406 909, 0404 069 995
EMAIL: search@elsearches.com.au
WEB: www.elsearches.com.au

19 August 2015

Department of Finance and Services
Level 13
McKell Building
2-24 Rawson Place
SYDNEY NSW 2000

Attention: Ms Peta Anderson

RE: Lot 1 DP 794709, Woodville Road, Chester Hill, NSW
Your Ref: GS91B

SUMMARY OF PROPRIETORS

Lot 1 DP 794709

Year	Proprietor	Source
1989-To Date	Minister for Education	Current Certificate of Title
1944-1989	His Most Gracious Majesty King George VI	Book 1945 No. 420
1915-1944	Alfred Henry Pettifer (assistant manager)	Book 1945 No. 420 Book 1050 No. 179
1892-1915	John Sullivan (umbrella maker)	Book 1050 No. 179, Book 495 No. 298

Environmental Legal Searches
Environmental Management Group Pty Ltd
ACN 108 771 482
ABN 76 784 207 704

MOBILE: 0422 406 909, 0404 069 995
EMAIL: search@elsearches.com.au
WEB: www.elsearches.com.au

Terms of Conditions & Limitations

1. The client is responsible for payment associated with the search.

2. The client is authorised to use our report subject to settlement of our account. Until the account is settled, the report remains the property of Environmental Legal Searches. If the account is not settled within 30 days of the invoice date, then the authority to use the report may be revoked. Where authority to use the report is revoked, all references to the report should be deleted or rendered inactive until the account is settled.

3. Search was based on **Lot 1 DP 794709** provided by **Ms Peta Anderson of Department of Finance and Services.** The street number (if applicable) is for reference only.

   The attached cadastral plan and Deposited Plan MUST be checked against the survey plan for the property for correctness.

4. Any details of the lease(s), sub-lease(s) and/or transfer of lease(s) were solely extracted from the records shown on the current certificate(s) of title (title search), documents of lease(s)/ sub-lease(s)/transfer of lease(s), the cancelled certificate(s) of title and/or the old system vendor/purchaser volume(s). The MOST RECENT record may not be available on the day of the searching.

5. Although the search is performed to a professional and diligent standard, we cannot warrant any loss or damages which may be associated with our search. We therefore limit any potential liability associated with our search to the cost of our services.

Land and Property Information Division

ABN: 84 104 377 806
GPO BOX 15
Sydney NSW 2001
DX 17 SYDNEY Telephone: 1300 052 637

NSW GOVERNMENT Land & Property Information

A division of the Department of Finance & Services

TITLE SEARCH

Title Reference: 1/794709

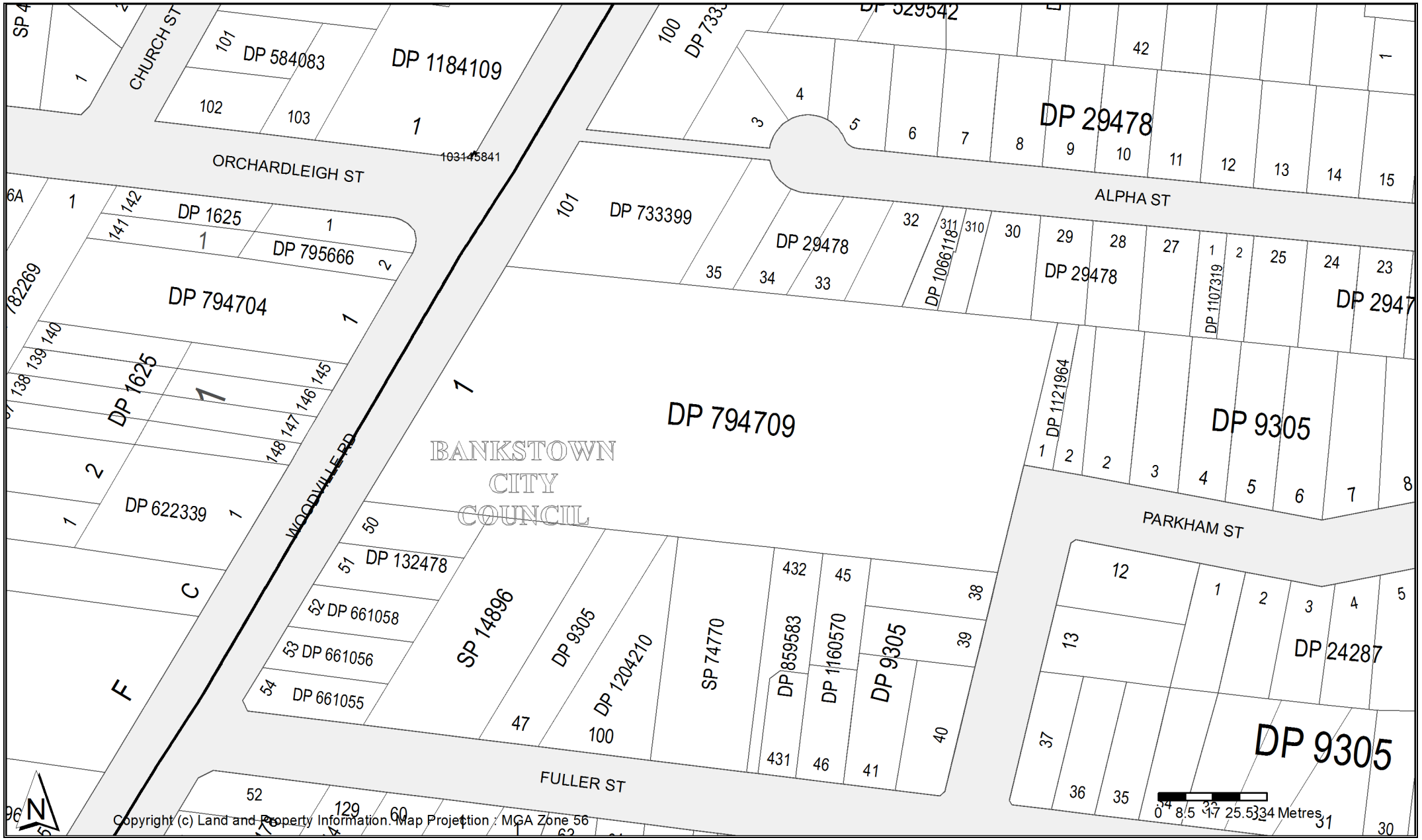
```
       LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH
       ------------------------------------------------------------


FOLIO: 1/794709
------

           SEARCH DATE       TIME              EDITION NO    DATE
           -----------       ----              ----------    ----
           13/8/2015        7:55 AM                1       3/10/1989


LAND
----
LOT 1 IN DEPOSITED PLAN 794709
   AT GUILDFORD
   LOCAL GOVERNMENT AREA BANKSTOWN
   PARISH OF LIBERTY PLAINS   COUNTY OF CUMBERLAND
   TITLE DIAGRAM DP794709

FIRST SCHEDULE
--------------
THE MINISTER FOR EDUCATION                              (CA40787)

SECOND SCHEDULE (3 NOTIFICATIONS)
---------------
1   RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2   QUALIFIED TITLE. CAUTION PURSUANT TO SECTION 28J OF THE REAL
    PROPERTY ACT, 1900. ENTERED 3.10.1989 BK 1945 NO 420
3   LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL
    PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN
    HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS
---------
NOTE: THE CERTIFICATE OF TITLE FOR THIS FOLIO OF THE REGISTER DOES
    NOT INCLUDE SECURITY FEATURES INCLUDED ON COMPUTERISED
    CERTIFICATES OF TITLE ISSUED FROM 4TH JANUARY, 2004. IT IS
    RECOMMENDED THAT STRINGENT PROCESSES ARE ADOPTED IN VERIFYING THE
    IDENTITY OF THE PERSON(S) CLAIMING A RIGHT TO DEAL WITH THE LAND
    COMPRISED IN THIS FOLIO.
UNREGISTERED DEALINGS: NIL

        ***  END OF SEARCH  ***



                                    PRINTED ON 13/8/2015
```

** ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE.*
WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

Cadastral Records Enquiry Report

Requested Parcel : Lot 1 DP 794709 **Identified Parcel :** Lot 1 DP 794709

Locality : CHESTER HILL **LGA :** BANKSTOWN **Parish :** LIBERTY PLAINS **County :** CUMBERLAND



LT 2/55

PLAN OF THE LAND COMPRISED IN DEED

BK. 1945 **NO.** 420 **CA.** 40787

Locality: GUILDFORD Mun / ~~Shire~~ City FAIRFIELD

Parish: ST JOHN County: CUMBERLAND

Reduction Ratio 1: 2000 Lengths are in metres

D P 794709

Registered: 26.9.1989

Title System: OLD SYSTEM

Purpose: LIMITED FOLIO CREATION

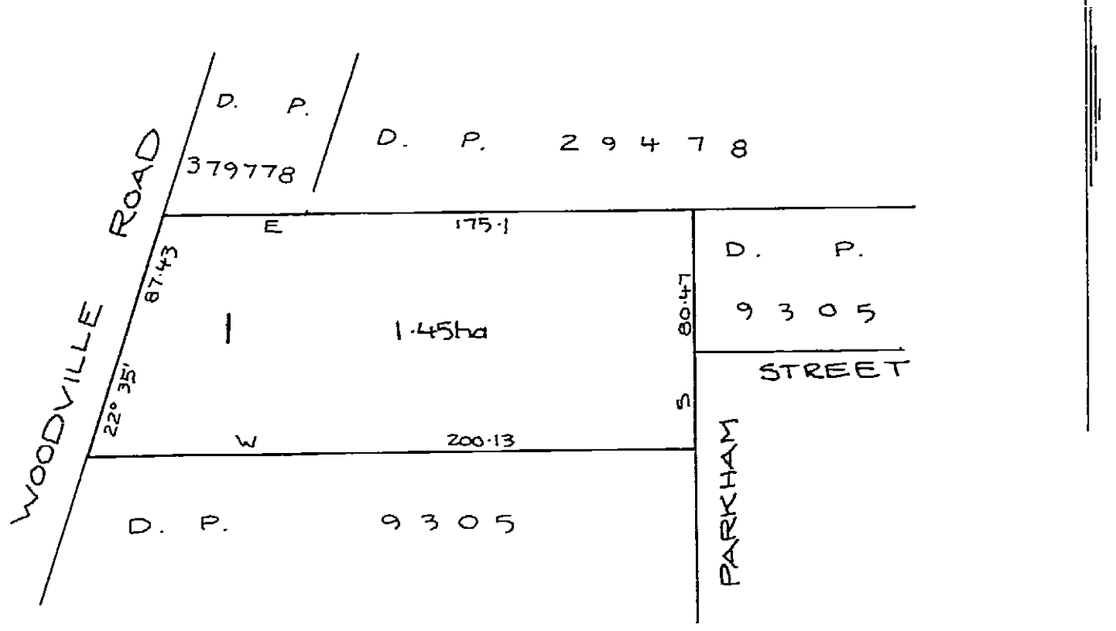
Ref Map: U9145-34*

Last Plan: D.P. 979585

N O O 1 D 1 D

THIS PLAN WAS PREPARED SOLELY TO IDENTIFY THE LAND IN THE ABOVE DEED AND THE BOUNDARIES HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL

THE PLAN IS NOT A CURRENT PLAN IN TERMS OF SEC. 327AA LOCAL GOVERNMENT ACT,1919.



10 20 30 40 50 60 70 Table of mm 110 120 130 140

This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day. 27th September, 1989

Req:R109827 /Doc:DP 0794709 P /Rev:21-Oct-1992 /Sts:OK.OK /Prt:13-Aug-2015 07:55 /Pgs:ALL /Seq:1 of 1
Ref: /Src:X

Land and Property Information Division

ABN: 84 104 377 806
GPO BOX 15
Sydney NSW 2001
DX 17 SYDNEY Telephone: 1300 052 637

NSW GOVERNMENT Land & Property Information

A division of the Department of Finance & Services

HISTORY OF TITLE TRANSACTION

Title Reference: 1/794709

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
13/8/2015 7:55AM

FOLIO: 1/794709

First Title(s): OLD SYSTEM
Prior Title(s): CA40787

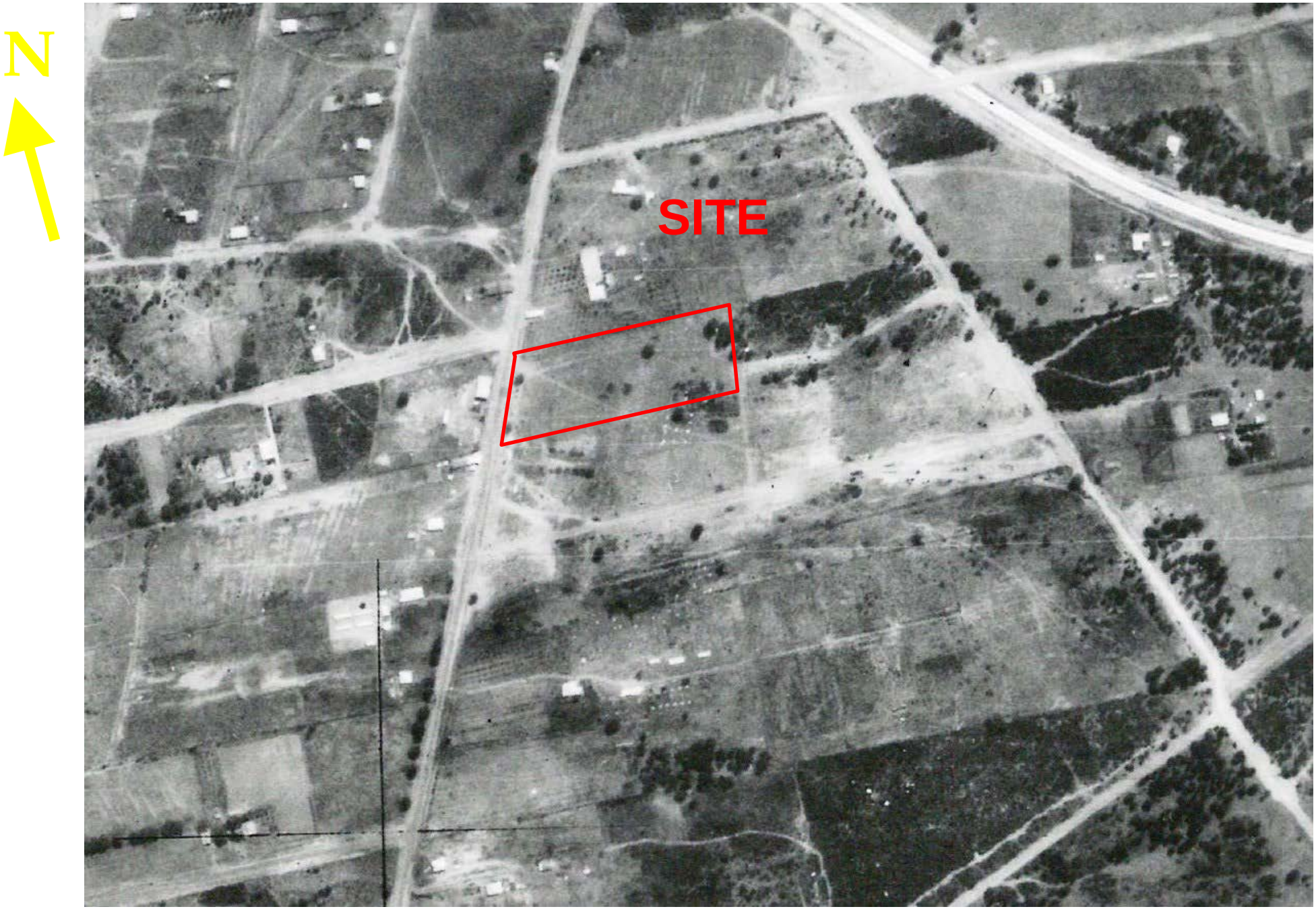
Recorded	Number	Type of Instrument	C.T. Issue
3/10/1989	CA40787	CONVERSION ACTION	FOLIO CREATED EDITION 1
24/11/2000	7242623	DEPARTMENTAL DEALING	
9/9/2002	8935570	UNNECESSARY - DEPARTMENTAL DEALING	
9/9/2002	8935945	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

PRINTED ON 13/8/2015

APPENDIX C

Historical Aerial Photographs



1930

1951


N
SITE
1961

1970

1978

1986

1994

2002

2005

2014

APPENDIX D

Geotechnical Terminology

CHARACTERISATION OF GEOTECHNICAL DATA

Geotechnical data generally fall into the categories of fact, interpretation and opinion, as defined by the Institution of Engineers, Australia, 1987 - Guidelines for the Provision of Geotechnical Information in Construction Contracts.

Facts are defined as the materials, statistics and properties which may be seen, measured or identified by means of accepted and preferably standardised criteria, classifications and tests. Examples of facts include: exploration locations, outcrop locations, samples and drill core, lithological names/descriptions of soils and rocks, measured water levels, laboratory test results and seismic time/distance plots.

Interpretative data is defined as information derived from competently made interpretation of facts using accepted and proven techniques, or reasonable judgement exercised in the knowledge of geological conditions or processes evident at the site. Examples of interpretative data are: borehole and test pit logs, inferred stratigraphy and correlations between boreholes or test pits, material and rock mass properties used in analysis (e.g. permeability), and seismic interpretation (yielding velocity and layer depths).

Opinion is derived from consideration of relevant available facts, interpretations and analysis and/or the exercise of judgement. Examples of opinions based on geotechnical/geological interpretations include bearing capacity and foundation suitability, need for foundation treatment, settlements, potential for grouting, excavation stability, ease of excavation, and suitability of construction materials.

SOIL DESCRIPTION

The methods of description and classification of soils are based on Australian Standard 1726, the SAA Site Investigation Code. The description of a soil is based on particle size distribution and plasticity as shown in the "GUIDE TO THE DESCRIPTION, IDENTIFICATION AND CLASSIFICATION OF SOILS".

