Coastplan Consulting

Proposed Residential Development, Lot 612 DP1160096, Blackhead Road, Hallidays Point

Phase 1 Contamination Assessment

Report No. RGS01243.1-AB

25 May 2016

REGIONAL
GEOTECHNICAL SOLUTIONS

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Manning-Great Lakes

Port Macquarie

Coffs Harbour

RGS01243.1-AB

25 May 2016

Coastplan Consulting
11 Manning Street
TUNCURRY NSW 2428

Attention: Gavin Maberly-Smith

Dear Gavin,

RE: Proposed Residential Development, Lot 612 DP1160096, Blackhead Road, Hallidays Point

Phase 1 Contamination Assessment

As requested, Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a Phase 1 Contamination Assessment at Lot 612 DP1160096, Blackhead Road, Hallidays Point. A residential development is proposed for the site. It is currently occupied by rural grazing land with some livestock yards in the northwest corner.

The assessment found the proposed residential development at the site is feasible with regard to the presence of soil contamination, provided the recommendations and advice of this report are adopted.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of

Regional Geotechnical Solutions Pty Ltd

Steven Morton

Principal

Regional Geotechnical Solutions Pty Ltd
ABN 51141848820

44 Bent Street
Wingham NSW 2429
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Appendices

1 INTRODUCTION

As requested, Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a Phase 1 Contamination Assessment at Lot 612 DP1160096, Blackhead Road, Hallidays Point

The site is understood to be currently (and previously) occupied by rural grazing land with some livestock yards in the northwest corner. A residential development is proposed for the site.

The purpose of the work described herein was to assess the suitability of the site for the proposed residential development with respect to the presence of site contamination resulting from past land use and activities. The work included:

- Identification of Areas of Concern and Chemicals of Concern;
- Undertaking limited targeted sampling and analysis at the selected Areas of Concern to allow assessment of the presence of contamination;
- Evaluation of test results against industry accepted criteria for the intended landuse;
- Conclusions regarding the presence of contamination at the site and its potential impacts on the proposed residential landuse;
- The requirement for remediation, further investigation, or ongoing management of site contamination.

The work was commissioned by Craig McColl of Focal Point Properties Pty Ltd in accordance with proposal number RGS01243.1-AA dated 17 March 2016.

2 METHODOLOGY

In accordance with the relevant sections of the *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013*), the assessment involved the following process:

- A brief study of site history, with the aim of identifying past activities on or near the site that might have the potential to cause contamination;
- Site walkover to assess visible surface conditions and identify any evidence of contamination, or past activities that may cause contamination;
- Review of available recent and historical aerial photography for the last 50 years to identify visible evidence of potential contamination or potentially contaminating activities;
- Search of government records of groundwater use in the area;
- Land title search of the respective lots using records available from the Land Titles Office to identify the history of land ownership, to assist in identifying potentially contaminating activities that may be associated with past site owners;
- Using the above information, characterise the site into Areas of Concern, in which the potential for contamination has been identified, and nominate Chemicals of Concern that might be associated with those activities.

Based on the results of the site history study, judgemental sampling at selected locations was undertaken to assist in identifying potential contamination and assessing the requirement for further investigation or site management with regard to contamination.

3 SITE SETTING and HISTORY

3.1 Site Description

The site is comprised of one lot identified as Lot 612 DP1160096, located at Blackhead Road, Hallidays Point.

The site is 17.02 hectares in area and is situated in moderately to steeply undulating terrain. A north – south ridgeline runs through the centre of the site. It is located on the northern side of Blackhead Road and to the west of and south of the existing Tallwoods residential development. Surface slopes range from approximately 3° - 5° toward the east and north east on the eastern side of the ridgeline and 2° - 5° toward the western boundary on the western side of the ridgeline. There were no structures on the site; vegetation consisted of grass cover to approximately 1m in height and sparsely spaced large Eucalypt trees up to approximately 25m in height.

An image of the site taken from the NSW Department of Property Information website is reproduced below.

Lot 612 DP1160096, Blackhead Road, Hallidays Point

The site is bound by other rural properties / grazing land to the east and west, Blackhead Road to the south and by a residential subdivision (Tallwoods Village) to the north.

3.2 Historical Aerial Photography

Aerial photographs of the site were purchased from the NSW Land and Property Management Authority and reviewed to assist in identifying past land uses that may contribute to site contamination. The results of the review are summarised in Table 1.

Table 1- Aerial Photograph Summary

Year	Site	Surrounding Land
1952	Site is undeveloped bushland.	The land immediately surrounding the site is also undeveloped bushland. Blackhead Road is clearly visible.
1963	No significant change.	Some land clearing has occurred to the south of Blackhead Road.
1971	No significant change.	Some land clearing has occurred to the north of the site in the area now known as Tallwoods Village.
1980	The site appears to have been cleared of vegetation.	Clearing of vegetation has occurred on land immediately surrounding the site.
1991	No significant change.	Clearing of vegetation to the north of the site in the area now known as Tallwoods Village has continued.
2001	No significant change.	Development of the golf course and some residential properties appears to have occurred in Tallwoods Village located to the north of the site. Residential development has occurred to the south of Blackhead Road.
2006	No significant change	There appears to have been further clearing of land on the property immediately to the east of the site and continued residential development in Tallwoods Village.

