LIMITED PHASE 2 ENVIRONMENTAL SITE INVESTIGATION

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

Geotechnical Engineering
Engineering Geology
Hydrogeology
Contaminated Site Assessment
Construction Materials Testing
Environmental Monitoring

BANK STREET PYRMONT SYDNEY

Prepared for

Aurecon

Prepared by

RCA AUSTRALIA

RCA ref 8535-401/1

JUNE 2011

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RCA ref 8535-401/1

1 June 2011

Aurecon Group
Level 2
116 Military Road
Neutral Bay NSW 2089

Attention: Mr Nick Hearfield

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

Geotechnical Engineering
Engineering Geology
Environmental Engineering
Hydrogeology
Construction Materials Testing
Environmental Monitoring
Noise & Vibration
Occupational Hygiene

LIMITED PHASE 2 ENVIRONMENTAL SITE INVESTIGATION

AURECON CONSTRUCTION COMPOUND, ANZAC BRIDGE MAINTENANCE PYRMONT, SYDNEY

1 INTRODUCTION

RCA Australia (RCA) was commissioned by Aurecon to undertake a limited phase 2 environmental site investigation at Bank Street, Pyrmont, Sydney.

The site has been divided into two (2) individual sites according to proposed site use, as shown on **Drawing 1, Appendix A**, to be used for:

- construction compound for Bridge Solutions Alliance (BSA) during bridge maintenance works;
- storage and access for Dragon boat equipment by NSW Maritime.

This report details the findings of the soil investigation conducted on the NSW Maritime portion of the site.

As part of their lease agreement for the compound, BSA are planning to undertake minor earthworks in order to grade the NSW Maritime portion of the site; including the filling of minor depressions, and to provide drainage infrastructure at the site. Aurecon has estimated the depth of disturbance will be between 0.5 and 1.0m below ground level, with deeper excavations to occur for a proposed boat ramp at the site.

The purpose of this investigation is to determine the contamination status of the site prior to the commencement of earthworks for due diligence and OH&S purposes.

2 SITE DESCRIPTION AND LOCATION

The site is located beneath the Anzac Bridge on Bank Street, Pyrmont, NSW. The site covers an area of approximately 0.56ha and is relatively flat, and unpaved. It is bound to the north by commercial development, to the east by commercial/industrial development and the Western Distributor, to the south by Blackwattle Bay, and to the west by Anzac Bridge and Blackwattle Bay.

The closest environmental feature is Blackwattle Bay, as shown on **Drawing 1**, **Appendix A**. The closest sensitive site is KU Maybanke preschool, located approximately 400m east of the site.

3 PREVIOUS REPORTS (REF [1])

As requested by BSA, no site history assessment has been undertaken due to the tight time frame associated with the works. However a previous assessment report completed by Noel Arnold & Associates was provided for consideration in the derivation of the scope of works.

RCA has undertaken a brief review of this report, which adopted the Health Investigation Level 'E' (HIL 'E') which is applicable to parks, recreational open space and playing fields; including secondary schools due to the proposed use of the site as a public boat ramp. Given the understanding that the site will now be fully capped, the use of these guidelines is considered conservative.

A total of eight (8) testpits were excavated in the central portion of the site, considered to be largely within the area of the Aurecon compound. Samples were collected of the shallow soils (<0.6m) and analysed for a suite of total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc, mercury), volatile organic compounds (VOC) and asbestos. The investigation found two (2) samples (TP5-0.4m and TP7-0.3m) to exceed the adopted guidelines for TPH C_{10}-C_{36} and five (5) samples (TP3-0.3m, TP5-0.4m, TP6-0.5m, TP7-0.3m, TP8-0.3m) to exceed the guidelines for benzo (a) pyrene and total PAH. The B(a)P and PAH concentrations reported are significantly over the acceptable concentrations for a commercial/industrial site and in excess of the criteria for acceptance as restricted solid waste at a licensed waste facility (ie, hazardous waste).

These sample locations are shown on **Drawing 2**, **Appendix A**.

The findings of this report indicate there is strong potential for contamination to be present at the site in the fill material, especially PAH. Noel Arnold recommended that this material be excavated and undergo additional waste classification prior to disposal. RCA understand that this work has not been undertaken.

In addition to the report above, RCA has considered the potential contamination based on the proximity of the site next to the harbour, and the potential for maritime related industries, as well as the potential for uncontrolled filling to have impacted the site.

4 FIELDWORK

An environmental scientist experienced in the handling of potentially contaminated soil undertook the fieldwork on the 29 April 2011.

A total of nine (9) test pits were excavated across the site to a maximum depth of 0.8m. Soil samples were collected from 0-0.3m at all locations, with TP11b having an additional sample taken from 0.6-0.8m as field staff indicated a boat ramp was proposed in this location. All samples were analysed for total recoverable hydrocarbons (TRH); benzene, toluene, ethylbenzene and xylenes (BTEX); polycyclic aromatic hydrocarbons (PAH) and metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg). An additional shallow sample (0-0.3m) was collected from four (4) of the locations to create two (2) composite samples, which had the additional analysis of organochlorine pesticides (OCP) and polychlorinated biphenols (PCB). Samples TP3a and TP11b had the additional analysis for tributyl tin (TBT).