SOIL CLASSIFICATION

The basic soil types and their subdivisions are defined by their particle sizes:

MAJOR SOIL CATEGORIES

Soil Classification	Particle Size
Boulders	Greater than 200mm
Cobbles	63 - 200mm
Gravel	2.36 - 63mm
Sand	0.075 - 2.36mm
Silt	0.002 - 0.075mm
Clay	Less than 0.002mm

MINOR SOIL CONSTITUENTS

As most natural soils are combinations of various constituents, the primary soil is further described and modified by its minor components:

Coarse grained soils			**Fine grained soils**		
% Fines		**Modifier**	**% Coarse**		**Modifier**
	≤ 5	Omit, or use 'trace'		≤ 15	Omit, or use 'trace'
> 5	≤ 12	Describe as 'with clay/silt', as applicable	> 15	≤ 30	Describe as 'with sand/gravel', as applicable
> 12		Prefix soil as 'silty/clayey', as applicable	> 30		Prefix soil as 'sand/gravelly', as applicable

COHESIVE SOILS

Clay and silt may be described according to their plasticity:

Descriptive Term	**Range of liquid limit (percent)**
Of low plasticity	≤ 35
Of medium plasticity	> 35 ≤ 50
Of high plasticity	> 50

MOISTURE CONDITION

Term	Description
Dry (D)	Cohesive soils; hard and friable or powdery, well dry of plastic limit. Granular soils; cohesionless and free-running.
Moist (M)	Soil feels cool, darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.
Wet (W)	Soil feels cool, darkened in colour. Cohesive soils usually weakened and free water forms on hands when handling. Granular soils tend to cohere.

CONSISTENCY - NON-COHESIVE SOILS

Term	Density index %		SPT "N" value
Very loose		≤ 15	< 5
Loose	> 15	≤ 35	5 - 10
Medium dense	> 35	≤ 65	10 - 30
Dense	> 65	≤ 85	30 - 50
Very dense	> 85		> 50

CONSISTENCY - COHESIVE SOILS

Term	Undrained shear strength (kPa)		Field guide to consistency	SPT "N" value
Very soft		≤ 12	Exudes between the fingers when squeezed in hand.	< 2
Soft	> 12	≤ 25	Can be moulded by light finger pressure.	2 - 4
Firm	> 25	≤ 50	Can be moulded by strong finger pressure.	4 - 8
Stiff	> 50	≤ 100	Cannot be moulded by fingers; can be indented by thumb	8 - 16
Very stiff	> 100	≤ 200	Can be indented by thumb nail.	16 - 32
Hard	> 200		Can be indented with difficulty by thumb nail.	> 32

GRAPHICAL SYMBOLS USED FOR GEOTECHNICAL BOREHOLE AND TEST PIT LOGS

SOIL - COARSE GRAINED


GW


GP


GM


GC

SW


SP


SM


SC

SOIL - FINE GRAINED


CH


CI

CL


MH


ML


OH


OL


Pt

ROCK


Sedimentary rock


Igneous rock


Metamorphic rock

FILL MATERIAL


Fill

GROUNDWATER


Level


Inflow

NGE No Groundwater Encountered

SOIL HORIZON BOUNDARIES

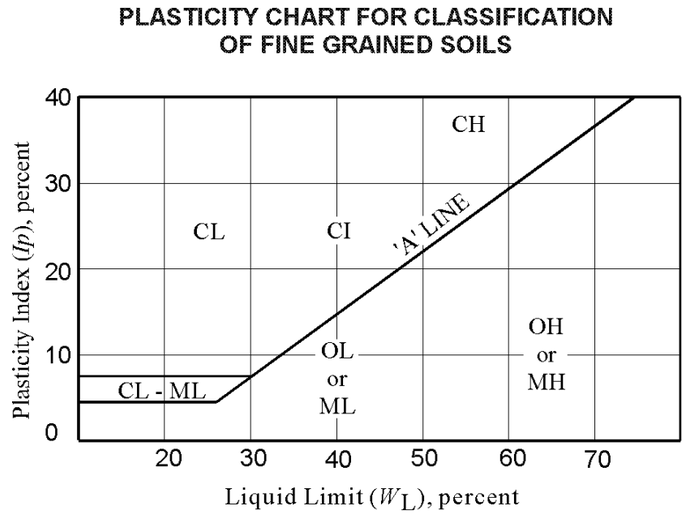
Boundary measured or determined from drilling conditions

Diffuse or uncertain boundary

GUIDE TO THE DESCRIPTION IDENTIFICATION AND CLASSIFICATION OF SOILS

Major Divisions		Particle Size (mm)	Group Symbol	Typical Names	Field Identification Sand and Gravels	Laboratory Classification				
							% < 0.06mm (see note 2)	Plasticity of Fine Fraction	$C_u = \frac{D_{50}}{D_{10}}$	$C_c = \frac{(D_{30})^2}{D_{10}D_{60}}$	Notes
COARSE GRAINED SOILS (more than half of material less than 63 mm is larger than 0.075 mm)	**BOULDERS**	200				Use the gradation curve of material passing 63mm for classification of fractions according to the criteria given in "Major Divisions"	—	—	—	—	
	COBBLES	63					—	—	—	—	
	GRAVELS (more than half of coarse fraction is larger than 2.36mm)	coarse 20	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength		0-5	—	> 4	between 1 and 3	1. Identify lines by the method given for fine grained soils.
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength		0-5	—	Fails to comply with above	—	
		medium 6	GM	Silty gravels, gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength		12-50	Below 'A' line or $I_p < 4$	—	—	2. Borderline classifications occur when the percentage of fines (fraction smaller than 0.06mm size) is greater than 5% and less than 12%.
		fine 2.36	GC	Clayey gravels, gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength		12-50	Above 'A' line or $I_p > 7$	—	—	Borderline classifications require the use of dual symbols e.g. SP-SM, GW-GC
	SANDS (more than half of coarse fraction is smaller than 2.36mm)	coarse 0.6	SW	Well graded sands, gravelly sands, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength		0-5	—	> 6	between 1 and 3	3. I_p = Plasticity Index
			SP	Poorly graded sands and gravelly sands; little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength		0-5	—	Fails to comply with above	Fails to comply with above	
		medium 0.2	SM	Silty sands, sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength		12-50	Below ‘A’ line or $I_p < 4$	—	—	
		fine 0.075	SC	Clayey sands, sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength		12-50	Above ‘A’ line or $I_p > 7$	—	—	

GUIDE TO THE DESCRIPTION, IDENTIFICATION AND CLASSIFICATION OF SOILS (CONT.)

Major Divisions		Particle Size (mm)	Group Symbol	Typical Names	Field Identification			Laboratory Classification			Notes
					Dry* Strength	Dilatancy†	Toughness ‡			Plasticity of Fine Fraction	
FINE GRAINED SOILS (more than half of material less than 63 mm is smaller than 0.075 mm)	**SILTS & CLAYS** (liquid limit < 50%)	<0.075	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	None to low	Quick to slow	None	Use the gradation curve of material passing 63mm for classification of fractions according to the criteria given in "Major Divisions"	More than 50% passing 0.06 mm	Below 'A' line	
			CL, CI	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	Medium to high	None to very slow	Medium			Above 'A' line	
			OL ⌖	Organic silts and organic silty clays of low plasticity	Low to medium	Slow	Low			Below 'A' line	
	SILTS & CLAYS (liquid limit > 50%)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, clastic silts	Low to medium	Slow to none	Low to medium			Below 'A' line	
			CH	Inorganic clays of high plasticity, fat clays	High to very high	None	High			Above 'A' line	
			OH ⌖	Organic clays of medium to high plasticity, organic silts	Medium to high	None to very slow	Low to medium			Below 'A' line	
	HIGHLY ORGANIC SOILS		Pt ⌖	Peat and other highly organic soils	Identified by colour, odour, spongy feel and generally by fibrous texture					—	⌖ Effervesces with H_2O_2

PLASTICITY CHART FOR CLASSIFICATION OF FINE GRAINED SOILS

FIELD IDENTIFICATION PROCEDURE FOR FINE GRAINED SOILS OR FRACTIONS

THESE PROCEDURES ARE TO BE PERFORMED ON THE MINUS 0.2MM SIZE PARTICLES. FOR FIELD CLASSIFICATION PURPOSES, SCREENING IS NOT INTENDED, SIMPLY REMOVE BY HAND THE COARSE PARTICLES THAT INTERFERE WITH THE TESTS.

*** Dry strength (Crushing characteristics)**

After removing particles larger than 0.2mm size, mould a pat of soil to the consistency of putty, adding water if necessary. Allow the pat to dry completely by oven, sun or air drying, and then test its strength by breaking and crumbling between the fingers. This strength is a measure of the character and quantity of the colloidal fraction contained in the soil. The dry strength increases with increasing plasticity. High dry strength is characteristic for clays of the CH group.

A typical inorganic silt possesses only very slight dry strength.

Silty fine sands and silts have about the same slight dry strength, but can be distinguished by the feel when powdering the dried specimen. Fine sand feels gritty whereas a typical silt has the smooth feel of flour.

† Dilatancy (Reaction to shaking)

After removing particles larger than 0.2mm size, prepare a pat of moist soil with a volume of 10 cm³. Add enough water if necessary to make the soil soft but not sticky.

Place the pat in the open palm of one hand and shake horizontally, striking vigorously against the other hand several times. A positive reaction consists of the appearance of water on the surface of the pat which changes to a livery consistency and becomes glossy. When the sample is squeezed between the fingers, the water and gloss disappear from the surface, the pat stiffens, and finally it cracks or crumbles.

The rapidity of appearance of water during shaking and of its disappearance during squeezing assist in identifying the character of the fines in a soil.

Very fine clean sands give the quickest and most distinct reaction whereas a plastic clay has no reaction. Inorganic silts, such as a typical rock flour, shows a moderately quick reaction.

‡ Toughness (Consistency near plastic limit)

After removing particles larger than 0.2mm size, a specimen of soil about 10cm³ in size is moulded to the consistency of putty. If too dry, water must be added and if sticky, the specimen should be spread out in a thin layer and allowed to lose some moisture by evaporation. The specimen is then rolled out by hand on a smooth surface or between the palms into a thread about 3mm in diameter. The thread is then folded and re-rolled repeatedly. During this manipulation the moisture content is gradually reduced and the specimen stiffens, finally loses its plasticity, and crumbles when the plastic limit is reached.

After the thread crumbles, the pieces should be lumped together with a slight kneading action continued until the lump crumbles. The tougher the thread near the plastic limit and the stiffer the lump when it finally crumbles, the more potent is the colloidal clay fraction in the soil.

Weakness of the thread at the plastic limit and quick loss of coherence of the lump below the plastic limit indicate either inorganic clay of low plasticity, or materials such as kaolin-type clays and organic clays which occur below the A-line. Highly organic clays have a very weak and spongy feel at the plastic limit.

EXPLANATION OF LOGGING TERMS FOR ENGINEERING GEOLOGY BOREHOLE LOGGING

ROCK SUBSTANCE WEATHERING CLASSIFICATION

RS	Residual soil
EW	Extremely weathered
HW	Highly weathered
MW	Moderately weathered
SW	Slightly weathered
F(s)	Fresh (stained defects)
F	Fresh

ESTIMATED STRENGTH CLASSIFICATION

EW	Extremely weak
VW	Very weak
W	Weak
MS	Medium strong
S	Strong
VS	Very strong
ES	Extremely strong

DEFECTS

Defects include all joints, bedding planes, fracture zones, seams, veins and cleavage partings.

RQD

Rock quality designation:

$$RQD = \frac{\text{length of core in pieces 100mm or longer}}{\text{length of run}} \times 100\%$$

WATER

Water table, with date

Water inflow

Partial drilling water loss

Complete drilling water loss

Angles of joint inclination (and other geological features and drill holes) are angles between the feature and a horizontal plane. In core, angles of joints (and other geological structures) are angles between the structure and the plane normal to the axis of the core. In vertical holes these angles are then the true inclination (dip) of the structure.

DEFINITIONS OF ENGINEERING GEOLOGICAL TERMS

This classification system provides a standard terminology for the engineering description of rock.

DEGREE OF WEATHERING [1]

TERM	SYMBOL	DEFINITION
Residual Soil	RS	Rock is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.
Extremely Weathered	EW	Rock substance affected by weathering to the extent that the rock exhibits soil properties - i.e. it can be remoulded and can be classified according to the Unified Classification System, but the texture of the original rock is still evident.
Highly Weathered	HW	Rock substance affected by weathering to the extent that limonite staining or bleaching affects the whole of the rock substance, and other signs of chemical or physical decomposition are evident. Porosity and strength may be increased or decreased compared to the fresh rock, usually as a result of iron bleaching or deposition. The colour and strength of the original substance is no longer recognisable.
Moderately Weathered	MW	Rock substance affected by weathering to the extent that staining extends throughout the whole of the rock substance, and the original colour of the fresh rock is no longer recognisable.
Slightly Weathered	SW	Rock substance affected by weathering to the extent that partial staining or discolouration of the rock substance, usually by limonite has taken place. The colour and texture of the fresh rock is recognisable.
Fresh (stained)	F_S	Rock substance unaffected by weathering. Weathering is limited to the surface of major discontinuities, for example an iron-stained joint.
Fresh	F	Rock substance unaffected by weathering.

ROCK STRENGTH [2]

Rock strength is defined by the Point Load Strength Index (Is (50)), and refers to the strength of the rock substance in the direction normal to the bedding.

TERM	Is (50)	FIELD GUIDE	APPROX. qu MPa *
Extremely Weak (EW)		Easily remoulded by hand to a material with soil properties.	
	0.03		0.7
Very weak (VW)		May be crumbled in the hand. Sandstone is "sugary" and friable.	
	0.1		2.4
Weak (W)		A piece of core 150mm long x 50mm dia. may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.	
	0.3		7
Medium Strong (MS)		A piece of core 150mm long x 50mm dia. may be broken by hand with considerable difficulty. Readily scored with a knife.	
	1		24
Strong (S)		A piece of core 150mm long x 50mm dia. cannot be broken by unaided hands, may be slightly scratched or scored with knife.	
	3		70
Very Strong (VS)		A piece of core 150mm long x 50mm dia. may be broken readily with hand held hammer. Cannot be scratched with pen knife.	
	10		240
Extremely Strong (ES)		A piece of core 150mm long x 50mm dia. is difficult to break with hand held hammer. Rings when struck with hammer.	

* The approximate unconfined compressive strength (qu) shown in the table is based on an assumed ratio to the point load index of 24:1. This ratio may vary widely and should be calibrated on site.

STRATIFICATION SPACING [2]

TERM	SEPARATION OF STRATIFICATION PLANES
Thinly laminated	< 6mm
Laminated	6mm - 20mm
Very thinly bedded	20mm - 60mm
Thinly bedded	60mm - 200mm
Medium bedded	200mm - 600mm
Thickly bedded	600mm - 2m
Very thickly bedded	> 2m

DISCONTINUITY SPACING [3]

TERM	SPACING
Very widely spaced	> 2m
Widely spaced	600mm - 2m
Moderately widely spaced	200mm 600mm
Closely spaced	60mm - 200mm
Very closely spaced	20mm - 60mm
Extremely closely spaced	< 20mm

APERTURE OF DISCONTINUITY SURFACES [4]

The degree to which a discontinuity is open, or to which the faces of the discontinuity have been separated and the space subsequently infilled (such as in a vein, fault or joint).

TERM	APERTURE THICKNESS (Discontinuities, veins, faults, joints)
Wide	> 200mm
Moderately wide	60mm - 200mm
Moderately narrow	20mm - 60mm
Narrow	6mm - 20mm
Very narrow	2mm - 6mm
Extremely narrow	> 0 - 2 mm
Tight	Zero

BLOCK SHAPE AND SIZE [4]

The following descriptive terms define shape:

Blocky	- approximately equidimensional.
Tabular	- one dimension considerably shorter than the other two.
Columnar	- one dimension considerably larger than the other two.

Block sizes are defined by the following descriptive terms:

TERM	BLOCK SIZE	EQUIVALENT DISCONTINUITY SPACINGS IN BLOCKY ROCK
Very large	$> 8m^3$	Extremely wide
Large	$> 0.2m^3$ - $8m^3$	Very wide
Medium	$> 0.008m^3$ - $0.2m^3$	Wide
Small	$> 0.0002m^3$ - $0.008m^3$	Moderately wide
Very small	$\leq 0.0002m^3$	Less than moderately wide

REFERENCES

1. Modifications of:
   (a) McMahon, B.K., Douglas, D.J., & Burgess, P.J., 1975. Engineering classification of sedimentary rocks in the Sydney area. Australian Geomechanics Journal, G5 (1), 51-53.
   (b) Geological Society Engineering Group Working Party, 1977. The description of rock masses for engineering purposes. Quarterly Jour. Engg. Geology, 10 (4), 355-388.

2. McMahon, B.K., Douglas , D.J., & Burgess, P. J., 1975. Engineering classification of sedimentary rocks in the Sydney area. Australian Geomechanics Journal, G5 (1), 51 -53.

3. ISRM Commission on Standardisation of Laboratory and Field Tests, 1978. Suggested methods for the quantitative description of discontinuities in rock masses. J1. Rock Mechanics Min. Sci. and Geomech. Abstra., 15, 319-368.

4. Geological Society Engineering Group Working Party, 1977. The description of rock masses for engineering purposes. Quarterly Journ. Engg Geology, 10 (4), 355-388.