3.3 Site Observations

Fieldwork was undertaken on 10 May 2016. Observations made during the site visit are summarised below:

- Access to the site was from The Pulpit, a road in the Tallwoods Village subdivision which adjoins the site to the north.

- No structures, or evidence of structures previously in existence, were observed on the site.
- Appears the site has been used primarily for rural grazing land. An old fence was situated toward the southern part of the site which suggests that livestock may have been kept in different sections of the property. Evidence of former livestock yards was observed in the northwest corner.
- One small stockpile of fill was thought to have been encountered in the central part of the site, however upon closer inspection the area was a thicket of weeds which gave the appearance of being a fill stockpile.
- The site was generally comprised of cleared land with thick waist high grass and sparse pockets of large Eucalypt trees up to 25m in height. The trees were predominantly located in the northern part of the site.
- A small dam was located close to the western property boundary approximately halfway along its length.
- The site is located in an area of moderately undulating terrain and sits along a north to south ridgeline which runs through the centre of the site.
- There a number of slope changes across the site. Surface slopes in the central and northern parts of the site (on the eastern side of the ridgeline) are approximately 3° – 5° to the east and north east. Surface slopes in central part of the site (on the western side of the ridgeline) are approximately 2° – 5° to the west and north west.
- The site is typically flat in the southern part of site towards Blackhead Road.
- Surface soils were expected to be comprised of topsoil/colluvium overlying residual clays.
- Drainage of the site would be via surface infiltration and overland flow following the slope changes described above.

A selection of images of the site is presented below.

Looking south across the centre of the site

Looking north showing the small dam close to the western boundary.

Looking north east across the centre of the site

Looking south east toward the southern part of the site

Looking north along the eastern boundary

Small thicket of weeds in the central part of the site

3.4 NSW EPA Records

A check with the NSW Office of Environment and Heritage website (www.environment.nsw.gov.au) revealed that no notices have been issued on the site under the Contaminated Land Management Act (1997).

3.5 Land Title Search

A list of past registered proprietors and lessors of the site was obtained from the Land Titles Office. A summary of the title details is included in Appendix A.

The title history search revealed the following:

Lot 612 DP 1160096

- Prior to 1952: Crown Land
- From 1952 to 1955: owned by the Rural Bank of New South Wales
- From 1955 to 1956: owned by a dairy farmer
- From 1956 to 1961: owned by a joiner
- From 1961 to 1963: owned by a farmer
- From 1962 to 1968: owned by an individual
- From 1968 to 1972: owned by a boat hirer
- From 1972 to 2005: owned by an orchardist
- From 2005 to date: owned by Focal Point Properties Pty Ltd (formerly Bell Equipment Pty Ltd) and John Earnings Pty Ltd

3.6 Council Records

The lot is zoned RU1 – Primary Production, as per the Greater Taree City Local Environmental Plan 2010.

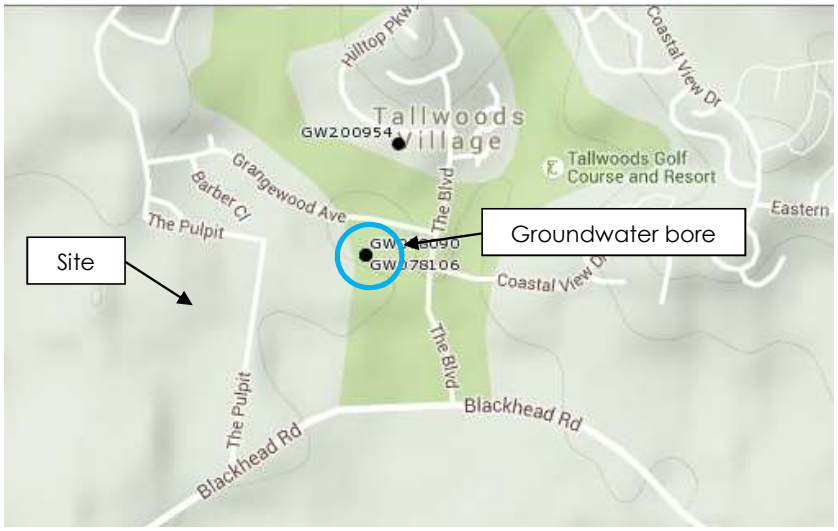
3.7 Geology

The site is situated in an area underlain by the Bundook Beds comprising grey to brown lithic sandstone and siltstone which is frequently cherty and ribbon banded, interbedded with massive greywackes and minor conglomerate and limestones.

3.8 Groundwater

A groundwater bore search on the NSW Office of Water website, http://waterinfo.nsw.gov.au/gw/ indicates that there are no licensed groundwater bores present within the site boundary.

