



REPORT

TO

ADCO CONSTRUCTIONS PTY LTD

ON

INSITU EXCAVATED NATURAL MATERIAL ASSESSMENT

FOR

OFFSITE DISPOSAL

AT

CNR JORDAN SPRINGS BOULEVARD & LAKESIDE PARADE, JORDAN SPRINGS NSW

Job No.: ADC 1646

Report No.: ENV AB

Our Ref No.: 178

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Reference No.: 178

17 January 2013

ADCO Constructions Pty Ltd
PO Box 1982
North Sydney NSW 2059

Attention: Mr Dean Israel

**RE: In Situ Excavated Natural Material Assessment Report
Cnr Jordan Springs Boulevard and Lakeside Parade
Jordan Springs NSW**

Works Requested

As requested, Compaction & Soil Testing Services Pty Ltd has undertaken an assessment of the material currently located within the property known as Cnr Jordan Springs Boulevard and Lakeside Parade, Jordan Springs NSW. The purpose of the assessment was to determine if the material could be classified as Excavated Natural Material (ENM) in accordance with the NSW EPA *Excavated Natural Material Exemption 2012*.

The NSW EPA *Excavated Natural Material Exemption 2012* is one of a number of exemptions to the DECC *Waste Classification Guidelines 2009*, formulated by the NSW Environment Protection Authority (NSW EPA), as a part of the Resource Recovery Scheme to reduce the amount of waste entering licensed landfills. Under the exemption, material classified as Excavated Natural Material can be applied to land as either general fill or engineered fill.

This report has been prepared for the expressed use of ADCO Constructions Pty Ltd and any third parties they deem necessary during the excavation, storage, transport and re-use or disposal of this material from Cnr Jordan Springs Boulevard and Lakeside Parade, Jordan Springs NSW. This report has been prepared for an expressed purpose and may not contain sufficient information for any other uses. The copyright of this report remains the property of Compaction & Soil Testing Services Pty Ltd until full payment has been received, upon which, the copyright is transferred to ADCO Constructions Pty Ltd. This report is not to be altered or amended in any form. This report is not to be copied except in full.

Should you have any further queries please do not hesitate to contact our office.

Yours sincerely,

Reviewed by:

Date: 17/01/2013 Date: 17/01/2013

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Student Environmental Consultant
Compaction & Soil Testing Services Pty
Ltd

Celia Moloney
Environmental Consultant
Compaction & Soil Testing Services Pty
Ltd

In Situ Excavated Natural Material Assessment Report
Cnr Jordan Springs Boulevard and Lakeside Parade, Jordan Springs NSW

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Scope of Works

In order to assess this material under the NSW EPA *Excavated Natural Material Exemption 2012*, the following works were undertaken by an environmental consultant from Compaction & Soil Testing Services Pty Ltd (CSTS):

- Visual assessment of the material to determine the material type, colour, consistency and conditions including the presence of foreign materials,
- Recovery of fifteen (15) discrete soil samples for chemical analysis in accordance with Australian Standard AS 4482.1 – 2005 – *Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds*,
- Recovery of fifteen (15) 6kg soil samples for assessment in accordance with an in-house modified version based on the principles of RTA Test Method T276 – Foreign Material Content of Recycled Concrete,
- Transport of the recovered samples to a laboratory accredited by the National Association of Testing Authorities (NATA) in accordance with stringent chain of custody (COC) procedures,
- Review of the results of the laboratory chemical analysis to determine if the material meets the chemical criteria for Excavated Natural Material,
- Completion of the foreign material assessments to determine if the material meets the foreign material content requirements for Excavated Natural Material,
- Compile a report detailing the findings of the investigation including a determination as to whether the material can be classified as ENM in accordance with the NSW EPA *Excavated Natural Material Exemption 2012*.

Field works were conducted by an environmental consultant from CSTS on 20 December 2012 under the supervision of a representative from ADCO Constructions Pty Ltd. All field works were conducted in accordance with relevant Australian Standards and accepted industry guidelines. As such, the recovered samples can be considered an accurate representation of the material onsite.

The recovered soil samples were forwarded by CSTS to Envirolab Services Pty Ltd, a laboratory accredited by the National Association of Testing Authorities (NATA). Envirolab Services Pty Ltd was chosen to undertake the chemical analysis due to their past experience with this form of analysis. Envirolab Services Pty Ltd employs a number of quality assurance and quality control measures when undertaking analysis to ensure the analysis is completed accurately. As such, the laboratory results can be considered as a true representation of the recovered material.

Upon receipt of the recovered samples, experienced technicians from Envirolab Services Pty Ltd assessed the samples for the following contaminants and physical properties in accordance with the conditions of the NSW EPA *Excavated Natural Material Exemption 2012*:

- Heavy Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc),
- Monocyclic Aromatic Hydrocarbons/BTEX (Benzene, Toluene, Ethyl-benzene, Xylene),

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- Polycyclic Aromatic Hydrocarbons (PAH),
- Volatile and Semi-Volatile Petroleum Hydrocarbons Chains (vTPH and sTPH),
- Electrical Conductivity of the material (EC)
- Acidity of the material (pH)

The following physical assessment of the samples was undertaken by experienced technicians from CSTS in accordance with conditions of the NSW EPA *Excavated Natural Material Exemption 2012* and the conditions of our NATA accreditation;

- Foreign Material Content

All laboratory tests were completed in accordance with the relevant Australian Standards and State Government. The results can therefore be considered as an accurate representation of the material.

Material Identification and Conditions

The material under investigation is located within the property known as Cnr Jordan Springs Boulevard and Lakeside Parade, Jordan Springs NSW (Figure A). Approximately 6,000m² was assessed, to a depth of 0.8m below ground level (bgl).

Upon visual inspection of the site, the site appeared to be relatively level and rectangular in shape. The area consisted of low vegetation cover with shrub growth observed (Figure B). Upon inspection of the surface and drilling of boreholes, the material appeared to consist predominately of brown silty shaly clay with traces of shale (Figure C).

During the investigation, no evidence of chemical contamination such as the staining or discolouration of the material or the emission of odours was observed. During the assessment, limited evidence of foreign materials such as plastic and cloth was observed. Though evidence of foreign material was observed, it was predicted that the concentration of foreign material would be less than the 2% permissible by definition of Excavated Natural Material within the *NSW EPA Excavated Natural Material Exemption 2012*. Based on the visual assessment, CSTS concluded that the material was likely to be classified as Excavated Natural Material (ENM). To confirm this assessment, a total of fifteen (15) discrete samples were recovered for chemical assessment. An additional fifteen (15) 6kg samples were recovered for foreign material content assessment.

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Figure A: Site Location



Source: Google Earth, Accessed: 16/01/2013, Image date: 14/11/2011

Figure B: Site Condition



Photograph taken by CSTS Environmental Consultant 20/12/2012

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Figure C: Material Condition



Photograph taken by CSTS Environmental Consultant 20/12/2012

Soil Sampling Process

In order to determine whether the material could be classified as Excavated Natural Material, chemical analysis of representative soil samples is required. Under the exemption, a total of fifteen (15) sample locations are required per 6,000m². As the proposed terminal depth of excavation was to be 0.8m bgl, a total of one (1) sample was required per surface sample location. As such, to assess the insitu material a total of fifteen (15) discrete soil samples were required for chemical analysis.

The soil samples were recovered from systematically selected locations throughout the area in accordance with Australian Standard AS 4482.1 – 2005 – *Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds* and the conditions of the NSW EPA *Excavated Natural Material Exemption 2012*.