APPENDIX E

Borehole Logs

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B1

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT with trace of fine gravel; contains grass roots in top 0.1m.; dark grey-brown; soft; moist to very moist.	D B1-0.0-0.2 +QC2 +TOPSOIL	Not Encountered	TUBE
				0.20			
			CI/SC (v)	SANDY SILTY CLAY; contains zones of extremely weathered sandstone (behaves as a medium dense clayey silty sand); grey to mid grey with yellow-brown and trace orange; firm; moist.			
0.5				0.50			
			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; light grey to mid grey with trace brown.			
				0.80			
				Tube Refusal at 0.8m. Hole Terminated at 0.80 m			
1.0							
1.5							
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B2

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT; contains grass roots; dark grey-brown; soft; moist.	D	B2-0.0-0.2	Not Encountered	TUBE
				0.20				
			CI/SC (v)	SANDY SILTY CLAY; contains zones of extremely weathered sandstone (behaves as a medium dense clayey silty sand); grey with brown and trace orange-brown; firm; moist.				
0.5				0.55				
			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; light grey with mid grey and trace brown.	SPT	10,19,29 N=47		
1.0								
				1.30				
				Tube Refusal at 1.3m. Hole Terminated at 1.30 m				
1.5								
2.0								
2.5								
3.0								
3.5								

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B3

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with sand and trace gravel; contains grass roots; dark grey-brown; soft; moist.	D	B3-0.0-0.1	Not Encountered	TUBE
				0.10				
				SANDY SILTY CLAY, with trace ironstone gravel; contains zones of extremely weathered sandstone (behaves as a medium dense clayey silty sand); grey, orange, brown, mottled; very stiff; moist.				
0.5			CI/SC (v)		SPT	8,10,20 N=30		
				0.90				
1.0				SANDSTONE; extremely weathered; extremely weak; light grey to mid grey with orange and brown.				
			ROCK (v)					
1.5				1.60				
				Tube Refusal at 1.6m. Hole Terminated at 1.60 m				
2.0								
2.5								
3.0								
3.5								

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No. **B4**

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with trace sand, grass roots; dark grey-brown; soft; moist.	D B4-0.0-0.1	Not Encountered	TUBE
				0.10			
				SANDY SILTY CLAY; contains zones of extremely weathered sandstone (behaves as a medium dense clayey silty sand); light grey with brown, orange and trace dark grey-brown mottle; stiff; moist.			
0.5			CI/SC (v)		SPT 8,9,12 N=21		
				0.90			
1.0				SANDSTONE; extremely weathered; extremely weak; light grey to mid grey with brown, trace dark grey.			
1.5			ROCK (v)				
2.0				2.00			
				Tube Refusal at 2.0m. Hole Terminated at 2.00 m			
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No. **B5**

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with sand and trace gravel; contains grass roots; dark grey-brown; soft; moist.	D B5-0.0-0.1	Not Encountered	TUBE
				0.10			
			CI/SC (v)	SANDY SILTY CLAY; contains zones of extremely weathered sandstone (behaves as a medium dense clayey silty sand); light grey with orange and brown; very stiff; moist.			
0.5					SPT 7, 19/100, - N=R		
				0.75			
			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; light grey to mid grey with orange and brown.			
1.0				1.00			
				Tube Refusal at 1.0m. Hole Terminated at 1.00 m			
1.5							
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No. **B6**

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with trace sand; dark grey-brown; soft; moist.	0.10 D B6-0.0-0.1	Not Encountered	TUBE
				SANDY SILTY CLAY; contains zones of extremely weathered sandstone (behaves as a medium dense clayey silty sand); light grey with orange and yellow mottle; firm to approx. 0.6m, then stiff; moist. - Zones of extremely weathered sandstone (extremely weak) from 0.3m to 0.35m and 0.5m to 0.6m.	U		
0.5							
			CI/SC (v)		SPT 6,12,13 N=25		
1.0							
1.5					1.50		
			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; light grey and grey with trace orange and brown.	1.90		
2.0				Tube Refusal at 1.9m. Hole Terminated at 1.90 m			
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B7

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT, trace sand and fine gravel; grass roots in top 0.1m; dark grey-brown; soft; moist.	D	B7-0.0-0.3	Not Encountered	TUBE
				0.30				
0.5				CLAYEY SILT with sand; contains zones of extremely weathered sandstone (behaves as a medium dense clayey silty sand); orange and brown mottled, trace yellow-brown and red-brown; soft; moist.	SPT	2,3,4 N=7		
1.0				- Becomes firm at approximately 0.8m.				
1.5			CI/SC (v)		SPT	9,6,10 N=16		
2.0				- Becomes stiff at approx. 1.8m.				
2.5				2.60				
			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; grey, brown, yellow-grey-brown and trace orange.				
3.0				3.00				
				Tube Refusal at 3.0m. Hole Terminated at 3.00 m				
3.5								
4.0								
4.5								

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B8

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	CLAYEY SILT, trace sand; grey-brown, grey and orange-brown; soft; moist.	D B8-0.0-0.15	Not Encountered	TUBE
				0.15			
				TOPSOIL - CLAYEY SILT with trace gravel, sand and rare coal; dark brown with trace dark grey-brown; soft; moist.			
			FILL (v)	- Contains a piece of glass at 0.4m.			
0.5							
				0.65			
				SANDY SILTY CLAY with trace fine ironstone gravel; contains zones of extremely weathered sandstone (behaves as a medium dense clayey silty sand); orange, brown and yellow-grey-brown mottled; firm; moist.	SPT 2,2,3 N=5		
1.0				- Becomes more light grey with orange-brown below 1.0m.			
1.5					SPT 4,8,13 N=21		
			CI/SC (v)	- Becomes very stiff at approx. 1.8m.			
2.0							
2.5							
				3.00			
3.0			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; light to mid grey, brown with trace orange-brown.			
				3.20			
				Tube Refusal at 3.2m. Hole Terminated at 3.20 m			
3.5							
4.0							
4.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B9

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with trace sand and gravel; grass roots in top 0.1m; dark grey-brown; soft; moist.	D	B9-0.0-0.2	Not Encountered	TUBE
0.5				0.50				
			CH (v)	SANDY SILTY CLAY with trace ironstone gravel; brown, orange-brown, trace red-brown; firm; moist. - Zone of higher gravel concentration 0.9m to 0.95m; moist to very moist.	SPT	2,1,3 N=4		
1.0								
				1.40				
1.5			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; grey and orange-brown, with brown.	SPT	20,-,- N=R		
2.0				2.00 Tube Refusal at 2.0m. Hole Terminated at 2.00 m				
2.5								
3.0								
3.5								

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B10

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
0.5			FILL (v)	TOPSOIL - CLAYEY SILT with sand and trace gravel; contains rare pieces of coal; dark grey-brown; firm; moist.	D	B10-0.0-0.4 + QC1	Not Encountered	TUBE
				0.60				
1.0			CH (v)	SILTY CLAY with sand and trace gravel; brown, yelllow-grey-brown; firm; moist.	SPT	2,2,3 N=5		
				1.40				
1.5				SANDY SILTY CLAY with trace ironstone gravel; grey and orange-brown mottled; stiff; moist.	SPT	5,7,10 N=17		
2.0			CH (v)					
2.5								
				2.80				
3.0			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; grey, brown and orange.				
				3.10				
				Tube Refusal at 3.1m. Hole Terminated at 3.10 m				
3.5								
4.0								
4.5								

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B11

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with trace sand; dark grey-brown; soft; moist.	0.10 D B11-0.0-0.1		
			FILL (v)	CLAYEY SILT / SILTY CLAY with trace ironstone gravel; yellow-brown, orange-brown, red, grey and brown mottled; firm; moist.			
0.5					0.50		
			FILL (v)	TOPSOIL - CLAYEY SILT with sand; (old topsoil layer) contains fine root fibres. dark grey-brown; firm; moist.	D B11-0.5-0.65 SPT 2,2,4 N=6		
					0.85		
1.0				SANDY SILTY CLAY; light grey and orange-brown mottled, trace brown and red-brown; firm; moist.			
1.5			CH (v)	- Becomes stiff at approx. 1.5m.	SPT 2,4,6 N=10		
2.0				- Groundwater level at 2.0m depth at end of hole.		2.0m at EOH, 9:30am	TUBE
2.5							
					2.70		
			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; grey, yellow-grey and yellow-grey-brown			
3.0				- Highly weathered zone from 3.0m to 3.1m. - Very slight seepage at 3.0m depth.		3.0m	
					3.40		
3.5				Tube Refusal at 3.4m. Hole Terminated at 3.40 m			
4.0							
4.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B12

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with trace of sand; contains grass roots; dark grey-brown; soft; moist.	0.10 D B12-0.0-0.1		
			FILL (v)	CLAYEY SILT / SILTY CLAY with trace sand and ironstone gravel; orange-brown and red mottled with trace brown; firm; moist.			
0.5				- Piece of glass at 0.45m.	0.55		
			FILL (v)	TOPSOIL - CLAYEY SILT with sand; (old topsoil layer) contains fine root fibres and small tree roots in SPT sample; dark grey-brown; soft to firm; moist.	D B12-0.55-0.80 SPT 2,2,3 N=5		
					0.85		
1.0				SANDY SILTY CLAY; grey and orange mottled; firm to stiff; moist.			
						1.4m at EOH, 10am	
1.5			CH (v)	- Groundwater level at 1.4m depth at end of hole. - Becomes very stiff below approx. 1.5m.	SPT 5,11,20 N=31		TUBE
2.0							
					2.40		
2.5			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; grey, brown and orange-brown. - Silty Clay seam from 2.5m to 2.7m		2.7m	
				- Slight groundwater inflow at 2.7m - Highly weathered zone 2.7m to 2.8m.			
3.0					3.00		
				Tube Refusal at 3.0m. Hole Terminated at 3.00 m			
3.5							
4.0							
4.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B13

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with trace sand; grass roots in top 0.05m; dark grey-brown; soft; moist.	D B13-0.0-0.15	Not Encountered	TUBE
				0.15			
			FILL (v)	SILTY CLAY with trace ironstone gravel; yellow-brown, orange-brown and grey mottled; firm; moist.			
0.5				0.50			
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT, contains fine roots fibres; (old topsoil layer) dark brown/ dark grey-brown; firm; moist.	D		
				0.70	SPT B13-0.5-0.7 2,2,4 N=6		
				SANDY SILTY CLAY with trace ironstone gravel; light grey, orange-brown and trace yellow-brown mottled; firm; moist.			
1.0							
1.5			CH (v)	- Becomes very stiff at approx. 1.5m.	SPT 4,7,11 N=18		
2.0							
				2.40			
2.5			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; brown, grey-brown, orange-brown.			
				2.60			
				Tube Refusal at 2.6m. Hole Terminated at 2.60 m			
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B14

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with trace sand; grass roots in top 0.05m; dark grey-brown; soft; moist to very moist.	D B14-0.0-0.15	Not Encountered	TUBE
				0.15			
				SANDY SILTY CLAY with trace ironstone gravel; yellow-grey with brown mottle; firm; moist.			
0.5			CH (v)		B SPT 2,6,- N=R		
				0.80			
				SANDSTONE; extremely weathered; extremely weak; light grey with brown/ orange-brown and yellow-grey-brown.			
1.0			ROCK (v)				
				1.30			
				Tube Refusal at 1.3m. Hole Terminated at 1.30 m			
1.5							
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B15

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 22/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL -SANDY CLAYEY SILT; contains grass roots; dark grey/dark grey-brown; soft; very moist to moist.	D B15-0.0-0.1	Not Encountered	TUBE
				0.10			
			CH (v)	SANDY SILTY CLAY with trace ironstone gravel; light grey with orange and brown; firm to stiff; moist.			
0.5				0.50			
				SANDSTONE; with thin 0.05m zones of Sandy Silty Clay; extremely weathered; extremely weak; light grey with orange and brown.	SPT 15,5/20,- N=R		
1.0							
1.5			ROCK (v)				
2.0				- Thin (0.05m) highly weathered zones below 2.0m.			
				2.40			
2.5				Tube Refusal at 2.4m. Hole Terminated at 2.40 m			
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B16

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 22/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL- CLAYEY SILT with sand; contains grass roots; dark grey-brown; soft; moist to very moist.	0.05 D B16-0.0-0.05	Not Encountered	TUBE
				SANDY SILTY CLAY; light grey and orange mottled with trace red-brown and brown; firm to approximately 0.6m then stiff; moist.	U		
0.5					SPT 2,5,6 N=11		
			CH (v)				
1.0							
1.5					SPT 6,8,4/30 N=R		
					1.80		
2.0			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; grey and orange and brown with dark brown staining. highly weathered zone from 1.83m to 1.93m.			
2.5					2.50		
				Tube Refusal at 2.5m. Hole Terminated at 2.50 m			
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B17

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 23/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT; contains grass roots in top 0.1m; dark grey-brown; soft; very moist.	D	B17-0.0-0.2	Not Encountered	TUBE
				0.20				
				SANDY SILTY CLAY; orange and grey mottled; soft; moist.	U			
0.5			CH (v)		SPT	1,1,2 N=3		
				0.90				
1.0				SANDY SILTY CLAY with trace ironstone gravel; light grey with orange-brown and brown, some dark grey below 1.2m; stiff; moist.				
1.5					SPT	2,5,5 N=10		
			CH (v)					
2.0								
2.5								
				2.80				
				SANDSTONE; extremely weathered; extremely weak; light grey with orange and brown.				
3.0					SPT	11,7/50,- N=R		
3.5			ROCK (v)					
4.0								
				4.20				
				Tube Refusal at 4.2m. Hole Terminated at 4.20 m				
4.5								

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No. **B18**

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 22/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT with fine gravel; contains grass roots in top 0.1m; dark grey; soft; moist to very moist.	D	B18-0.0-0.2	0.0m at 10.40am (water at surface)	TUBE
				0.20 SILTY CLAY with sand and trace fine ironstone gravel; grey and orange mottled with yellow-brown; firm; moist.				
0.5			CH (v)	- Becomes grey and orange with black/dark brown staining/mottle below 0.5m depth.	SPT	2,3,4 N=7		
1.0				1.10 SANDY SILTY CLAY; light grey, brown and orange-brown with trace dark brown; stiff; moist. - Highly weathered sandstone zones 1.2m to 1.25m and 1.4m to 1.45m.				
				- Groundwater inflow at 1.4m.			1.4m	
1.5			CI (v)	- Becomes very stiff at approx. 1.5m.	SPT	4,10,16 N=26		
2.0				- Groundwater level at 2.2m depth at end of hole. Approx. 50mins after completion of hole, groundwater level at ground surface.			2.2m at EOH, 9:50am	
				2.40 SANDSTONE; extremely weathered; extremely weak; light grey, orange and brown with mid grey.				
2.5								
3.0				- Contains some fine quartz gravel in SPT sample at 3.0m.	SPT	10,6/20,- N=R		
3.5			ROCK (v)					
4.0								
4.5				4.50 Hole Terminated at 4.50 m				

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No. **B19**

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 22/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT; contains grass roots; dark grey-brown; soft; moist.	D	B19-0.0-0.2		
				0.20				
			FILL (v)	CLAYEY SILT with sand and trace gravel; brown with orange-brown, trace yellow-brown; soft; moist.				
				0.45				
0.5			CH (v)	SANDY CLAYEY SILT with fine ironstone gravel; grey, orange and trace yellow-brown mottle; firm; moist.	SPT	2,2,2 N=4		
1.0				- Groundwater level at 0.9m depth at end of hole.			0.9m at EOH, 3pm	
				1.10				
1.5			CH (v)	SILTY CLAY with sand; contains fine root fibres; grey, orange and orange-brown mottled; firm; moist.	SPT	2,3,3 N=5		
2.0				2.00				
2.5			CI (v)	SANDY SILTY CLAY; with thin extremely weathered sandstone zones at 2.3m to 2.4m, 2.6m to 2.75m; grey/ greenish grey with orange and brown; stiff; moist.				TUBE
3.0					SPT	4,10,15 N=25		
3.5				- Highly weathered sandstone zone from 3.5m to 3.7m. Groundwater inflow at 3.5m depth.			3.5m	
4.0				4.20				
			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; grey, orange and brown.				
4.5				4.50				
				Hole Terminated at 4.50 m				

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B20

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 22/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with trace grass roots; dark grey-brown; soft; very moist to moist.	0.05 D B20-0.0-0.05		
				SANDY CLAYEY SILT; brown, orange-brown, grey and trace yellow-brown mottled; soft to firm; moist.			
0.5			FILL (v)		SPT 2,2,3 N=5		
					0.95		
1.0			CH (v)	SILTY CLAY with trace sand; light grey with orange and trace yellow mottle; soft to firm; moist.			
				- Decomposed tree roots at 1.2m and 1.4m.			
1.5				SANDY SILTY CLAY with fine ironstone gravel; grey, orange-brown and dark brown mottled; stiff; moist.	1.50 SPT 1,3,6 N=9		
2.0			CH (v)				
2.5				- Highly weathered zones from 2.4m to 2.45m, 2.7m to 2.75m, and 2.85m to 2.9m.			
					2.90		
3.0				SANDSTONE; extremely weathered; extremely weak; light grey with orange and brown staining.	SPT 5,10,18 N=28		
3.5			ROCK (v)				
4.0				- Zone of quartz gravel from 4.2m to 4.25m. Groundwater inflow at 4.2m depth. Groundwater level at 0.1m depth at end of hole and then at ground surface approx. 20mins after completion of hole.		4.2m	
					4.50		
4.5				Hole Terminated at 4.50 m			

0.1m at EOH, 10:40am. At surface at 11am

TUBE

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B21

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 22/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT; contains grass roots in top 0.1m; dark grey/dark grey-brown; soft; moist to very moist.	D B21-0.0-0.2		
				0.20			
			FILL (v)	CLAYEY SILT with sand and trace fine root fibres; brown with orange-brown and dark grey/black specks; soft to firm; moist.			
0.5				0.50			
			FILL (v)	CLAYEY SILT with trace sand; brown, orange, orange-brown and grey mottled; firm; moist.	SPT 2,2,3 N=5		
1.0							
				1.30			
			FILL (v)	TOPSOIL - CLAYEY SILT with sand; (old topsoil); contains root fibres; dark grey-brown/ dark brown; soft; moist.	D B21-1.3-1.5		
1.5				1.60			
			FILL (v)	SANDY CLAYEY SILT with gravel; contains fine root fibres; dark brown/ dark grey-brown; soft; moist to very moist.	SPT 2,1,3 N=4		
2.0							
				2.30			
			CH (v)	SILTY CLAY; orange, orange-brown, grey mottled, trace brown; stiff; moist. - Groundwater level at 2.7m at end of hole.		2.7m at EOH, 2:10pm.	TUBE
2.5							
				3.00			
3.0			CH (v)	SANDY SILTY CLAY, with trace gravel; grey, orange and brown; sitff; moist.	SPT 5,7,9 N=16	3.0m	
3.5				- Highly weathered siltstone zone from 3.7m to 3.8m; wet. Groundwater inflows at 3.0m and 3.7m.		3.7m	
4.0				4.20			
4.5				Tube Refusal at 4.2m. Hole Terminated at 4.20 m			

