



Preliminary Site Investigation

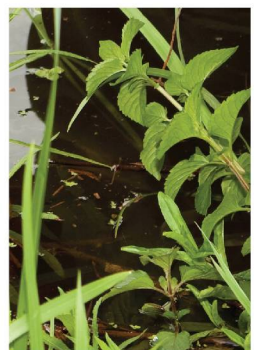
176 -194 Thornhill Road,
Highton

Prepared for
Barwon Water



Environmental
Site Assessments

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Appendices

Appendix 1: Stage 1 Subdivision Concept Plan

Appendix 2: Basic and Planning Property Reports

Appendix 3: Geological Survey Map, ASS Map for the Site, Bores With 2km

Appendix 4: Bore Logs and Sample Locations

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Appendix 6: Comparison Tables

Appendix 7: Chain of Custody Forms and Certificates of Analysis

1.0 INTRODUCTION

Environmental Site Assessments Pty Ltd ('ESA') was engaged by Barwon Water ('the Client') to undertake a Preliminary Site Investigation at 176-194 Thornhill Road, Highton ('the Site'). The client intends to develop the site for residential purposes (see **Appendix 1**). The purpose of this investigation is to ascertain whether the site is "Potentially Contaminated".

Potentially contaminated land is defined in Ministerial Direction No. 1 – Potentially Contaminated Land, as land used or known to have been used for industry, mining or the storage of chemicals, gas, wastes or liquid fuel (if not ancillary to another use of land). This practice note also deals with land that may have been contaminated by other means such as by ancillary activities, contamination from surrounding land, fill using contaminated soil or agricultural uses.

Ministerial Direction No. 1 – Potentially Contaminated Land (Direction No. 1) requires planning authorities when preparing planning scheme amendments, to satisfy themselves that the environmental conditions of land proposed to be used for a sensitive use (defined as residential, child-care centre, pre-school centre or primary school), agriculture or public open space are, or will be, suitable for that use.

1.1 Project Understanding and Objectives

This investigation will involve the collection and assessment of information derived from records of its previous use (preliminary study) coupled with a site inspection and limited soil sampling.

Limited soil sampling is carried out to:

- (a) Produce corroborative evidence as to the contamination status of the site; and
- (b) Determine whether further investigation is required.

1.2 Scope of Work Undertaken

Based on the project understanding and objectives described above, Environmental Site Assessments undertook the following scope of works:

- The collection of site history information from an aerial photograph review and other sources.
- The collection of geological and hydrogeological information about the site and its surroundings.
- A physical site inspection to identify potential sources of contamination.
- A limited soil-sampling program to provide an indication of the likely contamination status of the site soils.
- A report of the findings and recommendations.

No groundwater sampling or analysis was undertaken as part of this investigation.

2.0 SITE DESCRIPTION AND ENVIRONMENTAL SETTING

2.1 Site Details

The following table summarises the relevant details that describe the site.

Site Address	176-194 Thornhill Road, Highton
Municipality	Geelong
Current Land Use Zonings	Public Use Zone (PUZ1)
Current Site Uses	Reservoir, Service and Utility
Standard Parcel Identifier (SPI)	See Appendix 2

2.2 Surrounding Land Use

2.2.1 Current Surrounding Land Uses

North	Public Use Zone and Residential
South	Residential and Farming

East	Residential
West	Residential and Farming

2.2.2 Historical Surrounding Land Uses

A review of aerial photographs can be found in Section 3.0.

2.3 Relevant Planning Information

Under the Geelong planning scheme, the site is currently zoned Public Use Zone. A planning report sourced from the Department of Planning and Community Development (www.dpcd.vic.gov.au/planning) is included in **Appendix 2**.

According to the planning information, the site is not subject to the requirements of an Environmental Audit Overlay (EAO) but does have a Design and Development Overlay attached to it.

2.4 Regional Geology

A review of the GeoVic website (<http://er-info.dpi.vic.gov.au/>) indicates that the site geology is a mixture of:

- Nbm – Moorabool Viaduct Sand, Brighton Group, Neogene, Sedimentary (Marine), Gravel, Sand, Silt; and
- -Pxj – Jan Juc Formation, Palaeogene, Sedimentary (Marine), Marl, Clay, Silt, Glauconitic.

The geology map is attached to **Appendix 3**.

2.4.1 Potential Acid Sulfate Soils

According to the ASRIS website (<http://www.asris.csiro.au/>) the site has a Low Probability of Acid Sulfate Soils. The ASS map is attached to **Appendix 3**.

2.5 Regional Hydrogeology

A review of the “Visualising Victoria’s Groundwater (VVG)” website provided the following information about groundwater in the vicinity of the site. This information is reproduced below in Table 2.5.

Surface Elevation (m AHD)	76.05
Depth to Water Table	20-50m
TDS (mg/L)	3,500-7,000
Beneficial Use Segment (as per SEPP)	C
Water Table Beneficial Use (as per SEPP)	Maintenance of Ecosystems Stock Watering Industrial Water Use Primary Contact Recreation Buildings and Structures

Table 2.5

According to the VVG website, there are 10 groundwater bores within a 2km radius of the site. There is no information regarding the water quality of the groundwater beneath these bores. The bore data is attached to **Appendix 3**.

The wells are used for the following purposes:

- Groundwater Investigation
- Observation

2.6 Nearest Surface Water Bodies

- There are two reservoirs on the site.
- The Barwon River is 300m to the northwest.

- The Waurin Ponds Creek is 2km to the south.
- Corio Bay is 6km to the northeast.

2.7 Groundwater Flow Direction

Based on the contours of the surrounding land shown on the Victorian Water Resources website¹, the inferred groundwater flow direction is likely to be to the northwest towards the Barwon River.

3.0 SITE HISTORY REVIEW

Site and area history information can be found in the report "Highton Basins, 122A Thornhill Road, Highton: Ecological and Cultural Heritage Due Diligence Assessment – Ecology and Heritage Partners Pty Ltd (4 May 2015)". The report suggests that the Highton Basin site was commissioned on 30 June 1950.

3.1 Historical Aerial Photographs

A range of aerial photographs that featured the site were viewed. Observations for the historical aerial photographs relating to surrounding land use and the site are summarised in Table 3.2 below.

Table 3.1

Date	Run/Film/Photo	Observations
01/1947	10/628/21	• Vacant land onsite. • Thornhill Rd established to the east, Structures across Thornhill Rd (Orphanage). • Structures on farmland to the north. • Augustine Drive to the south, then vacant land. • Vacant land to the west.
05/1951	2/938A/2293	• Single storage basin present in the south-central portion of site. • No change to surrounding areas.
10/1968	1/2211/201	• Two storage basins and building now present onsite. • Increase in medium density residential properties to the north east. • Structures and sporting field to the south west (school and college) now present. • Vacant land directly south and west.
11/1972	6/2705/163	• No change onsite. • Increased residential properties and structures to the north.
02/1984	6/3872/102	• No change onsite. • Expansion of facilities to the south west. • Increased residential properties and structures to the north.
01/1990	6/4318/125	• No change onsite. • Increased residential properties and structures to the north. Suburb of Wandana Heights now well established. • Land immediately to the south and west remains vacant.

4.0 EPA RECORDS SEARCH

4.1 EPA Priority Sites Register ('PSR') Review

A review on 18 September 2015 of the EPA PSR dated 31 July 2015 indicated that no Clean Up or Pollution Abatement Notices (relevant to land and/or groundwater contamination) had been issued to the owner or occupier of the site. There were no properties in Highton listed on the PSR.

4.2 Nearby Environmental Audit Reports

A review of EPA's list of Certificates and Statements of Environmental Audit on 18 September 2015 indicates that there have been no previous environmental audits on site. There have also been no environmental audits with 500m of the site.

¹ <http://nremap-sc.nre.vic.gov.au/MapShare.v2/imf.jsp?site=water>

4.3 EPA Prescribed Waste Database

A review of the EPA Prescribed Waste Database undertaken on 18 September 2015 indicates that there are no listed treaters or disposers in Highton.

5.0 SITE INSPECTION

Land Parcel Site Inspection Details	
Date and Time of Inspection	21/9/15
Site Interviewee	N/A
Weather Conditions	Overcast.
Current Site Uses	Barwon Water, Storage Basin.
Previous Site Uses	Vacant land.
Site Coverage incl. condition and type of ground cover, e.g. bare ground, asphalt, concrete, gravel, etc.	Predominantly grass. Gravel roads/paths. Basin – Concrete.
Current Adjacent Land Uses incl. the apparent condition of adjacent properties	Residential.
Details of Structures on site incl. location and condition of all visible features, including foundations, positions of former buildings, tanks, pits, wells, drains and bores.	Concrete basin (central). Building (west): Pump station, storage shed, toilet block, truck wash bay.
Details of Chemical use incl. chemical storage and transfer areas, including the presence of waste or chemical containers	Sodium Hypochlorite, used for truck wash.
Presence of above ground storage tanks	Nil
Presence of underground storage tanks	Nil
Presence of septic tanks	Nil
Evidence of burning or burying of waste	Nil
Spill Incidents	Nil
Spill control systems, e.g. bund (materials of construction should be noted)	Bund around truck wash bay.
Locations of dispensing or fill points	N/A
Evidence of Fill Materials	Limited, reworked natural.
Presence of any stockpiled material	Garden mulch.
Evidence of Scrap and industrial or chemical waste	Nil

Evidence of settlement, subsidence and disturbed ground	Nil
Evidence of on site or adjacent cut and fill activities or quarrying	Large amount of material has been shifted to form basin.
Evidence of Contamination (discoloured soil, polluted water, affected plant growth)	Nil
Potential Asbestos containing material	Nil
Animal populations	Nil
Significant odours	Nil
Assessment of soil loss or deposition that has occurred in the past and evaluation of the future erosion potential	N/A
The direction of the flow of water run-off from the site and adjacent properties	Towards Thornhill Road (East).
The depth of any standing water, the direction and rate of flow of rivers, streams or canals, together with their flood levels and any tidal fluctuations	No standing water.
Transformers	Nil.
General Notes	Due to the bunding around the truck wash bay and the low risk to humans and the environment from Sodium Hypochlorite, it is not considered to be a contaminant of potential concern.

5.1 Previous Investigations

Ground Science Geotechnical undertook a geotechnical investigation on site in March 2015. The investigation locations are shown in Appendix A of their report.

According to the bore logs in Appendix B of the report, uncontrolled fill was located in the following bores/test pits:

- TP9 – Fill to 2m BGL (east of site)
- TP8 – Fill to 1.4m BGL (centre of site)
- TP7 – Fill to 0.3m BGL (centre west of site)
- TP6 – Fill to 0.3m BGL (centre west of site)
- TP4 – Fill to 0.5m BGL (south west of site)

No chemical analysis was undertaken as part of the investigation. Although the report stated that “uncontrolled fill” was located in several locations, this was characterised as “reworked natural fill” by ESA staff during their intrusive works. As such it is not considered to be imported fill and not of concern.

5.2 Identified Potential Contaminants of Concern

On-Site Activity / Use / Industry	Contaminants of Concern
Pesticide/Herbicide Use	Organochlorine/Organophosphate ('OC/OP') Pesticides, Arsenic, Lead
Fuel Storage / Use	Total Recoverable Hydrocarbons ('TRH'), Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene ('BTEXN'), Polycyclic

On-Site Activity / Use / Industry	Contaminants of Concern
	Aromatic Hydrocarbons ('PAHs'), Lead

6.0 SOIL SAMPLING PROGRAM

6.1 Relevant Guidelines and Standards

The sampling program was undertaken in accordance with the following guidelines, standards and policies:

- Australia Standard (AS 4482.1) - Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile compounds (Standards Australia, 2005).
- Australia Standard (AS 4482.2) - Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 2: Volatile Substances (Standards Australia, 1999).
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended).
- State Environment Protection Policy (Prevention and Management of Contamination of Land) No. S95, EPA Victoria, June 2002.

6.2 Quality Assurance / Quality Control

6.2.1 Environmental Site Assessments Quality Assurance (QA) Program

Environmental Site Assessments has developed and implemented a Quality Assurance Program in general accordance with the following guidelines:

- Australia Standard (AS 4482.1) - Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile compounds (Standards Australia, 2005).
- National Environment Protection Council (NEPC) - National Environment Protection (Assessment of Site Contamination) Measure (NEPM) - Schedule B3 Guideline on Laboratory Analysis of Potentially Contaminated Soils, 1999 (Amended).

As part of the Quality Assurance Program, Environmental Site Assessments ensures that the following methodology is employed:

- The use of appropriately qualified and trained environmental scientists to perform intrusive works.
- The use of standardised field sheets to record the findings of the site investigations.
- The collection and analysis of Quality Control samples as per AS 4482.1.
- The use of Chain of Custody procedures to ensure that sample integrity is maintained through the transport and handling stages.
- Only using NATA accredited laboratories for the analysis of samples collected during the investigation activities.

As per the Environmental Site Assessments Quality Assurance Program, the following data quality indicators were used for the assessment of the laboratory analytical data:

- All sample analysis to be conducted using NATA registered methods in accordance with NEPM 1999 (Amended) guidelines.
- Laboratory method blank analysis required to be below the Limit of Reporting (LOR).
- Surrogate compound concentrations required to be spiked at similar concentration to sample result.

6.2.2 Environmental Site Assessments Quality Control ('QC') Program

The overall precision of laboratory split samples and laboratory duplicates is generally assessed by their Relative Percentage Difference ('RPD').

The RPD of duplicated analysis were calculated and compared to the following criteria for acceptability. The acceptance criteria are listed in AS4482.1 (2005):

- Less than 50% for field quality control samples
- Less than 30% for laboratory duplicates where the detection is less than 10 times the LOR
- Less than 20% for laboratory duplicates where the detection is greater than 10 times the LOR
- RPDs for control spike duplicates will be compared to an acceptable limit of 20%
- RPDs for matrix spike duplicates will be compared to an acceptable limit of 20%, and

Percentage recoveries of control spikes and matrix spikes will be compared to an acceptable range of 70% – 130%. Where this range is exceeded, reference to the laboratories internal data quality objective limits will be made. In addition, percentage recoveries of surrogates will also be compared to the USEPA surrogate recovery limits.

6.2.3 Field Quality Control Samples

Based on the very limited soil sampling program undertaken, no field quality control samples were collected.

6.2.4 Sample Documentation

All samples collected were labelled in a clear and precise way for proper identification in the field and for tracking in the laboratory.

The samples had identifiable and unique numbers. The sample labels contained the following information:

- Company name
- Name of sampler
- Sample ID
- Date/Time sample was collected.

Chain-of-custody forms were used to document sample collection and transport to laboratories for analysis. All sample transports for analysis were accompanied by a chain-of-custody form.

The chain-of-custody forms identified the contents of each transport and maintained the custodial integrity of the samples. The coolers in which samples were stored were sealed with self-adhesive custody seals. All custody seals were signed.

6.2.5 Packaging and Transport

All sample containers were placed in a plastic cooler. The following outlines the packaging procedures that were followed for samples:

- When ice was used, it was packed in zip-locked, double plastic bags. The drain plug of the cooler was sealed with fiberglass tape to prevent melting ice from leaking out of the cooler.
- The bottom of the cooler was lined with bubble wrap to prevent breakage during transport.
- All glass sample containers were enclosed in bubble wrap to prevent breakage.
- Where required, empty space in the cooler was filled with bubble wrap to prevent movement and breakage during transport.
- Ice used to cool samples was placed on top and around the samples to chill them to the correct temperature.
- Each cooler was securely taped shut with signed custody seals.

6.2.6 Field Notes

The following information was recorded during the collection of samples:

- Sample location and description
- Sampling area sketch showing sample location and measured distances (where required)
- Sampler's name(s)
- Date and time of sample collection
- Sample ID
- Type of soil/material encountered (Fill, Natural etc.)
- GPS Coordinates
- Photoionisation Detector ('PID') readings
- Field observations and details related to analysis or integrity of samples (e.g., weather conditions, noticeable odours, colours etc.)
- Soil descriptions as per AS1726-1993
- Sample preservation details.

6.3 Analytical Results

A limited soil sampling program was undertaken on site on 21 September 2015. Twelve soil samples were collected from ten sample points across the site (SP01-SP10). The bore logs can be found in **Appendix 4**.

Table 6.3 illustrates the samples that were collected for analysis. The sample locations are shown in **Appendix 4**.