Once the sample location was identified, the surface sample was recovered by inserting a decontaminated sampling scoop vertically into the material. The material recovered on the scoop was transferred to a laboratory supplied 250ml jar. The sealed jar was then labelled with a job number and sample ID before being transferred into a chilled container to begin the cool down process which is required prior to chemical analysis of the soil. This process was repeated for each of the recovered samples.

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With the surface sample recovered, the test pit was excavated using a vehicle mounted hydraulic drill rig with continuous flight auger attachment to a final depth of 0.8m bgl. The samples were recovered directly from the auger using a decontaminated steel trowel to transfer a portion of the material into a laboratory supplied sample jar. The jar was sealed with a teflon seal, labelled with the relevant sample information and placed into a chilled transport container. The bulk material sample was recovered by collecting the material from the auger to the full depth of excavation. Once the soil sample had been recovered, the test pit was re-filled with the excavated material in accordance with Occupational Health and Safety (OHS) requirements.

In order to prevent cross contamination during the recovery of the samples, all of the equipment used was decontaminated between the recovery of each sample. The decontamination process is as follows:

- Remove soils adhering to the object by scrubbing with a clean soft bristled brush,
- Thoroughly wash the object in a solution of 3% phosphate free detergent (Decon 90),
- Thoroughly rinse the object in either distilled or potable water depending on availability,
- Dry the object with a clean cloth or terry towel.

With all of the samples placed into the chilled transport container, the container was sealed and immediately transported to Envirolab Services Pty Ltd (NATA accreditation No.: 2901) under stringent chain of custody (COC) procedures.

Upon receipt of all of the samples, a technician from Envirolab Services Pty Ltd checked the condition of the samples to confirm both the integrity of the sample jar seals, and that the samples were received in the appropriate condition. When satisfied the samples were recovered in an appropriate condition, Envirolab Services Pty Ltd returned Sample Receipt (Sample Receipt 83573) verifying the samples' integrity and confirming the samples had been received in a chilled state as required under current Australian Standards.

The recovered samples were analysed for a variety of potential contaminants within the following appropriate holding periods (Table A) as detailed in Schedule B (3) of *The National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM)*, developed by the National Environment Protection Council (NEPC).

Table A: Maximum holding times prior to assessment

ANALYTE	HOLDING TIME
Heavy Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Nickel and Zinc)	6 months
Mercury	28 days
BTEX (Benzene, Toluene, Ethyl-benzene, Xylenes)	14 days
PAH (Polycyclic Aromatic Hydrocarbon)	14 days

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Table A: Maximum holding times prior to assessment (Continued)

ANALYTE	HOLDING TIME
TPH (Semi-volatile Petroleum Hydrocarbons)	14 days
EC (Electrical Conductivity)	7 days
pH	7 days

Schedule B – National Environmental Protection (Assessment of Site Contamination) Measure 1999

Assessment Criteria

As the material is to be excavated and removed from the site for re-use as engineered fill, the material was assessed as Excavated Natural Material. The area of assessment has been calculated as 6,000m², and as such, a total of fifteen (15) surface sampling locations are required to be analysed (Table B).

Table B: Surface Sampling of Insitu Material

Area Size (m ²)	Number of Sampling Points	Distance between Sampling Points (m)	Diameter of Hotspot Detected (m)
500	5	10.0	11.8
1,000	6	12.9	15.2
2,000	7	16.9	19.9
3,000	9	18.2	21.5
4,000	11	19.1	22.5
5,000	13	19.6	23.1
6,000	15	20.0	23.6
7,000	17	20.3	23.9
8,000	19	20.5	24.2
9,000	20	21.2	25.0
10,000	21	21.8	25.7
15,000	25	25.0	28.9
20,000	30	25.8	30.5
25,000	35	26.7	31.5
30,000	40	27.5	32.4
35,000	45	27.9	32.9
40,000	50	28.3	33.4
45,000	52	29.3	34.6
50,000	55	30.2	35.6

Adapted from Table 4 – NSW EPA *Excavated Natural Material Exemption 2012*

If the proposed excavation depth is equal to or greater than 1.0m bgl, additional depth samples are required. In accordance with the NSW EPA *Excavated Natural Material Exemption 2012*, one (1) soil sample is to be recovered at 1.0m bgl from each surface sample point, and additional samples are to be recovered at 1.0m intervals thereafter to the depth of the proposed excavation. Should the proposed excavation terminate less than 0.5m below the last metre interval, no further sampling is required. If the proposed excavation terminates between 0.5m – 0.9m below the last metre interval, a sample is required at the termination depth (Table C). As the proposed excavation is 0.8m bgl, one (1) sample is required per surface

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sampling location. Therefore, a total of fifteen (15) samples are required to chemically assess if the material complied with the criteria of the NSW EPA *Excavated Natural Material Exemption 2012*.

Table C: Depth Sampling of Insitu Material

Excavation Depth	Sample Depth (bgl)	Number of Samples per surface location
<1.0m	0.0m	1
1.0m – <1.5m	0.0m, 1.0m	2
1.5m – <2.0m	0.0m, 1.0, Base of Excavation	3
2.0m - <2.5m	0.0m, 1.0m, 2.0m	3
2.5m - <3.0m	0.0m, 1.0m, 2.0, Base of Excavation	4
3.0m - <3.5m	0.0m 1.0m 2.0m, 3.0m	4

Adapted from Table 5 – NSW EPA *Excavated Natural Material Exemption 2012*

There are a range of chemical and physical attributes that must be assessed prior to classification. These are as follows:

- Heavy Metals,
- PAHs (Polycyclic Aromatic Hydrocarbons),
- VHCs (Volatile Chlorinated Hydrocarbons),
- TPHs (Totals Petroleum Hydrocarbons),
- BTEX (Benzene, Toluene, Ethyl-benzene and Xylene),
- Benzo(a)pyrene,
- Electrical Conductivity (EC),
- Foreign Material Content

Low levels of Heavy Metal are common and naturally occurring in soils, although elevated concentrations can potentially pose a significant risk to human health or the surrounding environment. As such, the NSW EPA has determined maximum acceptable contaminant concentrations for material being classified as Excavated Natural Material (Table D).

Table D: Excavated Natural Material Chemical Criteria

Chemicals and Other Attributes	Maximum Average Concentration for Characterisation	Absolute Maximum Concentration
Arsenic	20 mg/kg	40 mg/kg
Cadmium	0.5 mg/kg	1 mg/kg
Chromium	75 mg/kg	150 mg/kg
Copper	100 mg/kg	200 mg/kg
Lead	50 mg/kg	100 mg/kg
Mercury	0.5 mg/kg	1 mg/kg
Nickel	30 mg/kg	60 mg/kg
Zinc	150 mg/kg	300 mg/kg
Electrical Conductivity	1.5 dS/m	3 dS/m
pH	5 to 9 pH units	4.5 to 10 pH units

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Table D: Excavated Natural Material Chemical Criteria (Continued)

Chemicals and Other Attributes	Maximum Average Concentration for Characterisation	Absolute Maximum Concentration
Total Polycyclic Aromatic Hydrocarbons (PAH)	20 mg/kg	40 mg/kg
Benzo(a)pyrene	0.5 mg/kg	1 mg/kg
Benzene	N/A	0.5 mg/kg
Toluene	N/A	65 mg/kg
Ethyl-benzene	N/A	25 mg/kg
Xylene	N/A	15 mg/kg
Total Petroleum Hydrocarbons (TPH)	250 mg/kg	500 mg/kg
Rubber, Plastic Bitumen, Paper, Cloth, Paint and Wood	0.05%	0.10%
Total Foreign Material	N/A	2%

Adapted from Table 2 – NSW EPA Excavated Natural Material Exemption 2012

Laboratory Quality Assurance and Quality Control

Envirolab Services Pty Ltd is registered by NATA for Chemical Testing (Reg.No:2901) and Quality System compliance to ISO/IEC 17025. For this reason, they were deemed as suitably qualified to conduct the assessment of these soil samples.