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B22

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 22/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT; contains grass roots in top 0.1m; dark grey-brown; soft; moist.	D	B22-0.0-0.15		
0.15								
				SANDY CLAYEY SILT with gravel; contains rare fine root fibres; grey-brown, brown, orange, yellow-grey-brown; firm; moist.	D	B22-0.15-0.5		
0.5			FILL (v)		SPT	2,3,3 N=6		
1.0								
1.30								
1.5				SILTY CLAY with sand; contains rare fine root fibres; orange and grey mottled with trace yellow-brown; firm; moist.	SPT	1,2,4 N=6		
2.0			CH (v)					
2.5								
2.95								
3.0				SANDSTONE; extremely weathered; extremely weak; grey with brown staining, yellow-brown and yellow-grey-brown, trace orange.	SPT	6,10,17 N=27		
				- Groundwater level at 3.3m depth at end of hole.			3.3m at EOH, 11:45am	
3.5				- Highly weathered zone from 3.5m to 3.55m. Groundwater inflow at 3.55m depth.			3.55m	
			ROCK (v)					
4.0				- Clayey silt zones from 4.0m to 4.15m and 4.25m to 4.3m.				
				- Highly weathered zone from 4.35m to 4.5m. Groundwater inflow at 4.35m depth.			4.35m	
4.50								
4.5				Hole Terminated at 4.50 m				TUBE

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B23

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 22/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with trace sand; contains grass roots in top 0.1m; dark grey-brown; soft; moist to very moist.	D B23-0.0-0.15	Not Encountered	TUBE
				0.15			
				SANDY CLAYEY SILT with ironstone gravel; contains fine roots and root fibres; grey, orange, red-brown and brown; firm; moist.			
0.5			FILL (v)		SPT 2,2,2 N=4		
1.0							
				1.20			
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT with gravel; (old topsoil); contains rare fine root fibres; dark grey; soft to firm; moist.			
				1.40			
1.5				SILTY CLAY with trace ironstone gravel; grey, orange-brown, red-brown; firm; moist.			
			CH (v)		SPT 2,2,4 N=6		
2.0				2.00			
				SILTY CLAY; light grey with trace mid grey and yellow mottle; stiff; moist.			
2.5			CH (v)				
3.0					SPT 5,11,19 N=30		
				3.40			
3.5				SILTSTONE; extremely weathered; extremely weak; mid grey with some light grey and brown.			
			ROCK (v)				
4.0							
				4.40			
4.5				Tube Refusal at 4.4m. Hole Terminated at 4.40 m			

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B24

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 22/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT; contains grass roots; dark grey-brown; soft; moist.	D B24-0.0-0.15	Not Encountered	TUBE
				0.15			
				SANDY CLAYEY SILT with trace gravel; grey, grey-brown, yellow-grey-brown, with brown and trace orange-brown; firm; moist.			
0.5			FILL (v)		SPT 1,2,3 N=5		
1.0				1.00			
			FILL (v)	CLAYEY SILT with trace sand; grey, orange and red-brown with trace yellow-brown; firm; moist.			
				1.40			
1.5			FILL (v)	TOPSOIL - SANDY CLAYEY SILT with gravel; (old topsoil); contains fine root fibres and decomposed organics; dark grey-brown; firm; moist.	SPT 1,4,6 N=10		
				1.95			
2.0			CH (v)	SILTY CLAY with trace sand; light grey and yellow brown mottled, trace brown; stiff; moist.			
2.5				- Decomposed tree root at 2.3m			
				2.80			
3.0			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; grey with brown, yellow-brown and yellow-grey-brown.	SPT 7,6/20,- N=R		
3.5							
				3.80			
			ROCK (v)	SILTSTONE / SHALE; extremely weathered; extremely weak; laminated; dark grey.			
4.0				4.00 Tube Refusal at 4.0m. Hole Terminated at 4.00 m			
4.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B25

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 22/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with sand; contains grass roots in top 0.05m; dark grey-brown; soft; moist.	D B25-0.0-0.15	Not Encountered	TUBE
				0.15			
			FILL (v)	CLAYEY SILT with trace gravel; orange-brown and red-brown; firm; moist.			
0.5				0.50			
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT; (old topsoil); contains fine root fibres; dark brown; firm; moist.	D B25-0.5-0.7		
				0.70			
				SILTY CLAY with sand; light grey with orange and red-brown mottle; firm to stiff; moist.			
1.0			CH (v)		SPT 2,3,5 N=8		
1.5				1.50			
				Hole Terminated at 1.50 m			
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B26

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 23/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT; contains grass roots in top 0.1m; dark grey-brown; soft; moist to very moist.	D B26-0.0-0.25	Not Encountered	TUBE
				0.25			
0.5			FILL (v)	SANDY CLAYEY SILT; orange, grey and red-brown mottled, trace brown; soft to firm; moist. - Zone of highly weathered sandstone 0.4m to 0.5m.			
				0.70			
1.0			FILL (v)	TOPSOIL - CLAYEY SANDY SILT, trace gravel; (old topsoil); dark brown; soft; moist.			
				1.10			
1.5			CH (v)	SILTY CLAY with sand; grey, orange-brown and red-brown mottled; firm; moist.	SPT 1,2,2 N=4		
				1.50			
2.0				Hole Terminated at 1.50 m			
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B27

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 23/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT; contains grass roots; dark grey-brown; soft; moist to very moist.	0.05 D B27-0.0-0.05	Not Encountered	TUBE
			FILL (v)				
			FILL (v)	CLAYEY SILT with sand and gravel; grey and yellow-brown; soft; moist.	0.20		
				GRAVEL (Ironstone) in a CLAYEY SILT matrix; dark brown/ black with orange; loose/ soft; moist.	0.35		
0.5				SILTY CLAY with sand; grey, orange, with yellow-brown and brown; firm; moist.			
1.0			CH (v)	- Becomes stiff at approximately 1.3m.	SPT 3,4,7 N=11		
1.5				Hole Terminated at 1.50 m	1.50		
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

NSWPW LIB 1.03.GLB Log NSW PW BOREHOLE GS91A-ROWLAND HASSALL SCHOOL_BH.GPJ <<DrawingFiles>> 21/08/2015 11:51 8.30.004 Datgel Lab and In Situ Tool

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B28

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with trace sand; dark grey; soft; very moist.	D B28-0.0-0.25	Not Encountered	TUBE
				0.25			
			FILL (v)	CLAYEY SILT; orange-brown, grey and brown with dark grey; firm; moist.			
				0.35			
0.5			CH (v)	SANDY SILTY CLAY; light grey, trace yellow-brown and orange-brown; firm; moist.			
1.0							
				1.20	SPT 12,23,30 N=53		
			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; light grey with orange and yellow and brown staining.			
1.5				1.50			
				Hole Terminated at 1.50 m			
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B29

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT with gravel; contains grass roots; dark grey-brown; firm; moist.	D B29-0.0-0.1	Not Encountered	TUBE
				0.10 CLAYEY SILT with ironstone gravel; orange, brown and grey mottled; firm; moist.			
0.5			FILL (v)				
				0.90 TOPSOIL - CLAYEY SILT; (old topsoil); contains fine root fibres; dark grey-brown; firm; moist.			
1.0			FILL (v)		SPT 2,3,5 N=8		
				1.30 SILTY CLAY with sand; grey and orange mottled; stiff; moist.			
1.5			CH (v)	1.50 Hole Terminated at 1.50 m			
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B30

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - SANDY SILT with clay; contains grass roots; dark brown; soft; moist.	D B30-0.0-0.15 + QC3	Not Encountered	TUBE
				0.15			
			FILL (v)	CLAYEY SILT; contains fine root fibres; grey, brown, orange-brown and yellow-brown mottle; firm; moist.			
0.5				0.60			
			CH (v)	SILTY CLAY with sand; orange-brown, grey and trace yellow-brown mottled; stiff; moist.	SPT 2,4,8 N=12		
1.0							
1.5				1.50			
				Hole Terminated at 1.50 m			
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B31

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with sand; contains grass roots; dark grey-brown; soft; moist.	0.05 D B31-0.0-0.05	Not Encountered	TUBE
0.5			CH (v)	SANDY SILTY CLAY; light grey, orange and trace red-brown and yellow mottle; stiff; moist.			
1.0					SPT 3,3,6 N=9		
1.5				1.50 Hole Terminated at 1.50 m			
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B32

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT; grass roots in top 0.1m; dark grey-brown; soft; moist.	D B32-0.0-0.15	Not Encountered	TUBE
				0.15			
				SILTY CLAY with sand and trace ironstone gravel; grey, orange and trace red-brown mottled; firm; moist.			
			CH (v)				
0.5							
				0.60			
				SANDY SILTY CLAY; light grey with trace yellow mottle; stiff; moist.			
1.0			CH (v)		SPT 2,2,10 N=12		
1.5				1.50			
				Hole Terminated at 1.50 m			
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B33

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with sand and trace gravel; grass roots in top 0.05m; dark grey-brown; soft; moist.	D B33-0.0-0.15	Not Encountered	TUBE
				0.15			
				SANDY SILTY CLAY with trace fine ironstone gravel; grey and orange and trace yellow-brown; firm; moist.			
0.5			CH (v)				
1.0					SPT 9,11,10/50 N=R		
				- SPT refusal on some ironstone gravel			
1.5				1.50			
				Hole Terminated at 1.50 m			
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B34

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 21/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - CLAYEY SILT with trace sand; grass roots in top 0.05m; dark grey-brown; soft to firm; moist to very moist.	D B34-0.0-0.2	Not Encountered	TUBE
				0.20			
			CH (v)	SANDY SILTY CLAY with ironstone gravel; grey and orange-brown mottled; trace red-brown; firm; moist.			
				0.40			
0.5			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; mid grey with orange-brown staining.			
				0.70			
				Tube Refusal at 0.7m. Hole Terminated at 0.70 m			
1.0							
1.5							
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B35

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 23/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
			FILL (v)	TOPSOIL - SANDY CLAYEY SILT; contains grass roots; dark brown/ dark grey-brown; very soft; very moist to wet.	D B35-0.0-0.1 + QC4 + TOPSOIL	Not Encountered	TUBE
				0.10			
			CH (v)	SILTY CLAY with sand; light grey, orange and trace yellow-brown mottled; firm; moist.			
0.5				0.50			
			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; orange, brown and trace grey.			
1.0							
1.5				1.50			
				Hole Terminated at 1.50 m			
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B36

PROJECT: ROWLAND HASSALL SCHOOL
LOCATION: CHESTER HILL
CONTRACTOR: TERRATEST
SITE SUPERVISOR: P.ANDERSON

EQUIPMENT: GEOPROBE
PROJECT COORDINATOR: P.ANDERSON

DATE: 23/07/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST	WATER	METHOD
0.5			FILL (v)	TOPSOIL - SANDY CLAYEY SILT; contains grass roots in top 0.1m; dark yellow-brown; soft to very soft; very moist. 0.15	D B36-0.0-0.15	Not Encountered	TUBE
1.0			ROCK (v)	SANDSTONE; extremely weathered; extremely weak; orange, grey and brown.	B		
				1.30			
1.5				Tube Refusal at 1.3m. Hole Terminated at 1.30 m			
2.0							
2.5							
3.0							
3.5							

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS91A

SHEET: 1 OF 1

APPENDIX F

Analytical Results and Laboratory QA/QC Report

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1527369**	Page	: 1 of 45
Client	: **DEPARTMENT OF FINANCE AND SERVICES**	Laboratory	: Environmental Division Sydney
Contact	: PETA ANDERSON	Contact	:
Address	: LEVEL 14 McKELL BUILDING 2-24 RAWSON PLACE SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: peta.anderson@services.nsw.gov.au	E-mail	:
Telephone	: +61 02 99490200	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9372 7876	Facsimile	: +61-2-8784 8500
Project	: ROWLAND HASSAL SCHOOL	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: GS91B	Date Samples Received	: 31-Jul-2015 14:25
C-O-C number	: ----	Date Analysis Commenced	: 03-Aug-2015
Sampler	: PETA ANDERSON	Issue Date	: 12-Aug-2015 10:03
Site	: ----		
		No. of samples received	: 48
Quote number	: ----	No. of samples analysed	: 48

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
- Descriptive Results

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
Andrew Epps	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos
Pabi Subba	Senior Organic Chemist	Sydney Inorganics Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics

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.

- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- EA200 Legend
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Ch' Chrysotile (white asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- **EA200: As only one sample container was submitted for multiple tests,(ES1527369-40) sub sampling was conducted prior to Asbestos analysis. As this has the potential to understate detection, results should be scrutinised accordingly.**
- 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.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl (Method 15G1) is a more suitable method for the determination of exchange acidity ($H^+ + Al^{3+}$).

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	B1-0.0-0.2	B2-0.0-0.2	B3-0.0-0.1	B4-0.0-0.1	B5-0.0-0.1
			Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit	ES1527369-001	ES1527369-002	ES1527369-003	ES1527369-004	ES1527369-005
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.6	6.7	6.4	6.4	6.4
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	27.0	26.4	26.3	29.7	24.0
ED008: Exchangeable Cations								
^ Exchangeable Calcium	----	0.1	cmol/kg	6.1	8.0	8.1	6.2	6.9
^ Exchangeable Magnesium	----	0.1	cmol/kg	5.4	3.8	4.1	4.6	3.6
^ Exchangeable Potassium	----	0.1	cmol/kg	0.6	0.4	0.8	0.6	0.6
^ Exchangeable Sodium	----	0.1	cmol/kg	0.6	0.6	0.7	1.0	0.6
^ Cation Exchange Capacity	----	0.1	cmol/kg	12.8	12.8	13.7	12.4	11.7
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	13	12	11	13	8
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	22	20	18	23	18
Copper	7440-50-8	5	mg/kg	33	22	30	27	30
Lead	7439-92-1	5	mg/kg	74	63	52	63	49
Nickel	7440-02-0	2	mg/kg	16	16	12	21	14
Zinc	7440-66-6	5	mg/kg	79	84	69	98	81
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	2.55	3.42	2.83	2.52	3.46
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B1-0.0-0.2	B2-0.0-0.2	B3-0.0-0.1	B4-0.0-0.1	B5-0.0-0.1
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-001	ES1527369-002	ES1527369-003	ES1527369-004	ES1527369-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	----	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	----	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg		<0.05	----	----	<0.05	<0.05
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	<0.5
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	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<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	<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	<0.5
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	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<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**	**0.6**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B1-0.0-0.2	B2-0.0-0.2	B3-0.0-0.1	B4-0.0-0.1	B5-0.0-0.1
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-001	ES1527369-002	ES1527369-003	ES1527369-004	ES1527369-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ 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									
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	>C10_C16	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	%		117	----	----	113	120
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		84.0	----	----	80.9	81.7
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		111	----	----	101	108
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		90.6	90.8	90.8	88.0	91.3

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B1-0.0-0.2	B2-0.0-0.2	B3-0.0-0.1	B4-0.0-0.1	B5-0.0-0.1
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-001	ES1527369-002	ES1527369-003	ES1527369-004	ES1527369-005
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		92.3	92.6	90.7	85.0	93.2
2.4.6-Tribromophenol	118-79-6	0.5	%		108	109	104	104	107
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		93.0	93.4	90.8	93.3	93.0
Anthracene-d10	1719-06-8	0.5	%		96.0	96.3	93.5	97.4	95.9
4-Terphenyl-d14	1718-51-0	0.5	%		93.8	95.6	92.1	95.3	96.4
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		80.1	76.4	82.5	80.7	83.2
Toluene-D8	2037-26-5	0.2	%		89.5	83.6	85.2	85.7	88.1
4-Bromofluorobenzene	460-00-4	0.2	%		86.8	78.7	79.6	80.6	80.8

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	B6-0.0-0.1	B7-0.0-0.3	B8-0.0-0.15	B9-0.0-0.2	B10-0.0-0.4
			Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit	ES1527369-006	ES1527369-007	ES1527369-008	ES1527369-009	ES1527369-010
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.3	6.9	6.9	6.9	7.1
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	30.7	17.2	19.6	17.4	18.8
ED008: Exchangeable Cations								
^ Exchangeable Calcium	----	0.1	cmol/kg	7.8	7.1	8.2	9.7	8.7
^ Exchangeable Magnesium	----	0.1	cmol/kg	4.8	3.3	3.4	2.6	3.0
^ Exchangeable Potassium	----	0.1	cmol/kg	0.8	0.4	0.4	0.9	1.1
^ Exchangeable Sodium	----	0.1	cmol/kg	1.0	0.7	0.9	0.5	0.4
^ Cation Exchange Capacity	----	0.1	cmol/kg	14.4	11.4	13.0	13.8	13.2
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	11	9	11	8	12
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	18	16	18	16	20
Copper	7440-50-8	5	mg/kg	27	18	30	19	22
Lead	7439-92-1	5	mg/kg	60	17	41	31	35
Nickel	7440-02-0	2	mg/kg	19	22	22	13	14
Zinc	7440-66-6	5	mg/kg	131	40	78	63	100
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	3.12	1.63	1.63	1.48	1.56
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	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B6-0.0-0.1	B7-0.0-0.3	B8-0.0-0.15	B9-0.0-0.2	B10-0.0-0.4
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-006	ES1527369-007	ES1527369-008	ES1527369-009	ES1527369-010
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
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	----
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	----	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	<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	<0.5
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	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<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	<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	<0.5
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	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<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**	**0.6**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B6-0.0-0.1	B7-0.0-0.3	B8-0.0-0.15	B9-0.0-0.2	B10-0.0-0.4
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-006	ES1527369-007	ES1527369-008	ES1527369-009	ES1527369-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ 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									
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	>C10_C16	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	%		----	----	112	125	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	80.3	82.1	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	96.6	109	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		87.4	87.4	89.0	84.2	90.9