Groundwater Bore Map (From NSW Office of Water website)



Approximate location of nearest licensed groundwater bore GW078106 located in Lot 27 DP 345813 (outlined in blue)

The nearest licensed groundwater bore GW078106 is present on Lot 27 DP345813, approximately 500m to the east of the site, although its actual location was not visible during fieldwork. The bore records indicate that it was approved for irrigation and recreational use with its current status listed as "converted". It was constructed in 1997 and the profile observed during drilling is recorded as clay soils to 8.5m, broken shale to 20.7m and conglomerate to 67.0m. The water bearing zone was present from 13.7m to 21.3m and from 51.8m to 57.3m.

Regional groundwater flow direction typically follows topographic slopes, which for this site would be towards the east and north east.

3.9 Site History Summary

Based on available data the site was developed in the following chronological sequence:

- Prior to 1952 the site was crown land;
- From 1955 to 1956 the site was owned by a dairy farmer;
- From 1956 to 1961the site was owned by a joiner;
- From 1961 to 1963 the site was owned by a farmer;
- From 1962 to 1968 the site was owned by an individual;

- From 1968 to 1972 the site was owned by a boat hirer;
- From 1972 to 2005 the site was owned by an orchardist;
- Aerial photographs indicate that the site was cleared of vegetation prior to 1980;
- From the site history and observations made during the investigation, it appears that the site has been used for farming and/or rural grazing purposes;
- A number of remnant fences suggest that livestock may have been kept in different sections of the property. Evidence of former livestock yards was observed in the northwest corner;
- No structures, or evidence of former structures, (other than fences) were observed on the site;
- A small dam was located close to the western boundary approximately half along its length; and
- No areas of environmental significance such as water courses or national parks are located within close vicinity of the property.

4 SITE CONTAMINATION ASSESSMENT

4.1 Guidelines and Assessment Criteria

The *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013*). The NEPM (2013) document provides a range of guidelines for assessment of contaminants for various land use scenarios.

The proposed land use on the site is understood to be for a residential development. The investigation levels for a residential Type 'A' development with garden/ accessible soil have therefore been adopted as the primary investigation criteria in accordance with NEPM. On this basis the following criteria were adopted for this assessment:

- Health Investigation Levels for residential 'A' landuse (HIL-A) were used to assess the potential human health impact of heavy metals and PAH;
- Health Screening Levels (HSL-A) for fine textured (clay) soils on a residential site were adopted as appropriate for the soils encountered to assess the potential human health impact of petroleum hydrocarbons and BTEX compounds;
- Ecological investigation levels (EIL) for residential landuse were used for evaluation of the potential ecological/environmental impact of heavy metals and PAH. No areas of ecological significance were noted to be present in the immediate vicinity;
- Ecological Screening Levels (ESL) for fine textured (clay) soils on a residential site were adopted as appropriate for the soils encountered, to assess the potential ecological/environmental impact of petroleum hydrocarbons and BTEX compounds.

In accordance with NEPM 2013, exceedance of the criteria does not necessarily deem that remediation or clean-up is required, but is a trigger for further assessment of the extent of contamination and associated risks.

4.2 Conceptual Site Model

Based on the site observations and knowledge obtained about site activities as outlined above, potential Areas of Concern and Chemicals of Concern were identified for the assessment as outlined in Table 2. Based on the site observations and knowledge obtained about site activities as outlined above, potential pathways and receptors identified for the assessment are summarised in Table 3.

Table 2: Conceptual Site Model

Area of Concern	Mode of Potential Contamination	Chemicals of Concern	Likelihood
Soils in vicinity of former live stock yards	Potential spillage of chemicals from containers and farm machinery including cleaning fluids/ fuel /oils, herbicide/ pesticide.	Heavy Metals, TPH, BTEX, PAH, OC/OPP	Low to moderate
Whole of site	Leakage of fuels/oils from vehicles and farm machinery.	Heavy Metals, TPH, BTEX, PAH	Low
Whole of site	Presence of imported fill of unknown origin	Heavy Metals, TPH, BTEX, PAH, OC/OPP, asbestos	Low
Heavy Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc *BTEX - Benzene, Toluene, Ethylbenzene and Xylene* *TPH - Total Petroleum Hydrocarbons* *PAH – Polycyclic Aromatic Hydrocarbons* *OC/OPP – Organochlorine and Organophosphorus Pesticides*			

Table 3: Potential Pathways and Receptors

Chemicals of Concern	Pathway	Receptor
Asbestos, heavy metals, TPH, BTEX, PAH, OC/OPP	Skin contact	Onsite – Residents
Heavy Metals, TPH, BTEX, PAH, OC/OPP	Surface runoff and leaching of soils	Offsite - Environment surface waters
Heavy Metals, TPH, BTEX, PAH, OC/OPP	Leaching of soils	Onsite - Environment groundwater Offsite - Environment groundwater
Heavy Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc *BTEX - Benzene, Toluene, Ethylbenzene and Xylene* *TPH - Total Petroleum Hydrocarbons* *PAH – Polycyclic Aromatic Hydrocarbons* *OC/OPP – Organochlorine and Organophophorus Pesticides*		

Taking into account the elevation of the site and the likely depth to groundwater the risk of groundwater contamination was considered low as the potential sources of contamination were typically of surface origin. A groundwater assessment was therefore not undertaken as part of this Phase 1 contamination assessment.