Sample ID	Sampling Point	Depth of Sample (m BGL)	Lab Analysis	PID (PPM)/Odour	Visual Contamination
SP1/0-0.15	SP01	0-0.15	8 Metals***	0.0 / Nil	Nil

Sample ID	Sampling Point	Depth of Sample (m BGL)	Lab Analysis	PID (PPM)/Odour	Visual Contamination
SP2/0-0.15	SP02	0-0.15	OC/OP Pesticides & 15 Metals	0.0 / Nil	Nil
SP3/0-0.15	SP03	0-0.15	8 Metals***	0.0 / Nil	Nil
SP4/0-0.15	SP04	0-0.15	15 Metals**	0.0 / Nil	Nil
SP5/0-0.15	SP05	0-0.15	TRH,BTEXN,PAH, OC/OP Pesticides, PCB and 8 Metals	0.0 / Nil	Nil
SP6/0-0.15	SP06	0-0.15	OC/OP Pesticides & 15 Metals	0.0 / Nil	Nil
SP7/0-0.15	SP07	0-0.15	NEPM Basic Soil Screen*	0.0 / Nil	Nil
SP8/0-0.15	SP08	0-0.15	TRH,BTEXN,PAH, OC/OP Pesticides, PCB and 8 Metals	0.0 / Nil	Nil
SP9/0-0.15	SP09	0-0.15	15 Metals**	0.0 / Nil	Nil
SP10/0-0.15	SP10	0-0.15	NEPM Basic Soil Screen*	0.0 / Nil	Nil

Table 6.3

* Metals (including As, Ba, Be, B, Cd, Cr, Co, Cu, Hg, Mn, Ni, Pb, Se V, Zn), TRH, BTEX, PAH, Phenols, OCP, OPP, PCB, Cyanide and Hexavalent Chromium

** = 15 Metals includes As, Ba, Be, B, Cd, Cr, Co, Cu, Hg, Mn, Ni, Pb, Se V, and Zn

*** = 8 Metals includes As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn

6.3.1 Photoionisation Calibration

The photoionisation detector was calibrated prior to sample collection. The PID calibration sheet is attached to **Appendix 5**. All samples were analysed using the PID and the results are shown in Table 6.3.

6.3.2 Results of Analysis

The laboratory used for conducting the soil analysis was Australian Laboratory Services Pty Ltd ('ALS'). ALS is NATA certified for the analysis undertaken.

The comparison table for laboratory results is attached to **Appendix 6**. All chain of custody forms, certificates of analysis and laboratory QA/QC documents are in **Appendix 7**. The laboratory report number is EM1514844.

The laboratory results were compared with:

- National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended) HIL A (Residential Use)

The results were as follows:

- All results were below the upper thresholds for NEPM HIL A (Residential Use).
- Initial results indicated detectable concentrations of TRH in samples SP9/0-0.15 and SP10/0-0.15.
- A TPH Silica Gel Clean-Up was undertaken on these samples (see report EM1515147).
- The results for TRH were below the limit of reporting indicating that the initial detections were due to the presence of organics in the samples (e.g. roots, grass).
- Based on this fact, no comparisons to NEPM HSLs, ESLs or Management Limits were required.

6.3.3 ESA Quality Control

No quality control samples were collected due to the limited scope of sampling undertaken.

6.3.4 Laboratory QA/QC

As part of their NATA accreditation, ALS performs internal duplicate analysis of samples for comparison of results to demonstrate precision. Laboratory standards including matrix spike samples, laboratory control samples and surrogates are also conducted as a basis to demonstrate accuracy. In addition, internal laboratory blank samples are run to assess the potential for laboratory equipment errors. The laboratory QA/QC results are attached in **Appendix 7**.

6.3.4.1 ALS Environmental Laboratory

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

6.3.4.2 Sample Holding Times and Sample Receipt Temperature

Sample holding times were within acceptable ranges from collection to extraction. The documented temperature of samples upon receipt at the respective laboratory was within an acceptable range.

6.3.4.3 Conclusion

A review of the laboratory reports indicates that ALS has met their internal acceptance criteria for the quality control samples.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

Environmental Site Assessments Pty Ltd ('ESA') was engaged by Barwon Water ('the Client') to undertake a Preliminary Site Investigation ('PSI') at 176-194 Thornhill Road, Highton ('the Site'). The client wishes to develop the site for residential (sensitive) purposes.

The client has requested ESA to undertake PSI to determine whether the site is "Potentially Contaminated".

Potentially contaminated land is defined in Ministerial Direction No. 1 – Potentially Contaminated Land, as land used or known to have been used for industry, mining or the storage of chemicals, gas, wastes or liquid fuel (if not ancillary to another use of land). This practice note also deals with land that may have been contaminated by other means such as by ancillary activities, contamination from surrounding land, fill using contaminated soil or agricultural uses.

Ministerial Direction No. 1 – Potentially Contaminated Land (Direction No. 1) requires planning authorities when preparing planning scheme amendments, to satisfy themselves that the environmental conditions of land proposed to be used for a sensitive use (defined as residential, child-care centre, pre-school centre or primary school), agriculture or public open space are, or will be, suitable for that use.

Based on the investigation undertaken by Environmental Site Assessments, there **no indication that the site is potentially contaminated**. As per Ministerial Direction No. 1, **the site should be suitable for a residential (sensitive) reuse**.

7.2 Recommendations

No further investigation is required at this time.

8.0 REFERENCES

- Australia Standard (AS 4482.1) - Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile compounds (Standards Australia, 2005)
- Australia Standard (AS 4482.2) - Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 2: Volatile Substances (Standards Australia, 1999)
- Australian Standard (AS 1726 -1993) – Geotechnical Site Investigations (Standards Australia, 1993)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended)
- State Environment Protection Policy (Prevention and Management of Contamination of Land) No. S95, EPA Victoria, June 2002

- Industrial Waste Resource Guidelines (IWRG): Sampling and Analysis of Waters, Wastewaters, Soils and Wastes, Publication IWRG701, EPA Victoria, June 2009
- Potentially Contaminated Land – General Practice Note – June 2005 – Department of Sustainability and Environment Ministerial Direction No. 1 – Potentially Contaminated Land (Direction No. 1)
- Geotechnical Investigation – 122A Thornhill Road, Highton, Victoria - Ground Science Geotechnical (April 2015)
- Highton Basins, 122A Thornhill Road, Highton: Ecological and Cultural Heritage Due Diligence Assessment – Ecology and Heritage Partners Pty Ltd (4 May 2015)

DISCLAIMER

This disclaimer, together with any limitations specified in the report, applies to use of this report.

This report was prepared in accordance with a contracted scope of services. There were a series of cost, time and other constraints, which have affected the accuracy, and completeness of investigations undertaken.

This report has been prepared solely for use by, and is confidential to; the client who contracted the scope of services and Environmental Site Assessments accepts no responsibility for its use by other persons.

The contract for the preparation of this report contains express limitations upon the liability of Environmental Site Assessments, which should be considered carefully. This report is subject to copyright protection and the copyright owner reserves its rights. This report does not constitute legal advice.

This report must be read in conjunction with the Statement of Qualifications and Limitations contained within it.

STATEMENT OF QUALIFICATIONS AND LIMITATIONS

It is not possible to identify all contamination or potential contaminants in or under the surface of the site. This is an intrinsic risk when investigating potentially and contaminated sites. As such, Environmental Site Assessments has prepared the following information, which details the limitations of this environmental report.

In preparing this report, Environmental Site Assessments has relied on client/ third party information, which was not verified by Environmental Site Assessments, and Environmental Site Assessments does not accept responsibility for omissions or inaccuracies in the client/ third party information.

This report is based solely on the specific instructions received from its client and/or the scope of works agreed between Environmental Site Assessments and its client. Those instructions and/or scope of work may not be fully described in this report.

This report is based on the site conditions identified at the time of inspection. It is not possible to identify all contamination or potential contaminants in or under the surface of the site.

Investigations undertaken in respect of this report may have been constrained by the particular site conditions, such as the location of buildings, services and vegetation. Further, changes that may have occurred after inspection.

As a result of these matters, not all relevant site history, contaminants or potential for contamination may have been identified in this report.

No warranties express or implied, as to the accuracy or completeness of the matters contained within it are made.

Although normal standards of professional practice have been applied, the absence of any identified potential for air, soil or groundwater impacts on the subject property should not be interpreted as a conclusion that impacts do not exist on the site.

Subsurface conditions can vary across a particular site, which cannot be wholly defined by investigation.

As a result, it is unlikely that the results and estimations presented in this report will reflect the extremes of conditions within the site. Subsurface conditions including impact concentrations can change in a limited period of time. Any information provided may be based on "spot" tests. Conditions may vary between or beyond those locations from the interpreted conditions based on the actual data.

The analyses, evaluations, opinions and conclusions presented in this report are based on the information provided, and they could change if the information is in fact found to be unrepresentative of conditions between sampling and analysis locations.

The assessment and remediation of contamination is a developing science. Clean Up technology is constantly changing as scientific information on data collection, risk assessment, toxicology and remediation technologies are published. Further, opinions can vary as to the criterion for whether particular conditions constitute contamination, and if so how that contamination should be addressed or remediated. Different persons might reasonably or otherwise form opinions different to those of Environmental Site Assessments.

Use of the site for any purpose may require planning and other approvals and, in some cases, EPA and accredited site auditor approvals. Environmental Site Assessments offers no opinion as to the likelihood of obtaining any such approvals, or the conditions and obligations, which such approvals may impose, which may include the requirement for significant environment works.

The ongoing use of the site or use of the site for a different purpose may require the owner/ user to manage and/ or remediate site conditions, such as contamination and other conditions, including but not limited to conditions referred to in this report.

This report is not intended to be used for the purposes of tendering, programming of works, refurbishment works or demolition works unless used in conjunction with a specification detailing the extent of the works.

To ensure its contextual integrity, the report must be read in its entirety and should not be copied, distributed or referred to in part only.

Environmental Site Assessments makes no determination or recommendation regarding a decision whether to acquire or provide financing with respect to the site.



Appendix 1: Stage 1 Subdivision Concept Plan

YIELD BREAKDOWN

Lot Width (35.0+ depth)	
18m	0
16m	2
14m	9
12.5m	6
Lot Width (32 depth)	
18m	2
16m	2
14m	3
12.5m	5
7.5m	14
Lot Width (30 depth)	
14m	0
Lot Width (16 depth)	
16m	2
14m	1
12.5m	2
Total Lots	48

LEGEND

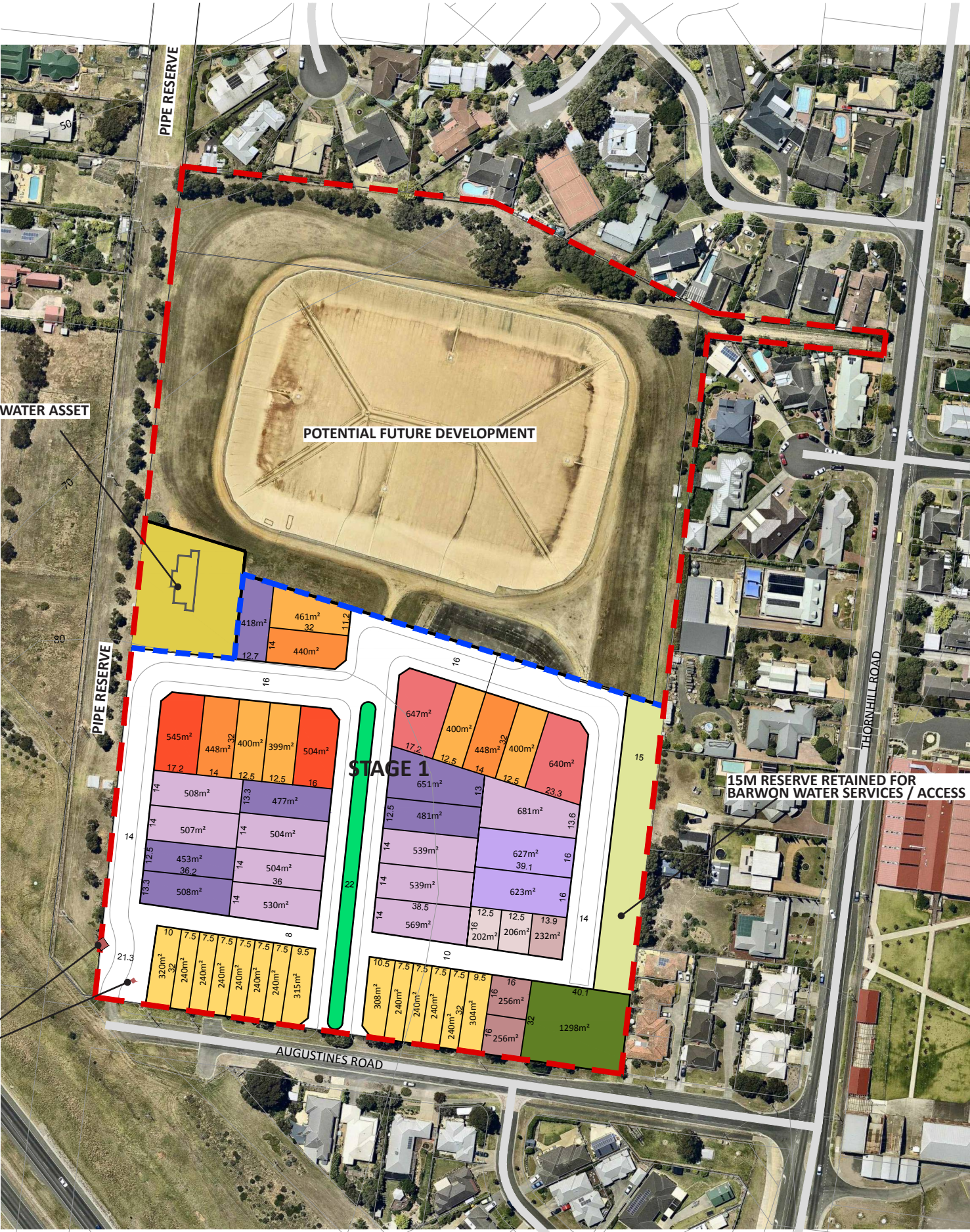
- Property Boundary
- Stage Boundary
- Retarding Basin
- Barwon Water Asset - Pump Station
- Passive Open Space
- Green Median
- Existing water valves to be retained
- Existing grated pit to be retained
- Existing brick building to be retained
- Contours (1m intervals)

LAND BUDGET

Total Precinct Area	3.42 Ha		
DESCRIPTION	AREA (Ha)	% Precinct	& NDA
Encumbered Land	0.13	3.80%	
Retarding Basin	0.13	3.80%	
Gross Developable Area	3.29	96.20%	
Public Open Space	0.18	5.26%	
Passive Open Space	0.18	5.26%	
Net Developable Area	3.11	90.94%	100%
Roads	1.14	33.34%	36.66%
Local Roads	1.14	33.34%	36.66%
Net Residential Area	1.97	57.60%	63.34%
Conventional Density Area	1.97	57.60%	63.34%

EXISTING ASSETS RETAINED IN WIDENED ROAD RESERVE

EXISTING BARWON WATER ASSET



Stage 1 Subdivision Concept Plan
Highton Basin, Barwon Water



DRAFT



ref.: 30048000F
date: 18 August 2015
rev.: F
drawn: DS/RW
checked: CD

please note:
This plan is based on preliminary information only
and may be subject to change as a result of formal
Council/Authority advice, detailed site investigations
and confirmation by survey

planning, urban design and
landscape architecture
melbourne - tel 9514 1500
abn 47 065 475 149



Appendix 2: Basic and Planning Property Reports

Property Report

from www.land.vic.gov.au on 18 September 2015 10:36 AM

Address: 176-194 THORNHILL ROAD HIGHTON 3216

Lot and Plan Number: This site has 13 parcels. See table below.

Standard Parcel Identifier (SPI): See table below.

Local Government (Council): GREATER GEELONG **Council Property Number:** 318640

Directory Reference: Melway 465 A1

Note: There are 3 properties identified for this site.

These can include units (or car spaces), shops, or part or whole floors of a building.
Dimensions for these individual properties are generally not available.

This property is in a designated bushfire prone area.

Special bushfire construction requirements apply. Planning provisions may apply.