The collection of all soil samples was undertaken in compliance with RCA methodology, which forms part of our accreditation. Soil sample collection methods comprised disturbed soil samples from the bulk of soil within the excavator bucket. These soil collection methods were chosen for the site due to the difficult digging conditions at the site and the requirement for full inspection of the site's strata.

No decontamination of the excavator bucket was undertaken, however the collection of the sample from within the bulk of the excavated material (rather than against the side of the bucket) is considered to prevent potential cross contamination.

The upper 1m of the subsurface at the site generally consisted of fill material containing clayey sand with concrete/brick/tile cobbles and fine to course gravel. Natural materials were encountered only in TP11b from 0.6-0.8m. All pits were logged by a qualified scientist and all samples were described for future reference. Test pit logs are attached in **Appendix B**.

5 QUALITY ASSURANCE/QUALITY CONTROL

All samples were preserved as recommended by the analytical laboratory and stored in the field in an Esky on ice (at approximately 4^{o}C). Samples were sent to the laboratory the day of sampling.

All samples were sent under Chain of Custody (COC) documentation detailing the sample identification, required analysis, the name of the sampler and date released from custody. The laboratory acknowledged the receipt of samples by signature and date and returned the COC with a sample receipt notice indicating the condition of the samples received upon receipt.

A total of one (1) soil duplicate sample was submitted blind to the laboratory for analysis. This represents a percentage of 10%, in accordance the Australian Standard and RCA protocol.

Results are summarised in **Appendix C**.

Results indicate that no soil analyses reported an RPD in excess of the acceptance criteria.

The field blank reported an arsenic concentration of 3.9mg/kg. This blank was obtained from the laboratory and was requested to be of suitable quality for metals analysis. It is considered that either this blank was suitable for organic analysis only or that there has been some cross contamination during the sampling process. Due to the non-volatile nature of the contaminant it is considered that the arsenic is more likely to be from source and not a result of cross contamination. The field blank and all samples collected reported arsenic concentrations well below the primary HIL 'E' guidelines (200mg/kg) and it is therefore considered that this minor non-compliance has no significant impact on results.

MGT Labmark was chosen as the primary laboratory; this laboratory is NATA accredited and are experienced in the analytical requirements for potentially contaminated soil.

MGT Labmark undertook internal quality assurance testing. Results are contained within the laboratory report sheets, **Appendix D**. **Table 1** presents a summary of their review.

Table 1 *Internal Quality Assurance Review*

	Number Samples (including QA)	Laboratory Duplicates	Spikes	Laboratory Control Samples	Laboratory Blanks
Requirement		**10%**	**5%**	**One every batch**	**One every batch**
Soil					
Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Hg)	11 (2)	2	1	1	1
TRH C_6-C_9	13 (2)	2	1	1	1
TRH C_{10}-C_{36}	11 (2)	2	1	1	1
BTEX	13 (2)	2	1	1	1
PAHs	10 (2)	2	1	1	1
OCP/PCB	1 (1)	0 (1)	0 (1)	1	1

Numbers in brackets refer to the tests undertaken on samples not from this project but within the same laboratory batch

Examination of the above table reveals that MGT Labmark has undertaken laboratory quality assurance testing in accordance with the NEPM:

- Recoveries of Surrogates were within acceptance criteria of 70-130%.
- Holding Times were within laboratory specified timeframes.
- Recoveries of laboratory control samples were within the acceptance criteria of 70-130%.
- Recoveries of Spikes were within acceptance criteria of 70-130%.

- Relative Percentage Differences for duplicates were within acceptance criteria.
- No laboratory blank was detected above the PQL.

It is therefore considered that the data obtained from this testing is accurate and reliable in as far as it can be ascertained.

6 SITE GUIDELINES

6.1 SOIL

6.1.1 NEPM – NATIONAL ENVIRONMENT PROTECTION (ASSESSMENT OF SITE CONTAMINATION) MEASURE (1999)

The guidelines used for the assessment of the soil on site were sourced from the National Environment Protection Measure (NEPM) for the Assessment of Site Contamination, 1999 (Ref [2]). Schedule B (1) of this measure provides a table for the investigation concentrations for contaminants based on human health risk and certain exposure scenarios due to site use.

Legislative requirements prescribe assessment on the basis of the most sensitive allowable site use.

Currently the site is undeveloped and based on information provided to RCA, the proposed use consists of dragon boat storage, access and a proposed dragon boat ramp, and development of a park by NSW Maritime. RCA therefore considers the following guidelines to be appropriate for site assessment:

- HIL 'E' - Parks, recreational open space and playing fields, including secondary schools.
- HIL 'F' - Commercial/industrial, no poultry, no fruit or vegetable consumption, no groundwater consumption: includes premises such as shops and offices as well as factories and industrial sites. Thirty years is the assumed duration of exposure.