4.3 Field Work

Field work for the assessment was undertaken on 10 May 2016 and included:

- Site walkover by an Environmental Engineer to assess visible surface conditions and identify any evidence of contamination, or past activities that may cause contamination;
- Collection of 9 primary and 1 duplicate surface soil samples using hand tools;
- Surface sample locations were based on professional judgement with consideration of the site history and visible site features.

The locations of the surface samples are shown on Figure 1. They were obtained on site by measurement relative to existing site features.

Soil samples were collected using disposable gloves and hand tools which were decontaminated between sampling points using Decon90 detergent and deionised water. The samples were collected in acid-rinsed 250mL glass jars and placed in an ice-chilled cooler box.

4.4 Laboratory Testing

Samples were transported under chain-of-custody conditions to ALS Laboratory Group, a NATA accredited specialist chemical testing laboratory, to be tested for the following suite of contaminants;

- Polycyclic Aromatic Hydrocarbons (PAH)
- Total Recoverable Hydrocarbons (TRH)
- Benzene, Toluene, Ethyl-benzene, Xylenes (BTEX)
- Organochlorine Pesticides (OC/OPs)
- Heavy metals (arsenic, cadmium, chromium, cobalt, copper, lead, mercury, and zinc)
- Presence of asbestos

The results are presented in Appendix B.

4.5 Quality Control

Samples were obtained using industry accepted protocols for sample treatment, preservation, and equipment decontamination. The laboratory conducted internal quality control testing including surrogates, blanks, and laboratory duplicate samples. The results are presented with the laboratory test results in Appendix B. A duplicate of SS8 (0.0 – 0.2m) was submitted to the laboratory for analysis as D2 (0.0 – 0.2m). Results of the duplicate analysis indicated heavy metal concentrations correlated very well between the samples.

On the basis of the results of the field and laboratory quality control procedures and testing the data is considered to reasonably represent the concentrations of contaminants in the soils at the sample locations at the time of sampling and the results can be adopted for this assessment.

5 SITE CONTAMINATION ASSESSMENT - RESULTS

5.1 Analysis Results

An appraisal of the laboratory test results presented in Appendix B is provided below with reference to the adopted soil investigation and screening levels discussed in Section 4.1.

- Concentrations of heavy metals were above laboratory detection, but were below adopted health investigation criteria for a Residential A site in each of the samples analysed;
- Concentrations of BTEX and phenol contaminants were below laboratory detection in all samples analysed;
- Concentrations of TRH hydrocarbons were below laboratory detection in all samples analysed;
- Concentrations of PAH hydrocarbons were below laboratory detection in all samples analysed;
- Concentrations of herbicide/pesticide contaminants were below laboratory detection in all samples analysed; and
- Asbestos was not detected in the submitted soil samples.

6 ASSESSMENT AND CONCLUSIONS REGARDING SITE CONTAMINATION

A Phase 1 Site Contamination Assessment was required to identify potentially contaminating activities that have occurred at the site, potential contamination types, and assess whether the property is suitable for the proposed residential development.

Based on the results outlined in this report the following conclusions and recommendations are made:

- It appears likely that the site has previously been used for rural grazing and farming. However, only minor evidence of such activities were present on the site at the time of field work. Visual evidence of contamination was not observed during the investigation.
- Subsequent laboratory analysis of surface soil samples taken from the site confirmed the anticipated low likelihood of contamination. The laboratory results indicated that all samples analysed had concentrations of the contaminants of concern at levels that were either below the laboratory detection limits and/or below the adopted residential landuse guideline levels.
- Given the large size of the site and relatively small number of samples collected and analysed during the investigation, the presence of undetected contamination is considered unlikely but cannot be precluded. Soil contamination (if any) would most likely be due to the presence of uncontrolled fill and/or isolated "hotspots" of contamination such as minor spills from farm equipment and machinery, and pesticide and herbicide use.
- Should uncontrolled fill materials or other materials suspected of being contaminated be encountered on the site during development of the proposed residence, the owner / builder should avail themselves of the services of a suitably qualified person to assess the potential risk of contamination.

Based on the results obtained in this investigation the proposed residential development of the site is feasible with regard to the presence of soil contamination, provided the recommendations and advice of this report are adopted.

7 LIMITATIONS

The findings presented in the report and used as the basis for recommendations presented herein were obtained using normal, industry accepted environmental practises and standards. To our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points. If site conditions encountered during construction vary significantly from those discussed in this report, Regional Geotechnical Solutions Pty Ltd should be contacted for further advice.