Further information about the building control system and building in bushfire prone areas can be found in the Building Commission section of the Victorian Building Authority website www.vba.vic.gov.au

Parcel Details

Lot/Plan or Crown Description	SPI	Lot/Plan or Crown Description	SPI
Lot 1 PS522323	1\PS522323	Lot 1 TP323821	1\TP323821
Lot RES1 PS522323	RES1\PS522323	Lot 1 TP413249	1\TP413249
Lot RES2 PS613933	RES2\PS613933	Lot 1 TP606996	1\TP606996
Lot 1 PS620847	1\PS620847	Lot 1 TP674585	1\TP674585
Lot 1 TP116450	1\TP116450	Lot 1 TP709421	1\TP709421
Lot 1 TP116973	1\TP116973	Lot 1 TP747618	1\TP747618
Lot 1 TP246558	1\TP246558		

State Electorates

Legislative Council: WESTERN VICTORIA

Legislative Assembly: SOUTH BARWON

Utilities

Regional Urban Water Business: Barwon Water

Rural Water Business: Southern Rural Water

Melbourne Water: outside drainage boundary

Power Distributor: POWERCOR (Information about [choosing an electricity retailer](#))

Planning information continued on next page

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Planning Zone Summary

Planning Zones:	<u>GENERAL RESIDENTIAL ZONE - SCHEDULE 1 (GRZ1)</u>
	<u>SCHEDULE TO THE GENERAL RESIDENTIAL ZONE - SCHEDULE 1</u>
	<u>GENERAL RESIDENTIAL ZONE - SCHEDULE 2 (GRZ2)</u>
	<u>SCHEDULE TO THE GENERAL RESIDENTIAL ZONE - SCHEDULE 2</u>
	<u>PUBLIC USE ZONE - SERVICE AND UTILITY (PUZ1)</u>
Planning Overlay:	<u>SCHEDULE TO THE PUBLIC USE ZONE - SERVICE AND UTILITY</u>
	<u>DESIGN AND DEVELOPMENT OVERLAY (DDO)</u>
	<u>DESIGN AND DEVELOPMENT OVERLAY - SCHEDULE 14 (DDO14)</u>

Planning scheme data last updated on 17 September 2015.

A planning scheme sets out policies and requirements for the use, development and protection of land. This report provides information about the zone and overlay provisions that apply to the selected land. Information about the State, local, particular and general provisions of the local planning scheme that may affect the use of this land can be obtained by contacting the local council or by visiting [Planning Schemes Online](#)

This report is NOT a **Planning Certificate** issued pursuant to Section 199 of the Planning & Environment Act 1987. It does not include information about exhibited planning scheme amendments, or zonings that may affect the land. To obtain a Planning Certificate go to [Titles and Property Certificates](#)

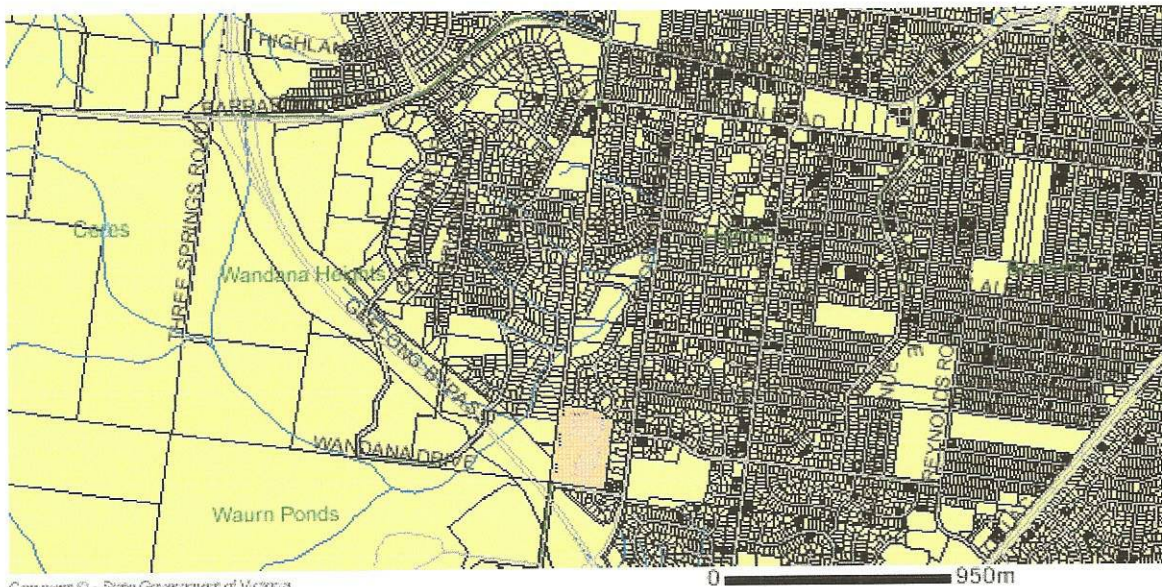
The Planning Property Report includes separate maps of zones and overlays

For details of surrounding properties, use this service to get the Reports for properties of interest

To view planning zones, overlay and heritage information in an interactive format visit [Planning Maps Online](#)

For other information about planning in Victoria visit www.delwp.vic.gov.au/planning

Area Map



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0 950m

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Planning Property Report

from www.dtpli.vic.gov.au/planning on 18 September 2015 01:23 PM

Address: 176-194 THORNHILL ROAD HIGHTON 3216

Lot and Plan Number: Lot 1 PS522323

This property has a total of 13 parcels.

For full parcel details get the free Basic Property report at [Property Reports](#)

Local Government (Council): GREATER GEELONG **Council Property Number:** 318640

Directory Reference: Melway 465 A1

See next page for planning information

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Planning Zones

GENERAL RESIDENTIAL ZONE - SCHEDULE 1 (GRZ1)

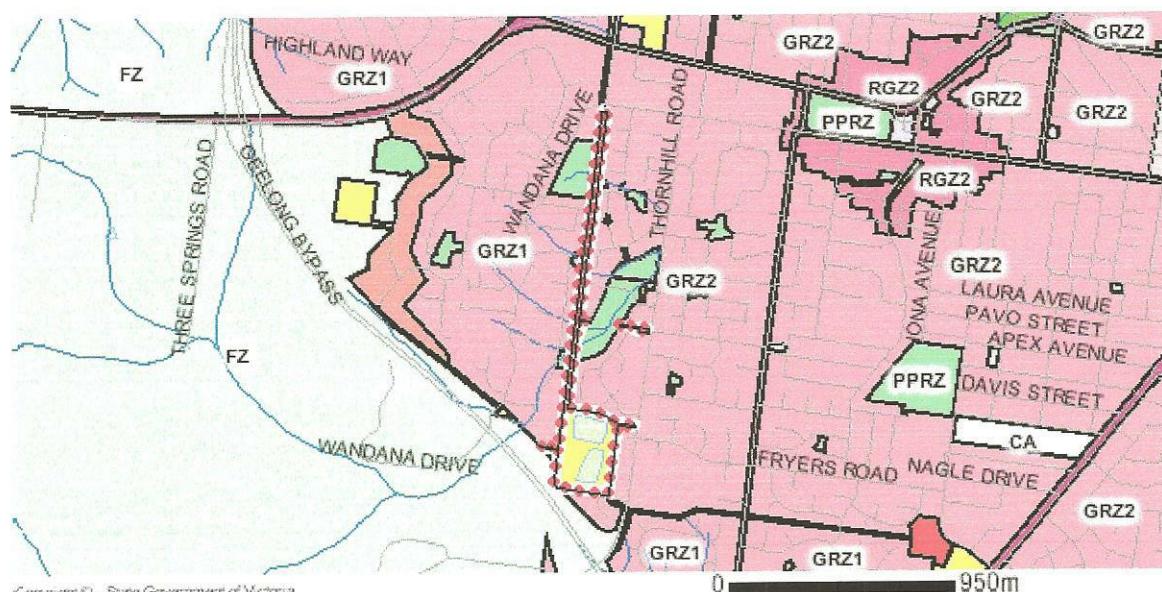
SCHEDULE TO THE GENERAL RESIDENTIAL ZONE - SCHEDULE 1

GENERAL RESIDENTIAL ZONE - SCHEDULE 2 (GRZ2)

SCHEDULE TO THE GENERAL RESIDENTIAL ZONE - SCHEDULE 2

PUBLIC USE ZONE - SERVICE AND UTILITY (PUZ1)

SCHEDULE TO THE PUBLIC USE ZONE - SERVICE AND UTILITY



Note: labels for zones may appear outside the actual zone - please compare the labels with the legend.

Zones Legend

ACZ - Activity Centre	IN1Z - Industrial 1	R1Z - General Residential
B1Z - Commercial 1	IN2Z - Industrial 2	R2Z - General Residential
B2Z - Commercial 1	IN3Z - Industrial 3	R3Z - General Residential
B3Z - Commercial 2	LDRZ - Low Density Residential	RAZ - Rural Activity
B4Z - Commercial 2	MUZ - Mixed Use	RCZ - Rural Conservation
B5Z - Commercial 1	NRZ - Neighbourhood Residential	RDZ1 - Road - Category 1
C1Z - Commercial 1	PCRZ - Public Conservation & Resource	RDZ2 - Road - Category 2
C2Z - Commercial 2	PDZ - Priority Development	RGZ - Residential Growth
CA - Commonwealth Land	PPRZ - Public Park & Recreation	RLZ - Rural Living
CCZ - Capital City	PUZ1 - Public Use - Service & Utility	RUZ - Rural
CDZ - Comprehensive Development	PUZ2 - Public Use - Education	SUZ - Special Use
DZ - Dockland	PUZ3 - Public Use - Health Community	TZ - Township
ERZ - Environmental Rural	PUZ4 - Public Use - Transport	UFZ - Urban Floodway
FZ - Farming	PUZ5 - Public Use - Cemetery/Crematorium	UGZ - Urban Growth
GRZ - General Residential	PUZ6 - Public Use - Local Government	
GWAZ - Green Wedge A	PUZ7 - Public Use - Other Public Use	
GWZ - Green Wedge	PZ - Port	

— Urban Growth Boundary

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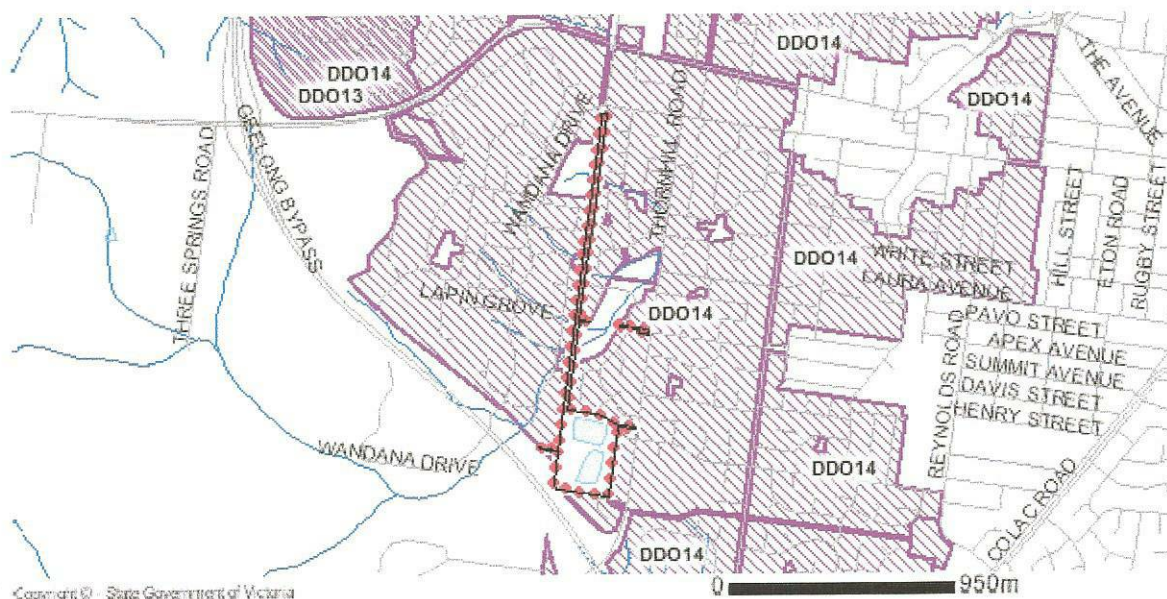
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Planning Overlay

DESIGN AND DEVELOPMENT OVERLAY (DDO)

DESIGN AND DEVELOPMENT OVERLAY - SCHEDULE 14 (DDO14)



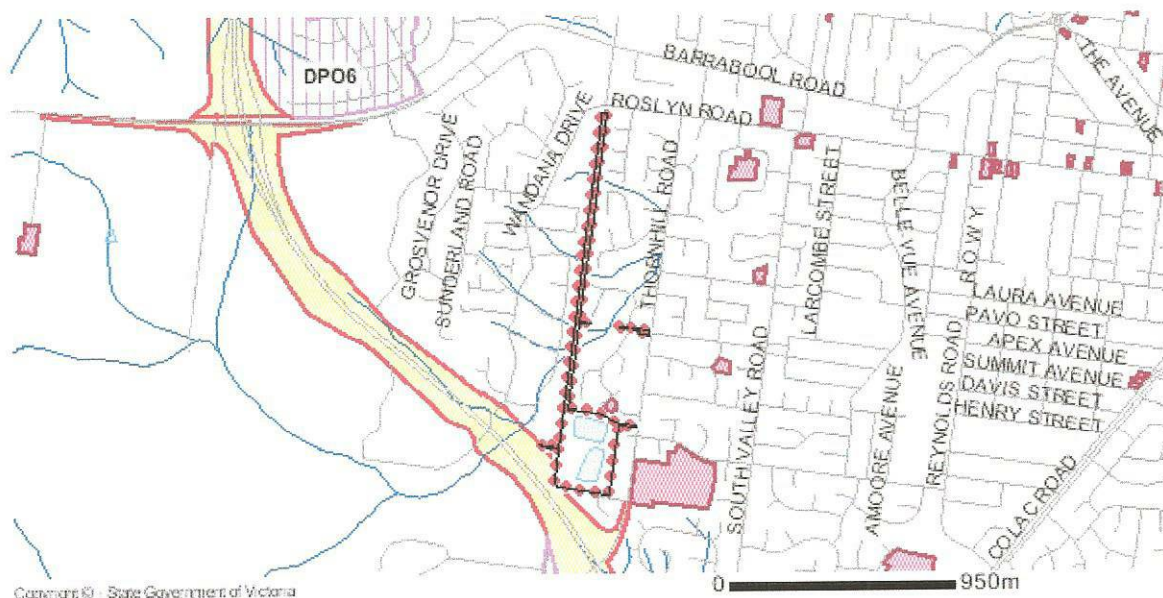
OTHER OVERLAYS

Other overlays in the vicinity not directly affecting this land

DEVELOPMENT PLAN OVERLAY (DPO)

HERITAGE OVERLAY (HO)

PUBLIC ACQUISITION OVERLAY (PAO)



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Planning Overlays Legend

Overlays Legend

 AEO - Airport Environs	 LSIO - Land Subject to Inundation
 BMO - Bushfire Management (also WMO)	 MAEO1 - Melbourne Airport Environs 1
 CLPO - City Link Project	 MAEO2 - Melbourne Airport Environs 2
 DCPD - Development Contributions Plan	 NCO - Neighbourhood Character
 DDO - Design & Development	 PO - Parking
 DDOPT - Design & Development Part	 PAO - Public Acquisition
 DPO - Development Plan	 RO - Restructure
 EAO - Environmental Audit	 RCO - Road Closure
 EMO - Erosion Management	 SBO - Special Building
 ESO - Environmental Significance	 SLO - Significant Landscape
 FO - Floodway	 SMD - Salinity Management
 HO - Heritage	 SRQ - State Resource
 IPO - Incorporated Plan	 VPO - Vegetation Protection

Note: due to overlaps some colours on the maps may not match those in the legend.

Further Planning Information

Planning scheme data last updated on 17 September 2015.

A **planning scheme** sets out policies and requirements for the use, development and protection of land.

This report provides information about the zone and overlay provisions that apply to the selected land.