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B6-0.0-0.1	B7-0.0-0.3	B8-0.0-0.15	B9-0.0-0.2	B10-0.0-0.4
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-006	ES1527369-007	ES1527369-008	ES1527369-009	ES1527369-010
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		92.0	89.9	91.4	87.0	94.2
2.4.6-Tribromophenol	118-79-6	0.5	%		101	85.0	87.8	93.0	96.1
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		91.5	91.1	94.2	92.2	93.0
Anthracene-d10	1719-06-8	0.5	%		93.0	94.0	95.7	94.5	95.1
4-Terphenyl-d14	1718-51-0	0.5	%		92.4	92.7	94.3	93.4	94.6
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		81.6	78.1	84.1	81.1	78.6
Toluene-D8	2037-26-5	0.2	%		85.6	83.7	90.1	85.4	83.4
4-Bromofluorobenzene	460-00-4	0.2	%		81.6	79.8	86.4	81.8	77.4

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	B11-0.0-0-0.1	B11-0.5-0.65	B12-0.0-0.1	B12-0.55-0.8	B13-0.0-0.15
			Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit	ES1527369-011	ES1527369-012	ES1527369-013	ES1527369-014	ES1527369-015
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.7	6.8	6.7	----	6.6
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	19.6	18.4	19.0	20.3	23.9
ED008: Exchangeable Cations								
^ Exchangeable Calcium	----	0.1	cmol/kg	6.1	5.8	6.2	----	6.2
^ Exchangeable Magnesium	----	0.1	cmol/kg	3.1	2.8	3.0	----	4.5
^ Exchangeable Potassium	----	0.1	cmol/kg	0.1	<0.1	<0.1	----	0.7
^ Exchangeable Sodium	----	0.1	cmol/kg	0.6	0.6	0.6	----	0.6
^ Cation Exchange Capacity	----	0.1	cmol/kg	9.9	9.2	9.9	----	12.0
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	9	9	10	8	8
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	20	16	18	17	20
Copper	7440-50-8	5	mg/kg	15	13	14	13	27
Lead	7439-92-1	5	mg/kg	25	24	19	21	49
Nickel	7440-02-0	2	mg/kg	12	13	11	13	17
Zinc	7440-66-6	5	mg/kg	46	41	34	36	115
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.08	1.19	0.84	----	1.26
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	<0.1	<0.1	----	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	<0.05	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	<0.05	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	<0.05	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	<0.05	<0.05	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	<0.05	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	<0.05	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	<0.05	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	<0.05	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	----	<0.05	<0.05	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	<0.05	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B11-0.0-0-0.1	B11-0.5-0.65	B12-0.0-0.1	B12-0.55-0.8	B13-0.0-0.15
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-011	ES1527369-012	ES1527369-013	ES1527369-014	ES1527369-015
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	<0.05	<0.05	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		----	<0.05	<0.05	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg		----	<0.05	<0.05	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		----	<0.05	<0.05	----	<0.05
Endrin	72-20-8	0.05	mg/kg		----	<0.05	<0.05	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	<0.05	<0.05	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	<0.05	<0.05	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		----	<0.05	<0.05	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	<0.05	<0.05	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	<0.05	<0.05	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		----	<0.2	<0.2	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		----	<0.05	<0.05	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		----	<0.2	<0.2	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	<0.05	<0.05	----	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg		----	<0.05	<0.05	----	<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**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B11-0.0-0-0.1	B11-0.5-0.65	B12-0.0-0.1	B12-0.55-0.8	B13-0.0-0.15
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-011	ES1527369-012	ES1527369-013	ES1527369-014	ES1527369-015
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ 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									
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	>C10_C16	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	%		----	122	117	----	129
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	74.2	92.5	----	88.7
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	96.2	118	----	118
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		88.2	88.0	87.1	----	90.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B11-0.0-0-0.1	B11-0.5-0.65	B12-0.0-0.1	B12-0.55-0.8	B13-0.0-0.15
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-011	ES1527369-012	ES1527369-013	ES1527369-014	ES1527369-015
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		91.2	86.1	87.8	----	93.9
2.4.6-Tribromophenol	118-79-6	0.5	%		92.2	88.7	92.7	----	99.5
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		92.3	92.4	91.9	----	94.4
Anthracene-d10	1719-06-8	0.5	%		95.6	93.9	94.0	----	97.4
4-Terphenyl-d14	1718-51-0	0.5	%		92.6	91.6	92.2	----	93.6
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		82.4	78.0	73.6	----	80.5
Toluene-D8	2037-26-5	0.2	%		83.0	84.0	82.3	----	82.3
4-Bromofluorobenzene	460-00-4	0.2	%		79.8	77.5	74.4	----	78.0

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	B13-0.5-0.7	B14-0.0-0.15	B15-0.0-0.1	B16-0.0-0.05	B17-0.0-0.2
			Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[23-Jul-2015]
Compound	CAS Number	LOR	Unit	ES1527369-016	ES1527369-017	ES1527369-018	ES1527369-019	ES1527369-020
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.9	6.5	6.0	6.6	6.5
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	17.5	23.7	28.3	25.0	29.8
ED008: Exchangeable Cations								
^ Exchangeable Calcium	----	0.1	cmol/kg	5.2	3.3	3.3	6.0	6.9
^ Exchangeable Magnesium	----	0.1	cmol/kg	2.9	6.3	6.2	5.0	4.0
^ Exchangeable Potassium	----	0.1	cmol/kg	<0.1	0.4	0.7	0.6	0.3
^ Exchangeable Sodium	----	0.1	cmol/kg	0.7	1.5	0.6	0.6	3.5
^ Cation Exchange Capacity	----	0.1	cmol/kg	8.9	13.1	11.3	12.1	14.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	9	10	14	11	9
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	15	20	18	18	17
Copper	7440-50-8	5	mg/kg	12	25	28	17	18
Lead	7439-92-1	5	mg/kg	14	41	38	27	33
Nickel	7440-02-0	2	mg/kg	13	11	11	12	13
Zinc	7440-66-6	5	mg/kg	31	75	64	43	59
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.17	0.62	2.31	2.33	0.78
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	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B13-0.5-0.7	B14-0.0-0.15	B15-0.0-0.1	B16-0.0-0.05	B17-0.0-0.2
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[23-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-016	ES1527369-017	ES1527369-018	ES1527369-019	ES1527369-020
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
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	----
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	----	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	<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	<0.5
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	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<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	<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	<0.5
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	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<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**	**0.6**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B13-0.5-0.7	B14-0.0-0.15	B15-0.0-0.1	B16-0.0-0.05	B17-0.0-0.2
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[23-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-016	ES1527369-017	ES1527369-018	ES1527369-019	ES1527369-020
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ 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									
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	>C10_C16	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	%		----	----	121	98.0	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	81.1	80.6	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	100	105	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		88.6	93.4	89.4	93.7	93.0

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B13-0.5-0.7	B14-0.0-0.15	B15-0.0-0.1	B16-0.0-0.05	B17-0.0-0.2
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[23-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-016	ES1527369-017	ES1527369-018	ES1527369-019	ES1527369-020
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		90.4	93.6	86.7	93.9	96.2
2.4.6-Tribromophenol	118-79-6	0.5	%		88.3	97.3	106	104	102
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		92.6	95.5	92.8	91.9	93.4
Anthracene-d10	1719-06-8	0.5	%		95.8	98.4	94.4	93.9	96.8
4-Terphenyl-d14	1718-51-0	0.5	%		93.4	97.4	94.8	93.0	95.1
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		84.0	81.6	78.3	80.4	93.0
Toluene-D8	2037-26-5	0.2	%		84.6	86.5	83.6	85.3	92.9
4-Bromofluorobenzene	460-00-4	0.2	%		83.0	82.2	77.1	77.0	90.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	B18-0.0-0.2	B19-0.0-0.2	B20-0.0-0.05	B21-0.0-0.2	B21-1.3-1.5
			Client sampling date / time	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]
Compound	CAS Number	LOR	Unit	ES1527369-021	ES1527369-022	ES1527369-023	ES1527369-024	ES1527369-025
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.4	5.7	6.0	6.2	6.3
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	22.9	20.0	22.8	24.6	20.2
ED008: Exchangeable Cations								
^ Exchangeable Calcium	----	0.1	cmol/kg	6.5	3.6	5.8	6.8	4.8
^ Exchangeable Magnesium	----	0.1	cmol/kg	3.2	3.8	5.2	5.1	2.5
^ Exchangeable Potassium	----	0.1	cmol/kg	0.4	0.6	0.7	1.3	0.1
^ Exchangeable Sodium	----	0.1	cmol/kg	2.2	0.5	0.9	0.6	0.5
^ Cation Exchange Capacity	----	0.1	cmol/kg	12.2	8.6	12.6	13.8	7.9
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	10	21	12	24	12
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	18	20	15	17	19
Copper	7440-50-8	5	mg/kg	18	26	26	21	26
Lead	7439-92-1	5	mg/kg	39	21	44	22	68
Nickel	7440-02-0	2	mg/kg	12	8	14	9	14
Zinc	7440-66-6	5	mg/kg	61	46	81	47	175
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.25	2.24	0.66	2.84	0.69
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B18-0.0-0.2	B19-0.0-0.2	B20-0.0-0.05	B21-0.0-0.2	B21-1.3-1.5
				Client sampling date / time	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-021	ES1527369-022	ES1527369-023	ES1527369-024	ES1527369-025
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
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	<0.5
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	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<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	<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	<0.5
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	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<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**	**0.6**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B18-0.0-0.2	B19-0.0-0.2	B20-0.0-0.05	B21-0.0-0.2	B21-1.3-1.5
				Client sampling date / time	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-021	ES1527369-022	ES1527369-023	ES1527369-024	ES1527369-025
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ 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									
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	>C10_C16	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	%		108	80.0	----	----	83.0
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		98.7	79.4	----	----	80.3
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		100	99.4	----	----	105
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		91.6	98.8	96.1	99.5	96.1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B18-0.0-0.2	B19-0.0-0.2	B20-0.0-0.05	B21-0.0-0.2	B21-1.3-1.5
				Client sampling date / time	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-021	ES1527369-022	ES1527369-023	ES1527369-024	ES1527369-025
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		95.7	96.0	92.4	96.0	89.8
2.4.6-Tribromophenol	118-79-6	0.5	%		99.3	89.7	84.8	92.8	83.2
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		95.1	92.9	90.0	92.9	90.8
Anthracene-d10	1719-06-8	0.5	%		98.0	90.7	87.9	90.7	88.5
4-Terphenyl-d14	1718-51-0	0.5	%		98.6	89.4	85.9	91.6	87.0
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		81.6	128	128	132	131
Toluene-D8	2037-26-5	0.2	%		87.1	116	112	124	122
4-Bromofluorobenzene	460-00-4	0.2	%		84.4	117	115	121	124

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	B22-0.0-0.15	B22-0.15-0.5	B23-0.0-0.15	B24-0.0-0.15	B25-0.0-0.15
			Client sampling date / time	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]
Compound	CAS Number	LOR	Unit	ES1527369-026	ES1527369-027	ES1527369-028	ES1527369-029	ES1527369-030
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.4	6.4	6.6	6.5	6.7
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	21.2	18.7	23.2	23.2	20.3
ED008: Exchangeable Cations								
^ Exchangeable Calcium	----	0.1	cmol/kg	4.8	8.0	5.3	4.5	7.8
^ Exchangeable Magnesium	----	0.1	cmol/kg	4.0	4.9	5.1	3.3	5.5
^ Exchangeable Potassium	----	0.1	cmol/kg	1.1	0.9	0.7	0.5	0.6
^ Exchangeable Sodium	----	0.1	cmol/kg	0.5	0.6	1.0	0.8	0.5
^ Cation Exchange Capacity	----	0.1	cmol/kg	10.4	14.4	12.2	9.0	14.3
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	10	12	10	11	14
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	21	16	26	22	19
Copper	7440-50-8	5	mg/kg	23	26	22	16	18
Lead	7439-92-1	5	mg/kg	42	20	41	33	27
Nickel	7440-02-0	2	mg/kg	14	19	14	9	10
Zinc	7440-66-6	5	mg/kg	72	67	59	40	98
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	3.70	0.70	0.86	2.00	1.31
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	<0.1	----	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B22-0.0-0.15	B22-0.15-0.5	B23-0.0-0.15	B24-0.0-0.15	B25-0.0-0.15
				Client sampling date / time	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-026	ES1527369-027	ES1527369-028	ES1527369-029	ES1527369-030
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
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	<0.5
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	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<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	<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	<0.5
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	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<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**	**0.6**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B22-0.0-0.15	B22-0.15-0.5	B23-0.0-0.15	B24-0.0-0.15	B25-0.0-0.15
				Client sampling date / time	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-026	ES1527369-027	ES1527369-028	ES1527369-029	ES1527369-030
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ **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									
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	>C10_C16	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	%		**84.0**	**----**	**84.0**	**----**	**89.0**
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**82.8**	**----**	**84.5**	**----**	**79.1**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**112**	**----**	**112**	**----**	**100**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**96.1**	**97.8**	**96.4**	**94.0**	**97.3**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B22-0.0-0.15	B22-0.15-0.5	B23-0.0-0.15	B24-0.0-0.15	B25-0.0-0.15
				Client sampling date / time	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]	[22-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-026	ES1527369-027	ES1527369-028	ES1527369-029	ES1527369-030
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		92.9	95.9	95.5	92.9	92.2
2.4.6-Tribromophenol	118-79-6	0.5	%		89.7	82.8	81.3	82.4	85.9
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		89.9	90.7	90.1	90.2	91.0
Anthracene-d10	1719-06-8	0.5	%		89.0	89.6	88.7	87.8	91.0
4-Terphenyl-d14	1718-51-0	0.5	%		86.8	86.9	86.6	86.6	88.8
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		131	132	113	115	118
Toluene-D8	2037-26-5	0.2	%		123	129	95.0	107	104
4-Bromofluorobenzene	460-00-4	0.2	%		126	129	99.9	108	106

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	B25-0.5-0.7	B26-0.0-0.25	B27-0.0-0.05	B28-0.0-0.25	B29-0.0-0.1
			Client sampling date / time	[22-Jul-2015]	[23-Jul-2015]	[23-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit	ES1527369-031	ES1527369-032	ES1527369-033	ES1527369-034	ES1527369-035
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	----	6.2	6.2	6.8	6.3
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	18.4	18.8	16.0	20.3	21.0
ED008: Exchangeable Cations								
^ Exchangeable Calcium	----	0.1	cmol/kg	----	3.4	4.6	5.4	6.4
^ Exchangeable Magnesium	----	0.1	cmol/kg	----	3.3	5.1	3.8	6.4
^ Exchangeable Potassium	----	0.1	cmol/kg	----	1.3	0.4	0.3	0.8
^ Exchangeable Sodium	----	0.1	cmol/kg	----	0.4	1.1	0.9	0.6
^ Cation Exchange Capacity	----	0.1	cmol/kg	----	8.4	12.1	10.5	14.3
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	9	10	12	9	10
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	18	18	16	19	20
Copper	7440-50-8	5	mg/kg	12	20	22	15	23
Lead	7439-92-1	5	mg/kg	15	33	45	41	47
Nickel	7440-02-0	2	mg/kg	13	13	13	12	15
Zinc	7440-66-6	5	mg/kg	24	52	70	77	76
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	----	1.87	0.44	2.02	1.44
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B25-0.5-0.7	B26-0.0-0.25	B27-0.0-0.05	B28-0.0-0.25	B29-0.0-0.1
				Client sampling date / time	[22-Jul-2015]	[23-Jul-2015]	[23-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-031	ES1527369-032	ES1527369-033	ES1527369-034	ES1527369-035
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		----	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		----	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		----	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		----	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		----	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		----	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		----	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		----	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg		----	<0.05	<0.05	<0.05	<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**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B25-0.5-0.7	B26-0.0-0.25	B27-0.0-0.05	B28-0.0-0.25	B29-0.0-0.1
				Client sampling date / time	[22-Jul-2015]	[23-Jul-2015]	[23-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-031	ES1527369-032	ES1527369-033	ES1527369-034	ES1527369-035
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ 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									
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	>C10_C16	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	%		----	107	95.0	116	111
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	79.9	83.9	80.5	79.1
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	105	109	100	102
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	96.9	96.8	97.5	92.3

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B25-0.5-0.7	B26-0.0-0.25	B27-0.0-0.05	B28-0.0-0.25	B29-0.0-0.1
				Client sampling date / time	[22-Jul-2015]	[23-Jul-2015]	[23-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-031	ES1527369-032	ES1527369-033	ES1527369-034	ES1527369-035
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		----	93.3	94.9	96.8	90.2
2.4.6-Tribromophenol	118-79-6	0.5	%		----	87.5	83.8	84.9	78.8
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	91.7	92.0	93.7	90.3
Anthracene-d10	1719-06-8	0.5	%		----	91.6	90.1	92.9	90.4
4-Terphenyl-d14	1718-51-0	0.5	%		----	88.9	88.4	89.2	87.9
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	122	108	117	120
Toluene-D8	2037-26-5	0.2	%		----	104	96.5	103	103
4-Bromofluorobenzene	460-00-4	0.2	%		----	109	100	106	105

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	B30-0.0-0.15	B31-0.0-0.05	B32-0.0-0.15	B33-0.0-0.15	B34-0.0-0.2
			Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit	ES1527369-036	ES1527369-037	ES1527369-038	ES1527369-039	ES1527369-040
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	5.6	5.9	6.7	6.9	7.7
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	21.6	23.0	19.7	24.5	22.2
ED008: Exchangeable Cations								
^ Exchangeable Calcium	----	0.1	cmol/kg	4.2	4.4	6.9	10.1	12.9
^ Exchangeable Magnesium	----	0.1	cmol/kg	4.7	5.2	3.8	4.5	7.2
^ Exchangeable Potassium	----	0.1	cmol/kg	0.4	0.6	0.4	0.4	0.2
^ Exchangeable Sodium	----	0.1	cmol/kg	0.5	0.9	0.5	0.7	1.0
^ Cation Exchange Capacity	----	0.1	cmol/kg	9.8	11.1	11.7	15.8	21.2
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	8	8	7	13	10
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	22	18	17	16	16
Copper	7440-50-8	5	mg/kg	26	26	22	28	26
Lead	7439-92-1	5	mg/kg	119	67	51	33	30
Nickel	7440-02-0	2	mg/kg	12	13	12	20	18
Zinc	7440-66-6	5	mg/kg	84	81	57	83	85
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	3.55	2.94	1.27	2.62	0.48
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B30-0.0-0.15	B31-0.0-0.05	B32-0.0-0.15	B33-0.0-0.15	B34-0.0-0.2
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-036	ES1527369-037	ES1527369-038	ES1527369-039	ES1527369-040
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
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	<0.5
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	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<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	<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	<0.5
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	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<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**	**0.6**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B30-0.0-0.15	B31-0.0-0.05	B32-0.0-0.15	B33-0.0-0.15	B34-0.0-0.2
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-036	ES1527369-037	ES1527369-038	ES1527369-039	ES1527369-040
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ 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									
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	>C10_C16	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	%		73.0	92.0	94.0	94.0	96.0
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		80.8	77.7	77.7	75.9	82.7
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		104	100	98.8	98.7	104
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		98.2	92.5	90.4	93.7	93.6