Quality Assurance Procedures

As Envirolab Services Pty Ltd is a NATA accredited laboratory, they must conform to a variety of quality assurance procedures. Quality control samples which are included in any given analytical run are listed below.

Reagent Blank

Sample-free reagents are carried through the preparation/extraction/digestion procedure and analysed at the beginning of every sample batch analysis, to provide a blank reference point for subsequent samples. For larger projects, a reagent blank is prepared and analysed every 20 samples.

Matrix Spike Duplicates

These consist of replicate samples which are spiked with identical concentrations of all target analyte(s). The spiking occurs during the sample preparation and prior to the extraction/digestion procedure. These samples are used to document the precision and bias of a method in a given sample matrix.

In the event that there is not enough sample available to prepare a spiked sample, another known soil/sand or water (or Milli-Q water) may be used. A duplicate spiked sample is prepared at least every 20 samples.

Surrogate Spike

These spikes are added to all samples which require analysis for organics (where relevant) prior to extraction, and are used to determine the extraction efficiency.

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Surrogates are organic compounds which are similar to the target analyte(s) in chemical composition and behaviour within the analytical process, but which are not normally found in environmental samples.

Internal Standard

All samples requiring analysis for organics (where relevant) after the extraction process have internally mandated compounds added to them; the compounds serve to give a standard of retention time and response, which does not vary between runs or with any given instrument.

Duplicate

Duplicates consist of a separated portion of a sample being analysed, which is treated identically to the other samples in the batch. A duplicate is prepared at least every 20 samples.

Control Standards

Prepared from a source independent of the calibration standards, at least one control standard is included in each run to confirm calibration validity.

Additional QC Samples

A calibration standard and blank are run after every 20 samples of an instrumental analysis run, to assess for any possible analytical drift.

Statistical Analysis of QC Data

Quality control data is plotted on control charts using the APHA procedure, with warning and control limits at 2 and 3 standard deviations respectively.

Certified Reference Materials

Certified Reference Materials and Standards are regularly placed in the system to act as blind samples. These materials and standards have certified reference values given for various parameters.

Proficiency Testing

Proficiency test samples are regularly analysed by our laboratories. Envirolab Services Pty Ltd participates in a number of programs to assure that their analytical methods and procedures also remain proficient. Results and proficiency status reports are compiled and sent to participating laboratories post-data interpretation. Failure to comply with acceptable values by either organisation may result in further investigation.

Interlaboratory/Intralaboratory Testing

Envirolab Services Pty Ltd has schedules in the Quality Systems to participate in Inter/Intra laboratory testing conducted both internally and by external parties.

Failure to meet the internal acceptance criteria will result in sample/sample batch repeat.

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CSTS has checked the QA/QC procedures adopted by the laboratory against the appropriate guidelines. The quality control sample numbers adopted by Envirolab Services Pty Ltd are considered to be adequate for the analyses undertaken, and conform to the recommendations provided in the National Environment Protection Measure (NEM) 1999 "*Guideline on Laboratory Analysis of Potentially Contaminated Soils*" as well as the Australian and New Zealand Environment and Conservation Council (ANZECC)-1996 "*Guidelines for the Laboratory Analysis of Contaminated Soils*".

Overall, the quality control elements indicate that the analytical data fall within acceptable levels of accuracy and precision for the analysis of both soils and water. The analytical data provided is therefore considered reliable and relevant for this assessment.

Results of the Laboratory Analysis

The foreign material content analysis was conducted in-house by an experienced technician from CSTS in accordance with the approved in-house method derived from the RTA T276 – Foreign Material Content of Recycled Concrete.

The result of the foreign material content analysis determined that the material contained low quantities of foreign material (Table E). The concentrations of foreign material detected were within the acceptable range prescribed within the ENM exemption. Therefore, the presence of foreign material within the material will not alter the overall classification of the material.

The chemical analysis of the recovered samples was undertaken by experienced technicians from Envirolab Services Pty Ltd in accordance with relevant Australian Standards and the conditions of their NATA Accreditation.

Low EC levels and neutral pH levels were detected within the recovered soil samples (Table E). The concentrations detected were within the maximum allowable ranges and will not affect the overall classification of the material. Furthermore, the calculated average pH and EC levels were within the respective maximum allowable average ranges as detailed within the NSW EPA *Excavated Natural Material Exemption 2012*. As such, the pH and EC levels of the material will not alter the overall classification of the material.

The chemical analysis detected concentrations of Arsenic, Chromium, Copper, Lead, Nickel and Zinc within the recovered soil samples. With the exception of Zinc, the concentrations detected were generally consistent between the samples (Table F). Though elevated concentrations of Zinc were detected, all of the detected concentrations of Heavy Metals were within the respective absolute maximum allowable limits as detailed within the NSW EPA *Excavated Natural Material Exemption 2012*. Furthermore, the calculated averages were within the respective maximum allowable average limits prescribed within the NSW EPA *Excavated Natural Material Exemption 2012*. Therefore, the presence of Heavy Metals will not alter the overall classification of the material.

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No concentrations of BTEX, TPH Total PAH or Benzo(a)pyrene were detected above the Practical Quantitation Limit (Table G). Therefore, the material is considered as not affected by the presence of BTEX, TPH, Total PAH and Benzo(a)pyrene, and will not alter the overall classification of the material.

Based on the conducted assessment, CSTS concluded that the material is suitable for classification as Excavated Natural Material in accordance with the NSW EPA *Excavated Natural Material Exemption 2012*.

Table E: Electrical Conductivity and Foreign Material Content

Sample Id	Electrical Conductivity (µS/cm)	Electrical Conductivity (dS/m)	pH (pH units)	Total Foreign Material (%)	Rubber, Plastic, Bitumen, Paper, Cloth, Paint & Wood
201	120	0.1	5.9	0.0	0.0
202	190	0.2	7.3	0.0	0.0
203	120	0.1	6.4	0.0	0.0
204	110	0.1	5.9	0.1	0.1
205	100	0.1	6.9	0.0	0.0
206	240	0.2	7.3	0.1	0.1
207	330	0.3	8.4	0.0	0.0
208	190	0.2	6.8	0.0	0.0
209	110	0.1	6.2	0.1	0.0
210	96	0.1	5.6	0.0	0.0
211	91	0.1	5.9	0.0	0.0
212	270	0.3	7.5	0.2	0.0
213	280	0.3	7.2	0.0	0.0
214	74	0.1	6.0	0.0	0.0
215	120	0.1	6.4	0.1	0.0
Average	163	0.2	6.6	0.04	0.01
Max. Allowable Average	1,500	1.5	5 to 9	N/A	0.05%
Absolute Max. SCC	3,000	3.0	4.5 to 10	2.0%	0.10%

Adapted from Envirolab Certificate of Analysis 83573, NSW EPA *Excavated Natural Material Exemption 2012*.

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Table F: Concentration of Heavy Metals (mg/kg)

Sample ID	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
201	8	<PQL	12	54	30	<PQL	30	180
202	8	<PQL	11	46	27	<PQL	59	260
203	5	<PQL	7	31	16	<PQL	25	110
204	6	<PQL	10	24	17	<PQL	8	42
205	5	<PQL	9	29	17	<PQL	22	100
206	9	<PQL	10	29	20	<PQL	13	52
207	5	<PQL	8	32	21	<PQL	29	120
208	6	<PQL	12	27	20	<PQL	21	83
209	7	<PQL	12	36	21	<PQL	21	90
210	6	<PQL	10	31	19	<PQL	9	39
211	6	<PQL	9	38	23	<PQL	15	83
212	6	<PQL	16	22	21	<PQL	11	36
213	6	<PQL	11	25	16	<PQL	10	46
214	9	<PQL	17	34	28	<PQL	18	94
215	6	<PQL	9	42	19	<PQL	24	120
Average	7	<PQL	11	33	21	<PQL	21	97
Maximum Allowable Average	20	0.5	75	100	50	0.5	30	150
Absolute Maximum SCC	40	1	150	200	100	1	60	300

Adapted from Envirolab Certificate of Analysis 83573, NSW EPA Excavated Natural Material Exemption 2012.