This report alone should not be used by contractors as the basis for preparation of tender documents or project estimates. Contractors using this report as a basis for preparation of tender documents should avail themselves of all relevant background information regarding the site before deciding on selection of construction materials and equipment.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of

Regional Geotechnical Solutions Pty Ltd

Steven Morton

Principal

Figures

Legend

Surface Sample Location

Client:	Coastplan Consulting	Job No.	RGS01243
Project:	Proposed Residential Development Lot 612 DP1160096	Drawn By:	APH
		Date:	25-May-16
Title:	Sample Location Plan	Drawing No.	**Figure 1**

REGIONAL
GEOTECHNICAL SOLUTIONS

Appendix A

Site History Documentation

ADVANCE LEGAL SEARCHERS PTY LIMITED

(ACN 47 943 842)
ABN 82 147 943 842

P.O. Box 149
Yagoona NSW 2199

Telephone: +612 9644 1679
Mobile: +61412 169 809
Facsimile: +612 8076 3026
Email: alsearch@optusnet.com.au

06th May, 2016

REGIONAL GEOTECHNICAL SOLUTIONS PTY LTD
44 Bent Street,
WINGHAM, NSW 2429

Attention: Andrew Hills

RE: **Lot 612 Blackhead Road,**
Hallidays Point

Current Search

Folio Identifier 612/1160096 (title attached)
DP 1160096 (plan attached)
Dated 04th May, 2016
Registered Proprietor:
FOCAL POINT PROPERTIES PTY LIMITED
JOHN EARNINGS PTY LIMITED

Title Tree
Lot 612 DP 1160096

Folio Identifier 612/1160096

Folio Identifier 61/1077935

Folio Identifier 6/588352

Certificate of Title Volume 13281 Folio 38

(a)	**(b)**
CTVol 11841 Folio 195	CTVol 11841 Folio 196
CTVol 8214 Folio 21	CTVol 8214 Folio 2

Certificate of Title Volume 7073 Folio's 12 to 14

Certificate of Title Volume 6704 Folios 143

Certificate of Title Volume 6591 Folio 240

Crown Land

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Summary of proprietor(s)

Lot 612 DP 1160096

Year	Proprietor
	(Lot 612 DP 1160096)
2011 – todate	Focal Point Properties Pty Limited John Earnings Pty Limited
	(Lot 61 DP 1077935)
2010 – 2011	Focal Point Properties Pty Limited *(formerly Bell Equipment Pty Limited)* John Earnings Pty Limited
2005 – 2010	John Earnings Pty Limited Bell Equipment Pty Limited
2005 – 2005	Carl John Carlson, orchardist Joan Alva Carlson, spinster
	(Lot 6 DP 588352)
1988 – 2005	Carl John Carlson, orchardist Joan Alva Carlson, spinster
	(Lot 6 DP 588352 – CTVol 13281 Fol 38)
1977 – 1988	Carl John Carlson, orchardist Joan Alva Carlson, spinster

See Notes (a) & (b)

Note (a)

	(Lot 2 DP 555158 – CTVol 11841 Fol 195)
1972 – 1977	Carl John Carlson, orchardist Joan Alva Carlson, spinster
1972 – 1972	Hubert Frank Godfrey, boat hirer Rita May Godfrey, wife
	(Portion 30 & Part 29 Parish Beryan – Area 180 Acres 2 Roods 11 Perches – CTVol 8214 Fol 21)
1968 – 1972	Hubert Frank Godfrey, boat hirer Rita May Godfrey, wife
1963 – 1968	Iris Lucy Thomas, spinster
1961 – 1963	George Walter Alfred Watson, farmer Wilga Josephine Watson, wife
	(Portion 30 & Part 29 Parish Beryan – Area 180 Acres 2 Roods 11 Perches – CTVol 7073 Fol's 12 to 14)
1956 – 1961	Thomas James Fleet Arthur, joiner Henry Orchard Arthur, joiner Frederick Ernest Arthur, joiner
	(Portion 30 & Part 29 Parish Beryan – Area 180 Acres 2 Roods 11 Perches – CTVol 6704 Fol 143)
1955 – 1956	Colin James Newell, dairy farmer
1953 – 1955	Rural Bank of New South Wales
	(Portion 30 & Portion 29 Parish Beryan – Area 210 Acres – CTVol 6591 Fol 240)
1952 – 1953	Rural Bank of New South Wales
	(Portion 30 & Portion 29 Parish Beryan – Area 210 Acres)
Prior – 1952	Crown Land
(1919 – 1952)	*(ACP 1919/132 Maitland to Rural Bank of New South Wales)*
(1903 – 1919)	*(Conditional Lease 1903/43 Maitland to Herbert John Hardy)*

****

Note (b)