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B30-0.0-0.15	B31-0.0-0.05	B32-0.0-0.15	B33-0.0-0.15	B34-0.0-0.2
				Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-036	ES1527369-037	ES1527369-038	ES1527369-039	ES1527369-040
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		96.9	80.6	90.7	93.2	90.0
2.4.6-Tribromophenol	118-79-6	0.5	%		90.9	88.1	84.3	84.2	86.0
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		93.0	89.3	86.1	88.9	89.3
Anthracene-d10	1719-06-8	0.5	%		90.0	89.6	87.8	89.0	88.1
4-Terphenyl-d14	1718-51-0	0.5	%		89.2	86.1	83.4	85.6	84.9
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		117	122	130	122	115
Toluene-D8	2037-26-5	0.2	%		104	104	116	130	124
4-Bromofluorobenzene	460-00-4	0.2	%		105	107	115	113	106

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	B35-0.0-0.1	B36-0.0-0.15	QC1	QC2	QC3
			Client sampling date / time	[23-Jul-2015]	[23-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit	ES1527369-041	ES1527369-042	ES1527369-043	ES1527369-044	ES1527369-045
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.3	6.4	----	----	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	24.6	23.9	18.7	22.6	20.5
ED008: Exchangeable Cations								
^ Exchangeable Calcium	----	0.1	cmol/kg	7.4	3.6	----	----	----
^ Exchangeable Magnesium	----	0.1	cmol/kg	3.8	3.3	----	----	----
^ Exchangeable Potassium	----	0.1	cmol/kg	0.8	0.2	----	----	----
^ Exchangeable Sodium	----	0.1	cmol/kg	0.6	1.0	----	----	----
^ Cation Exchange Capacity	----	0.1	cmol/kg	12.6	8.3	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	10	6	9	15	9
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	15	17	20	19	19
Copper	7440-50-8	5	mg/kg	20	23	23	38	27
Lead	7439-92-1	5	mg/kg	59	44	55	65	111
Nickel	7440-02-0	2	mg/kg	11	16	14	20	13
Zinc	7440-66-6	5	mg/kg	108	67	201	101	88
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	2.66	2.15	----	----	----
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	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B35-0.0-0.1	B36-0.0-0.15	QC1	QC2	QC3
				Client sampling date / time	[23-Jul-2015]	[23-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-041	ES1527369-042	ES1527369-043	ES1527369-044	ES1527369-045
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
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	----	----	----
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	----	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	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B35-0.0-0.1	B36-0.0-0.15	QC1	QC2	QC3
				Client sampling date / time	[23-Jul-2015]	[23-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-041	ES1527369-042	ES1527369-043	ES1527369-044	ES1527369-045
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg		<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	----	----	----
^ **Total Xylenes**	1330-20-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**123**	**85.0**	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**83.6**	**75.1**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**108**	**94.1**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**92.9**	**95.3**	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	B35-0.0-0.1	B36-0.0-0.15	QC1	QC2	QC3
				Client sampling date / time	[23-Jul-2015]	[23-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]	[21-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527369-041	ES1527369-042	ES1527369-043	ES1527369-044	ES1527369-045
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		91.0	93.3	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		81.8	86.2	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		88.5	90.8	----	----	----
Anthracene-d10	1719-06-8	0.5	%		87.8	89.8	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		84.9	87.9	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		96.4	109	----	----	----
Toluene-D8	2037-26-5	0.2	%		103	99.0	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		105	96.4	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC4	----	----	----	----
			Client sampling date / time	[23-Jul-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1527369-046	--------	--------	--------	--------
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	----	----	----	----	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	**23.4**	----	----	----	----
ED008: Exchangeable Cations								
^ Exchangeable Calcium	----	0.1	cmol/kg	----	----	----	----	----
^ Exchangeable Magnesium	----	0.1	cmol/kg	----	----	----	----	----
^ Exchangeable Potassium	----	0.1	cmol/kg	----	----	----	----	----
^ Exchangeable Sodium	----	0.1	cmol/kg	----	----	----	----	----
^ Cation Exchange Capacity	----	0.1	cmol/kg	----	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**10**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**16**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**23**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**63**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**12**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**114**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	----	----	----	----	----
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	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC4	----	----	----	----
				Client sampling date / time	[23-Jul-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1527369-046	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
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		----	----	----	----	----
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	----	0.05	mg/kg		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC4	----	----	----	----
				Client sampling date / time	[23-Jul-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1527369-046	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		----	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		----	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg		----	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		----	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		----	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		----	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		----	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	----	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		----	----	----	----	----
^ **Total Xylenes**	1330-20-7	0.5	mg/kg		----	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		----	----	----	----	----
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	%		----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC4	----	----	----	----
				Client sampling date / time	[23-Jul-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1527369-046	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	----	----	----

Analytical Results

Sub-Matrix: **SOLID** (Matrix: **SOLID**)			Client sample ID	**B34-0.0-0.2**	**F1**	**----**	**----**	**----**
			Client sampling date / time	[21-Jul-2015]	[21-Jul-2015]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1527369-040**	**ES1527369-047**	**--------**	**--------**	**--------**
				Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**Yes**	**----**	**----**	**----**
Asbestos Type	1332-21-4	-	--	**-**	**Ch + Am**	**----**	**----**	**----**
Sample weight (dry)	----	0.01	g	**39.2**	**190**	**----**	**----**	**----**
APPROVED IDENTIFIER:	----	-	--	**G.MORGAN**	**G.MORGAN**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	RB	----	----	----	----
			Client sampling date / time	[23-Jul-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1527369-048	--------	--------	--------	--------
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOLID**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	B34-0.0-0.2 - [21-Jul-2015]	Mid brown clay soil with grey rocks.
EA200: Description	F1 - [21-Jul-2015]	Four pieces of bonded asbestos fibre board approximately 145 x 100 x 5mm.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1527369**	Page	: 1 of 20
Client	: **DEPARTMENT OF FINANCE AND SERVICES**	Laboratory	: Environmental Division Sydney
Contact	: PETA ANDERSON	Contact	:
Address	: LEVEL 14 McKELL BUILDING 2-24 RAWSON PLACE SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: peta.anderson@services.nsw.gov.au	E-mail	:
Telephone	: +61 02 99490200	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9372 7876	Facsimile	: +61-2-8784 8500
Project	: ROWLAND HASSAL SCHOOL	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: GS91B	Date Samples Received	: 31-Jul-2015
C-O-C number	: ----	Date Analysis Commenced	: 03-Aug-2015
Sampler	: PETA ANDERSON	Issue Date	: 12-Aug-2015
Site	: ----	No. of samples received	: 48
Quote number	: ----	No. of samples analysed	: 48

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
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
RPD = Relative Percentage Difference
# = Indicates failed QC

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

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
Andrew Epps	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
		Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA002 : pH (Soils) (QC Lot: 174158)									
ES1527369-002	B2-0.0-0.2	EA002: pH Value	----	0.1	pH Unit	6.7	6.8	0.00	0% - 20%
ES1526565-005	Anonymous	EA002: pH Value	----	0.1	pH Unit	7.6	7.6	0.00	0% - 20%
EA002 : pH (Soils) (QC Lot: 174163)									
ES1527369-012	B11-0.5-0.65	EA002: pH Value	----	0.1	pH Unit	6.8	6.8	0.00	0% - 20%
ES1527369-023	B20-0.0-0.05	EA002: pH Value	----	0.1	pH Unit	6.0	6.1	0.00	0% - 20%
EA002 : pH (Soils) (QC Lot: 174164)									
ES1527369-034	B28-0.0-0.25	EA002: pH Value	----	0.1	pH Unit	6.8	6.7	1.78	0% - 20%
ES1527370-002	Anonymous	EA002: pH Value	----	0.1	pH Unit	6.8	6.9	0.00	0% - 20%
EA055: Moisture Content (QC Lot: 172096)									
ES1527345-016	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	9.5	9.2	3.86	No Limit
ES1527369-003	B3-0.0-0.1	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	26.3	24.9	5.26	0% - 20%
EA055: Moisture Content (QC Lot: 172097)									
ES1527369-012	B11-0.5-0.65	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	18.4	19.5	5.79	0% - 50%
ES1527369-023	B20-0.0-0.05	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	22.8	25.4	10.4	0% - 20%
EA055: Moisture Content (QC Lot: 172098)									
ES1527369-032	B26-0.0-0.25	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	18.8	18.6	0.556	0% - 50%
ES1527369-043	QC1	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	18.7	19.4	3.83	0% - 50%
ED008: Exchangeable Cations (QC Lot: 173374)									
ES1527369-001	B1-0.0-0.2	ED008: Cation Exchange Capacity	----	0.1	meq/100g	12.8	13.1	2.85	0% - 20%
		ED008: Exchangeable Calcium	----	0.1	meq/100g	6.1	6.4	5.11	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	5.4	5.5	0.00	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.6	0.6	0.00	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.6	0.6	0.00	0% - 20%
ES1527369-010	B10-0.0-0.4	ED008: Cation Exchange Capacity	----	0.1	meq/100g	13.2	13.2	0.00	0% - 20%
		ED008: Exchangeable Calcium	----	0.1	meq/100g	8.7	8.7	0.00	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	3.0	3.0	0.00	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	1.1	1.1	0.00	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.4	0.4	0.00	0% - 20%
ED008: Exchangeable Cations (QC Lot: 173375)									
ES1527369-022	B19-0.0-0.2	ED008: Cation Exchange Capacity	----	0.1	meq/100g	8.6	9.2	7.40	0% - 20%
		ED008: Exchangeable Calcium	----	0.1	meq/100g	3.6	3.9	7.15	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	3.8	4.0	7.13	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.6	0.6	0.00	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.5	0.6	0.00	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED008: Exchangeable Cations (QC Lot: 173375) - continued									
ES1527369-032	B26-0.0-0.25	ED008: Cation Exchange Capacity	----	0.1	meq/100g	8.4	8.3	0.00	0% - 20%
		ED008: Exchangeable Calcium	----	0.1	meq/100g	3.4	3.3	0.00	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	3.3	3.3	0.00	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	1.3	1.2	0.00	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.4	0.4	0.00	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 176385)									
ES1527369-001	B1-0.0-0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	22	17	21.9	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	16	19	21.4	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	13	14	9.58	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	33	35	5.46	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	74	88	16.4	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	79	100	22.7	0% - 50%
ES1527369-011	B11-0.0-0-0.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	20	19	8.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	12	12	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	8	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	15	13	16.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	25	20	22.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	46	35	25.2	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 176387)									
ES1527369-021	B18-0.0-0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	18	22	18.3	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	12	12	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	10	12	16.4	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	18	18	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	39	35	10.8	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	61	48	25.1	0% - 50%
ES1527369-031	B25-0.5-0.7	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	18	18	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	13	15	8.82	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	9	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	12	15	27.3	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	15	16	10.2	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	24	30	19.3	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 177182)									
EB1524625-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	11	30.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 177182) - continued									
EB1524625-001	Anonymous	EG005T: Copper	7440-50-8	5	mg/kg	26	26	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	33	32	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	31	31	0.00	No Limit
ES1527369-041	B35-0.0-0.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	16	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	11	12	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	10	10	10.4	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	21	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	59	66	10.8	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	108	115	6.70	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 176384)									
ES1527369-001	B1-0.0-0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1527369-011	B11-0.0-0-0.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 176386)									
ES1527369-021	B18-0.0-0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1527369-031	B25-0.5-0.7	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 177183)									
EB1524625-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1527369-041	B35-0.0-0.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 178959)									
ES1527369-001	B1-0.0-0.2	EP003: Total Organic Carbon	----	0.02	%	2.55	2.52	1.48	0% - 20%
ES1527369-011	B11-0.0-0-0.1	EP003: Total Organic Carbon	----	0.02	%	1.08	1.10	1.81	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 178960)									
ES1527369-022	B19-0.0-0.2	EP003: Total Organic Carbon	----	0.02	%	2.24	2.25	0.555	0% - 20%
ES1527369-033	B27-0.0-0.05	EP003: Total Organic Carbon	----	0.02	%	0.44	0.44	0.00	0% - 20%
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 171612)									
ES1527369-001	B1-0.0-0.2	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1527369-012	B11-0.5-0.65	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 171613)									
ES1527369-022	B19-0.0-0.2	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1527369-033	B27-0.0-0.05	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 171611)									
ES1527369-001	B1-0.0-0.2	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 171611) - continued									
ES1527369-001	B1-0.0-0.2	EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES1527369-012	B11-0.5-0.65	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 171616)									
ES1527369-022	B19-0.0-0.2	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 171616) - continued									
ES1527369-022	B19-0.0-0.2	EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES1527369-033	B27-0.0-0.05	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 171610)									
ES1527369-001	B1-0.0-0.2	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 171610) - continued									
ES1527369-001	B1-0.0-0.2	EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1527369-012	B11-0.5-0.65	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 171615)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 171615) - continued									
ES1527369-022	B19-0.0-0.2	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1527369-033	B27-0.0-0.05	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 171583)									
ES1527369-001	B1-0.0-0.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1527369-011	B11-0.0-0-0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 171588)									
ES1527369-022	B19-0.0-0.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1527369-033	B27-0.0-0.05	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 171609)									
ES1527369-001	B1-0.0-0.2	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1527369-012	B11-0.5-0.65	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 171614)									
ES1527369-022	B19-0.0-0.2	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1527369-033	B27-0.0-0.05	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 171583)									
ES1527369-001	B1-0.0-0.2	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1527369-011	B11-0.0-0-0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 171588)									
ES1527369-022	B19-0.0-0.2	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1527369-033	B27-0.0-0.05	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 171609)									
ES1527369-001	B1-0.0-0.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
ES1527369-012	B11-0.5-0.65	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 171614)									
ES1527369-022	B19-0.0-0.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
ES1527369-033	B27-0.0-0.05	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 171583)									
ES1527369-001	B1-0.0-0.2	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1527369-011	B11-0.0-0-0.1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP080: BTEXN (QC Lot: 171588)									
ES1527369-022	B19-0.0-0.2	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1527369-033	B27-0.0-0.05	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 174740)									
ES1526972-008	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
ES1527379-013	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.128	0.128	0.507	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 174740) - continued									
ES1527379-013	Anonymous	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.022	0.022	0.00	0% - 20%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.009	0.008	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	24.2	24.0	0.959	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.607	0.623	2.66	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	25.8	24.8	4.16	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 177831)									
ES1526972-008	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES1527806-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED008: Exchangeable Cations (QCLot: 173374)								
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	103	90	128
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	97.0	86	120
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	100	85	135
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	103	86	128
ED008: Exchangeable Cations (QCLot: 173375)								
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	102	90	128
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	94.6	86	120
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	96.1	85	135
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	99.9	86	128
EG005T: Total Metals by ICP-AES (QCLot: 176385)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	113	92	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	101	87	121
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	100.0	80	136
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	100	93	127
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	100	86	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	105	93	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	106	81	133
EG005T: Total Metals by ICP-AES (QCLot: 176387)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	118	92	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	99.1	87	121
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	102	80	136
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	106	93	127
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	108	86	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	105	93	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	101	81	133
EG005T: Total Metals by ICP-AES (QCLot: 177182)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	102	92	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	97.8	87	121
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	110	80	136
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	111	93	127
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	102	86	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	104	93	131

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 177182) - continued								
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	104	81	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 176384)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	88.4	70	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 176386)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	89.4	70	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 177183)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	81.3	70	105
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 178959)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	98.4	70	130
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 178960)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	98.0	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 171612)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	112	57	117
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 171613)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	92.0	57	117
EP068A: Organochlorine Pesticides (OC) (QCLot: 171611)								
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	108	76	120
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	109	69	117
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	93.3	67	127
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.5	68	118
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	101	71	113
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.1	69	119
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	101	69	119
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	107	76	120
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.5	67	121
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.4	65	113
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	96.4	66	118
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	109	60	124
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	100	67	123
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	93.8	57	115
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	100	65	123
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	108	71	115
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.5	68	116
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	95.7	68	116
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	89.8	66	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	89.8	65	129
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	102	68	120

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 171616)								
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.2	76	120
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	98.8	69	117
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	104	67	127
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	98.0	68	118
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	98.2	71	113
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.8	69	119
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	90.6	69	119
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	99.5	76	120
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	85.8	67	121
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.6	65	113
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	87.9	66	118
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	100.0	60	124
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.3	67	123
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	91.9	57	115
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	101	65	123
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	98.1	71	115
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.2	68	116
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	86.2	68	116
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	80.6	66	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	101	65	129
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	68	120
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 171610)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	96.5	79	123
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	93.6	77	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	96.8	79	123
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	93.6	73	121
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	99.0	76	122
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	92.7	70	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	94.4	72	114
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	93.1	77	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	96.4	81	123
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	99.8	72	113
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	96.8	79	123
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	95.6	77	123
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	90.4	71	113
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	97.5	80	124
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	92.3	79	123
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	96.0	79	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 171615)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	99.3	79	123
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	96.6	77	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	95.2	79	123
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	93.0	73	121
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	91.1	76	122
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	87.6	70	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	98.6	72	114
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	95.4	77	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	97.7	81	123
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	94.2	72	113
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	97.4	79	123
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	96.6	77	123
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	98.6	71	113
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	94.4	80	124
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	99.8	79	123
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	97.6	79	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 171583)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	89.0	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 171588)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	108	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 171609)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	108	71	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	250 mg/kg	117	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	101	64	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 171614)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	104	71	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	250 mg/kg	114	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	110	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 171583)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	89.6	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 171588)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	108	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 171609)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	102	70	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	116	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	200 mg/kg	101	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 171614)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 171614) - continued								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	103	70	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	118	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	200 mg/kg	101	63	131
EP080: BTEXN (QCLot: 171583)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	81.8	62	116
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	77.5	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	80.4	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	64.8	62	138
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	83.2	60	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	80.6	62	128
EP080: BTEXN (QCLot: 171588)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	97.5	62	116
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	98.7	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	105	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	91.5	62	138
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	110	60	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	100	62	128