Table G: Hydrocarbon & Volatile Compound Concentrations (mg/kg)

Sample ID	Benzo(a)pyrene	Total Polycyclic Aromatic Hydrocarbons	Total Petroleum Hydrocarbons (C ₁₀ -C ₃₆)	Benzene	Toluene	Ethyl-benzene	Xylenes (Total)
201	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
202	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
203	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
204	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
205	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
206	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
207	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
208	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
209	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
210	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
211	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
212	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
213	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
214	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL

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**Table G: Hydrocarbon & Volatile Compound Concentrations (mg/kg)
(Continued)**

Sample ID	Benzo(a)pyrene	Total Polycyclic Aromatic Hydrocarbons	Total Petroleum Hydrocarbons (C ₁₀ -C ₃₆)	Benzene	Toluene	Ethyl-benzene	Xylenes (Total)
215	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Average	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Maximum Allowable Average	0.5	20	250	N/A	N/A	N/A	N/A
Absolute Maximum SCC	1	40	500	0.5	65	25	15

Adapted from Envirolab Certificate of Analysis 83573, NSW EPA *Excavated Natural Material Exemption 2012*.

Conclusion and Recommendations

CSTS was engaged to assess the approximate 6,000m² of material within the property known as Cnr Jordan Springs Boulevard and Lakeside Parade, Jordan Springs NSW. The purpose of the investigation was to determine whether the material was suitable for classification as Excavated Natural Material in accordance with the NSW EPA *Excavated Natural Material Exemption 2012*.

Visual inspection of the material concluded the material consisted predominately of brown silty shaly clay with traces of shale. During the investigation, the material appeared to be consistent, with no evidence of chemical contamination such as staining or discolouration of the material or the emission of odours observed. Minor evidence of foreign materials such as plastic and cloth was observed, though predicted to be low in quantity. Based on this visual assessment, CSTS concluded the material may be suitable for classification as Excavated Natural Material. To confirm this assessment, CSTS recovered fifteen (15) discrete samples for chemical analysis. A further fifteen (15) 6kg samples were recovered for foreign material content assessment.

The analysis detected low quantities of foreign material within the recovered samples. The quantities detected were below the maximum allowable concentrations prescribed in the *Excavated Natural Material Exemption 2012*. Therefore, the presence of foreign material within the material will not alter the classification of the material.

The laboratory analysis detected low EC levels and neutral pH levels within the recovered samples. The detected EC and pH levels were within the respective maximum allowable concentrations detailed within the NSW EPA *Excavated Natural Material Exemption 2012*. Furthermore, the calculated averages were within the respective maximum allowable average concentrations. Therefore, the EC and pH levels within the material will not alter the overall classification of the material.

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The chemical analysis detected concentrations of Arsenic, Chromium, Copper, Lead, Nickel and Zinc within the recovered samples. With the exception of Zinc, the concentrations were low and generally consistent between the samples. Though elevated Zinc concentrations were detected, the concentrations of all detected Heavy Metals were within the respective absolute maximum allowable concentrations as detailed within the NSW EPA *Excavated Natural Material Exemption 2012*. Furthermore, the calculated average concentrations for all of the detected heavy Metals were within the applicable maximum allowable average concentration prescribed within the NSW EPA *Excavated Natural Material Exemption 2012*. Therefore, the presence of Heavy Metals will not alter the overall classification of the material.

No concentrations of BTEX, TPH, Benzo(a)pyrene or Total PAH were detected within the recovered samples. Therefore, the material is considered as not affected by the presence of BTEX, TPH, Benzo(a)pyrene and Total PAH, and will not alter the overall classification of the material.

Based on this assessment, CSTS has classified **approximately 6,000m² of brown silty shaly clay with traces of shale to a depth of 0.8mbgl** as **Excavated Natural Material** in accordance with the NSW EPA *Excavated Natural Material Exemption 2012*.

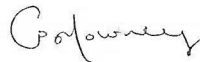
Should you have any further queries regarding this investigation, please do not hesitate to contact our office on (02) 9675 7522.

Yours sincerely,

Reviewed by:



Date: 17/01/2013



Date: 17/01/2013

Craig Ridley
Student Environmental Consultant
Compaction & Soil Testing Services
Pty Ltd

Celia Moloney
Environmental Consultant
Compaction & Soil Testing Services Pty
Ltd

Compaction & Soil Testing Services Pty Limited

Limitations

This classification covers **ONLY** the 6,000m² of brown silty shaly clay with traces of shale material to a terminal depth of 0.8m bgl to be excavated from within Cnr Jordan Springs Boulevard and Lakeside Parade, Jordan Springs NSW. No other material is covered under this classification.

This report covers the site at the time of sampling. Should there be any variations in site conditions since the above mentioned date such as importation of fill, chemical spillage, illegal dumping, etc, further assessment will be required. Should any suspect materials be encountered, we recommend that this office be contacted immediately for further assessment. Neither Compaction & Soil Testing Services Pty Ltd nor any other reputable firm can give unqualified warranties on the conditions of the site and subsurface conditions.

Transporting of this material must be carried out in accordance with the **Protection of Environmental Operations (POEO) Act 1997**.

Section 143 of the **Protection of the Environment Act 1997** states that if the waste is transported to a place that cannot lawfully be used as a waste facility for that waste, then the transporter and owner of the waste are each guilty of an offence. The transporter and owner of the waste both have a duty to ensure that the waste is disposed of in an appropriate manner. Compaction & Soil Testing Services Pty Ltd accepts no liability whatsoever for the unlawful disposal of any wastes from any site.

While Compaction & Soil Testing Services Pty Ltd takes all reasonable due care and diligence, we offer no absolute warranty for the material between the locations sampled and investigated. In addition Compaction & Soil Testing Services Pty Ltd does not assume any liability for site conditions not observed or accessible at the time of the investigation.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. If there is any change in the proposed development described in the report then all recommendations should be reviewed. No other warranty expressed or implied is made or intended. Copyright on this report remains the property of Compaction & Soil Testing Services Pty Ltd.

Subject to payment of all fees due for the investigation, the client alone shall have license to use the report. This report shall not be reproduced except in full.