	(Lot 3 DP 555158 – CTVol 11841 Fol 196)
1972 – 1977	Carl John Carlson, orchardist Joan Alva Carlson, spinster
1972 – 1972	Hubert Frank Godfrey, boat hirer Rita May Godfrey, wife
	(Portion 30 & Part 29 Parish Beryan – Area 180 Acres 2 Roods 11 Perches – CTVol 8214 Fol 21)
1968 – 1972	Hubert Frank Godfrey, boat hirer Rita May Godfrey, wife
1962 – 1968	Iris Lucy Thomas, spinster
1961 – 1962	George Walter Alfred Watson, farmer Wilga Josephine Watson, wife
	(Portion 30 & Part 29 Parish Beryan – Area 180 Acres 2 Roods 11 Perches – CTVol 7073 Fol's 12 to 14)
1956 – 1961	Thomas James Fleet Arthur, joiner Henry Orchard Arthur, joiner Frederick Ernest Arthur, joiner
	(Portion 30 & Part 29 Parish Beryan – Area 180 Acres 2 Roods 11 Perches – CTVol 6704 Fol 143)
1955 – 1956	Colin James Newell, dairy farmer
1953 – 1955	Rural Bank of New South Wales
	(Portion 30 & Portion 29 Parish Beryan – Area 210 Acres – CTVol 6591 Fol 240)
1952 – 1953	Rural Bank of New South Wales
	(Portion 30 & Portion 29 Parish Beryan – Area 210 Acres)
Prior – 1952	Crown Land
(1919 – 1952)	*(ACP 19-132 Maitland to Rural Bank of New South Wales)*
(1903 – 1919)	*(Conditional Lease 03-43 Maitland to Herbert John Hardy)*

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Appendix B

Laboratory Test Results

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1610214**	Page	: 1 of 16
Client	: **REGIONAL GEOTECHNICAL SOLUTION**	Laboratory	: Environmental Division Sydney
Contact	: Andrew Hills	Contact	:
Address	: 44 BENT STREET WINGHAM NSW, AUSTRALIA 2429	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6553 5641	Telephone	: +61-2-8784 8555
Project	: RGS01243.1	Date Samples Received	: 12-May-2016 09:00
Order number	: ----	Date Analysis Commenced	: 13-May-2016
C-O-C number	: ----	Issue Date	: 20-May-2016 15:02
Sampler	: Andrew Hills		
Site	: ----		
Quote number	: ----		
No. of samples received	: 14		
No. of samples analysed	: 13		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW
Shaun Spooner	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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.

- EP080: The trip spike and its control have been analysed for volatile TPH and BTEX only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained. Result comfirmed by re-extraction and re-analysis.
- **EA200: As only one sample container was submitted for multiple tests, sub sampling was conducted prior to Asbestos analysis. As this has the potential to understate detection, results should be scrutinised accordingly and NATA accreditation does not apply to analysis on these samples.**
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- 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.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	Trip Spike	Trip Blank	SS1 0.0-0.2	SS2 0.0-0.2	SS3 0.0-0.2
			Client sampling date / time	[10-May-2016]	[10-May-2016]	10-May-2016 14:30	10-May-2016 14:40	10-May-2016 15:00
Compound	CAS Number	LOR	Unit	ES1610214-001	ES1610214-002	ES1610214-003	ES1610214-004	ES1610214-005
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	----	----	15.3	24.3	22.7
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	No	No	No
Asbestos Type	1332-21-4	-	--	----	----	-	-	-
Sample weight (dry)	----	0.01	g	----	----	12.3	21.2	19.7
APPROVED IDENTIFIER:	----	-	--	----	----	S.SPOONER	S.SPOONER	S.SPOONER
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	<5	6	<5
Cadmium	7440-43-9	1	mg/kg	----	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	----	----	7	6	4
Copper	7440-50-8	5	mg/kg	----	----	10	14	13
Lead	7439-92-1	5	mg/kg	----	----	5	5	<5
Nickel	7440-02-0	2	mg/kg	----	----	3	3	2
Zinc	7440-66-6	5	mg/kg	----	----	31	39	28
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	<0.1	----	----
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	----	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Trip Spike	Trip Blank	SS1 0.0-0.2	SS2 0.0-0.2	SS3 0.0-0.2
				Client sampling date / time	[10-May-2016]	[10-May-2016]	10-May-2016 14:30	10-May-2016 14:40	10-May-2016 15:00
Compound	CAS Number	LOR	Unit		ES1610214-001	ES1610214-002	ES1610214-003	ES1610214-004	ES1610214-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin	72-20-8	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		----	----	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		----	----	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		----	----	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Trip Spike	Trip Blank	SS1 0.0-0.2	SS2 0.0-0.2	SS3 0.0-0.2
				Client sampling date / time	[10-May-2016]	[10-May-2016]	10-May-2016 14:30	10-May-2016 14:40	10-May-2016 15:00
Compound	CAS Number	LOR	Unit		ES1610214-001	ES1610214-002	ES1610214-003	ES1610214-004	ES1610214-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Acenaphthene	83-32-9	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	----	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	----	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		**12**	<10	<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		**14**	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		**10**	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		----	----	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		----	----	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		----	----	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	----	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	----	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Trip Spike	Trip Blank	SS1 0.0-0.2	SS2 0.0-0.2	SS3 0.0-0.2
				Client sampling date / time	[10-May-2016]	[10-May-2016]	10-May-2016 14:30	10-May-2016 14:40	10-May-2016 15:00
Compound	CAS Number	LOR	Unit		ES1610214-001	ES1610214-002	ES1610214-003	ES1610214-004	ES1610214-005
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		1.7	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		1.3	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		3.5	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		1.8	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	----	107	84.2	126
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	95.1	109	106
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	101	105	98.9
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	82.4	79.5	82.0
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	89.1	86.9	88.3
2.4.6-Tribromophenol	118-79-6	0.5	%		----	----	63.8	70.3	68.4
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	102	99.9	101
Anthracene-d10	1719-06-8	0.5	%		----	----	91.7	87.9	88.1
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	100	99.4	98.7
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		98.6	105	116	105	117
Toluene-D8	2037-26-5	0.2	%		109	91.3	97.8	91.3	106
4-Bromofluorobenzene	460-00-4	0.2	%		105	93.1	85.7	90.6	101