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 174740)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	96.1	79	121
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.0	83	113
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	89.4	84	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.9	83	117
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	107	84	116
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.3	84	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.5	77	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 177831)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	108	77	115

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Matrix Spike (MS) Report

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 176385)							
ES1527369-002	B2-0.0-0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	112	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	109	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	105	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	101	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	98.6	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	96.1	70	130
EG005T: Total Metals by ICP-AES (QCLot: 176387)							
ES1527369-022	B19-0.0-0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	96.0	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	100	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	113	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	107	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	104	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	106	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	100	70	130
EG005T: Total Metals by ICP-AES (QCLot: 177182)							
EB1524625-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	102	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	104	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	108	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	107	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	104	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	102	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 176384)							
ES1527369-002	B2-0.0-0.2	EG035T: Mercury	7439-97-6	5 mg/kg	104	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 176386)							
ES1527369-022	B19-0.0-0.2	EG035T: Mercury	7439-97-6	5 mg/kg	104	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 177183)							
EB1524625-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	93.4	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 171612)							
ES1527369-001	B1-0.0-0.2	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	111	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 171613)							
ES1527369-022	B19-0.0-0.2	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	119	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 171611)							
ES1527369-001	B1-0.0-0.2	EP068: 4.4`-DDT	50-29-3	2 mg/kg	97.6	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	94.7	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 171611) - continued							
ES1527369-001	B1-0.0-0.2	EP068: Dieldrin	60-57-1	0.5 mg/kg	110	70	130
		EP068: Endrin	72-20-8	2 mg/kg	96.4	70	130
		EP068: gamma-BHC	58-89-9	0.5 mg/kg	106	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	102	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 171616)							
ES1527369-022	B19-0.0-0.2	EP068: 4.4`-DDT	50-29-3	2 mg/kg	87.5	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	93.9	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	86.1	70	130
		EP068: Endrin	72-20-8	2 mg/kg	94.8	70	130
		EP068: gamma-BHC	58-89-9	0.5 mg/kg	105	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	100	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 171610)							
ES1527369-001	B1-0.0-0.2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	88.2	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	95.5	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 171615)							
ES1527369-022	B19-0.0-0.2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	94.6	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	98.2	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 171583)							
ES1527369-001	B1-0.0-0.2	EP080: C6 - C9 Fraction	----	32.5 mg/kg	102	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 171588)							
ES1527369-022	B19-0.0-0.2	EP080: C6 - C9 Fraction	----	32.5 mg/kg	89.0	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 171609)							
ES1527369-001	B1-0.0-0.2	EP071: C10 - C14 Fraction	----	523 mg/kg	86.7	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	103	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	121	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 171614)							
ES1527369-022	B19-0.0-0.2	EP071: C10 - C14 Fraction	----	523 mg/kg	88.2	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	105	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	120	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 171583)							
ES1527369-001	B1-0.0-0.2	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	102	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 171588)							
ES1527369-022	B19-0.0-0.2	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	89.7	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 171609)							
ES1527369-001	B1-0.0-0.2	EP071: >C10 - C16 Fraction	>C10_C16	860 mg/kg	95.6	73	137

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 171609) - continued							
ES1527369-001	B1-0.0-0.2	EP071: >C16 - C34 Fraction	----	3223 mg/kg	112	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	115	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 171614)							
ES1527369-022	B19-0.0-0.2	EP071: >C10 - C16 Fraction	>C10_C16	860 mg/kg	97.3	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	118	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	101	52	132
EP080: BTEXN (QCLot: 171583)							
ES1527369-001	B1-0.0-0.2	EP080: Benzene	71-43-2	2.5 mg/kg	82.1	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	83.6	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	84.5	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	87.2	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	86.2	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	83.3	70	130
EP080: BTEXN (QCLot: 171588)							
ES1527369-022	B19-0.0-0.2	EP080: Benzene	71-43-2	2.5 mg/kg	77.6	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	83.8	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	85.5	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	77.6	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	92.1	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	80.5	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 174740)							
ES1527369-048	RB	EG020A-T: Arsenic	7440-38-2	1 mg/L	96.3	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	93.8	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	91.4	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	97.7	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	108	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	105	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	104	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 177831)							
ES1527369-048	RB	EG035T: Mercury	7439-97-6	0.01 mg/L	88.2	70	130

ALS Environmental

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **ES1527369**	Page	: 1 of 16
Client	: **DEPARTMENT OF FINANCE AND SERVICES**	Laboratory	: Environmental Division Sydney
Contact	: PETA ANDERSON	Telephone	: +61-2-8784 8555
Project	: ROWLAND HASSAL SCHOOL	Date Samples Received	: 31-Jul-2015
Site	: ----	Issue Date	: 12-Aug-2015
Sampler	: PETA ANDERSON	No. of samples received	: 48
Order number	: GS91B	No. of samples analysed	: 48

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA002 : pH (Soils)							
Soil Glass Jar - Unpreserved							
B1-0.0-0.2,	B2-0.0-0.2,	06-Aug-2015	28-Jul-2015	**8**	----	----	----
B3-0.0-0.1,	B4-0.0-0.1,						
B5-0.0-0.1,	B6-0.0-0.1,						
B7-0.0-0.3,	B8-0.0-0.15,						
B9-0.0-0.2,	B10-0.0-0.4,						
B11-0.0-0-0.1,	B11-0.5-0.65,						
B12-0.0-0.1,	B13-0.0-0.15,						
B13-0.5-0.7,	B14-0.0-0.15,						
B28-0.0-0.25,	B29-0.0-0.1,						
B30-0.0-0.15,	B31-0.0-0.05,						
B32-0.0-0.15,	B33-0.0-0.15,						
B34-0.0-0.2							
Soil Glass Jar - Unpreserved							
B15-0.0-0.1,	B16-0.0-0.05,	06-Aug-2015	29-Jul-2015	**7**	----	----	----
B18-0.0-0.2,	B19-0.0-0.2,						
B20-0.0-0.05,	B21-0.0-0.2,						
B21-1.3-1.5,	B22-0.0-0.15,						
B22-0.15-0.5,	B23-0.0-0.15,						
B24-0.0-0.15,	B25-0.0-0.15						
Soil Glass Jar - Unpreserved							
B17-0.0-0.2,	B26-0.0-0.25,	06-Aug-2015	30-Jul-2015	**6**	----	----	----
B27-0.0-0.05,	B35-0.0-0.1,						
B36-0.0-0.15							

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA002 : pH (Soils)							
Soil Glass Jar - Unpreserved (EA002)							
B1-0.0-0.2, B2-0.0-0.2, B3-0.0-0.1, B4-0.0-0.1, B5-0.0-0.1, B6-0.0-0.1, B7-0.0-0.3, B8-0.0-0.15, B9-0.0-0.2, B10-0.0-0.4, B11-0.0-0-0.1, B11-0.5-0.65, B12-0.0-0.1, B13-0.0-0.15, B13-0.5-0.7, B14-0.0-0.15, B28-0.0-0.25, B29-0.0-0.1, B30-0.0-0.15, B31-0.0-0.05, B32-0.0-0.15, B33-0.0-0.15, B34-0.0-0.2	**21-Jul-2015**	**06-Aug-2015**	28-Jul-2015	×	**06-Aug-2015**	06-Aug-2015	✓
Soil Glass Jar - Unpreserved (EA002)							
B15-0.0-0.1, B16-0.0-0.05, B18-0.0-0.2, B19-0.0-0.2, B20-0.0-0.05, B21-0.0-0.2, B21-1.3-1.5, B22-0.0-0.15, B22-0.15-0.5, B23-0.0-0.15, B24-0.0-0.15, B25-0.0-0.15	**22-Jul-2015**	**06-Aug-2015**	29-Jul-2015	×	**06-Aug-2015**	06-Aug-2015	✓
Soil Glass Jar - Unpreserved (EA002)							
B17-0.0-0.2, B26-0.0-0.25, B27-0.0-0.05, B35-0.0-0.1, B36-0.0-0.15	**23-Jul-2015**	**06-Aug-2015**	30-Jul-2015	×	**06-Aug-2015**	06-Aug-2015	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
B1-0.0-0.2, B2-0.0-0.2, B3-0.0-0.1, B4-0.0-0.1, B5-0.0-0.1, B6-0.0-0.1, B7-0.0-0.3, B8-0.0-0.15, B9-0.0-0.2, B10-0.0-0.4, B11-0.0-0-0.1, B11-0.5-0.65, B12-0.0-0.1, B12-0.55-0.8, B13-0.0-0.15, B13-0.5-0.7, B14-0.0-0.15, B28-0.0-0.25, B29-0.0-0.1, QC1, B30-0.0-0.15, B31-0.0-0.05, B32-0.0-0.15, B33-0.0-0.15, B34-0.0-0.2, QC2, QC3	**21-Jul-2015**	**----**	----	----	**03-Aug-2015**	04-Aug-2015	✓
Soil Glass Jar - Unpreserved (EA055-103)							
B15-0.0-0.1, B16-0.0-0.05, B18-0.0-0.2, B19-0.0-0.2, B20-0.0-0.05, B21-0.0-0.2, B21-1.3-1.5, B22-0.0-0.15, B22-0.15-0.5, B23-0.0-0.15, B24-0.0-0.15, B25-0.0-0.15, B25-0.5-0.7	**22-Jul-2015**	**----**	----	----	**03-Aug-2015**	05-Aug-2015	✓
Soil Glass Jar - Unpreserved (EA055-103)							
B17-0.0-0.2, B26-0.0-0.25, B27-0.0-0.05, B35-0.0-0.1, B36-0.0-0.15, QC4	**23-Jul-2015**	**----**	----	----	**03-Aug-2015**	06-Aug-2015	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED008: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED008)							
B1-0.0-0.2, B2-0.0-0.2, B3-0.0-0.1, B4-0.0-0.1, B5-0.0-0.1, B6-0.0-0.1, B7-0.0-0.3, B8-0.0-0.15, B9-0.0-0.2, B10-0.0-0.4, B11-0.0-0-0.1, B11-0.5-0.65, B12-0.0-0.1, B13-0.0-0.15, B13-0.5-0.7, B14-0.0-0.15, B28-0.0-0.25, B29-0.0-0.1, B30-0.0-0.15, B31-0.0-0.05, B32-0.0-0.15, B33-0.0-0.15, B34-0.0-0.2	**21-Jul-2015**	**10-Aug-2015**	18-Aug-2015	✓	**10-Aug-2015**	18-Aug-2015	✓
Soil Glass Jar - Unpreserved (ED008)							
B15-0.0-0.1, B16-0.0-0.05, B18-0.0-0.2, B19-0.0-0.2, B20-0.0-0.05, B21-0.0-0.2, B21-1.3-1.5, B22-0.0-0.15, B22-0.15-0.5, B23-0.0-0.15, B24-0.0-0.15, B25-0.0-0.15	**22-Jul-2015**	**10-Aug-2015**	19-Aug-2015	✓	**10-Aug-2015**	19-Aug-2015	✓
Soil Glass Jar - Unpreserved (ED008)							
B17-0.0-0.2, B26-0.0-0.25, B27-0.0-0.05, B35-0.0-0.1, B36-0.0-0.15	**23-Jul-2015**	**10-Aug-2015**	20-Aug-2015	✓	**10-Aug-2015**	20-Aug-2015	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
B1-0.0-0.2, B2-0.0-0.2, B3-0.0-0.1, B4-0.0-0.1, B5-0.0-0.1, B6-0.0-0.1, B7-0.0-0.3, B8-0.0-0.15, B9-0.0-0.2, B10-0.0-0.4, B11-0.0-0-0.1, B11-0.5-0.65, B12-0.0-0.1, B12-0.55-0.8, B13-0.0-0.15, B13-0.5-0.7, B14-0.0-0.15, B28-0.0-0.25, B29-0.0-0.1, B30-0.0-0.15, B31-0.0-0.05, B32-0.0-0.15, B33-0.0-0.15, B34-0.0-0.2	**21-Jul-2015**	**07-Aug-2015**	17-Jan-2016	✓	**07-Aug-2015**	17-Jan-2016	✓
Soil Glass Jar - Unpreserved (EG005T)							
QC1, QC2, QC3	**21-Jul-2015**	**07-Aug-2015**	17-Jan-2016	✓	**10-Aug-2015**	17-Jan-2016	✓
Soil Glass Jar - Unpreserved (EG005T)							
B15-0.0-0.1, B16-0.0-0.05, B18-0.0-0.2, B19-0.0-0.2, B20-0.0-0.05, B21-0.0-0.2, B21-1.3-1.5, B22-0.0-0.15, B22-0.15-0.5, B23-0.0-0.15, B24-0.0-0.15, B25-0.0-0.15, B25-0.5-0.7	**22-Jul-2015**	**07-Aug-2015**	18-Jan-2016	✓	**07-Aug-2015**	18-Jan-2016	✓
Soil Glass Jar - Unpreserved (EG005T)							
B17-0.0-0.2, B26-0.0-0.25, B27-0.0-0.05	**23-Jul-2015**	**07-Aug-2015**	19-Jan-2016	✓	**07-Aug-2015**	19-Jan-2016	✓
Soil Glass Jar - Unpreserved (EG005T)							
B35-0.0-0.1, B36-0.0-0.15, QC4	**23-Jul-2015**	**07-Aug-2015**	19-Jan-2016	✓	**10-Aug-2015**	19-Jan-2016	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
QC1, QC2, QC3	**21-Jul-2015**	**07-Aug-2015**	18-Aug-2015	✓	**10-Aug-2015**	18-Aug-2015	✓
Soil Glass Jar - Unpreserved (EG035T)							
B1-0.0-0.2, B2-0.0-0.2, B3-0.0-0.1, B4-0.0-0.1, B5-0.0-0.1, B6-0.0-0.1, B7-0.0-0.3, B8-0.0-0.15, B9-0.0-0.2, B10-0.0-0.4, B11-0.0-0-0.1, B11-0.5-0.65, B12-0.0-0.1, B12-0.55-0.8, B13-0.0-0.15, B13-0.5-0.7, B14-0.0-0.15, B28-0.0-0.25, B29-0.0-0.1, B30-0.0-0.15, B31-0.0-0.05, B32-0.0-0.15, B33-0.0-0.15, B34-0.0-0.2	**21-Jul-2015**	**07-Aug-2015**	18-Aug-2015	✓	**11-Aug-2015**	18-Aug-2015	✓
Soil Glass Jar - Unpreserved (EG035T)							
B15-0.0-0.1, B16-0.0-0.05, B18-0.0-0.2, B19-0.0-0.2, B20-0.0-0.05, B21-0.0-0.2, B21-1.3-1.5, B22-0.0-0.15, B22-0.15-0.5, B23-0.0-0.15, B24-0.0-0.15, B25-0.0-0.15, B25-0.5-0.7	**22-Jul-2015**	**07-Aug-2015**	19-Aug-2015	✓	**11-Aug-2015**	19-Aug-2015	✓
Soil Glass Jar - Unpreserved (EG035T)							
B35-0.0-0.1, B36-0.0-0.15, QC4	**23-Jul-2015**	**07-Aug-2015**	20-Aug-2015	✓	**10-Aug-2015**	20-Aug-2015	✓
Soil Glass Jar - Unpreserved (EG035T)							
B17-0.0-0.2, B26-0.0-0.25, B27-0.0-0.05	**23-Jul-2015**	**07-Aug-2015**	20-Aug-2015	✓	**11-Aug-2015**	20-Aug-2015	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP003: Total Organic Carbon (TOC) in Soil							
Pulp Bag (EP003)							
B1-0.0-0.2, B2-0.0-0.2, B3-0.0-0.1, B4-0.0-0.1, B5-0.0-0.1, B6-0.0-0.1, B7-0.0-0.3, B8-0.0-0.15, B9-0.0-0.2, B10-0.0-0.4, B11-0.0-0-0.1, B11-0.5-0.65, B12-0.0-0.1, B13-0.0-0.15, B13-0.5-0.7, B14-0.0-0.15, B28-0.0-0.25, B29-0.0-0.1, B30-0.0-0.15, B31-0.0-0.05, B32-0.0-0.15, B33-0.0-0.15, B34-0.0-0.2	**21-Jul-2015**	**11-Aug-2015**	18-Aug-2015	✓	**11-Aug-2015**	18-Aug-2015	✓
Pulp Bag (EP003)							
B15-0.0-0.1, B16-0.0-0.05, B18-0.0-0.2, B19-0.0-0.2, B20-0.0-0.05, B21-0.0-0.2, B21-1.3-1.5, B22-0.0-0.15, B22-0.15-0.5, B23-0.0-0.15, B24-0.0-0.15, B25-0.0-0.15	**22-Jul-2015**	**11-Aug-2015**	19-Aug-2015	✓	**11-Aug-2015**	19-Aug-2015	✓
Pulp Bag (EP003)							
B17-0.0-0.2, B26-0.0-0.25, B27-0.0-0.05, B35-0.0-0.1, B36-0.0-0.15	**23-Jul-2015**	**11-Aug-2015**	20-Aug-2015	✓	**11-Aug-2015**	20-Aug-2015	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066)							
B1-0.0-0.2, B4-0.0-0.1, B5-0.0-0.1, B8-0.0-0.15, B9-0.0-0.2, B11-0.5-0.65, B12-0.0-0.1, B13-0.0-0.15, B28-0.0-0.25, B29-0.0-0.1, B30-0.0-0.15, B31-0.0-0.05, B32-0.0-0.15, B33-0.0-0.15, B34-0.0-0.2	**21-Jul-2015**	**03-Aug-2015**	04-Aug-2015	✓	**05-Aug-2015**	12-Sep-2015	✓
Soil Glass Jar - Unpreserved (EP066)							
B15-0.0-0.1, B16-0.0-0.05, B18-0.0-0.2, B19-0.0-0.2, B21-1.3-1.5, B22-0.0-0.15, B23-0.0-0.15, B25-0.0-0.15	**22-Jul-2015**	**03-Aug-2015**	05-Aug-2015	✓	**05-Aug-2015**	12-Sep-2015	✓
Soil Glass Jar - Unpreserved (EP066)							
B26-0.0-0.25, B27-0.0-0.05, B35-0.0-0.1, B36-0.0-0.15	**23-Jul-2015**	**03-Aug-2015**	06-Aug-2015	✓	**05-Aug-2015**	12-Sep-2015	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068)								
B1-0.0-0.2,	B4-0.0-0.1,	**21-Jul-2015**	**03-Aug-2015**	04-Aug-2015	✓	**05-Aug-2015**	12-Sep-2015	✓
B5-0.0-0.1,	B8-0.0-0.15,							
B9-0.0-0.2,	B11-0.5-0.65,							
B12-0.0-0.1,	B13-0.0-0.15,							
B28-0.0-0.25,	B29-0.0-0.1,							
B30-0.0-0.15,	B31-0.0-0.05,							
B32-0.0-0.15,	B33-0.0-0.15,							
B34-0.0-0.2								
Soil Glass Jar - Unpreserved (EP068)								
B15-0.0-0.1,	B16-0.0-0.05,	**22-Jul-2015**	**03-Aug-2015**	05-Aug-2015	✓	**05-Aug-2015**	12-Sep-2015	✓
B18-0.0-0.2,	B19-0.0-0.2,							
B21-1.3-1.5,	B22-0.0-0.15,							
B23-0.0-0.15,	B25-0.0-0.15							
Soil Glass Jar - Unpreserved (EP068)								
B26-0.0-0.25,	B27-0.0-0.05,	**23-Jul-2015**	**03-Aug-2015**	06-Aug-2015	✓	**05-Aug-2015**	12-Sep-2015	✓
B35-0.0-0.1,	B36-0.0-0.15							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) B28-0.0-0.25, B29-0.0-0.1, B30-0.0-0.15, B31-0.0-0.05, B32-0.0-0.15, B33-0.0-0.15, B34-0.0-0.2	**21-Jul-2015**	**03-Aug-2015**	04-Aug-2015	✓	**04-Aug-2015**	12-Sep-2015	✓
Soil Glass Jar - Unpreserved (EP071) B1-0.0-0.2, B2-0.0-0.2, B3-0.0-0.1, B4-0.0-0.1, B5-0.0-0.1, B6-0.0-0.1, B7-0.0-0.3, B8-0.0-0.15, B9-0.0-0.2, B10-0.0-0.4, B11-0.0-0-0.1, B11-0.5-0.65, B12-0.0-0.1, B13-0.0-0.15, B13-0.5-0.7, B14-0.0-0.15	**21-Jul-2015**	**03-Aug-2015**	04-Aug-2015	✓	**05-Aug-2015**	12-Sep-2015	✓
Soil Glass Jar - Unpreserved (EP071) B19-0.0-0.2, B20-0.0-0.05, B21-0.0-0.2, B21-1.3-1.5, B22-0.0-0.15, B22-0.15-0.5, B23-0.0-0.15, B24-0.0-0.15, B25-0.0-0.15	**22-Jul-2015**	**03-Aug-2015**	05-Aug-2015	✓	**04-Aug-2015**	12-Sep-2015	✓
Soil Glass Jar - Unpreserved (EP071) B15-0.0-0.1, B16-0.0-0.05, B18-0.0-0.2	**22-Jul-2015**	**03-Aug-2015**	05-Aug-2015	✓	**05-Aug-2015**	12-Sep-2015	✓
Soil Glass Jar - Unpreserved (EP071) B26-0.0-0.25, B27-0.0-0.05, B35-0.0-0.1, B36-0.0-0.15	**23-Jul-2015**	**03-Aug-2015**	06-Aug-2015	✓	**04-Aug-2015**	12-Sep-2015	✓
Soil Glass Jar - Unpreserved (EP071) B17-0.0-0.2	**23-Jul-2015**	**03-Aug-2015**	06-Aug-2015	✓	**05-Aug-2015**	12-Sep-2015	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)T: PAH Surrogates							
Soil Glass Jar - Unpreserved (EP075(SIM))							
B1-0.0-0.2, B2-0.0-0.2, B3-0.0-0.1, B4-0.0-0.1, B5-0.0-0.1, B6-0.0-0.1, B7-0.0-0.3, B8-0.0-0.15, B9-0.0-0.2, B10-0.0-0.4, B11-0.0-0-0.1, B11-0.5-0.65, B12-0.0-0.1, B13-0.0-0.15, B13-0.5-0.7, B14-0.0-0.15, B28-0.0-0.25, B29-0.0-0.1, B30-0.0-0.15, B31-0.0-0.05, B32-0.0-0.15, B33-0.0-0.15, B34-0.0-0.2	**21-Jul-2015**	**03-Aug-2015**	04-Aug-2015	✓	**05-Aug-2015**	12-Sep-2015	✓
Soil Glass Jar - Unpreserved (EP075(SIM))							
B15-0.0-0.1, B16-0.0-0.05, B18-0.0-0.2, B19-0.0-0.2, B20-0.0-0.05, B21-0.0-0.2, B21-1.3-1.5, B22-0.0-0.15, B22-0.15-0.5, B23-0.0-0.15, B24-0.0-0.15, B25-0.0-0.15	**22-Jul-2015**	**03-Aug-2015**	05-Aug-2015	✓	**05-Aug-2015**	12-Sep-2015	✓
Soil Glass Jar - Unpreserved (EP075(SIM))							
B17-0.0-0.2, B26-0.0-0.25, B27-0.0-0.05, B35-0.0-0.1, B36-0.0-0.15	**23-Jul-2015**	**03-Aug-2015**	06-Aug-2015	✓	**05-Aug-2015**	12-Sep-2015	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080S: TPH(V)/BTEX Surrogates								
Soil Glass Jar - Unpreserved (EP080)								
B1-0.0-0.2,	B2-0.0-0.2,	**21-Jul-2015**	**03-Aug-2015**	04-Aug-2015	✓	**04-Aug-2015**	04-Aug-2015	✓
B3-0.0-0.1,	B4-0.0-0.1,							
B5-0.0-0.1,	B6-0.0-0.1,							
B7-0.0-0.3,	B8-0.0-0.15,							
B9-0.0-0.2,	B10-0.0-0.4,							
B11-0.0-0-0.1,	B11-0.5-0.65,							
B12-0.0-0.1,	B13-0.0-0.15,							
B13-0.5-0.7,	B14-0.0-0.15,							
B28-0.0-0.25,	B29-0.0-0.1,							
B30-0.0-0.15,	B31-0.0-0.05,							
B32-0.0-0.15,	B33-0.0-0.15,							
B34-0.0-0.2								
Soil Glass Jar - Unpreserved (EP080)								
B15-0.0-0.1,	B16-0.0-0.05,	**22-Jul-2015**	**03-Aug-2015**	05-Aug-2015	✓	**04-Aug-2015**	05-Aug-2015	✓
B18-0.0-0.2,	B19-0.0-0.2,							
B20-0.0-0.05,	B21-0.0-0.2,							
B21-1.3-1.5,	B22-0.0-0.15,							
B22-0.15-0.5,	B23-0.0-0.15,							
B24-0.0-0.15,	B25-0.0-0.15							
Soil Glass Jar - Unpreserved (EP080)								
B17-0.0-0.2,	B26-0.0-0.25,	**23-Jul-2015**	**03-Aug-2015**	06-Aug-2015	✓	**04-Aug-2015**	06-Aug-2015	✓
B27-0.0-0.05,	B35-0.0-0.1,							
B36-0.0-0.15								