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Appendix 3: Geological Survey Map, ASS Map for the Site, Bores With 2km

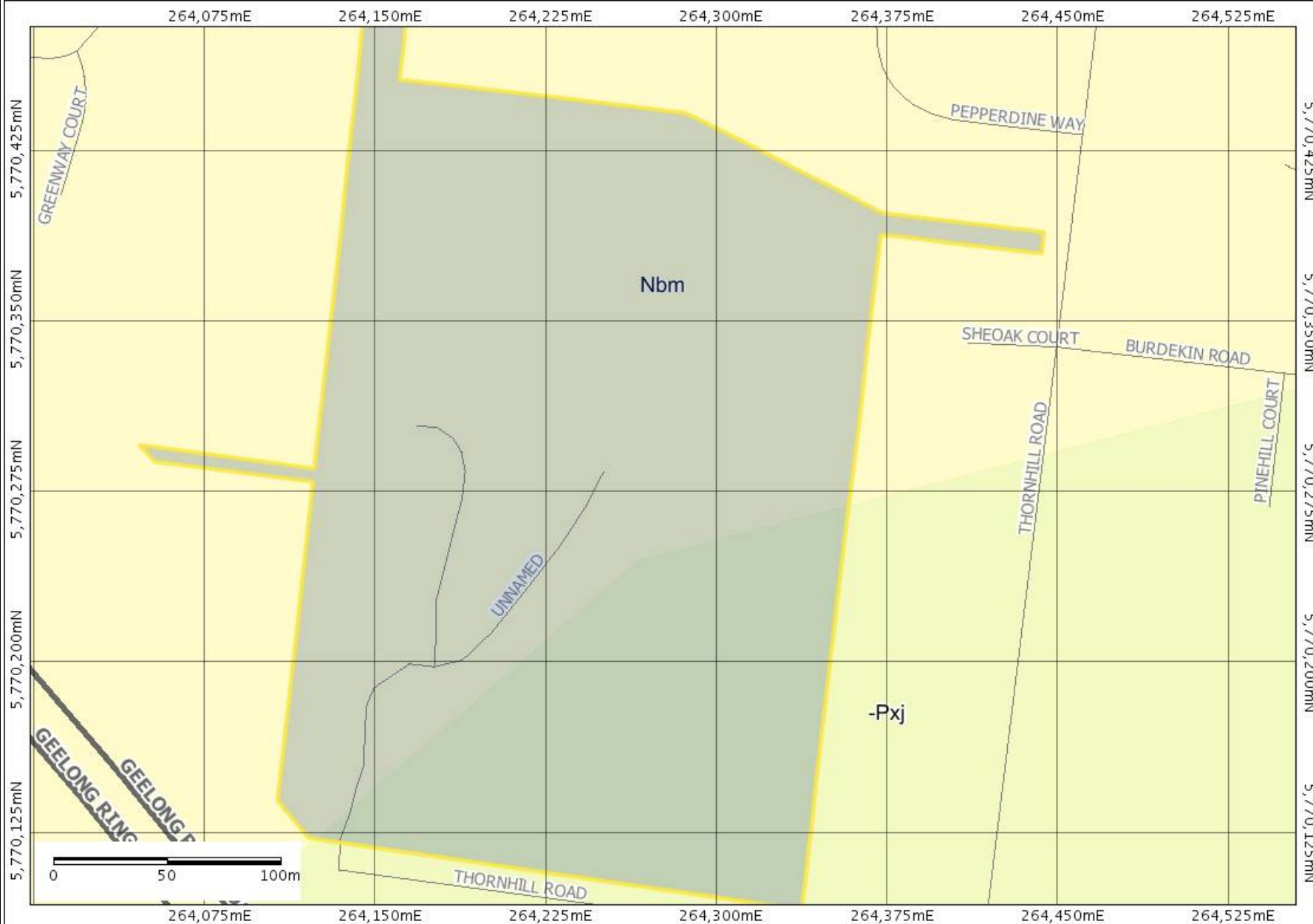
Towns (25K)

Roads (vmtrans)

-  Freeway
-  Highway
-  Main Road
-  Other

Victoria Boundary

-  Coastline
-  Boundary



Disclaimer: This map is a snapshot generated from Victoria Government data. This material may be of assistance to you but the State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons accessing this information should make appropriate enquiries to assess the currency of the data.

Generated from GeoVic 3

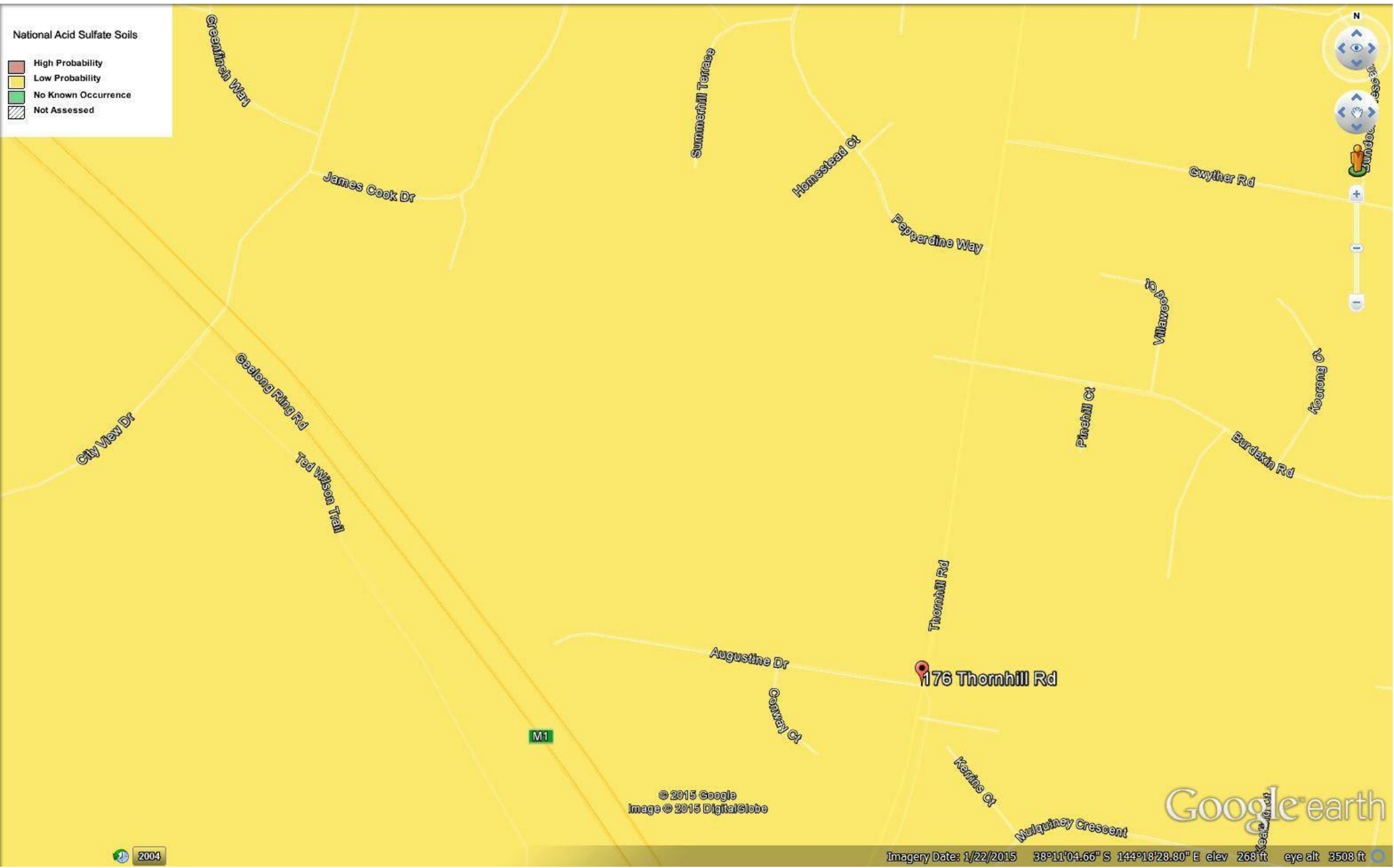
Map Created Fri Sep 18 2015 10:58:49 GMT+1000 (EST)

Map Scale: 1:2,456
Projection: MGA 55



National Acid Sulfate Soils

- High Probability
- Low Probability
- No Known Occurrence
- Not Assessed



© 2015 Google
Image © 2015 DigitalGlobe

Google earth

2004

Imagery Date: 1/22/2015 38°11'04.66" S 144°18'28.80" E elev 268 ft eye alt 3508 ft



Bore Details:: 48034

[Normal Version](#)

Bore Details

Bore ID 48034

Datum	Longitude	Latitude	MGA zone	Easting(m)	Northing(m)
GDA 1994	144.325000	-38.178000	55	265712.2	5771084.2

Surveyed Elevation (m AHD)	Digitised Elevation (m AHD)	Location Accuracy	Total Depth	Completion date
	41.00		39.62	1968-03-04

Bore Authority	Bore type	Bore use 1	Bore use 2	Bore use 3
	Groundwater			

Monitoring status	Monitoring frequency	Parish	Old Bore ID	Local Bore name
Not Monitored				

Construction Details

Driller SCOTT J B

Drilling method Not Known

Aquifer

No aquifer details available

Monitoring

No water level records available for this bore

Chemistry

No hydrochemistry information available for this bore

Lithology

No lithographical information available for this bore

Stratigraphy

No stratigraphy information for this bore

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Bore Details:: WRK062012

[Normal Version](#)

Bore Details

Bore ID WRK062012

Datum	Longitude	Latitude	MGA zone	Easting(m)	Northing(m)
GDA 1994	144.320000	-38.170000	55	265189.0	5771898.0

Surveyed Elevation (m AHD)	Digitised Elevation (m AHD)	Location Accuracy	Total Depth	Completion date
			19.50	2011-05-16

Bore Authority	Bore type	Bore use 1	Bore use 2	Bore use 3
	Groundwater	Observation		

Monitoring status	Monitoring frequency	Parish	Old Bore ID	Local Bore name
Not Monitored				

Construction Details

Driller NOT KNOWN

Drilling method Mechanical Auger

Casing type	Casing diameter	Casing From depth	Casing To depth
	50.0 mm		13.50 m

Screen type	Screen diameter	Screen aperture	Screened from	Screened to	Screened in
			13.50 m	19.50 m	CLAY

Aquifer

No aquifer details available

Monitoring

No water level records available for this bore

Chemistry

No hydrochemistry information available for this bore

Lithology

Lithology details for bore: WRK062012

Log Type	From (m)	To (m)	Description
Driller	0.00	0.80	CLAY
Driller	0.80	17.00	CLAY
Driller	17.00	19.50	CLAY

Stratigraphy

No stratigraphy information for this bore

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Bore Details:: WRK062129

[Normal Version](#)

Bore Details

Bore ID WRK062129

Datum	Longitude	Latitude	MGA zone	Easting(m)	Northing(m)
GDA 1994	144.320000	-38.170000	55	265190.0	5771899.0

Surveyed Elevation (m AHD)	Digitised Elevation (m AHD)	Location Accuracy	Total Depth	Completion date
			10.00	2011-04-23

Bore Authority	Bore type	Bore use 1	Bore use 2	Bore use 3
	Groundwater	Observation		

Monitoring status	Monitoring frequency	Parish	Old Bore ID	Local Bore name
Not Monitored				

Construction Details

Driller NOT KNOWN

Drilling method Mechanical Auger

Casing type	Casing diameter	Casing From depth	Casing To depth
	50.0 mm		7.00 m

Screen type	Screen diameter	Screen aperture	Screened from	Screened to	Screened in
		1.00 mm	7.00 m	10.00 m	BASA

Aquifer

No aquifer details available

Monitoring

No water level records available for this bore

Chemistry

No hydrochemistry information available for this bore

Lithology

Lithology details for bore: WRK062129

Log Type	From (m)	To (m)	Description
Driller	0.00	6.00	CLAY
Driller	6.00	10.00	BASALT

Stratigraphy

No stratigraphy information for this bore

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Bore Details:: WRK062131

[Normal Version](#)

Bore Details

Bore ID WRK062131

Datum	Longitude	Latitude	MGA zone	Easting(m)	Northing(m)
GDA 1994	144.320000	-38.170000	55	265190.0	5771899.0

Surveyed Elevation (m AHD)	Digitised Elevation (m AHD)	Location Accuracy	Total Depth	Completion date
			12.00	2011-04-28

Bore Authority	Bore type	Bore use 1	Bore use 2	Bore use 3
	Groundwater	Observation		

Monitoring status	Monitoring frequency	Parish	Old Bore ID	Local Bore name
Not Monitored				

Construction Details

Driller NOT KNOWN

Drilling method Rotary Air

Casing type	Casing diameter	Casing From depth	Casing To depth
	50.0 mm		8.00 m

Screen type	Screen diameter	Screen aperture	Screened from	Screened to	Screened in
		1.00 mm	8.00 m	12.00 m	BASA

Aquifer

No aquifer details available

Monitoring

No water level records available for this bore

Chemistry

No hydrochemistry information available for this bore

Lithology

Lithology details for bore: WRK062131

Log Type	From (m)	To (m)	Description
Driller	0.00	1.00	FILL
Driller	1.00	12.00	BASALT

Stratigraphy

No stratigraphy information for this bore

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Bore Details:: WRK069174

[Normal Version](#)

Bore Details

Bore ID WRK069174

Datum	Longitude	Latitude	MGA zone	Easting(m)	Northing(m)
GDA 1994	144.320000	-38.182000	55	265235.0	5770564.0

Surveyed Elevation (m AHD)	Digitised Elevation (m AHD)	Location Accuracy	Total Depth	Completion date
			4.00	2012-05-25

Bore Authority	Bore type	Bore use 1	Bore use 2	Bore use 3
	Groundwater	Observation		

Monitoring status	Monitoring frequency	Parish	Old Bore ID	Local Bore name
Not Monitored				

Construction Details

Driller NOT KNOWN

Drilling method Mechanical Auger

Casing type	Casing diameter	Casing From depth	Casing To depth
	50.0 mm		1.00 m

Screen type	Screen diameter	Screen aperture	Screened from	Screened to	Screened in
			1.00 m	4.00 m	CLAY

Aquifer

No aquifer details available

Monitoring

No water level records available for this bore

Chemistry

No hydrochemistry information available for this bore

Lithology

Lithology details for bore: WRK069174

Log Type	From (m)	To (m)	Description
Driller	0.00	1.00	FILL
Driller	1.00	4.00	CLAY

Stratigraphy

No stratigraphy information for this bore

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Bore Details:: WRK069213

[Normal Version](#)

Bore Details

Bore ID WRK069213

Datum	Longitude	Latitude	MGA zone	Easting(m)	Northing(m)
GDA 1994	144.320000	-38.182000	55	265235.0	5770564.0

Surveyed Elevation (m AHD)	Digitised Elevation (m AHD)	Location Accuracy	Total Depth	Completion date
			8.00	2012-05-31

Bore Authority	Bore type	Bore use 1	Bore use 2	Bore use 3
	Groundwater	Observation		

Monitoring status	Monitoring frequency	Parish	Old Bore ID	Local Bore name
Not Monitored				

Construction Details

Driller NOT KNOWN

Drilling method Mechanical Auger

Casing type	Casing diameter	Casing From depth	Casing To depth
	50.0 mm		6.50 m

Screen type	Screen diameter	Screen aperture	Screened from	Screened to	Screened in
		1.00 mm	6.50 m	8.00 m	GRAV

Aquifer

No aquifer details available

Monitoring

No water level records available for this bore

Chemistry

No hydrochemistry information available for this bore

Lithology

Lithology details for bore: WRK069213

Log Type	From (m)	To (m)	Description
Driller	0.00	1.00	FILL
Driller	1.00	7.00	CLAY
Driller	7.00	8.00	GRAVEL

Stratigraphy

No stratigraphy information for this bore

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Bore Details:: WRK960321

[Normal Version](#)

Bore Details

Bore ID WRK960321

Datum	Longitude	Latitude	MGA zone	Easting(m)	Northing(m)
GDA 1994	144.318000	-38.172000	55	265050.0	5771660.0

Surveyed Elevation (m AHD)	Digitised Elevation (m AHD)	Location Accuracy	Total Depth	Completion date
	37.63		18.00	2002-10-30

Bore Authority	Bore type	Bore use 1	Bore use 2	Bore use 3
	Groundwater	Groundwater Investigation		

Monitoring status	Monitoring frequency	Parish	Old Bore ID	Local Bore name
Not Monitored				

Construction Details

Driller BARNES S

Drilling method Hand Auger

Casing type	Casing diameter	Casing From depth	Casing To depth
	50.0 mm		12.00 m

Screen type	Screen diameter	Screen aperture	Screened from	Screened to	Screened in
	50 mm	0.40 mm	12.00 m	18.00 m	SAND

Aquifer

Aquifer Summary Details

Aquifer from (m)	Aquifer to (m)	Aquifer material	Aquifer Name	Source
Water from (m)		Water to (m)	Lithology	
SWL when constructed (m)	EC when constructed (mS/cm)		TDS when constructed (mg/l)	

Pumping Test	
Pumping test date	2002-10-30 00:00:00
Pump depth (m)	
Pump type	
Pumping rate (l/s)	
Pumping time (hh:mm)	
Drawdown (m)	
Recovery time (hh:mm)	
Pumping data source	

Aquifer parameters	
Transmissivity (m ² /day)	
Hydraulic conductivity (m/d)	
Storativity	
Yield (l/s)	
Data Source	

Monitoring

No water level records available for this bore

Chemistry

No hydrochemistry information available for this bore

Lithology

Lithology details for bore: WRK960321

Log Type	From (m)	To (m)	Description
Driller	0.00	8.00	SILTY CLAY; GREY; FIRM MOIST
Driller	8.00	18.00	SILTY SAND;YELLOW;ORANGE BROWN