Refer to **Appendix E** for a copy of the exposure scenarios for the derivation of the above guidelines.

The NEPM sets out an acceptance procedure by which sites can be considered as suitable for use depending on the sample results. The mean of the sample results can be compared to the guidelines as long as:

- no single value exceeds 250% of the chosen guidelines;
- the standard deviation of the results for each analyte is less than 50% of the guideline.

However, this approach does not allow for sampling and analytical variability, therefore the Sampling Design Guidelines (Ref [3]) recommends the use of the 95%UCL_{ave}, calculated for a site using samples collected from the same lithology, for comparison with the guidelines.

6.1.2 NSWEPA – SERVICE STATION GUIDELINES

The guidelines adopted for TPH C_6-C_9, TPH C_{10}-C_{36} and BTEX were the "Guidelines for Assessing Service Station Sites" produced by the NSWEPA, December 1994, (Ref [4]). These guidelines are applicable for soil and water concentrations on all sites where fuel has been stored.

6.2 APPROPRIATENESS OF THE GUIDELINES

The NEPM document has been approved by the NSWEPA for use on potentially contaminated sites and supersedes most of the preceding reference documents. This document is currently being reviewed. The HIL 'E' criteria are considered conservative for the site in the event that it is sealed and so the HIL 'F' criteria has been included.

The Service Station Guidelines are still current for TPH and BTEX concentrations. Due to changes pending in the NEPM document, laboratory analysis is now being undertaken for total recoverable hydrocarbons (TRH). This analysis includes all forms of hydrocarbons, not just petroleum hydrocarbons and therefore can be considered a conservative measure against the TPH criteria.

The exposure settings on which the NEPM guidelines are based directly affect the investigation concentration used to assess the contamination status of the site. While the development appears to fit into the listed categories it is possible that a change in the development may designate the site into a more sensitive land use.

7 RESULTS

All soil results are compared to the relevant guidelines in **Appendix F**. In summary:

- All samples analysed for BTEX reported concentrations below the laboratory limit of detection, and therefore below the site guidelines.
- All samples analysed of TRH C_6 – C_{10} reported concentrations below the laboratory limit of detection, and therefore below the site guidelines.
- All samples analysed for TRH C_{10} – C_{36} reported concentrations below the site guideline, with the exception of TP1a and TP11b which reported elevated concentrations.
- All samples analysed for PAHs reported concentrations below the site guideline, with the exception of:
    - TP1a which reported elevated concentrations of benzo(a) pyrene; and

  - TP11b and TP5a which reported elevated concentrations of benzo(a) pyrene and total PAHs.

- All samples analysed for metals reported concentrations below the primary HIL 'E' site guidelines.

- All samples analysed for OCPs reported concentrations below the laboratory limit of detection and therefore below the primary HIL 'E' site guidelines.

- All samples analysed for PCBs reported concentrations below the laboratory limit of detection and therefore below the primary HIL 'E' site guidelines.

- All samples analysed for TBT reported concentrations below the laboratory level of detection, which is <1ng/g. There are currently no guidelines for TBT in soil, however the absence of detectable concentrations is considered to indicate a low risk to human health or the environment.

8 DISCUSSION

Significant TRH and PAH contamination was identified in samples TP1a, TP5a and TP11b.

Samples TP1a and TP5a are both contained within a fill layer that includes construction materials within a clayey sand matrix. Results of other samples in this material, by RCA and by Noel Arnold (Ref [1]), indicate a wide range of contaminant concentrations. It is therefore considered that contamination is randomly distributed throughout fill material and that there are possibly higher concentrations that have not been identified.

Sample TP11b is contained within the natural soils below the fill material, suggesting that contamination at this location appears to have taken place before the fill material was placed on site and that the contamination has been interacting with the environment for a significant amount of time. This sample is the only one of the deeper soils and so no conclusions regarding the extent of contamination can be made. It is likely however, in the absence of any known historical point source of contamination, that the detected concentrations may have resulted from interaction with the Harbour where there is a high volume of shipping or harbourside commercial/industrial activities where historical discharges may have caused hydrocarbon contamination. Therefore it is possible that all the natural soils which have historically interacted with the Harbour may be similarly contaminated.

The identified contamination is semi volatile and biodegradable, however PAH are less amenable to these processes and the depth to TP11B would significantly restrict the biodegradation processes. It would not be expected that significant decrease of the identified concentrations would occur without active intervention and augmentation.

In its current condition, there is unlikely to be any significant exposure to human health as there is no active use of the site and only transient occupants (passersby) enter the site. The proposed increased use of the site may increase the possible exposure to human health from soils contact. During any construction works of the site prior to sealing, OH&S measures should be implemented to ensure that exposure is minimised. These measures could include minimising dust during earthworks, masks to prevent dust inhalation, and minimising dermal contact with soils.