If you have any queries about this investigation please do not hesitate to contact the undersigned

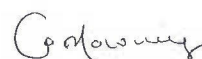
Yours sincerely,



Date: 17/01/2013

Craig Ridley
Student Environmental Consultant
Compaction & Soil Testing Services Pty Ltd

Reviewed by:



Date: 17/01/2013

Celia Moloney
Environmental Consultant
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Appendix

Site Sampling Plan

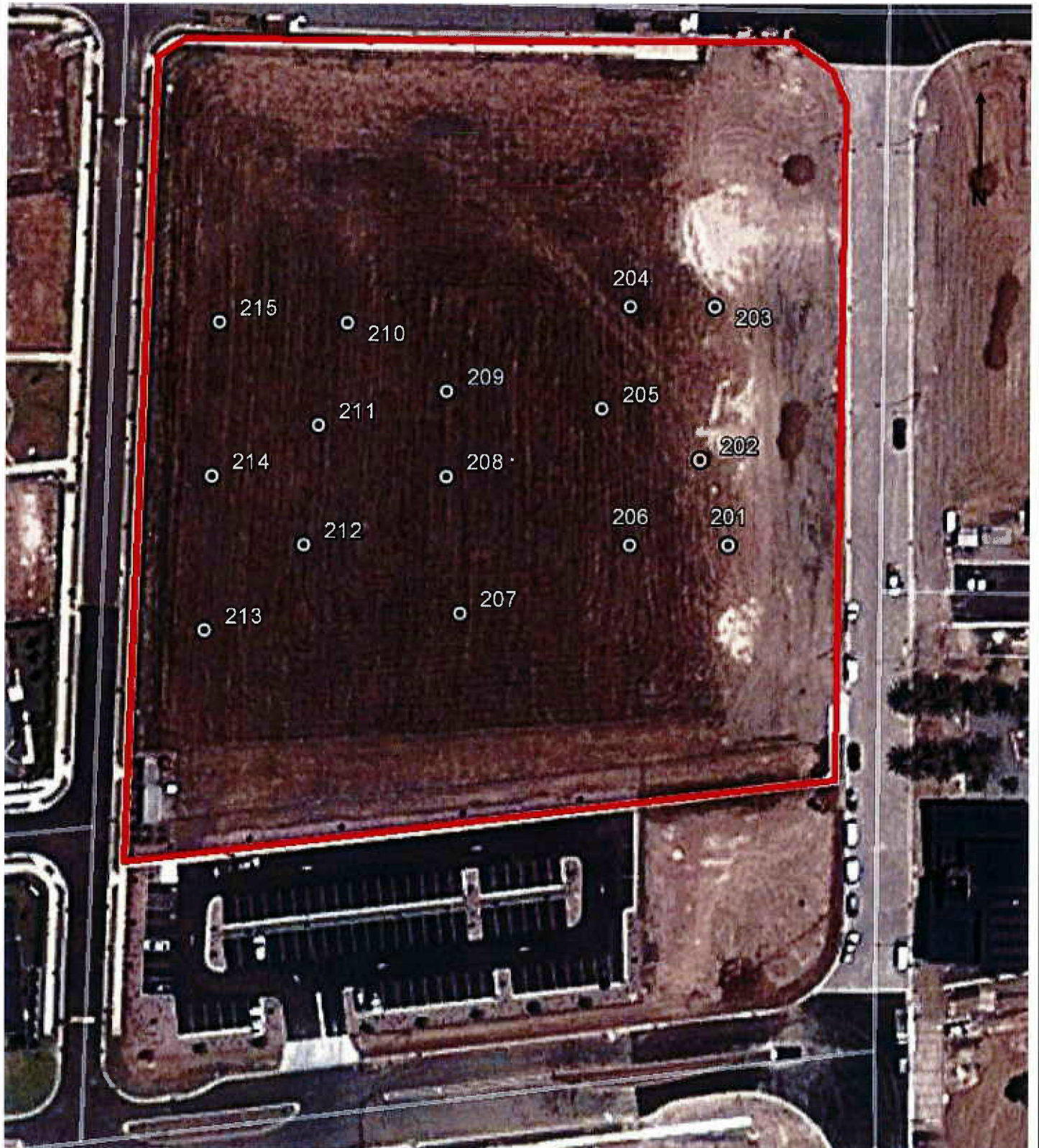
CSTS Chain of Custody Documentation

CSTS Foreign Material Content Reports

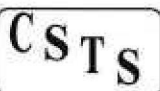
Envirolab Sample Receipt 83573

Envirolab Chain of Custody Documentation 83573

Envirolab Sample Receipt Certificate of Analysis 83573



Compaction and Soil Testing Services Pty Ltd



Notes: This drawing has been produced using a base plan provided by others to which additional information e.g.: density test, DCP and Test Pit locations or notes have been added. Some or all the information shown on the plan may not be relevant at the time of producing this drawing.

Drawn:	CR
Approved:	PC
Date:	16/01/2013
Scale:	Not to Scale

Insitu Excavated Natural Material Assessment
 Cnr Jordan Springs Boulevard & Lakeside Parade
 Jordan Springs NSW

Drawing No:	ADC 1646 ENV AB001
Job No:	ADC 1646



Laboratory Test Request

Client	ADCO Constructions Pty Ltd	Job No. ADC 1646
		Date Sampled: 20/12/2012
Project	Woolworths Site	Sampled By: CR
		Date Requested: 20/12/2012
Location	Jordan Springs	Date Results Requested By: STA
		Sampling Method:

Lab Sample No.		3343	3344	3345	3346	3347
Road / Street						
Chainage / Pit / GPS						
Offset						
Sample Depth (m)						
Sample type						
Sample ID		201	202	203	204	205
FOR USE AS						
MATERIAL SOURCE						

TESTING REQUIRED	Method					
Compaction - Std / Mod						
CBR - Soaked						
CBR - Equivalent						
Particle Size Distribution						
Atterberg						
Emerson						
Min Max						
Shrink / Swell Index						
Moisture Content						
Unit Weight						
Foreign Material	in house ENM	X	X	X	X	X

Remarks:



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3343 - FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008
--------------------	--

Sample Identification	201
Date Sampled	20/12/2012
Date Analysed	27/12/2012
Sample History	Oven Dried
Sampled by:	CR
% Retained on 4.75mm Sieve	37.28

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.0
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.0
TYPE II	
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.0
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3344 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008
Sample Identification	202
Date Sampled	20/12/2012
Date Analysed	27/12/2012
Sample History	Oven Dried
Sampled by:	CR
% Retained on 4.75mm Sieve	27.52

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.0
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.0
TYPE II	
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.0
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3345 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008
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Sample Identification	203
Date Sampled	20/12/2012
Date Analysed	27/12/2012
Sample History	Oven Dried
Sampled by:	CR
% Retained on 4.75mm Sieve	47.89

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.0
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.0
TYPE II	-
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	-
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.0
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3346 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008
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Sample Identification	204
Date Sampled	20/12/2012
Date Analysed	27/12/2012
Sample History	Oven Dried
Sampled by:	CR
% Retained on 4.75mm Sieve	41.47

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.0
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.0
TYPE II	
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	
Rubber	0.0
Plastic	0.1
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.1

Total Foreign Material Content (%)	0.1
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3347 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008
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Sample Identification	205
Date Sampled	20/12/2012
Date Analysed	27/12/2012
Sample History	Oven Dried
Sampled by:	CR
% Retained on 4.75mm Sieve	22.82

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.0
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.0
TYPE II	
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.0
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3348 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008
Sample Identification	206
Date Sampled	20/12/2012
Date Analysed	27/12/2012
Sample History	Oven Dried
Sampled by:	CR
% Retained on 4.75mm Sieve	47.61

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.0
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.0
TYPE II	-
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	-
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.1
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.1

Total Foreign Material Content (%)	0.1
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3349 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008		
Sample Identification	207		
Date Sampled	20/12/2012		
Date Analysed	27/12/2012		
Sample History	Oven Dried		
Sampled by:	CR		
% Retained on 4.75mm Sieve	42.38		

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.0
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.0
TYPE II	Percentage Retained (%)
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	Percentage Retained (%)
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.0
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3350 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008
--------------------	--

Sample Identification	208
Date Sampled	20/12/2012
Date Analysed	27/12/2012
Sample History	Oven Dried
Sampled by:	CR
% Retained on 4.75mm Sieve	51.27

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.0
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.0
TYPE II	
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.0
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3351 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008
Sample Identification	209
Date Sampled	20/12/2012
Date Analysed	27/12/2012
Sample History	Oven Dried
Sampled by:	CR
% Retained on 4.75mm Sieve	26.05