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS4 0.0-0.2	SS5 0.0-0.2	SS6 0.0-0.2	SS7 0.0-0.2	SS8 0.0-0.2
				Client sampling date / time	10-May-2016 15:15	10-May-2016 15:20	10-May-2016 15:30	10-May-2016 15:40	10-May-2016 15:50
Compound	CAS Number	LOR	Unit		ES1610214-006	ES1610214-007	ES1610214-008	ES1610214-009	ES1610214-010
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		20.8	26.2	21.8	17.8	21.0
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		----	No	----	No	No
Asbestos Type	1332-21-4	-	--		----	-	----	-	-
Sample weight (dry)	----	0.01	g		----	19.5	----	12.9	11.8
APPROVED IDENTIFIER:	----	-	--		----	S.SPOONER	----	S.SPOONER	S.SPOONER
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		9	6	8	9	7
Copper	7440-50-8	5	mg/kg		13	<5	12	13	12
Lead	7439-92-1	5	mg/kg		6	<5	6	8	6
Nickel	7440-02-0	2	mg/kg		4	<2	2	4	3
Zinc	7440-66-6	5	mg/kg		43	8	33	34	34
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	----	----	----	----
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS4 0.0-0.2	SS5 0.0-0.2	SS6 0.0-0.2	SS7 0.0-0.2	SS8 0.0-0.2
				Client sampling date / time	10-May-2016 15:15	10-May-2016 15:20	10-May-2016 15:30	10-May-2016 15:40	10-May-2016 15:50
Compound	CAS Number	LOR	Unit		ES1610214-006	ES1610214-007	ES1610214-008	ES1610214-009	ES1610214-010
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<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	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<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	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<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	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<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	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<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	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS4 0.0-0.2	SS5 0.0-0.2	SS6 0.0-0.2	SS7 0.0-0.2	SS8 0.0-0.2
				Client sampling date / time	10-May-2016 15:15	10-May-2016 15:20	10-May-2016 15:30	10-May-2016 15:40	10-May-2016 15:50
Compound	CAS Number	LOR	Unit		ES1610214-006	ES1610214-007	ES1610214-008	ES1610214-009	ES1610214-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS4 0.0-0.2	SS5 0.0-0.2	SS6 0.0-0.2	SS7 0.0-0.2	SS8 0.0-0.2
				Client sampling date / time	10-May-2016 15:15	10-May-2016 15:20	10-May-2016 15:30	10-May-2016 15:40	10-May-2016 15:50
Compound	CAS Number	LOR	Unit		ES1610214-006	ES1610214-007	ES1610214-008	ES1610214-009	ES1610214-010
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		123	108	118	113	114
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		107	91.3	92.4	100	95.9
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		96.8	70.4	92.3	85.8	90.4
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		79.3	81.4	79.7	79.1	72.3
2-Chlorophenol-D4	93951-73-6	0.5	%		86.5	88.3	86.6	85.3	75.8
2.4.6-Tribromophenol	118-79-6	0.5	%		72.7	65.7	72.4	62.6	62.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		98.1	99.3	99.1	98.9	86.8
Anthracene-d10	1719-06-8	0.5	%		87.2	88.2	85.6	85.7	80.7
4-Terphenyl-d14	1718-51-0	0.5	%		95.1	99.6	97.5	96.9	90.6
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		118	108	112	112	122
Toluene-D8	2037-26-5	0.2	%		95.0	84.9	97.0	98.1	105
4-Bromofluorobenzene	460-00-4	0.2	%		90.2	94.0	96.0	99.8	100