Similarly the potential risk to the environment in the site's current state is considered low. The concentrations identified the shallow fill and the deeper natural material may be leaching into the groundwater or into the surface water and Blackwattle Bay, however the concentrations from this material are unlikely to be significantly impacting the quality of the receiving waters.

RCA recommends the following:

- Capping of the site, concrete/bitumen/marker layer and grass, such that an effective barrier between potential receptors (environment or users of the site) and the potentially contaminated fill is created.

- Implementation of a site environmental management plan which identifies that the site is potentially contaminated and details controls to ensure the protection of human health and the environment. These controls should include the following:

    - OH&S controls for any works being undertaken prior to capping of the site and any works beneath the cap on the site when complete. These should include, but not necessarily be restricted to, dust mitigation, restriction of contact with potentially contaminated soils and strict hygiene standards prior to eating or drinking.

    - A requirement that all materials requiring offsite disposal are placed in stockpiles of similar appearance for waste characterisation sampling, in order to be accepted by a licensed waste facility. Currently all samples of the fill material are classified as restricted solid waste with the exception of TP5A which is hazardous waste. Waste classification guidelines are two tiered and if leachable concentrations are acceptable, the total concentrations identified in the fill material during this investigation could be classified as general solid waste. The natural material (as characterised by TP11b) would be classified as hazardous waste and would require a specialised contractor to remove and treat the waste prior to disposal.

- Minimising disturbance of all natural soils due to the detected contamination at TP11:

    - If excavation in the vicinity of TP11 is required, it is recommended that a construction management plan be compiled to implement measures to protect human health and the environment. This plan should include all site management plan conditions and consider what additional measures may be required due to additional exposure by the works.

9 CONCLUSIONS

This report presents the findings of an environmental site investigation undertaken at a site beneath the Anzac Bridge, Pyrmont.

The investigation comprised the sampling of shallow (<1m) soils from a total of nine (9) test pits across the site. Samples were analysed from a suite of contaminants including TRH, BTEX, PAH, metals, OCP, PCB and TBT.

Results of this sampling, and previous sampling in the other portion of the site, indicates that contamination is randomly distributed throughout the fill material and this entire layer should be considered potentially contaminated. There is insufficient information to determine the distribution of contamination through the natural soils, however based on the presumption that the contamination is historically associated with the Harbour water quality and previous Harbourside activities, RCA recommends that the natural soils also be considered potential contaminated.

RCA considers the site suitable for its proposed use of Dragon boat storage and access after being sealed. RCA considers that a management plan for the site, and in particular all construction work, is required to take into account potential human health and environmental risk associated with potentially contaminated material. All materials to be taken offsite will require waste classification before being able to do so, and based on the results it is likely that this material would be classified as hazardous waste.

10 LIMITATIONS

The services performed by RCA has been conducted in a manner consistent with that generally exercised by members of its profession and consulting practice.

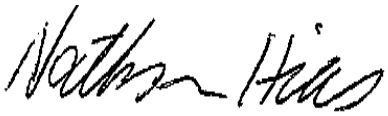
This report has been prepared for the sole use of Bridge Solutions Alliance (BSA) and NSW Maritime. The report may not contain sufficient information for purposes of other uses or for parties other than BSA and NSW Maritime. This report shall only be presented in full and may not be used to support objectives other than those stated in the report without written permission from RCA.

The information in this report is considered accurate at the date of issue with regard to the current conditions of the site. Conditions can vary across any site that cannot be explicitly defined by investigation.

Environmental conditions including contaminant concentrations can change in a limited period of time. This should be considered if the report is used following a significant period of time after the date of issue.

Yours faithfully

RCA AUSTRALIA



Nathan Hills
Environmental Scientist

Fiona Brooker
Associate Environmental Engineer

REFERENCES

[1] Noel Arnold & Associates, *Soil Contamination Investigation*, June 2010.

[2] NEPC, *National Environment Protection (Assessment of Site Contamination) Measure*, 1999.

[3] NSWEPA, *Sampling Design Guidelines*, September 1995.

[4] NSWEPA, *Guidelines for Assessing Service Station Sites*, December 1994.

GLOSSARY

95%UCL_{ave}	A statistical calculation – 95% Upper Confidence Limit of the mean concentration.
EMP	Environmental Management Plan.
HIL 'E'	Parks, recreational open space and playing fields Health Based Investigation Level, pg 9 Schedule B1, *National Environment Protection (Assessment of Site Contamination) Measure.*
HIL 'F'	Commercial/industrial Health Based Investigation Levels, pg 9 Schedule B1 *National Environment Protection (Assessment of Site Contamination) Measure*.
Hotspot	A sample, or location, where contaminant concentrations exceed 250% of the appropriate guideline.
In Situ	In place, without excavation.