Stratigraphy

No stratigraphy information for this bore

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Bore Details:: WRK960322

[Normal Version](#)

Bore Details

Bore ID WRK960322

Datum	Longitude	Latitude	MGA zone	Easting(m)	Northing(m)
GDA 1994	144.318000	-38.172000	55	265073.0	5771673.0

Surveyed Elevation (m AHD)	Digitised Elevation (m AHD)	Location Accuracy	Total Depth	Completion date
	36.16		18.00	2002-10-30

Bore Authority	Bore type	Bore use 1	Bore use 2	Bore use 3
	Groundwater	Groundwater Investigation		

Monitoring status	Monitoring frequency	Parish	Old Bore ID	Local Bore name
Not Monitored				

Construction Details

Driller BARNES S

Drilling method Hand Auger

Casing type	Casing diameter	Casing From depth	Casing To depth
	50.0 mm		12.00 m

Screen type	Screen diameter	Screen aperture	Screened from	Screened to	Screened in
	50 mm	0.40 mm	12.00 m	18.00 m	SAND

Aquifer

Aquifer Summary Details

Aquifer from (m)	Aquifer to (m)	Aquifer material	Aquifer Name	Source
Water from (m)		Water to (m)	Lithology	
SWL when constructed (m)	EC when constructed (mS/cm)		TDS when constructed (mg/l)	

Pumping Test	
Pumping test date	2002-10-30 00:00:00
Pump depth (m)	
Pump type	
Pumping rate (l/s)	
Pumping time (hh:mm)	
Drawdown (m)	
Recovery time (hh:mm)	
Pumping data source	

Aquifer parameters	
Transmissivity (m ² /day)	
Hydraulic conductivity (m/d)	
Storativity	
Yield (l/s)	
Data Source	

Monitoring

No water level records available for this bore

Chemistry

No hydrochemistry information available for this bore

Lithology

Lithology details for bore: WRK960322

Log Type	From (m)	To (m)	Description
Driller	0.00	8.00	SILTY CLAY; GREY FIRM MOIST
Driller	8.00	18.00	SILTY SAND;YELLOW;ORANGE;BROWN

Stratigraphy

No stratigraphy information for this bore

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Bore Details:: WRK960323

[Normal Version](#)

Bore Details

Bore ID WRK960323

Datum	Longitude	Latitude	MGA zone	Easting(m)	Northing(m)
GDA 1994	144.318000	-38.172000	55	265076.0	5771648.0

Surveyed Elevation (m AHD)	Digitised Elevation (m AHD)	Location Accuracy	Total Depth	Completion date
	36.45		18.00	2002-10-30

Bore Authority	Bore type	Bore use 1	Bore use 2	Bore use 3
	Groundwater	Groundwater Investigation		

Monitoring status	Monitoring frequency	Parish	Old Bore ID	Local Bore name
Not Monitored				

Construction Details

Driller BARNES S

Drilling method Hand Auger

Casing type	Casing diameter	Casing From depth	Casing To depth
	50.0 mm		12.00 m

Screen type	Screen diameter	Screen aperture	Screened from	Screened to	Screened in
	50 mm	0.40 mm	12.00 m	18.00 m	SAND

Aquifer

Aquifer Summary Details

Aquifer from (m)	Aquifer to (m)	Aquifer material	Aquifer Name	Source
Water from (m)		Water to (m)	Lithology	
SWL when constructed (m)	EC when constructed (mS/cm)		TDS when constructed (mg/l)	

Pumping Test	
Pumping test date	2002-10-30 00:00:00
Pump depth (m)	
Pump type	
Pumping rate (l/s)	
Pumping time (hh:mm)	
Drawdown (m)	
Recovery time (hh:mm)	
Pumping data source	

Aquifer parameters	
Transmissivity (m ² /day)	
Hydraulic conductivity (m/d)	
Storativity	
Yield (l/s)	
Data Source	

Monitoring

No water level records available for this bore

Chemistry

No hydrochemistry information available for this bore

Lithology

Lithology details for bore: WRK960323

Log Type	From (m)	To (m)	Description
Driller	0.00	8.00	SILTY CLAY; GREY FIRM MOIST
Driller	8.00	18.00	SILTY SAND;YELLOW;ORANGE;BROWN

Stratigraphy

No stratigraphy information for this bore

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Bore Details:: WRK979812

[Normal Version](#)

Bore Details

Bore ID WRK979812

Datum	Longitude	Latitude	MGA zone	Easting(m)	Northing(m)
GDA 1994	144.319000	-38.198000	55	265229.0	5768827.0

Surveyed Elevation (m AHD)	Digitised Elevation (m AHD)	Location Accuracy	Total Depth	Completion date
	23.56		25.00	

Bore Authority	Bore type	Bore use 1	Bore use 2	Bore use 3
	Groundwater			

Monitoring status	Monitoring frequency	Parish	Old Bore ID	Local Bore name
Not Monitored				

Construction Details

Driller NOT KNOWN

Aquifer

No aquifer details available

Monitoring

No water level records available for this bore

Chemistry

No hydrochemistry information available for this bore

Lithology

No lithographical information available for this bore

Stratigraphy

No stratigraphy information for this bore

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Appendix 4: Sample Locations

BOREHOLE NUMBER: SP1

Client Barwon Water
Project Number _____
Date Started 21/09/15 **Date Completed** 21/09/15
Drilling Contractor N/A
Equipment Hand Auger
Hole Size 50mm

Project Name Barwon Water - Highton
Location Thornhill Road, Highton
Hole Location (GPS) _____
Logged By Andrew Wigley
Notes _____

Depth (m)	Graphic Log	Classification Symbol	Material Description	Sample ID	Analysed	PID (ppm)	Odour/ Staining
0		FILL	FILL. SANDY CLAY. Dark Brown, Low Plasticity, Firm, Dry, Fine Grain Sand, some Organic Matter.	SP1/0-0.15	8 Metals	0.0	Nil
0.04							
0.08							
0.12							
0.16							
0.2		SC	CLAYEY SAND. BROWN, Medium Grain Sand, Dry, Loose.	SP1/0.35-0.5	Hold	0.0	Nil
0.24							
0.28							
0.32							
0.36							
0.4							
0.44							
0.48							
			End Of Bore at 0.5m				

BOREHOLE NUMBER: SP2

Client Barwon Water
Project Number _____
Date Started 21/09/15 **Date Completed** 21/09/15
Drilling Contractor N/A
Equipment Hand Auger
Hole Size 50mm

Project Name Barwon Water - Highton
Location Thornhill Road, Highton
Hole Location (GPS) _____
Logged By Andrew Wigley
Notes _____

Depth (m)	Graphic Log	Classification Symbol	Material Description	Sample ID	Analysed	PID (ppm)	Odour/ Staining
0		FILL	FILL. SANDY CLAY. Dark Brown, Low Plasticity, Firm, Dry, Fine Grain Sand, some Organic Matter.	SP2/0-0.15	OC/OP Pesticides & 15 Metals	0.0	Nil
0.04							
0.08							
0.12							
0.16							
0.2		SC	CLAYEY SAND. BROWN, Medium Grain Sand, Dry, Loose.	SP2/0.35-0.5	Hold	0.0	Nil
0.24							
0.28							
0.32							
0.36							
0.4							
0.44							
0.48							
			End Of Bore at 0.5m				

BOREHOLE NUMBER: SP3

Client Barwon Water
Project Number _____
Date Started 21/09/15 **Date Completed** 21/09/15
Drilling Contractor N/A
Equipment Hand Auger
Hole Size 50mm

Project Name Barwon Water - Highton
Location Thornhill Road, Highton
Hole Location (GPS) _____
Logged By Andrew Wigley
Notes _____

Depth (m)	Graphic Log	Classification Symbol	Material Description	Sample ID	Analysed	PID (ppm)	Odour/ Staining
0		FILL	FILL. SANDY CLAY. Dark Brown, Low Plasticity, Firm, Dry, Fine Grain Sand, some Organic Matter.	SP3/0-0.15	8 Metals	0.0	Nil
0.04							
0.08							
0.12							
0.16							
0.2							
0.24							
0.28		SC	CLAYEY SAND. BROWN, Medium Grain Sand, Dry, Loose.	SP3/0.35-0.5	Hold	0.0	Nil
0.32							
0.36							
0.4							
0.44							
0.48							
			End Of Bore at 0.5m				

BOREHOLE NUMBER: SP4

Client Barwon Water
Project Number _____
Date Started 21/09/15 **Date Completed** 21/09/15
Drilling Contractor N/A
Equipment Hand Auger
Hole Size 50mm

Project Name Barwon Water - Highton
Location Thornhill Road, Highton
Hole Location (GPS) _____
Logged By Andrew Wigley
Notes _____

Depth (m)	Graphic Log	Classification Symbol	Material Description	Sample ID	Analysed	PID (ppm)	Odour/ Staining
0		FILL	FILL. SANDY CLAY. Dark Brown, Low Plasticity, Firm, Dry, Fine Grain Sand, some Organic Matter.	SP4/0-0.15	15 Metals	0.0	Nil
0.04							
0.08							
0.12							
0.16							
0.2							
0.24							
0.28							
0.32							
0.36							
0.4		CI	CLAY. Orange/Brown, Medium Plasticity, Dry, Firm, some White Limestone Fragments	SP4/0.35-0.5	Hold	0.0	Nil
0.44							
0.48							
			End Of Bore at 0.5m				

BOREHOLE NUMBER: SP5

Client Barwon Water
Project Number _____
Date Started 21/09/15 **Date Completed** 21/09/15
Drilling Contractor N/A
Equipment Hand Auger
Hole Size 50mm

Project Name Barwon Water - Highton
Location Thornhill Road, Highton
Hole Location (GPS) _____
Logged By Andrew Wigley
Notes _____

Depth (m)	Graphic Log	Classification Symbol	Material Description	Sample ID	Analysed	PID (ppm)	Odour/ Staining
0		FILL	FILL. SANDY CLAY. Dark Brown, Low Plasticity, Firm, Dry, Fine Grain Sand, some Organic Matter.	SP5/0-0.15	TRH,BTEXN,PAH, OC/OP Pesticides, PCB and 8 Metals	0.0	Nil
0.04							
0.08							
0.12							
0.16							
0.2							
0.24							
0.28		CH	CLAY. Orange/Brown with Red Mottles, High Plasticity, Dry, Stiff.	SP5/0.35-0.5	Hold	0.0	Nil
0.32							
0.36							
0.4							
0.44							
0.48							
			End Of Bore at 0.5m				

BOREHOLE NUMBER: SP6

Client Barwon Water
Project Number _____
Date Started 21/09/15 **Date Completed** 21/09/15
Drilling Contractor N/A
Equipment Hand Auger
Hole Size 50mm

Project Name Barwon Water - Highton
Location Thornhill Road, Highton
Hole Location (GPS) _____
Logged By Andrew Wigley
Notes _____

Depth (m)	Graphic Log	Classification Symbol	Material Description	Sample ID		Analysed	PID (ppm)	Odour/ Staining
0		FILL	FILL. SANDY CLAY. Dark Brown, Low Plasticity, Firm, Dry, Fine Grain Sand, some Organic Matter.		SP6/0-0.15	OC/OP Pesticides & 15 Metals	0.0	Nil
0.04								
0.08								
0.12								
0.16								
0.2								
0.24								
0.28								
0.32		SC	SANDY CLAY. Orange/Brown, Low Plasticity, Dry, Firm, Fine to Medium Grain Sand.		SP6/0.35-0.5	Hold	0.0	Nil
0.36								
0.4								
0.44								
0.48								
			End Of Bore at 0.5m					

BOREHOLE NUMBER: SP7

Client Barwon Water
Project Number _____
Date Started 21/09/15 **Date Completed** 21/09/15
Drilling Contractor N/A
Equipment Hand Auger
Hole Size 50mm

Project Name Barwon Water - Highton
Location Thornhill Road, Highton
Hole Location (GPS) _____
Logged By Andrew Wigley
Notes _____

Depth (m)	Graphic Log	Classification Symbol	Material Description	Sample ID	Analysed	PID (ppm)	Odour/ Staining
0		FILL	FILL. SANDY CLAY. Dark Brown, Low Plasticity, Firm, Dry, Fine Grain Sand, some Organic Matter.	SP7/0-0.15	NEPM Basic Soil Screen	0.0	Nil
0.04							
0.08							
0.12							
0.16							
0.2							
0.24		SC	SANDY CLAY. Orange/Brown, Low Plasticity, Dry, Firm, Fine Grain Sand. Some White Limestone Fragments.	SP7/0.35-0.5	Hold	0.0	Nil
0.28							
0.32							
0.36							
0.4							
0.44							
0.48							
			End Of Bore at 0.5m				

BOREHOLE NUMBER: SP8

Client Barwon Water
Project Number _____
Date Started 21/09/15 **Date Completed** 21/09/15
Drilling Contractor N/A
Equipment Hand Auger
Hole Size 50mm

Project Name Barwon Water - Highton
Location Thornhill Road, Highton
Hole Location (GPS) _____
Logged By Andrew Wigley
Notes _____

Depth (m)	Graphic Log	Classification Symbol	Material Description	Sample ID	Analysed	PID (ppm)	Odour/ Staining
0		FILL	FILL. SANDY CLAY. Dark Brown, Low Plasticity, Firm, Dry, Fine Grain Sand, some Organic Matter.	SP8/0-0.15	TRH,BTEXN,PAH, OC/OP Pesticides, PCB and 8 Metals	0.0	Nil
0.04							
0.08							
0.12							
0.16							
0.2							
0.24							
0.28							
0.32							
0.36							
0.4		CH	CLAY. Orange/Brown with Red Mottles, High Plasticity, Dry, Stiff.	SP8/0.35-0.5	Hold	0.0	Nil
0.44							
0.48							
			End Of Bore at 0.5m				

BOREHOLE NUMBER: SP9

Client Barwon Water
Project Number _____
Date Started 21/09/15 **Date Completed** 21/09/15
Drilling Contractor N/A
Equipment Hand Auger
Hole Size 50mm

Project Name Barwon Water - Highton
Location Thornhill Road, Highton
Hole Location (GPS) _____
Logged By Andrew Wigley
Notes _____

Depth (m)	Graphic Log	Classification Symbol	Material Description	Sample ID	Analysed	PID (ppm)	Odour/ Staining
0		FILL	FILL. SANDY CLAY. Dark Brown, Low Plasticity, Firm, Dry, Fine Grain Sand, some Organic Matter.	SP9/0-0.15	15 Metals	0.0	Nil
0.04							
0.08							
0.12							
0.16							
0.2							
0.24							
0.28							
0.32							
0.36							
0.4		CI	CLAY. Orange/Brown, Medium Plasticity, Dry, Firm.	SP9/0.35-0.5	Hold	0.0	Nil
0.44							
0.48							
			End Of Bore at 0.5m				

BOREHOLE NUMBER: SP10

Client Barwon Water
Project Number _____
Date Started 21/09/15 **Date Completed** 21/09/15
Drilling Contractor N/A
Equipment Hand Auger
Hole Size 50mm

Project Name Barwon Water - Highton
Location Thornhill Road, Highton
Hole Location (GPS) _____
Logged By Andrew Wigley
Notes _____

Depth (m)	Graphic Log	Classification Symbol	Material Description	Sample ID	Analysed	PID (ppm)	Odour/ Staining
0		FILL	FILL. SANDY CLAY. Dark Brown, Low Plasticity, Firm, Dry, Fine Grain Sand, some Organic Matter.	SP10/0-0.15	NEPM Basic Soil Screen	0.0	Nil
0.04							
0.08							
0.12							
0.16							
0.2							
0.24							
0.28							
0.32							
0.36							
0.4		CH	CLAY. Light Brown, High Plasticity, Dry, Stiff.	SP10/0.35-0.5	Hold	0.0	Nil
0.44							
0.48							
			End Of Bore at 0.5m				



Phone: 0433 747 187
seton@envirositeassessments.com
PO Box 3106,
Waurn Ponds, VIC 3216
www.envirositeassessments.com

Legend



Sample Point

Aerial sourced from Nearmap

Designed: A.Stephens

Revision: 1

Drawn: A.Stephens

Date: 29.09.15

File: Sample Locations.pdf



0 Metres 10

Title: Sample Locations
Project: Barwon Water - Highton
Location: 176-194 Thornhill Rd, Highton
Client: Barwon Water