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.1
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.1
TYPE II	
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.1
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3352 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008		
Sample Identification	210		
Date Sampled	20/12/2012		
Date Analysed	27/12/2012		
Sample History	Oven Dried		
Sampled by:	CR		
% Retained on 4.75mm Sieve	34.20		

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.0
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.0
TYPE II	Percentage Retained (%)
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	Percentage Retained (%)
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.0
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3353 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008		
Sample Identification	211		
Date Sampled	20/12/2012		
Date Analysed	27/12/2012		
Sample History	Oven Dried		
Sampled by:	CR		
% Retained on 4.75mm Sieve	27.80		

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.0
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.0
TYPE II	
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.0
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3354 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008
Sample Identification	212
Date Sampled	20/12/2012
Date Analysed	27/12/2012
Sample History	Oven Dried
Sampled by:	CR
% Retained on 4.75mm Sieve	51.70

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.2
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.2
TYPE II	Percentage Retained (%)
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	Percentage Retained (%)
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.2
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3355 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008
Sample Identification	213
Date Sampled	20/12/2012
Date Analysed	27/12/2012
Sample History	Oven Dried
Sampled by:	CR
% Retained on 4.75mm Sieve	41.82

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.0
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.0
TYPE II	
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.0
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



Compaction & Soil Testing Services Pty Limited

1/78 Owen Street, GLENDENNING NSW 2761 • ABN 44 106 976 738

Phone: (02) 9675 7522 Fax: (02) 9675 7544

Email: office@comsoiltest.com.au Web: www.comsoiltest.com.au

Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3356 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008
Sample Identification	214
Date Sampled	20/12/2012
Date Analysed	27/12/2012
Sample History	Oven Dried
Sampled by:	CR
% Retained on 4.75mm Sieve	40.22

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.0
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.0
TYPE II	
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.0
---	------------

Prakash Chandra
Signed:

Date: 17/1/13



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Foreign Materials Content of Recycled Crushed Concrete Test Report

Client:	ADCO Constructions Pty Ltd	Job No.:	ADC 1646
Project:	Woolworths Site	Report Date:	17/01/2013
Location:	Jordan Springs NSW	Report No.:	3357 FM

Test Method	RTA T276 - Foreign Materials Content of Recycled Crushed Concrete Adapted In-House to Suit NSW DECC Excavated Natural Material Exemption 2008
Sample Identification	215
Date Sampled	20/12/2012
Date Analysed	27/12/2012
Sample History	Oven Dried
Sampled by:	CR
% Retained on 4.75mm Sieve	37.48

Foreign Material Type

TYPE I	Percentage Retained (%)
Metal	0.0
Glass	0.1
Asphalt	0.0
Concrete	0.0
Ceramics and Slag (other than Blast Furnace Slag)	0.0
Type I Total	0.1
TYPE II	-
Plaster	0.0
Friable Materials	0.0
Type II Total	0.0
TYPE III	-
Rubber	0.0
Plastic	0.0
Bitumen	0.0
Paper	0.0
Cloth	0.0
Paint	0.0
Construction & Processed Timber	0.0
Type III Total	0.0

Total Foreign Material Content (%)	0.1
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Prakash Chandra
Signed:

Date: 17/1/13



Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

Compaction and Soil Testing Pty Ltd
Unit 1, 78 Owen St
Glendenning NSW 2761

ph: 9675 7522
Fax: 9675 7544

Attention: Craig Ridley

Sample log in details:

Your reference:	ADC 1646
Envirolab Reference:	83573
Date received:	20/12/12
Date results expected to be reported:	9/01/13

Samples received in appropriate condition for analysis:	YES
No. of samples provided	15 soils
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack
Sampling Date Provided:	YES

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Compaction and Soil Testing Services Pty Ltd

Laboratory Test Request

Job No	APC 1646
Sheet	1 of 1

Project: Jordan Springs	CSTS Contact Person: Craig Ridley <input type="checkbox"/> Tested material to be disposed off site (EPA Validation)	Date Requested: 20/12/2012 Requested by: CM Date Required by: STA
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Laboratory Reference No.	Sample Identification <small>e.g. BH / TP No. Depth, & sample No. client reference No. sample location.</small>	Sample type <small>i.e. U50, or D for disturbed samples. S: Soil W: Water R: Rock</small>	Sampling Date	Test Method Requested - Test Required (/) Test completed (X)																	Additional Test Details <small>i.e. degree of compaction for CBR, confining pressures for triaxial, etc.</small>	Notes:				
				Combo 3	EC	pH																				
83573-12	212	S	20/12/2012	X	X	X																				
13	213	S	20/12/2012	X	X	X																				
14	214	S	20/12/2012	X	X	X																				
15	215	S	20/12/2012	X	X	X																				

Date Relinquished: 20/12/2012	Samples Received:	Send results to: office@comsoiltest.com.au; craig@comsoiltest.com.au	
Relinquished By: CM	Please sign and date to acknowledge receipt of and return by fax.	Compaction & Soil Testing Services Pty Ltd	Phone: (02) 96757522
Total number of samples in container: 15	Date: 20/12/12.	Unit 1/78 Owen Street	Fax: (02) 96757544
Results required by: STA	Signature:	Glendenning NSW 2761	

CERTIFICATE OF ANALYSIS

83573

Client:

Compaction and Soil Testing Pty Ltd
Unit 1, 78 Owen St
Glendenning
NSW 2761

Attention: Craig Ridley

Sample log in details:

Your Reference:	ADC 1646	
No. of samples:	15 soils	
Date samples received / completed instructions received	20/12/12	/ 20/12/12

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	9/01/13	/	4/01/13
Date of Preliminary Report:	Not Issued		


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Results Approved By:


Rhian Morgan
Reporting Supervisor


Priya Samarawickrama
Senior Chemist


Alex MacLean
Chemist


Jeremy Faircloth
Chemist

Client Reference: ADC 1646

vTRH(C6-C10)/BTEXN in Soil	UNITS	83573-1	83573-2	83573-3	83573-4	83573-5
Our Reference:	-----	201	202	203	204	205
Your Reference	-----	201	202	203	204	205
Date Sampled	-----	20/12/2012	20/12/2012	20/12/2012	20/12/2012	20/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	22/12/2012	22/12/2012	22/12/2012	22/12/2012	22/12/2012
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	106	107	109	105	105

vTRH(C6-C10)/BTEXN in Soil	UNITS	83573-6	83573-7	83573-8	83573-9	83573-10
Our Reference:	-----	206	207	208	209	210
Your Reference	-----	206	207	208	209	210
Date Sampled	-----	20/12/2012	20/12/2012	20/12/2012	20/12/2012	20/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	22/12/2012	22/12/2012	22/12/2012	22/12/2012	22/12/2012
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	117	117	104	112	109

Client Reference: ADC 1646

vTRH(C6-C10)/BTEXN in Soil	UNITS	83573-11	83573-12	83573-13	83573-14	83573-15
Our Reference:	-----	211	212	213	214	215
Your Reference	-----	20/12/2012	20/12/2012	20/12/2012	20/12/2012	20/12/2012
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	22/12/2012	22/12/2012	22/12/2012	22/12/2012	22/12/2012
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	115	113	103	112	107

Client Reference: ADC 1646

svTRH(C10-C40) in Soil	UNITS	83573-1	83573-2	83573-3	83573-4	83573-5
Our Reference:	-----	201	202	203	204	205
Your Reference	-----	20/12/2012	20/12/2012	20/12/2012	20/12/2012	20/12/2012
Date Sampled	-----	Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	97	105	100	97	109

svTRH(C10-C40) in Soil	UNITS	83573-6	83573-7	83573-8	83573-9	83573-10
Our Reference:	-----	206	207	208	209	210
Your Reference	-----	20/12/2012	20/12/2012	20/12/2012	20/12/2012	20/12/2012
Date Sampled	-----	Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	97	123	92	96	88

svTRH(C10-C40) in Soil	UNITS	83573-11	83573-12	83573-13	83573-14	83573-15
Our Reference:	-----	211	212	213	214	215
Your Reference	-----	20/12/2012	20/12/2012	20/12/2012	20/12/2012	20/12/2012
Date Sampled	-----	Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	85	96	90	91	95