Intralaboratory	Prefix intra – as meaning within. A sample sent twice to the sample laboratory for comparative analysis.
kg	kilogram, 1000 gram.
Leachate	Fluid that has passed through a soil stratum, possibly collects contaminants.
µg	microgram, 1/1000 milligram.
mg	milligram, 1/1000 gram.
NEPC	National Environment Protection Council.
NEPM	National Environment Protection Measure.
PPE	Personal Protective Equipment.
PQL	Practical Quantitation Limit.
QA	Quality Assurance.
QC	Quality Control.
RPD	Relative Percentage Difference.
TCLP	Toxicity Characteristic Leaching Procedure. An analysis designed to mimic the transfer of contaminants from soil into water. Undertaken in acidic environment and used to determine impact in landfill conditions.

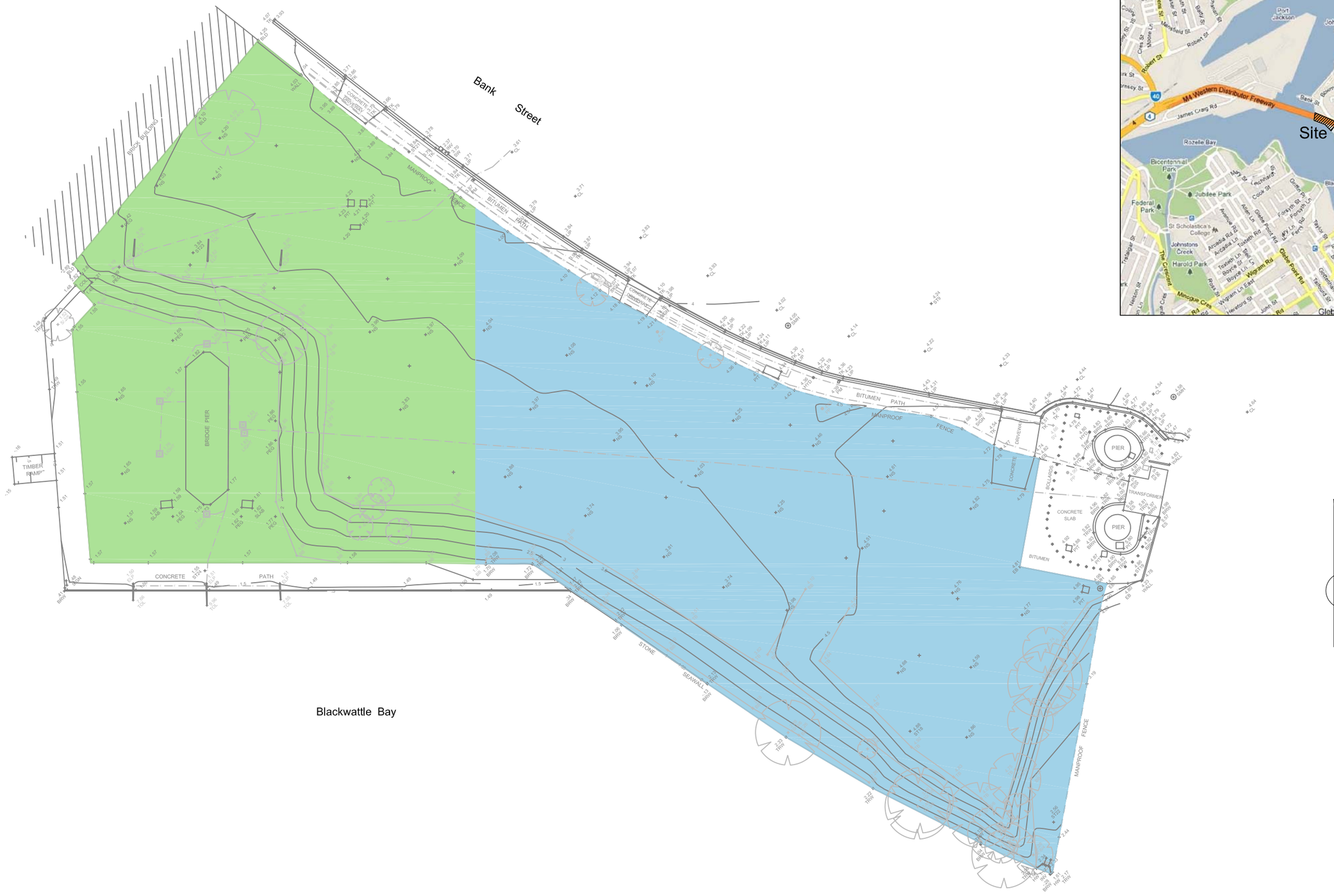
Chemical Compounds

BTEX	Benzene, Toluene, Ethylbenzene, Xylene.
OCPs	Organochlorin Pesticides.
PAH	Polycyclic Aromatic Hydrocarbons. Multi-ring compounds found in fuels, oils and creosote. These are also common combustion products.
PCBs	Poly Chlorinated Biphenyls.
TRH	Total Recoverable Hydrocarbons.