Matrix: **SOLID**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Snap Lock Bag - Subsampled by ALS (EA200)								
B34-0.0-0.2,	F1	**21-Jul-2015**	**----**	----	----	**05-Aug-2015**	17-Jan-2016	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
RB	**23-Jul-2015**	**05-Aug-2015**	19-Jan-2016	✓	**08-Aug-2015**	19-Jan-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
RB	**23-Jul-2015**	**----**	----	----	**10-Aug-2015**	20-Aug-2015	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Exchangeable Cations with pre-treatment	ED008	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	2	11	**18.18**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH (1:5)	EA002	2	18	**11.11**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	11	**18.18**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Exchangeable Cations with pre-treatment	ED008	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	11	**9.09**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	**9.09**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Exchangeable Cations with pre-treatment	ED008	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	11	**9.09**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	**9.09**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	11	**9.09**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	**9.09**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Total Mercury by FIMS	EG035T	2	12	**16.67**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	16	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	12	**8.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	12	**8.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	12	**8.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in Bulk Solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Exchangeable Cations with pre-treatment	ED008	SOIL	In house: Referenced to Rayment & Higginson (2011) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.
Asbestos Identification in Bulk Solids	EA200	SOLID	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining

Analytical Methods	Method	Matrix	Method Descriptions
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)

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CLIENT: DEPARTMENT OF FINANCE, SERVICES AND INNOVATION	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☐ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: L14 McKELL BUILDING, 2-24 RAWSON PL, SYDNEY 2000		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
PROJECT: ROWLAND HASSALL SCHOOL	**ALS QUOTE NO.:** SY/494/14	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: GS91B		COC: (1) 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: PETA ANDERSON **CONTACT PH:** 9372 7834		OF: 1 2 3 (4) 5 6 7	Other comment:

SAMPLER: PETA ANDERSON **SAMPLER MOBILE:** 0419 977 309	**RELINQUISHED BY:** *P.ANDERSON*	**RECEIVED BY:** Steven	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? (YES / NO) **EDD FORMAT (or default):**	DATE/TIME: 31.07.2015 / 11:00	DATE/TIME: 31/7/15 1425	DATE/TIME:	DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed): Peta.Anderson@finance.nsw.gov.au				
Email Invoice to (will default to PM if no other addresses are listed): Peta.Anderson@finance.nsw.gov.au				

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	S - 8	S - 26	EA002 (pH)	ED008 (CEC)	EP003 (TOC)				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	B1-0.0-0.2	21.07.2015	S	ST	1	1		1	1	1				
2	B2-0.0-0.2	21.07.2015	S	ST	1		1	1	1	1				
3	B3-0.0-0.1	21.07.2015	S	ST	1		1	1	1	1				
4	B4-0.0-0.1	21.07.2015	S	ST	1	1		1	1	1				
5	B5-0.0-0.1	21.07.2015	S	ST	1	1		1	1	1				
6	B6-0.0-0.1	21.07.2015	S	ST	1		1	1	1	1				
7	B7-0.0-0.3	21.07.2015	S	ST	1		1	1	1	1				Please report CEC in cmol/kg.
8	B8-0.0-0.15	21.07.2015	S	ST	1	1		1	1	1				
9	B9-0.0-0.2	21.07.2015	S	ST	1	1		1	1	1				
10	B10-0.0-0.4	21.07.2015	S	ST	1		1	1	1	1				
11	B11-0.0-0.1	21.07.2015	S	ST	1		1	1	1	1				
12	B11-0.5-0.65	21.07.2015	S	ST	1	1		1	1	1				
				TOTAL	12	6	6	12	12	12	0			

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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Sydney
Work Order Reference
ES1527369

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CLIENT: DEPARTMENT OF FINANCE, SERVICES AND INNOVATION	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT **(List due date):**
OFFICE: L14 McKELL BUILDING, 2-24 RAWSON PL, SYDNEY 2000		☐ Non Standard or urgent TAT **(List due date):**
PROJECT: ROWLAND HASSALL SCHOOL	**ALS QUOTE NO.:** SY/494/14	**COC SEQUENCE NUMBER (Circle)**
ORDER NUMBER: GS91B		COC: 1 (2) 3 4 5 6 7
PROJECT MANAGER: PETA ANDERSON	**CONTACT PH:** 9372 7834	OF: 1 2 3 (4) 5 6 7
SAMPLER: PETA ANDERSON	**SAMPLER MOBILE:** 0419 977 309	
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**	
Email Reports to (will default to PM if no other addresses are listed): Peta.Anderson@finance.nsw.gov.au		
Email Invoice to (will default to PM if no other addresses are listed): Peta.Anderson@finance.nsw.gov.au		

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
P.ANDERSON			
DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME:
31.07.2015 / 11:00	31/7/15 1425		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	S - 8	S - 26	S - 2	EA002 (pH)	ED008 (CEC)	EP003 (TOC)			Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	B12-0.0-0.1	21.07.2015	S	ST	1	1			1	1	1			Please report CEC in cmol/kg.
14	B12-0.55-0.8	21.07.2015	S	ST	1			1						
15	B13-0.0-0.15	21.07.2015	S	ST	1	1			1	1	1			
16	B13-0.5-0.7	21.07.2015	S	ST	1		1		1	1	1			
17	B14-0.0-0.15	21.07.2015	S	ST	1		1		1	1	1			
18	B15-0.0-0.1	22.07.2015	S	ST	1	1			1	1	1			
19	B16-0.0-0.05	22.07.2015	S	ST	1	1			1	1	1			
20	B17-0.0-0.2	23.07.2015	S	ST	1		1		1	1	1			
21	B18-0.0-0.2	22.07.2015	S	ST	1	1			1	1	1			
22	B19-0.0-0.2	22.07.2015	S	ST	1	1			1	1	1			
23	B20-0.0-0.05	22.07.2015	S	ST	1		1		1	1	1			
24	B21-0.0-0.2	22.07.2015	S	ST	1		1		1	1	1			
				TOTAL	12	6	5	1	11	11	11			

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: DEPARTMENT OF FINANCE, SERVICES AND INNOVATION	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: L14 McKELL BUILDING, 2-24 RAWSON PL, SYDNEY 2000		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
PROJECT: ROWLAND HASSALL SCHOOL	**ALS QUOTE NO.:** SY/494/14	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: GS91B		COC: 1 2 **(3)** 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: PETA ANDERSON	**CONTACT PH:** 9372 7834	OF: 1 2 3 **(4)** 5 6 7	Other comment:
SAMPLER: PETA ANDERSON	**SAMPLER MOBILE:** 0419 977 309	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**	*P.ANDERSON*	Steven
Email Reports to (will default to PM if no other addresses are listed): Peta.Anderson@finance.nsw.gov.au		DATE/TIME:	DATE/TIME: 31/7/15 1425
Email Invoice to (will default to PM if no other addresses are listed): Peta.Anderson@finance.nsw.gov.au		31.07.2015 / 11:00	

RELINQUISHED BY:	**RECEIVED BY:**
DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	S - 8	S - 26	S - 2	EA002 (pH)	ED008 (CEC)	EP003 (TOC)			Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
25	B21-1.3-1.5	22.07.2015	S	ST	1	1			1	1	1			Please report CEC in cmol/kg.
26	B22-0.0-0.15	22.07.2015	S	ST	1	1			1	1	1			
27	B22-0.15-0.5	22.07.2015	S	ST	1		1		1	1	1			
28	B23-0.0-0.15	22.07.2015	S	ST	1	1			1	1	1			
29	B24-0.0-0.15	22.07.2015	S	ST	1		1		1	1	1			
30	B25-0.0-0.15	22.07.2015	S	ST	1	1			1	1	1			
31	B25-0.5-0.7	22.07.2015	S	ST	1			1						
32	B26-0.0-0.25	23.07.2015	S	ST	1	1			1	1	1			
33	B27-0.0-0.05	23.07.2015	S	ST	1	1			1	1	1			
34	B28-0.0-0.25	21.07.2015	S	ST	1	1			1	1	1			
35	B29-0.0-0.1	21.07.2015	S	ST	1	1			1	1	1			
36	B30-0.0-0.15	21.07.2015	S	ST	1	1			1	1	1			
				TOTAL	12	9	2	1	11	11	11			

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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CLIENT: DEPARTMENT OF FINANCE, SERVICES AND INNOVATION	**TURNAROUND REQUIREMENTS :** ☐ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: L14 McKELL BUILDING, 2-24 RAWSON PL, SYDNEY 2000	(Standard TAT may be longer for some tests e.g.. Ultra Trace Organics) ☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
PROJECT: ROWLAND HASSALL SCHOOL	**ALS QUOTE NO.:** SY/494/14	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: GS91B	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 **(4)** 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: PETA ANDERSON **CONTACT PH:** 9372 7834	OF: 1 2 3 **(4)** 5 6 7	Other comment:

SAMPLER: PETA ANDERSON **SAMPLER MOBILE:** 0419 977 309	**RELINQUISHED BY:**	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? (YES / NO) **EDD FORMAT (or default):**	*P.ANDERSON*	Glenn		
Email Reports to (will default to PM if no other addresses are listed): Peta.Anderson@finance.nsw.gov.au	DATE/TIME:	DATE/TIME: 31/7/15 1420	DATE/TIME:	DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): Peta.Anderson@finance.nsw.gov.au	31.07.2015 / 11:00			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	S - 8	S - 2	EA002 (pH)	ED008 (CEC)	EP003 (TOC)	EA200B (Asbestos)	W - 2		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
37	B31-0.0-0.05	21.07.2015	S	ST	1	1		1	1	1				Please report CEC in cmol/kg.
38	B32-0.0-0.15	21.07.2015	S	ST	1	1		1	1	1				
39	B33-0.0-0.15	21.07.2015	S	ST	1	1		1	1	1				
40	B34-0.0-0.2	21.07.2015	S	ST	1	1		1	1	1	1			
41	B35-0.0-0.1	23.07.2015	S	ST	1	1		1	1	1				
42	B36-0.0-0.15	23.07.2015	S	ST	1	1		1	1	1				
43	QC1	21.07.2015	S	ST	1		1							
44	QC2	21.07.2015	S	ST	1		1							
45	QC3	21.07.2015	S	ST	1		1							
46	QC4	23.07.2015	S	ST	1		1							
47	F1	21.07.2015	S	B	1						1			
48	RB	23.07.2015	W	N	1							1		
				TOTAL	12	6	4	6	6	6	2			

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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