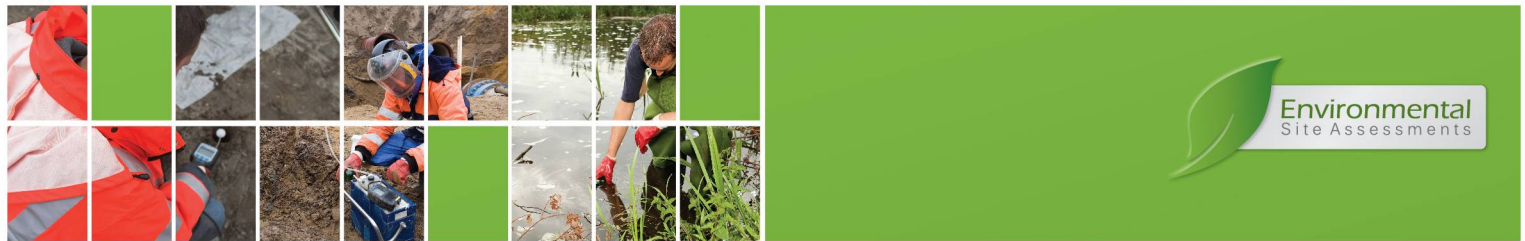


Appendix 5: PID Calibration Form



Project Name	BW HIGHTON	Calibrated By	AW
Project Address	12 THORNHILL RD, HIGHTON	Date	21/09/15

Sensor	Type	Serial Number	Span Gas	Concentration	Reading	
					Zero	Span
PID	10.6ev	1062P83010	Isobutylene	100ppm	0	100



Appendix 6: Comparison Tables

	BTEX								Cyanides	Halogenated Benzenes	Halogenated Phenols						Herbicides	Inorganics	Lead	
	Benzene	Ethylbenzene	Toluene	Total BTEX	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10 less BTEX (F1)	Cyanide (WAD)	Hexachlorobenzene	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,6-dichlorophenol	2-chlorophenol	Pentachlorophenol	Atrazine	Moisture	Lead	Arsenic
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg
EQL	0.2	0.5	0.5	0.2	0.5	0.5	0.5	10	1	0.05	0.5	0.5	0.5	0.5	0.5	2	0.05	1	5	5
NEPM 2013 Table 1A(1) HILs Res A Soil										10						100	320		300	100

LocCode	Sample_Depth_Range	Field_ID	Sampled_Date-Time																				
SP01	0-0.15	SP1/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.8	8	54
SP02	0-0.15	SP2/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	14.9	13	39
SP03	0-0.15	SP3/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.4	10	36
SP04	0-0.15	SP4/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.8	15	30
SP05	0-0.15	SP5/0-0.15	9/21/2015	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	-	<0.05	-	-	-	-	-	-	-	13.3	12	42
SP06	0-0.15	SP6/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	12.1	11	44
SP07	0-0.15	SP7/0-0.15	9/21/2015	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<1	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.05	17.2	14	33
SP08	0-0.15	SP8/0-0.15	9/21/2015	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	-	<0.05	-	-	-	-	-	-	-	10.6	17	54
SP09	0-0.15	SP9/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.1	10	11
SP10	0-0.15	SP10/0-0.15	9/21/2015	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<1	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.05	10.8	10	44

		Metals																							
		Barium	Beryllium	Boron	Cadmium	Chromium (hexavalent)	Chromium (III+VI)	Cobalt	Copper	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL		10	1	50	1	0.5	2	2	5	5	0.1	2	5	5	5	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
NEPM 2013 Table 1A(1) HILs Res A Soil			60	4500	20	100		100	6000	3800	40	400	200		7400				6		50				
LocCode	Sample_Depth_Range	Field_ID	Sampled_Date-Time																						
SP01	0-0.15	SP1/0-0.15	9/21/2015	-	-	-	<1	-	29	-	<5	-	<0.1	36	-	-	22	-	-	-	-	-	-	-	
SP02	0-0.15	SP2/0-0.15	9/21/2015	40	<1	<50	<1	-	22	9	33	123	<0.1	19	<5	114	13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
SP03	0-0.15	SP3/0-0.15	9/21/2015	-	-	-	<1	-	23	-	<5	-	<0.1	15	-	-	10	-	-	-	-	-	-	-	
SP04	0-0.15	SP4/0-0.15	9/21/2015	30	<1	<50	<1	-	20	8	<5	129	<0.1	16	<5	89	20	-	-	-	-	-	-	-	
SP05	0-0.15	SP5/0-0.15	9/21/2015	-	-	-	<1	-	27	-	<5	-	<0.1	23	-	-	12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
SP06	0-0.15	SP6/0-0.15	9/21/2015	20	<1	<50	<1	-	26	9	<5	96	<0.1	19	<5	126	15	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
SP07	0-0.15	SP7/0-0.15	9/21/2015	50	<1	<50	<1	<0.5	28	10	7	222	<0.1	24	<5	105	32	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	
SP08	0-0.15	SP8/0-0.15	9/21/2015	-	-	-	<1	-	47	-	<5	-	<0.1	33	-	-	82	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
SP09	0-0.15	SP9/0-0.15	9/21/2015	100	<1	<50	<1	-	18	13	13	514	<0.1	15	<5	62	46	-	-	-	-	-	-	-	
SP10	0-0.15	SP10/0-0.15	9/21/2015	60	1	<50	<1	<0.5	32	15	7	205	<0.1	32	<5	123	33	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	

				Organochlorine Pesticides													Organophosphorou										
				DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Azinophos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dichlorvos	
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
NEPM 2013 Table 1A(1) HILs Res A Soil						240		270				10				6		300					160				
LocCode	Sample_Depth_Range	Field_ID	Sampled_Date-Time																								
SP01	0-0.15	SP1/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SP02	0-0.15	SP2/0-0.15	9/21/2015	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
SP03	0-0.15	SP3/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SP04	0-0.15	SP4/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SP05	0-0.15	SP5/0-0.15	9/21/2015	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
SP06	0-0.15	SP6/0-0.15	9/21/2015	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
SP07	0-0.15	SP7/0-0.15	9/21/2015	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
SP08	0-0.15	SP8/0-0.15	9/21/2015	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
SP09	0-0.15	SP9/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SP10	0-0.15	SP10/0-0.15	9/21/2015	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	

s Pesticides							PAH	PAH/Phenols														
Dimethoate	Ethion	Fenthion	Malathion	Methyl parathion	Monocrotophos	Prothiofos	Benzo[b+j]fluoranthene	2,4-dimethylphenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Acenaphthene	Acenaphthylene	Anthracene	Benzo[a]anthracene	Benzo[a] pyrene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz[a,h]anthracene	Carcinogenic PAHs (as B[a]P TPE)
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.05	0.05	0.05	0.05	0.2	0.2	0.05	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 Table 1A(1) HILs Res A Soil																						3

LocCode	Sample_Depth_Range	Field_ID	Sampled_Date-Time	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP01	0-0.15	SP1/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP02	0-0.15	SP2/0-0.15	9/21/2015	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
SP03	0-0.15	SP3/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP04	0-0.15	SP4/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP05	0-0.15	SP5/0-0.15	9/21/2015	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SP06	0-0.15	SP6/0-0.15	9/21/2015	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
SP07	0-0.15	SP7/0-0.15	9/21/2015	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SP08	0-0.15	SP8/0-0.15	9/21/2015	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SP09	0-0.15	SP9/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP10	0-0.15	SP10/0-0.15	9/21/2015	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

									Pesticides						Polychlorinated Biphenyls				
	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Phenol	Pyrene	Bifenthrin	Demeton-S-methyl	Fenamiphos	Mirex	Parathion	Pirimphos-ethyl	PCBs (Sum of total)	C10-C16	C10-C16 (SG)	C16-C34	C16-C34 (SG)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.05	0.05	0.05	0.05	0.2	0.05	0.1	50	50	100	100
NEPM 2013 Table 1A(1) HILs Res A Soil					300		3000		600			10			1				

LocCode	Sample_Depth_Range	Field_ID	Sampled_Date-Time																
SP01	0-0.15	SP1/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP02	0-0.15	SP2/0-0.15	9/21/2015	-	-	-	-	-	-	-	<0.05	<0.05	-	<0.2	<0.05	-	-	-	-
SP03	0-0.15	SP3/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP04	0-0.15	SP4/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP05	0-0.15	SP5/0-0.15	9/21/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.05	-	<0.2	<0.05	<0.1	<50	<50	<100
SP06	0-0.15	SP6/0-0.15	9/21/2015	-	-	-	-	-	-	-	<0.05	<0.05	-	<0.2	<0.05	-	-	-	-
SP07	0-0.15	SP7/0-0.15	9/21/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.1	<50	<50	<100
SP08	0-0.15	SP8/0-0.15	9/21/2015	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.05	<0.05	-	<0.2	<0.05	<0.1	60	<50
SP09	0-0.15	SP9/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP10	0-0.15	SP10/0-0.15	9/21/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.1	50	<50	<100

TPH									
	C34- C40	C6 - C9	C10 - C14	C15 - C28	C29- C36	+C10 - C36 (Sum of total)	C10 - C40 (Sum of total)	C10 - C40 (SG)	C6- C10
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	100	10	50	100	100	50	50	50	10
NEPM 2013 Table 1A(1) HILs Res A Soil									

LocCode	Sample_Depth_Range	Field_ID	Sampled_Date-Time									
SP01	0-0.15	SP1/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-
SP02	0-0.15	SP2/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-
SP03	0-0.15	SP3/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-
SP04	0-0.15	SP4/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-
SP05	0-0.15	SP5/0-0.15	9/21/2015	<100	<10	<50	<100	<100	<50	<50	<50	<10
SP06	0-0.15	SP6/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-
SP07	0-0.15	SP7/0-0.15	9/21/2015	<100	<10	<50	<100	<100	<50	<50	<50	<10
SP08	0-0.15	SP8/0-0.15	9/21/2015	<100	<10	<50	<100	<100	<50	170	<50	<10
SP09	0-0.15	SP9/0-0.15	9/21/2015	-	-	-	-	-	-	-	-	-
SP10	0-0.15	SP10/0-0.15	9/21/2015	<100	<10	<50	<100	<100	<50	50	<50	<10



Appendix 7: Chain of Custody Forms and Certificates of Analysis



CHAIN OF CUSTODY

ADELAIDE 21 Burna Road Pooraka SA 5096
Ph. 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053
Ph. 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callamondah Drive Clinton QLD 4680
Ph. 07 7471 5600 E: gladstone@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740
Ph. 07 4644 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph. 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850
Ph. 02 6372 5735 E: mudgee@alsglobal.com

NEWCASTLE 5 Rose Gum Road Warabrook NSW 2204
Ph. 02 4968 9433 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph. 024423 2063 E: nowra@alsglobal.com
PERTH 10 Had Way Malaga WA 6060
Ph. 08 9209 7855 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
Ph. 02 8784 8556 E: samples.sydney@alsglobal.com
TOWNSVILLE 14-15 Cesma Court Bohle QLD 4818
Ph. 07 4796 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph. 02 4223 3125 E: portkembra@alsglobal.com

CLIENT: Environmental Site Assessments		TURNAROUND REQUIREMENTS: ☒ Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: PO BOX 3106, WAURN PONDS, VIC 3216		(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		Custody Seal Intact? Yes No N/A	
PROJECT: BW HIGHTON		ALS QUOTE NO.: —		Free ice / frozen ice bricks present upon receipt? Yes No N/A	
ORDER NUMBER: —				Random Sample Temperature on Receipt: °C	
PROJECT MANAGER: SETON LILLAS		CONTACT PH: 0433 747 187		Other comment:	
SAMPLER: ANDREW WIGLEY		SAMPLER MOBILE: 0439 135 516			
COC emailed to ALS? (YES) (NO) ☒		EDD FORMAT (or default): YES			
Email Reports to: andrew@envirositeassessments.com		RELINQUISHED BY: <i>Andrew Wigley</i>		RECEIVED BY: <i>Tom</i>	
Email Invoice to: accounts@envirositeassessments.com		DATE/TIME: 21/09/15		DATE/TIME: 17:55, 21/9/15	
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: —					

Environmental Division
Melbourne
Work Order Reference
EM1514844



Telephone : + 61-3-8549 9800

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).							
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	P-21/19 (NEM Suite)	S-16	S-12 (OCPS)	S-2 (B metals)	S-3 (5 metals)			Hold
1	SP1 10-0.15	21/09/15	S	125ML Glass Jar	1				X				
2	SP1 10.35-0.5	"	S	"	1								X
3	SP2 10-0.15	"	S	"	1			X		X			
4	SP2 10.35-0.5	"	S	"	1								X
5	SP3 10-0.15	"	S	"	1				X				
6	SP3 10.35-0.5	"	S	"	1								X
7	SP4 10-0.15	"	S	"	1					X			
8	SP4 10.35-0.5	"	S	"	1								X
9	SP5 10-0.15	"	S	"	1		X						
10	SP5 10.35-0.5	"	S	"	1								X
TOTAL					10	0	1	1	2	2			5

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.



ALS Laboratory:
please tick →

☐ MACKAY 78 Harbour Road Mackay QLD 4740
 Ph: 07 4941 0177 E: mackay@alsglobal.com
☒ MELBOURNE 2-4 Westall Road Springvale VIC 3171
 Ph: 03 8549 9500 E: samples.melbourne@alsglobal.com
☐ MUDGEE 27 Sydney Road Mudgee NSW 2850
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■NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304
 Ph. 02 4966 9433 E. samples.newcastle@alsglobal.com
 ■NOWRA 4/13 Geary Place North Nowra NSW 2541
 Ph. 024423 2063 E. nowra@alsglobal.com
 ■PERTH 10 Hod Way Malaga WA 6009
 Ph. 08 9209 7655 E. samples.perth@alsglobal.com

QSYDNEY 277-289 Woodpark Road Smithfield NSW 2154
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
QTOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E: townesville.environmental@alsglobal.com
QWOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Environmental Site Assessments		TURNAROUND REQUIREMENTS : ☒ Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: PO BOX 3106, WAURN PONDS, VIC 3216		(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: BW HICHTON		ALS QUOTE NO.: —		Free ice / frozen ice bricks present upon receipt? Yes No N/A	
ORDER NUMBER: —				Random Sample Temperature on Receipt: °C	
PROJECT MANAGER: SETON LILLAS		CONTACT PH: 0433 747 187		Other comment:	
SAMPLER: ANDREW WIGLEY		SAMPLER MOBILE: 0439 135 516		RELINQUISHED BY:	
COC emailed to ALS? YES NO		EDD FORMAT (or default): YES		RECEIVED BY: Tom	
Email Reports to: andrew@envirositeassessments.com		DATE/TIME: 21/09/15		DATE/TIME: 17:55, 21/9/15	
Email Invoice to: accounts@envirositeassessments.com					
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 <i>(refer to codes below)</i>	TOTAL CONTAINERS	P-21/1a (NEPA/suite)	S-16	S-12 (ACPS)	S-2 (9 Metals)	S-3 (15 Metals)			Hold	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
11	SP6/0-0.15		S	125mL Glass Jar	1			X		X				
12	SP6/0.35-0.5		S	"	1								X	
13	SP8/0-0.15		S	"	1	X								
14	SP7/0.35-0.5		S	"	1								X	
15	SP8/0-0.15		S	"	1		X							
16	SP8/0.35-0.5		S	"	1								X	
17	SP9/0-0.15		S	"	1					X				
18	SP9/0.35-0.5		S	"	1								X	
19	SP10/0-0.15		S	"	1	X								
20	SP10/0.35-0.5		S	"	1								X	
TOTAL					10	2	1	1	0	2			5	

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 Specimen 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.