Appendix A

Drawings

Locality Plan
N.T.S



LEGEND

- NSW Maritime
- Bridge Solutions Alliance office and compound

NOTE: Drawing adapted from plan supplied by Dencon Surveying Pty Ltd
Dwg No. 748-004, Dated 29/4/11

0 10 20 30 40
metres

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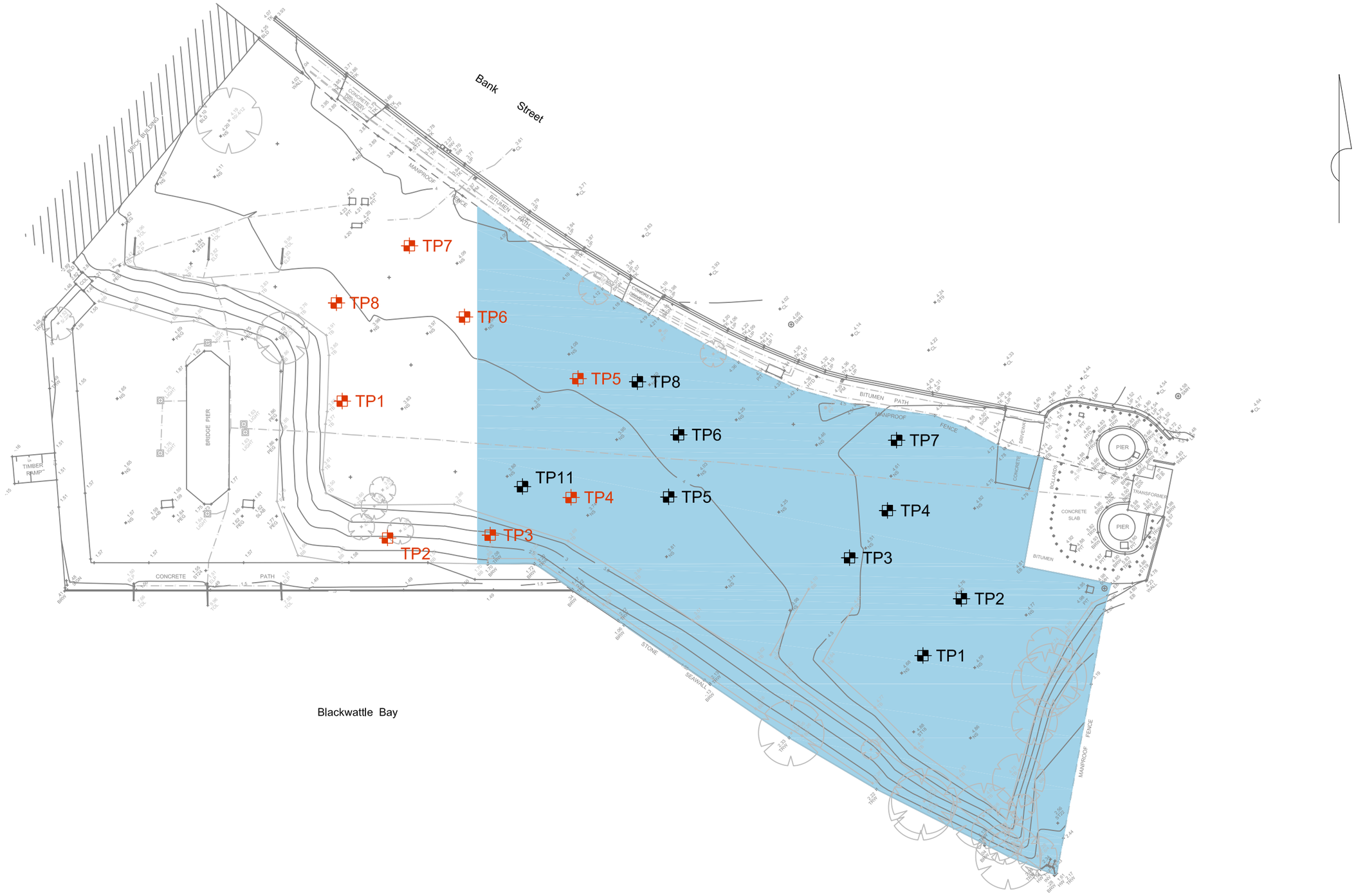
SITE LOCATION PLAN
BANK STREET
PYRMONT

CLIENT	Aurecon Group			RCA Ref	8535-401/1
DRAWN BY	NH	SCALE	1 : 600 (A3)	DRAWING No 1	REV 1
APPROVED BY	FB	DATE	27/5/2011	OFFICE	NEWCASTLE

CDT-DWG-A3H-001/1



LEGEND

- NSW Maritime
- Approximate test pit location
- Approximate test pit location, previous report by Noel Arnold & Associates, 25/6/2010

NOTE: Drawing adapted from plan supplied by Dencon Surveying Pty Ltd Dwg No. 748-004, Dated 29/4/11