Client Reference: ADC 1646

PAHs in Soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ----- -----	83573-1 201 20/12/2012 Soil	83573-2 202 20/12/2012 Soil	83573-3 203 20/12/2012 Soil	83573-4 204 20/12/2012 Soil	83573-5 205 20/12/2012 Soil
Date extracted	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.1	<0.1	<0.1	0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d ₁₄	%	100	99	97	97	96

Client Reference: ADC 1646

PAHs in Soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ----- -----	83573-6 206 20/12/2012 Soil	83573-7 207 20/12/2012 Soil	83573-8 208 20/12/2012 Soil	83573-9 209 20/12/2012 Soil	83573-10 210 20/12/2012 Soil
Date extracted	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d ₁₄	%	96	103	90	97	91

Client Reference: ADC 1646

PAHs in Soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ----- -----	83573-11 211 20/12/2012 Soil	83573-12 212 20/12/2012 Soil	83573-13 213 20/12/2012 Soil	83573-14 214 20/12/2012 Soil	83573-15 215 20/12/2012 Soil
Date extracted	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	87	100	96	93	95

Client Reference: ADC 1646

Acid Extractable metals in soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ----- -----	83573-1 201 20/12/2012 Soil	83573-2 202 20/12/2012 Soil	83573-3 203 20/12/2012 Soil	83573-4 204 20/12/2012 Soil	83573-5 205 20/12/2012 Soil
Date digested	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Arsenic	mg/kg	8	8	5	6	5
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	12	11	7	10	9
Copper	mg/kg	54	46	31	24	29
Lead	mg/kg	30	27	16	17	17
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	30	59	25	8	22
Zinc	mg/kg	180	260	110	42	100

Acid Extractable metals in soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ----- -----	83573-6 206 20/12/2012 Soil	83573-7 207 20/12/2012 Soil	83573-8 208 20/12/2012 Soil	83573-9 209 20/12/2012 Soil	83573-10 210 20/12/2012 Soil
Date digested	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Arsenic	mg/kg	9	5	6	7	6
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	10	8	12	12	10
Copper	mg/kg	29	32	27	36	31
Lead	mg/kg	20	21	20	21	19
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	13	29	21	21	9
Zinc	mg/kg	52	120	83	90	39

Acid Extractable metals in soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ----- -----	83573-11 211 20/12/2012 Soil	83573-12 212 20/12/2012 Soil	83573-13 213 20/12/2012 Soil	83573-14 214 20/12/2012 Soil	83573-15 215 20/12/2012 Soil
Date digested	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Arsenic	mg/kg	6	6	6	9	6
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	9	16	11	17	9
Copper	mg/kg	38	22	25	34	42
Lead	mg/kg	23	21	16	28	19
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	15	11	10	18	24
Zinc	mg/kg	83	36	45	94	120

Client Reference: ADC 1646

Miscellaneous Inorg - soil						
Our Reference:	UNITS	83573-1	83573-2	83573-3	83573-4	83573-5
Your Reference	-----	201	202	203	204	205
Date Sampled	-----	20/12/2012	20/12/2012	20/12/2012	20/12/2012	20/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/01/2013	03/01/2013	03/01/2013	03/01/2013	03/01/2013
Date analysed	-	03/01/2013	03/01/2013	03/01/2013	03/01/2013	03/01/2013
pH 1:5 soil:water	pH Units	5.9	7.3	6.4	5.9	6.9
Electrical Conductivity 1:5 soil:water	µS/cm	120	190	120	110	100

Miscellaneous Inorg - soil						
Our Reference:	UNITS	83573-6	83573-7	83573-8	83573-9	83573-10
Your Reference	-----	206	207	208	209	210
Date Sampled	-----	20/12/2012	20/12/2012	20/12/2012	20/12/2012	20/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/01/2013	03/01/2013	03/01/2013	03/01/2013	03/01/2013
Date analysed	-	03/01/2013	03/01/2013	03/01/2013	03/01/2013	03/01/2013
pH 1:5 soil:water	pH Units	7.3	8.4	6.8	6.2	5.6
Electrical Conductivity 1:5 soil:water	µS/cm	240	330	190	110	96

Miscellaneous Inorg - soil						
Our Reference:	UNITS	83573-11	83573-12	83573-13	83573-14	83573-15
Your Reference	-----	211	212	213	214	215
Date Sampled	-----	20/12/2012	20/12/2012	20/12/2012	20/12/2012	20/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/01/2013	03/01/2013	03/01/2013	03/01/2013	03/01/2013
Date analysed	-	03/01/2013	03/01/2013	03/01/2013	03/01/2013	03/01/2013
pH 1:5 soil:water	pH Units	5.9	7.5	7.2	6.0	6.4
Electrical Conductivity 1:5 soil:water	µS/cm	91	270	280	74	120

Client Reference: ADC 1646

Moisture						
Our Reference:	UNITS	83573-1	83573-2	83573-3	83573-4	83573-5
Your Reference:	-----	201	202	203	204	205
Date Sampled	-----	20/12/2012	20/12/2012	20/12/2012	20/12/2012	20/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	27/12/2012	27/12/2012	27/12/2012	27/12/2012	27/12/2012
Moisture	%	33	33	9.6	8.6	5.7

Moisture						
Our Reference:	UNITS	83573-6	83573-7	83573-8	83573-9	83573-10
Your Reference:	-----	206	207	208	209	210
Date Sampled	-----	20/12/2012	20/12/2012	20/12/2012	20/12/2012	20/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	27/12/2012	27/12/2012	27/12/2012	27/12/2012	27/12/2012
Moisture	%	7.9	5.0	12	6.5	18

Moisture						
Our Reference:	UNITS	83573-11	83573-12	83573-13	83573-14	83573-15
Your Reference:	-----	211	212	213	214	215
Date Sampled	-----	20/12/2012	20/12/2012	20/12/2012	20/12/2012	20/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/12/2012	21/12/2012	21/12/2012	21/12/2012	21/12/2012
Date analysed	-	27/12/2012	27/12/2012	27/12/2012	27/12/2012	27/12/2012
Moisture	%	19	19	8.8	33	9.1

Client Reference: ADC 1646

MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 draft Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 draft Guideline on Investigation Levels for Soil and Groundwater.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM draft B1 Guideline on Investigation Levels for Soil and Groundwater.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA 22nd ED, 4500-H+.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell and dedicated meter, in accordance with APHA 22nd ED 2510 and Rayment & Lyons.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