CERTIFICATE OF ANALYSIS

Work Order	: EM1514844	Page	: 1 of 12
Client	: ENVIRONMENTAL SITE ASSESSMENTS PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: MR SETON LILLAS	Contact	: Carol Walsh
Address	: P.O. BOX 3106 WAURN PONDS VIC 3216	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: seton@envirositeassessments.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: ----	Telephone	: +61-3-8549 9608
Facsimile	: ----	Facsimile	: +61-3-8549 9601
Project	: BW HIGHTON	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 21-Sep-2015 17:55
C-O-C number	: ----	Date Analysis Commenced	: 22-Sep-2015
Sampler	: ANDREW WIGLEY	Issue Date	: 28-Sep-2015 13:19
Site	: ----		
Quote number	: ----	No. of samples received	: 20
		No. of samples analysed	: 10

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Chris Lemaitre	Non-Metals Team Leader	Melbourne Inorganics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Xing Lin	Senior Organic Chemist	Melbourne Organics



General Comments

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

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

Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SP1/0-0.15	SP2/0-0.15	SP3/0-0.15	SP4/0-0.15	SP5/0-0.15
Client sampling date / time					[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]
Compound	CAS Number	LOR	Unit		EM1514844-001	EM1514844-003	EM1514844-005	EM1514844-007	EM1514844-009
					Result	Result	Result	Result	Result
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1	%		15.8	14.9	7.4	10.8	13.3
EG005T: Total Metals by ICP-AES									
Barium	7440-39-3	10	mg/kg		----	40	----	30	----
Beryllium	7440-41-7	1	mg/kg		----	<1	----	<1	----
Boron	7440-42-8	50	mg/kg		----	<50	----	<50	----
Cobalt	7440-48-4	2	mg/kg		----	9	----	8	----
Manganese	7439-96-5	5	mg/kg		----	123	----	129	----
Selenium	7782-49-2	5	mg/kg		----	<5	----	<5	----
Vanadium	7440-62-2	5	mg/kg		----	114	----	89	----
Arsenic	7440-38-2	5	mg/kg		54	39	36	30	42
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		29	22	23	20	27
Copper	7440-50-8	5	mg/kg		<5	33	<5	<5	<5
Lead	7439-92-1	5	mg/kg		8	13	10	15	12
Nickel	7440-02-0	2	mg/kg		36	19	15	16	23
Zinc	7440-66-6	5	mg/kg		22	13	10	20	12
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)									
Hexavalent Chromium	18540-29-9	0.5	mg/kg		----	----	----	----	----
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser									
Weak Acid Dissociable Cyanide	----	1	mg/kg		----	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)									
^ Total Polychlorinated biphenyls	----	0.1	mg/kg		----	----	----	----	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	<0.05	----	----	<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



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SP1/0-0.15	SP2/0-0.15	SP3/0-0.15	SP4/0-0.15	SP5/0-0.15
Client sampling date / time				[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]
Compound	CAS Number	LOR	Unit	EM1514844-001	EM1514844-003	EM1514844-005	EM1514844-007	EM1514844-009
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	----	----	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg	----	<0.05	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg	----	<0.05	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	----	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	<0.05	----	----	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg	----	<0.05	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	----	----	<0.05
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
Mirex	2385-85-5	0.2	mg/kg	----	----	----	----	----
^ 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
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	----	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	<0.05	----	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	----	<0.2	----	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	----	<0.05	----	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	----	<0.05	----	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	<0.05	----	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	----	<0.2	----	----	<0.2
Malathion	121-75-5	0.05	mg/kg	----	<0.05	----	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	----	<0.05	----	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	<0.05	----	----	<0.05
Parathion	56-38-2	0.2	mg/kg	----	<0.2	----	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	<0.05	----	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	----	<0.05	----	----	<0.05
Ethion	563-12-2	0.05	mg/kg	----	<0.05	----	----	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SP1/0-0.15	SP2/0-0.15	SP3/0-0.15	SP4/0-0.15	SP5/0-0.15
Client sampling date / time					[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]
Compound	CAS Number	LOR	Unit		EM1514844-001	EM1514844-003	EM1514844-005	EM1514844-007	EM1514844-009
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Carbophenothion	786-19-6	0.05	mg/kg		----	<0.05	----	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		----	<0.05	----	----	<0.05
EP068C: Triazines									
Atrazine	1912-24-9	0.05	mg/kg		----	----	----	----	----
EP068D: Pyrethroids									
Bifenthrin	82657-04-3	0.05	mg/kg		----	----	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	----	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		----	----	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		----	----	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg		----	----	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		----	----	----	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg		----	----	----	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg		----	----	----	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg		----	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		----	----	----	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg		----	----	----	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg		----	----	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	----	----	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		----	----	----	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		----	----	----	----	<0.5
Fluorene	86-73-7	0.5	mg/kg		----	----	----	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		----	----	----	----	<0.5
Anthracene	120-12-7	0.5	mg/kg		----	----	----	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		----	----	----	----	<0.5
Pyrene	129-00-0	0.5	mg/kg		----	----	----	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	----	----	<0.5
Chrysene	218-01-9	0.5	mg/kg		----	----	----	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	----	----	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	----	----	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	----	----	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	----	----	----	<0.5

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SP1/0-0.15	SP2/0-0.15	SP3/0-0.15	SP4/0-0.15	SP5/0-0.15
Client sampling date / time				[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	
Compound	CAS Number	LOR	Unit	EM1514844-001	EM1514844-003	EM1514844-005	EM1514844-007	EM1514844-009	
				Result	Result	Result	Result	Result	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	----	----	----	----	<0.5	
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	----	----	----	----	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	----	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	----	----	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	----	0.6	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	----	1.2	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	----	----	----	----	<10	
C10 - C14 Fraction	----	50	mg/kg	----	----	----	----	<50	
C15 - C28 Fraction	----	100	mg/kg	----	----	----	----	<100	
C29 - C36 Fraction	----	100	mg/kg	----	----	----	----	<100	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	----	----	<50	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	----	----	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	----	----	<10	
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	----	----	----	<50	
>C16 - C34 Fraction	----	100	mg/kg	----	----	----	----	<100	
>C34 - C40 Fraction	----	100	mg/kg	----	----	----	----	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	----	----	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	----	----	<50	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	----	----	----	----	<0.2	
Toluene	108-88-3	0.5	mg/kg	----	----	----	----	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	----	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	----	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	----	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	----	----	----	----	<0.2	
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	----	----	----	<0.5	
Naphthalene	91-20-3	1	mg/kg	----	----	----	----	<1	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	----	105	
EP068S: Organochlorine Pesticide Surrogate									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SP1/0-0.15	SP2/0-0.15	SP3/0-0.15	SP4/0-0.15	SP5/0-0.15
Client sampling date / time					[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]
Compound	CAS Number	LOR	Unit		EM1514844-001	EM1514844-003	EM1514844-005	EM1514844-007	EM1514844-009
					Result	Result	Result	Result	Result
EP068S: Organochlorine Pesticide Surrogate - Continued									
Dibromo-DDE	21655-73-2	0.05	%		----	94.4	----	----	99.0
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	95.8	----	----	99.6
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	----	----	73.8
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	----	----	91.0
2,4,6-Tribromophenol	118-79-6	0.5	%		----	----	----	----	57.9
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	----	----	92.4
Anthracene-d10	1719-06-8	0.5	%		----	----	----	----	118
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	----	----	95.4
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	----	----	88.2
Toluene-D8	2037-26-5	0.2	%		----	----	----	----	90.3
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	----	----	81.4



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SP6/0-0.15	SP7/0-0.15	SP8/0-0.15	SP9/0-0.15	SP10/0-0.15
Client sampling date / time				[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]
Compound	CAS Number	LOR	Unit	EM1514844-011	EM1514844-013	EM1514844-015	EM1514844-017	EM1514844-019
				Result	Result	Result	Result	Result
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	12.1	17.2	10.6	14.1	10.8
EG005T: Total Metals by ICP-AES								
Barium	7440-39-3	10	mg/kg	20	50	----	100	60
Beryllium	7440-41-7	1	mg/kg	<1	<1	----	<1	1
Boron	7440-42-8	50	mg/kg	<50	<50	----	<50	<50
Cobalt	7440-48-4	2	mg/kg	9	10	----	13	15
Manganese	7439-96-5	5	mg/kg	96	222	----	514	205
Selenium	7782-49-2	5	mg/kg	<5	<5	----	<5	<5
Vanadium	7440-62-2	5	mg/kg	126	105	----	62	123
Arsenic	7440-38-2	5	mg/kg	44	33	54	11	44
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	26	28	47	18	32
Copper	7440-50-8	5	mg/kg	<5	7	<5	13	7
Lead	7439-92-1	5	mg/kg	11	14	17	10	10
Nickel	7440-02-0	2	mg/kg	19	24	33	15	32
Zinc	7440-66-6	5	mg/kg	15	32	82	46	33
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)								
Hexavalent Chromium	18540-29-9	0.5	mg/kg	----	<0.5	----	----	<0.5
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser								
Weak Acid Dissociable Cyanide	----	1	mg/kg	----	<1	----	----	<1
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	----	<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	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SP6/0-0.15	SP7/0-0.15	SP8/0-0.15	SP9/0-0.15	SP10/0-0.15
Client sampling date / time				[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]
Compound	CAS Number	LOR	Unit	EM1514844-011	EM1514844-013	EM1514844-015	EM1514844-017	EM1514844-019
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
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
Mirex	2385-85-5	0.2	mg/kg	----	<0.20	----	----	<0.20
^ 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
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	----	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SP6/0-0.15	SP7/0-0.15	SP8/0-0.15	SP9/0-0.15	SP10/0-0.15
Client sampling date / time					[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]
Compound	CAS Number	LOR	Unit		EM1514844-011	EM1514844-013	EM1514844-015	EM1514844-017	EM1514844-019
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
EP068C: Triazines									
Atrazine	1912-24-9	0.05	mg/kg		----	<0.05	----	----	<0.05
EP068D: Pyrethroids									
Bifenthrin	82657-04-3	0.05	mg/kg		----	<0.05	----	----	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	<0.5	----	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		----	<0.5	----	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		----	<0.5	----	----	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		----	<1	----	----	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		----	<0.5	----	----	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg		----	<0.5	----	----	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg		----	<0.5	----	----	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg		----	<0.5	----	----	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		----	<0.5	----	----	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg		----	<0.5	----	----	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg		----	<0.5	----	----	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		----	<2	----	----	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	<0.5	<0.5	----	<0.5

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SP6/0-0.15	SP7/0-0.15	SP8/0-0.15	SP9/0-0.15	SP10/0-0.15
Client sampling date / time				[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	
Compound	CAS Number	LOR	Unit	EM1514844-011	EM1514844-013	EM1514844-015	EM1514844-017	EM1514844-019	
				Result	Result	Result	Result	Result	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	<0.5	----	<0.5	
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	----	<0.5	<0.5	----	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	<0.5	<0.5	----	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	<0.5	<0.5	----	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	0.6	0.6	----	0.6	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	1.2	1.2	----	1.2	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	----	<10	
C10 - C14 Fraction	----	50	mg/kg	----	<50	<50	----	<50	
C15 - C28 Fraction	----	100	mg/kg	----	<100	<100	----	<100	
C29 - C36 Fraction	----	100	mg/kg	----	<100	<100	----	<100	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	<50	<50	----	<50	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	<10	----	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	<10	<10	----	<10	
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	<50	60	----	50	
>C16 - C34 Fraction	----	100	mg/kg	----	<100	110	----	<100	
>C34 - C40 Fraction	----	100	mg/kg	----	<100	<100	----	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	<50	170	----	50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	<50	60	----	50	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	----	<0.2	
Toluene	108-88-3	0.5	mg/kg	----	<0.5	<0.5	----	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	<0.5	----	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	<0.5	----	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	<0.5	----	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	----	<0.2	<0.2	----	<0.2	
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	<0.5	<0.5	----	<0.5	
Naphthalene	91-20-3	1	mg/kg	----	<1	<1	----	<1	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	----	100	102	----	103	
EP068S: Organochlorine Pesticide Surrogate									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SP6/0-0.15	SP7/0-0.15	SP8/0-0.15	SP9/0-0.15	SP10/0-0.15
Client sampling date / time					[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]	[21-Sep-2015]
Compound	CAS Number	LOR	Unit		EM1514844-011	EM1514844-013	EM1514844-015	EM1514844-017	EM1514844-019
					Result	Result	Result	Result	Result
EP068S: Organochlorine Pesticide Surrogate - Continued									
Dibromo-DDE	21655-73-2	0.05	%		100	94.3	94.7	----	92.0
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		104	95.3	94.5	----	74.4
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	74.7	77.0	----	73.4
2-Chlorophenol-D4	93951-73-6	0.5	%		----	81.6	81.8	----	78.6
2,4,6-Tribromophenol	118-79-6	0.5	%		----	57.1	58.1	----	63.7
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	80.9	88.7	----	85.4
Anthracene-d10	1719-06-8	0.5	%		----	90.0	101	----	108
4-Terphenyl-d14	1718-51-0	0.5	%		----	88.5	89.2	----	92.7
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		----	90.5	93.7	----	87.8
Toluene-D8	2037-26-5	0.2	%		----	89.2	94.4	----	88.8
4-Bromofluorobenzene	460-00-4	0.2	%		----	80.1	89.4	----	83.4

QUALITY CONTROL REPORT

Work Order	: EM1514844	Page	: 1 of 14
Client	: ENVIRONMENTAL SITE ASSESSMENTS PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: MR SETON LILLAS	Contact	: Carol Walsh
Address	: P.O. BOX 3106 WAURN PONDS VIC 3216	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: seton@envirositeassessments.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: ----	Telephone	: +61-3-8549 9608
Facsimile	: ----	Facsimile	: +61-3-8549 9601
Project	: BW HIGHTON	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 21-Sep-2015
C-O-C number	: ----	Date Analysis Commenced	: 22-Sep-2015
Sampler	: ANDREW WIGLEY	Issue Date	: 28-Sep-2015
Site	: ----	No. of samples received	: 20
Quote number	: ----	No. of samples analysed	: 10

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



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Chris Lemaitre	Non-Metals Team Leader	Melbourne Inorganics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Xing Lin	Senior Organic Chemist	Melbourne Organics



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

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%.

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (QC Lot: 220901)									
EM1514830-005	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	5.5	6.4	15.2	No Limit
EM1514844-005	SP3/0-0.15	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	7.4	7.4	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 222541)									
EM1514790-001	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	140	140	0.00	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	30	33	10.3	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	8	9	13.9	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	17	19	11.6	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	19	20	5.83	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	9	9	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	189	202	6.54	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	40	44	10.8	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	14	17	14.9	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EM1514844-005	SP3/0-0.15	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	20	20	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	23	23	0.00	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	8	8	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	15	15	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	36	37	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	11	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	81	86	6.38	0% - 50%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	119	114	4.27	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	10	10	0.00	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 222540)									
EM1514790-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1514844-005	SP3/0-0.15	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG048: Hexavalent Chromium (Alkaline Digest) (QC Lot: 222760)									



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 (%)
EG048: Hexavalent Chromium (Alkaline Digest) (QC Lot: 222760) - continued									
EM1514739-001	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1514857-006	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser (QC Lot: 222549)									
EM1514844-013	SP7/0-0.15	EK028SF: Weak Acid Dissociable Cyanide	----	1	mg/kg	<1	<1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 221417)									
EM1514790-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 221420)									
EM1514844-015	SP8/0-0.15	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: Mirex	2385-85-5	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
EM1514790-001	Anonymous	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



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: 221420) - continued									
EM1514790-001	Anonymous	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: Mirex	2385-85-5	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		
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 221420)									
EM1514844-015	SP8/0-0.15	EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EM1514790-001	Anonymous	EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	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 (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 221420) - continued									
EM1514790-001	Anonymous	EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068C: Triazines (QC Lot: 221420)									
EM1514844-015	SP8/0-0.15	EP068: Atrazine	1912-24-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
EM1514790-001	Anonymous	EP068: Atrazine	1912-24-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
EP068D: Pyrethroids (QC Lot: 221420)									
EM1514844-015	SP8/0-0.15	EP068: Bifenthrin	82657-04-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
EM1514790-001	Anonymous	EP068: Bifenthrin	82657-04-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 221419)									
EM1514844-019	SP10/0-0.15	EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EM1514790-001	Anonymous	EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	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 (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 221419)									
EM1514844-019	SP10/0-0.15	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(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		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
EM1514790-001	Anonymous	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(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 220655)									
EM1514795-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1514824-009	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 221418)									
EM1514844-019	SP10/0-0.15	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



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: 221418) - continued									
EM1514844-019	SP10/0-0.15	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1514790-001	Anonymous	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
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 220655)									
EM1514795-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1514824-009	Anonymous	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: 221418)									
EM1514844-019	SP10/0-0.15	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	60	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	50	60	18.2	No Limit
EM1514790-001	Anonymous	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
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 220655)									
EM1514795-001	Anonymous	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
EM1514824-009	Anonymous	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



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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike	Spike Recovery (%)	Recovery Limits (%)
				Concentration		LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 222541)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	107	79	113
EG005T: Barium	7440-39-3	10	mg/kg	<10	143 mg/kg	101	92	116
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	5.63 mg/kg	117	77	125
EG005T: Boron	7440-42-8	50	mg/kg	<50	33.2 mg/kg	118	84	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	98.4	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	107	89	113
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	16 mg/kg	102	81	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	113	90	116
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	100	85	107
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	107	87	113
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	103	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	100	93	109
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	29.6 mg/kg	103	81	117
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	106	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 222540)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	99.8	85	103
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 222760)								
EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	40 mg/kg	96.5	80	120
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser (QCLot: 222549)								
EK028SF: Weak Acid Dissociable Cyanide	----	1	mg/kg	<1	20 mg/kg	100	86	118
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 221417)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	96.7	55	135
EP068A: Organochlorine Pesticides (OC) (QCLot: 221420)								
EP068: 4,4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.7	50	134
EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	51	131
EP068: 4,4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	88.0	38	140
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	97.2	52	128
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	87.4	45	133
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.6	57	135
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	46	134
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.1	52	132
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	92.0	51	131
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.4	52	128
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	87.7	51	131