0 10 20 30 40
metres

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

NSW MARITIME
TEST PIT LOCATION PLAN
BANK STREET
PYRMONT

CLIENT	Aurecon Group			RCA Ref	8535-401/1
DRAWN BY	NH	SCALE	1 : 600 (A3)	DRAWING No 2	REV 1
APPROVED BY	FB	DATE	27/5/2011	OFFICE	NEWCASTLE

CDT-DWG-A3H-001/1

Appendix B

Test Pit Log Sheets

ENVIRONMENTAL TEST PIT LOG

TP1

SHEET 1 OF 1

RCA AUSTRALIA
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PROJECT No: 8535
CLIENT: Aurecon
PROJECT: Environmental Site Investigation
LOCATION: Bank Street, Pyrmont

DATE: 29/04/2011
SURFACE RL:
COORDS:
EXCAVATION METHOD: 3t Excavator

Test Pit Information				Field Material Information						
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		0.30m D-TP1a 0.40m	0.10		FILL, Concrete and brick cobbles, tile fragments		D		FILL
			0.40		FILL, Concrete and brick cobbles, tile fragments, with fine to coarse gravel in brown/beige clayey sand matrix		M		
			0.5		TEST PIT TP1 TERMINATED AT 0.40 m				
			1.0						
			1.5						

LOGGED: NH | CHECKED: FB | DATE: 20/05/2011

ENVIRONMENTAL TEST PIT LOG

TP2

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 8535
CLIENT: Aurecon
PROJECT: Environmental Site Investigation
LOCATION: Bank Street, Pyrmont

DATE: 29/04/2011
SURFACE RL:
COORDS:
EXCAVATION METHOD: 3t Excavator

Test Pit Information				Field Material Information						
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		0.10m D-TP2a 0.20m	0.30		FILL, Clayey SAND, brown, with fine to coarse gravel		W		FILL
			0.5		TEST PIT TP2 TERMINATED AT 0.30 m				
			1.0						
			1.5						

LOGGED: NH | CHECKED: FB | DATE: 20/05/2011

ENVIRONMENTAL TEST PIT LOG

TP3

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 8535
CLIENT: Aurecon
PROJECT: Environmental Site Investigation
LOCATION: Bank Street, Pyrmont

DATE: 29/04/2011
SURFACE RL:
COORDS:
EXCAVATION METHOD: 3t Excavator

Test Pit Information				Field Material Information						
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		0.20m D-TP3a 0.30m	0.30		FILL, GRAVEL, fine to coarse, concrete and brick cobbles, tile fragments in brown clayey sand matrix		M		FILL
					TEST PIT TP3 TERMINATED AT 0.30 m				
			0.5						
			1.0						
			1.5						

LOGGED: NH | CHECKED: FB | DATE: 20/05/2011

ENVIRONMENTAL TEST PIT LOG

TP4

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 8535
CLIENT: Aurecon
PROJECT: Environmental Site Investigation
LOCATION: Bank Street, Pyrmont

DATE: 29/04/2011
SURFACE RL:
COORDS:
EXCAVATION METHOD: 3t Excavator

Test Pit Information				Field Material Information						
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		0.20m D-TP4a QA1 0.30m	0.30		FILL, Clayey SAND, brown, with concrete and brick cobbles, tile fragments and fine to coarse gravel		M		FILL
			0.5		TEST PIT TP4 TERMINATED AT 0.30 m				
			1.0						
			1.5						

LOGGED: NH | CHECKED: FB | DATE: 20/05/2011

ENVIRONMENTAL TEST PIT LOG

TP5

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 8535
CLIENT: Aurecon
PROJECT: Environmental Site Investigation
LOCATION: Bank Street, Pyrmont

DATE: 29/04/2011
SURFACE RL:
COORDS:
EXCAVATION METHOD: 3t Excavator

Test Pit Information				Field Material Information						
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		0.20m D-TP5a 0.30m	0.10 0.30		FILL, Concrete and brick cobbles, tile fragments		D		FILL
					FILL, Clayey SAND, brown, with fine to coarse gravel throughout		M		
					TEST PIT TP5 TERMINATED AT 0.30 m				
			0.5						
			1.0						
			1.5						

LOGGED: NH | CHECKED: FB | DATE: 20/05/2011

ENVIRONMENTAL TEST PIT LOG
TP6

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 8535
CLIENT: Aurecon
PROJECT: Environmental Site Investigation
LOCATION: Bank Street, Pyrmont

DATE: 29/04/2011
SURFACE RL:
COORDS:
EXCAVATION METHOD: 3t Excavator

Test Pit Information				Field Material Information						
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		0.20m D-TP6a 0.30m	0.10 0.30		FILL, Concrete and brick cobbles, tile fragments		D		FILL
					FILL, Clayey SAND, brown, with concrete and brick cobbles and fine to coarse gravel throughout		M		
			0.5		TEST PIT TP6 TERMINATED AT 0.30 m				
			1.0						
			1.5						