Client Reference: ADC 1646

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			21/12/2012	83573-1	21/12/2012 21/12/2012	LCS-8	21/12/2012
Date analysed	-			22/12/2012	83573-1	22/12/2012 22/12/2012	LCS-8	22/12/2012
TRHC ₆ - C ₉	mg/kg	25	Org-016	<25	83573-1	<25 <25	LCS-8	96%
TRHC ₆ - C ₁₀	mg/kg	25	Org-016	<25	83573-1	<25 <25	LCS-8	96%
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	25	Org-016	[NT]	83573-1	<25 <25	[NR]	[NR]
Benzene	mg/kg	0.2	Org-016	<0.2	83573-1	<0.2 <0.2	LCS-8	99%
Toluene	mg/kg	0.5	Org-016	<0.5	83573-1	<0.5 <0.5	LCS-8	95%
Ethylbenzene	mg/kg	1	Org-016	<1	83573-1	<1 <1	LCS-8	91%
m+p-xylene	mg/kg	2	Org-016	<2	83573-1	<2 <2	LCS-8	97%
o-Xylene	mg/kg	1	Org-016	<1	83573-1	<1 <1	LCS-8	97%
naphthalene	mg/kg	1	Org-014	<1	83573-1	<1 <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	111	83573-1	106 105 RPD: 1	LCS-8	94%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH (C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			21/12/2012	83573-1	21/12/2012 21/12/2012	LCS-7	21/12/2012
Date analysed	-			21/12/2012	83573-1	21/12/2012 21/12/2012	LCS-7	21/12/2012
TRHC ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	83573-1	<50 <50	LCS-7	107%
TRHC ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	83573-1	<100 <100	LCS-7	108%
TRHC ₂₈ - C ₃₆	mg/kg	100	Org-003	<100	83573-1	<100 <100	LCS-7	83%
TRH>C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	83573-1	<50 <50	LCS-7	107%
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	50	Org-003	[NT]	83573-1	<50 <50	[NR]	[NR]
TRH>C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	83573-1	<100 <100	LCS-7	83%
TRH>C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	83573-1	<100 <100	LCS-7	85%
Surrogate o-Terphenyl	%		Org-003	98	83573-1	97 93 RPD: 4	LCS-7	129%

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QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			21/12/2012	83573-1	21/12/2012 21/12/2012	LCS-7	21/12/2012
Date analysed	-			21/12/2012	83573-1	21/12/2012 21/12/2012	LCS-7	21/12/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	LCS-7	102%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	LCS-7	104%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	LCS-7	108%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	LCS-7	108%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	LCS-7	110%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	LCS-7	99%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	83573-1	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	83573-1	<0.05 <0.05	LCS-7	103%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	83573-1	<0.1 <0.1	[NR]	[NR]
Benzo(a)pyrene TEQ	mg/kg	0.5	Org-012 subset	[NT]	83573-1	<0.5 <0.5	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	103	83573-1	100 95 RPD: 5	LCS-7	95%

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QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base Duplicate %RPD		
Date digested	-			21/12/2012	83573-1	21/12/2012 21/12/2012	LCS-1	21/12/2012
Date analysed	-			21/12/2012	83573-1	21/12/2012 21/12/2012	LCS-1	21/12/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	83573-1	8 7 RPD: 13	LCS-1	93%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	83573-1	<0.5 <0.5	LCS-1	97%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	83573-1	12 11 RPD: 9	LCS-1	95%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	83573-1	54 52 RPD: 4	LCS-1	94%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	83573-1	30 29 RPD: 3	LCS-1	95%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	83573-1	<0.1 <0.1	LCS-1	103%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	83573-1	30 26 RPD: 14	LCS-1	95%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	83573-1	180 160 RPD: 12	LCS-1	96%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorg - soil						Base Duplicate %RPD		
Date prepared	-			03/01/2013	83573-1	03/01/2013 03/01/2013	LCS-1	03/01/2013
Date analysed	-			03/01/2013	83573-1	03/01/2013 03/01/2013	LCS-1	03/01/2013
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	83573-1	5.9 5.9 RPD: 0	LCS-1	101%
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	83573-1	120 120 RPD: 0	LCS-1	104%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank				
Moisture								
Date prepared	-			[NT]				
Date analysed	-			[NT]				
Moisture	%	0.1	Inorg-008	[NT]				
QUALITY CONTROL	UNITS		Dup. Sm#		Duplicate			
vTRH(C6-C10)/BTEX in Soil					Base + Duplicate + %RPD			
Date extracted	-		83573-11	21/12/2012 21/12/2012				
Date analysed	-		83573-11	22/12/2012 22/12/2012				
TRHC ₆ - C ₉	mg/kg		83573-11	<25 <25				
TRHC ₆ - C ₁₀	mg/kg		83573-11	<25 <25				
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg		83573-11	<25 <25				
Benzene	mg/kg		83573-11	<0.2 <0.2				
Toluene	mg/kg		83573-11	<0.5 <0.5				
Ethylbenzene	mg/kg		83573-11	<1 <1				

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QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
m+p-xylene	mg/kg	83573-11	<2 <2
o-Xylene	mg/kg	83573-11	<1 <1
naphthalene	mg/kg	83573-11	<1 <1
Surrogate aaa- Trifluorotoluene	%	83573-11	115 111 RPD: 4
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	83573-11	21/12/2012 21/12/2012
Date analysed	-	83573-11	21/12/2012 21/12/2012
TRHC ₁₀ - C ₁₄	mg/kg	83573-11	<50 <50
TRHC ₁₅ - C ₂₈	mg/kg	83573-11	<100 <100
TRHC ₂₉ - C ₃₆	mg/kg	83573-11	<100 <100
TRH>C ₁₀ -C ₁₆	mg/kg	83573-11	<50 <50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	83573-11	<50 <50
TRH>C ₁₆ -C ₃₄	mg/kg	83573-11	<100 <100
TRH>C ₃₄ -C ₄₀	mg/kg	83573-11	<100 <100
Surrogate o-Terphenyl	%	83573-11	85 117 RPD: 32
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	83573-11	21/12/2012 21/12/2012
Date analysed	-	83573-11	21/12/2012 21/12/2012
Naphthalene	mg/kg	83573-11	<0.1 <0.1
Acenaphthylene	mg/kg	83573-11	<0.1 <0.1
Acenaphthene	mg/kg	83573-11	<0.1 <0.1
Fluorene	mg/kg	83573-11	<0.1 <0.1
Phenanthrene	mg/kg	83573-11	<0.1 <0.1
Anthracene	mg/kg	83573-11	<0.1 <0.1
Fluoranthene	mg/kg	83573-11	<0.1 <0.1
Pyrene	mg/kg	83573-11	<0.1 <0.1
Benzo(a)anthracene	mg/kg	83573-11	<0.1 <0.1
Chrysene	mg/kg	83573-11	<0.1 <0.1
Benzo(b+k)fluoranthene	mg/kg	83573-11	<0.2 <0.2
Benzo(a)pyrene	mg/kg	83573-11	<0.05 <0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	83573-11	<0.1 <0.1
Dibenzo(a,h)anthracene	mg/kg	83573-11	<0.1 <0.1
Benzo(g,h,i)perylene	mg/kg	83573-11	<0.1 <0.1
Benzo(a)pyrene TEQ	mg/kg	83573-11	<0.5 <0.5
Surrogate p-Terphenyl- d ₁₄	%	83573-11	87 61 RPD: 35

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QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date digested	-	83573-11	21/12/2012 21/12/2012
Date analysed	-	83573-11	21/12/2012 21/12/2012
Arsenic	mg/kg	83573-11	6 6 RPD: 0
Cadmium	mg/kg	83573-11	<0.5 <0.5
Chromium	mg/kg	83573-11	9 10 RPD: 11
Copper	mg/kg	83573-11	38 30 RPD: 24
Lead	mg/kg	83573-11	23 19 RPD: 19
Mercury	mg/kg	83573-11	<0.1 <0.1
Nickel	mg/kg	83573-11	15 12 RPD: 22
Zinc	mg/kg	83573-11	83 62 RPD: 29
QUALITY CONTROL Miscellaneous Inorg - soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date prepared	-	83573-11	03/01/2013 03/01/2013
Date analysed	-	83573-11	03/01/2013 03/01/2013
pH 1:5 soil:water	pH Units	83573-11	5.9 5.8 RPD: 2
Electrical Conductivity 1:5 soil:water	µS/cm	83573-11	91 91 RPD: 0

Report Comments:

Asbestos ID was analysed by Approved Identifier: Not applicable for this job
Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.