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP068A: Organochlorine Pesticides (OC) (QCLot: 221420) - continued								
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	69.9	50	132
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	82.6	41	141
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	65.5	38	130
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	86.6	52	132
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.9	49	133
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	100	48	128
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	91.2	52	130
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	78.5	43	133
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	87.0	41	141
EP068: Mirex	2385-85-5	0.05	mg/kg	<0.05	0.5 mg/kg	87.3	58	138
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	100	51	131
EP068B: Organophosphorus Pesticides (OP) (QCLot: 221420)								
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	15.0	14	162
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	92.1	53	131
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	87.2	51	133
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	69.3	50	134
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	81.4	54	135
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	85.1	53	131
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	59.9	41	141
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	90.8	53	131
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	74.6	34	134
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	45.7	43	139
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	86.5	51	133
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	57.5	46	138
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	51	131
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	61.7	51	133
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	28.7	10	184
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	105	51	135
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.1	49	133
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	90.6	51	133
EP068C: Triazines (QCLot: 221420)								
EP068: Atrazine	1912-24-9	0.05	mg/kg	<0.05	0.5 mg/kg	92.6	54	138
EP068D: Pyrethroids (QCLot: 221420)								
EP068: Bifenthrin	82657-04-3	0.05	mg/kg	<0.05	0.5 mg/kg	87.4	54	132
EP075(SIM)A: Phenolic Compounds (QCLot: 221419)								
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	3 mg/kg	80.7	57	119
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	3 mg/kg	72.5	54	120
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	3 mg/kg	76.2	61	117



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075(SIM)A: Phenolic Compounds (QCLot: 221419) - continued								
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	3 mg/kg	86.4	66	114
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	3 mg/kg	90.0	65	117
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	3 mg/kg	93.2	67	113
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	3 mg/kg	85.4	66	114
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	3 mg/kg	66.2	56	116
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	6 mg/kg	86.7	62	122
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	3 mg/kg	78.5	57	119
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	6 mg/kg	43.3	16	124
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	3 mg/kg	85.2	65	113
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 221419)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	103	68	114
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	81.8	61	125
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	99.3	68	116
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	86.6	62	116
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	95.6	64	114
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	3 mg/kg	89.8	64	114
	205-82-3							
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	90.8	59	117
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	101	67	115
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	105	63	119
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	87.8	62	114
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	106	67	115
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	97.7	62	120
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	94.8	62	116
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	105	65	119
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	108	69	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	107	66	116
EP080/071: Total Petroleum Hydrocarbons (QCLot: 220655)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	91.8	66	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 221418)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	89.0	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	89.5	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	85.8	70	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 220655)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	88.2	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 221418)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	1051 mg/kg	92.3	68	130



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 221418) - continued								
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	86.1	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	70.1	38	132
EP080: BTEXN (QCLot: 220655)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	96.8	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	86.7	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	85.5	72	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	91.1	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	89.8	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	98.8	75	129

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			
				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: 222541)							
EM1514791-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	104	78	124
		EG005T: Barium	7440-39-3	50 mg/kg	86.7	71	135
		EG005T: Beryllium	7440-41-7	50 mg/kg	105	85	125
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.8	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	97.4	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	106	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	# 82.3	76	124
		EG005T: Manganese	7439-96-5	50 mg/kg	89.8	68	136
		EG005T: Nickel	7440-02-0	50 mg/kg	91.0	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	90.4	71	125
		EG005T: Vanadium	7440-62-2	50 mg/kg	96.2	76	124
		EG005T: Zinc	7440-66-6	50 mg/kg	86.1	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 222540)							
EM1514791-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	92.6	76	116
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 222760)							
EM1514790-001	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	40 mg/kg	92.6	58	114
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser (QCLot: 222549)							
EM1514844-019	SP10/0-0.15	EK028SF: Weak Acid Dissociable Cyanide	----	20 mg/kg	91.6	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
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 221417)							
EM1514791-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	102	44	144
EP068A: Organochlorine Pesticides (OC) (QCLot: 221420)							
EM1514806-059	Anonymous	EP068: 4,4'-DDT	50-29-3	0.5 mg/kg	97.7	20	133
		EP068: Aldrin	309-00-2	0.5 mg/kg	96.9	23	136
		EP068: Dieldrin	60-57-1	0.5 mg/kg	101	42	136
		EP068: Endrin	72-20-8	0.5 mg/kg	104	23	146
		EP068: gamma-BHC	58-89-9	0.5 mg/kg	107	22	139
		EP068: Heptachlor	76-44-8	0.5 mg/kg	96.8	18	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 221420)							
EM1514806-059	Anonymous	EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	99.4	45	133
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	93.8	41	127
		EP068: Diazinon	333-41-5	0.5 mg/kg	103	49	135
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	96.4	47	133
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	77.9	40	128
EP075(SIM)A: Phenolic Compounds (QCLot: 221419)							
EM1514806-058	Anonymous	EP075(SIM): 2-Chlorophenol	95-57-8	3 mg/kg	88.4	65	123
		EP075(SIM): 2-Nitrophenol	88-75-5	3 mg/kg	49.0	40	134
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	3 mg/kg	68.2	56	122
		EP075(SIM): Pentachlorophenol	87-86-5	3 mg/kg	28.9	15	139
		EP075(SIM): Phenol	108-95-2	3 mg/kg	80.3	63	117
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 221419)							
EM1514806-058	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	97.5	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	100.0	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 220655)							
EM1514795-002	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	83.4	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 221418)							
EM1514806-056	Anonymous	EP071: C10 - C14 Fraction	----	658 mg/kg	90.9	53	123
		EP071: C15 - C28 Fraction	----	3160 mg/kg	93.0	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	88.6	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 220655)							
EM1514795-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	81.0	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 221418)							
EM1514806-056	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	1051 mg/kg	95.3	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	89.4	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	70.8	44	126
EP080: BTEXN (QCLot: 220655)							



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: BTEXN (QCLot: 220655) - continued							
EM1514795-002	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	97.1	50	136
		EP080: Toluene	108-88-3	2 mg/kg	108	56	139

QA/QC Compliance Assessment for DQO Reporting

Work Order	: EM1514844	Page	: 1 of 7
Client	: ENVIRONMENTAL SITE ASSESSMENTS PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: MR SETON LILLAS	Telephone	: +61-3-8549 9608
Project	: BW HIGHTON	Date Samples Received	: 21-Sep-2015
Site	: ----	Issue Date	: 28-Sep-2015
Sampler	: ANDREW WIGLEY	No. of samples received	: 20
Order number	: ----	No. of samples analysed	: 10

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

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

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



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	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103) SP1/0-0.15, SP2/0-0.15, SP3/0-0.15, SP4/0-0.15, SP5/0-0.15, SP6/0-0.15, SP7/0-0.15, SP8/0-0.15, SP9/0-0.15, SP10/0-0.15	21-Sep-2015	----	----	----	22-Sep-2015	05-Oct-2015	✓	
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T) SP1/0-0.15, SP2/0-0.15, SP3/0-0.15, SP4/0-0.15, SP5/0-0.15, SP6/0-0.15, SP7/0-0.15, SP8/0-0.15, SP9/0-0.15, SP10/0-0.15	21-Sep-2015	23-Sep-2015	19-Mar-2016	✓	24-Sep-2015	19-Mar-2016	✓	
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T) SP1/0-0.15, SP2/0-0.15, SP3/0-0.15, SP4/0-0.15, SP5/0-0.15, SP6/0-0.15, SP7/0-0.15, SP8/0-0.15, SP9/0-0.15, SP10/0-0.15	21-Sep-2015	23-Sep-2015	19-Oct-2015	✓	24-Sep-2015	19-Oct-2015	✓	
EG048: Hexavalent Chromium (Alkaline Digest)								
Soil Glass Jar - Unpreserved (EG048G) SP7/0-0.15, SP10/0-0.15	21-Sep-2015	23-Sep-2015	19-Oct-2015	✓	23-Sep-2015	30-Sep-2015	✓	
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser								
Soil Glass Jar - Unpreserved (EK028SF) SP7/0-0.15, SP10/0-0.15	21-Sep-2015	23-Sep-2015	05-Oct-2015	✓	24-Sep-2015	07-Oct-2015	✓	
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved (EP066) SP5/0-0.15, SP7/0-0.15, SP8/0-0.15, SP10/0-0.15	21-Sep-2015	22-Sep-2015	05-Oct-2015	✓	23-Sep-2015	01-Nov-2015	✓	

Page : 3 of 7
 Work Order : EM1514844
 Client : ENVIRONMENTAL SITE ASSESSMENTS PTY LTD
 Project : BW HIGHTON



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068)		21-Sep-2015	22-Sep-2015	05-Oct-2015	✔	23-Sep-2015	01-Nov-2015	✔
SP2/0-0.15,	SP5/0-0.15,							
SP6/0-0.15,	SP7/0-0.15,							
SP8/0-0.15,	SP10/0-0.15							
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071)		21-Sep-2015	22-Sep-2015	05-Oct-2015	✔	23-Sep-2015	01-Nov-2015	✔
SP5/0-0.15,	SP7/0-0.15,							
SP8/0-0.15,	SP10/0-0.15							
EP075(SIM)T: PAH Surrogates								
Soil Glass Jar - Unpreserved (EP075(SIM))		21-Sep-2015	22-Sep-2015	05-Oct-2015	✔	23-Sep-2015	01-Nov-2015	✔
SP5/0-0.15,	SP7/0-0.15,							
SP8/0-0.15,	SP10/0-0.15							
EP080S: TPH(V)/BTEX Surrogates								
Soil Glass Jar - Unpreserved (EP080)		21-Sep-2015	22-Sep-2015	05-Oct-2015	✔	25-Sep-2015	05-Oct-2015	✔
SP5/0-0.15,	SP7/0-0.15,							
SP8/0-0.15,	SP10/0-0.15							



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)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	18	11.11	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	11	18.18	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	2	12	16.67	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.67	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
TRH - Semivolatile Fraction	EP071	2	11	18.18	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	19	10.53	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
WAD Cyanide by Segmented Flow Analyser	EK028SF	1	7	14.29	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	12	8.33	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.67	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
TRH - Semivolatile Fraction	EP071	1	11	9.09	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
WAD Cyanide by Segmented Flow Analyser	EK028SF	1	7	14.29	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	12	8.33	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.67	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
TRH - Semivolatile Fraction	EP071	1	11	9.09	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
WAD Cyanide by Segmented Flow Analyser	EK028SF	1	7	14.29	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	12	8.33	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.67	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	11	9.09	5.00	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
WAD Cyanide by Segmented Flow Analyser	EK028SF	1	7	14.29	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
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).
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 (SnCl ₂)(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 SnCl ₂ 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)
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	SOIL	In house: Referenced to USEPA SW846, Method 3060A. Hexavalent chromium is extracted by alkaline digestion. The digest is determined by photometrically by automatic discrete analyser, following pH adjustment. The instrument uses colour development using dephenylcarbazide. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
WAD Cyanide by Segmented Flow Analyser	EK028SF	SOIL	In house: Referenced to APHA 4500-CN-O. Caustic leachates of soil samples are introduced into an automated segmented flow analyser. Hydrogen cyanide is liberated from a slightly acidified (pH 4.5) and is dialysed. Tight cyanide complexes that would not be amenable to oxidation by chlorine are not converted. Iron cyanide complexes are precipitated with zinc acetate. Liberated HCN diffuses through a membrane into a stream of sodium hydroxide where it is carried as CN- The cyanide in caustic solution is buffered to pH 5.2 and further converted to cyanogen chloride by reaction with chloramine-T. Cyanogen chloride subsequently reacts with 4-pyridine carboxylic and 1,3 - dimethylbarbituric acids to give a red colour complex. This colour is measured at 600 nm. This method is compliant with NEPM (2013) Schedule B(3)
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.

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Work Order : EM1514844
Client : ENVIRONMENTAL SITE ASSESSMENTS PTY LTD
Project : BW HIGHTON



Preparation Methods	Method	Matrix	Method Descriptions
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.

Rebatch

Client / Client code: ENV SITASS

Project: BW Highton

Project Manager: Seton Lillas

Date /time sample rec: Monday, 21 September 2015

Date/time Instructions rec: 28/9 @ 2:29pm

Due date: 5th October

Due date surcharge: standard

Environmental Division

Melbourne

Work Order Reference

Work Order Reference
EM1515147



Telephone : + 61-3-8549 9600

[illegible]

CERTIFICATE OF ANALYSIS

Work Order : **EM1515147**
Client : **ENVIRONMENTAL SITE ASSESSMENTS PTY LTD**
Contact : MR SETON LILLAS
Address : P.O. BOX 3106
 WAURN PONDS VIC 3216
E-mail : seton@envirositeassessments.com
Telephone : ----
Facsimile : ----
Project : BW HIGHTON
Order number : ----
C-O-C number : ----
Sampler : ANDREW WIGLEY
Site : ----

Quote number : ----

Page : 1 of 2
Laboratory : Environmental Division Melbourne
Contact : Carol Walsh
Address : 4 Westall Rd Springvale VIC Australia 3171

E-mail : carol.walsh@alsglobal.com
Telephone : +61-3-8549 9608
Facsimile : +61-3-8549 9601
QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Date Samples Received : 21-Sep-2015 17:55
Date Analysis Commenced : 22-Sep-2015
Issue Date : 29-Sep-2015 13:22

No. of samples received : 2
No. of samples analysed : 2

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Xing Lin	Senior Organic Chemist	Melbourne Organics



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.

- This work order is a rebatch of EM1514844.

Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SP8/0-0.15	SP10/0-0.15	----	----	----
Client sampling date / time				[21-Sep-2015]	[21-Sep-2015]	----	----	----
Compound	CAS Number	LOR	Unit	EM1515147-001	EM1515147-002	-----	-----	-----
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	10.6	10.8	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
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	----	----	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup								
>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	----	----	----

QUALITY CONTROL REPORT

Work Order	: EM1515147	Page	: 1 of 4
Client	: ENVIRONMENTAL SITE ASSESSMENTS PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: MR SETON LILLAS	Contact	: Carol Walsh
Address	: P.O. BOX 3106 WAURN PONDS VIC 3216	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: seton@envirositeassessments.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: ----	Telephone	: +61-3-8549 9608
Facsimile	: ----	Facsimile	: +61-3-8549 9601
Project	: BW HIGHTON	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 21-Sep-2015
C-O-C number	: ----	Date Analysis Commenced	: 22-Sep-2015
Sampler	: ANDREW WIGLEY	Issue Date	: 29-Sep-2015
Site	: ----	No. of samples received	: 2
Quote number	: ----	No. of samples analysed	: 2

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



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Xing Lin	Senior Organic Chemist	Melbourne Organics



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



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**

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 (%)
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QC Lot: 227117)									
EM1515147-002	SP10/0-0.15	EP071-SVSG: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071-SVSG: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071-SVSG: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup (QC Lot: 227117)									
EM1515147-002	SP10/0-0.15	EP071-SVSG: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071-SVSG: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071-SVSG: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: <i>Compound</i>	CAS Number	LOR	Unit	Result				
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 227117)								
EP071-SVSG: C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
EP071-SVSG: C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
EP071-SVSG: C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup (QCLot: 227117)								
EP071-SVSG: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	----	----	----	----
EP071-SVSG: >C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
EP071-SVSG: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment for DQO Reporting

Work Order	: EM1515147	Page	: 1 of 4
Client	: ENVIRONMENTAL SITE ASSESSMENTS PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: MR SETON LILLAS	Telephone	: +61-3-8549 9608
Project	: BW HIGHTON	Date Samples Received	: 21-Sep-2015
Site	: ----	Issue Date	: 29-Sep-2015
Sampler	: ANDREW WIGLEY	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

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

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Control Samples (LCS)					
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	0	2	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)					
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	0	2	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103) SP8/0-0.15, SP10/0-0.15	21-Sep-2015	----	----	----	28-Sep-2015	05-Oct-2015	✓
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Soil Glass Jar - Unpreserved (EP071-SVSG) SP8/0-0.15, SP10/0-0.15	21-Sep-2015	22-Sep-2015	05-Oct-2015	✓	29-Sep-2015	01-Nov-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)							
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	1	2	50.00	10.00	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	0	2	0.00	5.00	✘	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	1	2	50.00	5.00	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	0	2	0.00	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
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).
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	SOIL	In-house, (USEPA SW 846 - 8015A) Sample extracts are cleaned up using silica gel and are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
Preparation Methods	Method	Matrix	Method Descriptions
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.