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SS9 0.0-0.2	D2 0.0-0.2	TSC	----	----
			Client sampling date / time	10-May-2016 16:05	10-May-2016 15:50	[10-May-2016]	----	----
Compound	CAS Number	LOR	Unit	ES1610214-011	ES1610214-013	ES1610214-014	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	30.2	21.8	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	----	----	----
Asbestos Type	1332-21-4	-	--	-	-	----	----	----
Sample weight (dry)	----	0.01	g	15.5	15.2	----	----	----
APPROVED IDENTIFIER:	----	-	--	G.MORGAN	G.MORGAN	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	6	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	4	7	----	----	----
Copper	7440-50-8	5	mg/kg	5	12	----	----	----
Lead	7439-92-1	5	mg/kg	5	6	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	3	----	----	----
Zinc	7440-66-6	5	mg/kg	8	33	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	----	----	----
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS9 0.0-0.2	D2 0.0-0.2	TSC	----	----
				Client sampling date / time	10-May-2016 16:05	10-May-2016 15:50	[10-May-2016]	----	----
Compound	CAS Number	LOR	Unit		ES1610214-011	ES1610214-013	ES1610214-014	--------	--------
					Result	Result	Result	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	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	----	----	----
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	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SS9 0.0-0.2	D2 0.0-0.2	TSC	----	----
			Client sampling date / time	10-May-2016 16:05	10-May-2016 15:50	[10-May-2016]	----	----
Compound	CAS Number	LOR	Unit	ES1610214-011	ES1610214-013	ES1610214-014	--------	--------
				Result	Result	Result	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	**23**	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	**27**	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	**15**	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SS9 0.0-0.2	D2 0.0-0.2	TSC	----	----
				Client sampling date / time	10-May-2016 16:05	10-May-2016 15:50	[10-May-2016]	----	----
Compound	CAS Number	LOR	Unit		ES1610214-011	ES1610214-013	ES1610214-014	--------	--------
					Result	Result	Result	----	----
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	**5.4**	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	**0.9**	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	**4.2**	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	**1.9**	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	**12.4**	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	**6.1**	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**130**	**123**	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**113**	**105**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**98.7**	**97.3**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**77.2**	**81.0**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**82.5**	**87.8**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**63.5**	**63.7**	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**92.2**	**98.9**	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**90.0**	**87.0**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**102**	**98.6**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**108**	**121**	**102**	----	----
Toluene-D8	2037-26-5	0.2	%		**88.6**	**99.7**	**107**	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**87.6**	**88.8**	**100**	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	SS1 0.0-0.2 - 10-May-2016 14:30:00	Mid brown clay soil with grey rocks.
EA200: Description	SS2 0.0-0.2 - 10-May-2016 14:40:00	Mid brown clay soil with grey rocks.
EA200: Description	SS3 0.0-0.2 - 10-May-2016 15:00:00	Mid brown clay soil with grey rocks.
EA200: Description	SS5 0.0-0.2 - 10-May-2016 15:20:00	Mid brown clay soil with grey rocks.
EA200: Description	SS7 0.0-0.2 - 10-May-2016 15:40:00	Mid brown clay soil with grey rocks.
EA200: Description	SS8 0.0-0.2 - 10-May-2016 15:50:00	Mid brown clay soil with grey rocks.
EA200: Description	SS9 0.0-0.2 - 10-May-2016 16:05:00	Mid brown clay soil.
EA200: Description	D2 0.0-0.2 - 10-May-2016 15:50:00	Mid brown clay soil.

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

TABLE B1 - RESULTS OF CHEMICAL ANALYSES (concentrations in mg/kg) '**Residential A' Site.**

Report No. **RGS01243.1-AB**

Client: Coastplan Consulting
Job No. RGS01243.1
Project: Proposed Residential Development
Location: Minmi

Location	DEPTH	Asebestos	TOTAL RECOVERABLE HYDROCARBONS					PAH		OC-OP PESTICIDES	BTEX	PCB	HEAVY METALS							
	(m)		C6-C10	C10-C16	C16-C34	C34-C40	TOTAL 10-40	Total	b-a-p				As	Cd	Cr*	Cu	Pb	Ni	Zn	Hg
SS1	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.05	<0.2	<0.1	<5	<1	7	10	5	3	31	<0.1
SS2	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.05	<0.2	<0.1	6	<1	6	14	5	3	39	<0.1
SS3	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.05	<0.2	<0.1	<5	<1	4	13	<5	2	28	<0.1
SS4	0.0 - 0.2	----	<10	<50	<100	<100	<50	<0.5	<0.5	<0.05	<0.2	<0.1	<5	<1	9	13	6	4	43	<0.1
SS5	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.05	<0.2	<0.1	<5	<1	6	<5	<5	<2	8	<0.1
SS6	0.0 - 0.2	----	<10	<50	<100	<100	<50	<0.5	<0.5	<0.05	<0.2	<0.1	<5	<1	8	12	6	2	33	<0.1
SS7	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.05	<0.2	<0.1	5	<1	9	13	8	4	34	<0.1
SS8	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.05	<0.2	<0.1	<5	<1	7	12	6	3	34	<0.1
SS9	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.05	<0.2	<0.1	<5	<1	4	5	5	<2	8	<0.1
D2 (Duolicate of SS8)	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.05	<0.2	<0.1	6	<1	7	12	6	3	33	<0.1
Health Based Soil investigation Level				280				300	3	70	NL	1	100	20	100#	600	300	400	7400	40
Ecological Investigation Level (EIL):			800	1000	3500	10000							40		447	149	1100	41	218	
Ecological Screening Level (ESL):			180	120	300	2800			0.7		50		**Coarse grained soil in mg/kg**							
			180	120	1300	5600			0.7		65		**Fine grained soil in mg/kg**							

NOTES:

Denotes concentration exceeds health based guideline for Residential A land use (NEPM 2013)

Denotes concentration exceeds ecological guideline for Residential land use

Denotes concentration exceeds health and ecological based guideline for Residential land use

NL No Limit available

LOR Limit of Reporting

TRH health based guidelines for upper 1m of soil