LOGGED: NH | CHECKED: FB | DATE: 20/05/2011

ENVIRONMENTAL TEST PIT LOG
TP7

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 8535
CLIENT: Aurecon
PROJECT: Environmental Site Investigation
LOCATION: Bank Street, Pyrmont

DATE: 29/04/2011
SURFACE RL:
COORDS:
EXCAVATION METHOD: 3t Excavator

Test Pit Information				Field Material Information						
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		0.20m D-TP7a 0.30m	0.10 0.20 0.30 0.40 0.5 1.0 1.5		FILL, Concrete and brick cobbles, tile fragments FILL, Clayey SAND, brown/beige, with concrete and brick cobbles and fine to coarse gravel FILL, Silty SAND, dark brown/black, with fine to coarse gravel and extremely weathered sandstone throughout Clayey SAND, brown, with some concrete cobbles TEST PIT TP7 TERMINATED AT 0.40 m		D M		FILL

LOGGED: NH | CHECKED: FB | DATE: 20/05/2011

ENVIRONMENTAL TEST PIT LOG

TP8

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 8535
CLIENT: Aurecon
PROJECT: Environmental Site Investigation
LOCATION: Bank Street, Pyrmont

DATE: 29/04/2011
SURFACE RL:
COORDS:
EXCAVATION METHOD: 3t Excavator

Test Pit Information				Field Material Information						
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		0.20m D-TP8a 0.30m	0.10 0.30		FILL, Concrete and brick cobbles, tile fragments		D		FILL
					FILL, Clayey SAND, brown, with concrete and brick cobbles and fine to coarse gravel throughout		M		
					TEST PIT TP8 TERMINATED AT 0.30 m				
			0.5						
			1.0						
			1.5						

LOGGED: NH | CHECKED: FB | DATE: 20/05/2011

ENVIRONMENTAL TEST PIT LOG

TP11

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 8535
CLIENT: Aurecon
PROJECT: Environmental Site Investigation
LOCATION: Bank Street, Pyrmont

DATE: 29/04/2011
SURFACE RL:
COORDS:
EXCAVATION METHOD: 3t Excavator

Test Pit Information				Field Material Information						
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		0.30m D-TP11a 0.40m	0.5		FILL, Clayey SAND, brown, with concrete and brick cobbles and fine to coarse gravel		M		FILL
		0.70m D-TP11b 0.80m	0.60 0.80		Clayey SAND, dark brown/black, with fine to coarse gravel				NATURAL
			1.0 1.5		TEST PIT TP11 TERMINATED AT 0.80 m				

LOGGED: NH | CHECKED: FB | DATE: 20/05/2011

Appendix C

External Quality Assurance

Sample Identification	TP4a	QA1	RPD %	TB110427.7 /MTB27041	TS110427.7
Sample Depth (m)	0.2-0.3				
Date	29/4/11			29/4/11	29/4/11
Duplicate Type	Intralaboratory			Trip Blanks	Trip Spike
Sample Profile	clayey sand, brown				
Sample Purpose	Investigation				
Sample collected by	NH				
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)					
Benzene	0.25	0.25	*0.0*	< 0.5	99
Toluene	0.25	0.25	*0.0*	< 0.5	83
Ethylbenzene	0.25	0.25	*0.0*	< 0.5	72
meta- and para-Xylene	0.5	0.5	*0.0*	< 1	72
ortho-Xylene	0.25	0.25	*0.0*	< 0.5	72
Total Xylenes	0.75	0.75	*0.0*	< 1.5	--
Total Recoverable Hydrocarbons (TRH)					
TRH C6-C9	5	5	*0.0*	< 10	91
TRH C10-C14	25	25	*0.0*	--	--
TRH C15-C28	50	50	*0.0*	--	--
TRH C29-C36	50	50	*0.0*	--	--
TRH C10-C36	125	125	*0.0*	--	--
Metals					
Arsenic	3.3	--	--	**3.9**	--
Cadmium	< 0.1	--	--	< 0.1	--
Chromium	40	--	--	< 2	--
Copper	11	--	--	< 2	--
Nickel	25	--	--	< 1	--
Lead	29	--	--	< 2	--
Zinc	35	--	--	< 5	--
Mercury	< 0.05	--	--	< 0.05	--

Note all units in mg/kg except for trip spikes results in % recovery

Results underlined were not detected and are reported as half the detection limit for statistical purpose.

BOLD identifies where RPD results

>50	*where both sample results exceed ten x PQL*
>75	*where both sample results are within 5 to 10 x PQL*
>100	*where both sample results are within 2 to 5 x PQL*
*AD>2.5 * PQL*	*where one or both sample results are <2 x PQL*

***BOLD identified where** blanks >0*

Where results are within two of the above ranges the most conservative criteria have been used to assess duplicate performance

Appendix D

Laboratory Report Sheets

mgt LabMark
ENVIRONMENTAL LABORATORIES

Certificate of Analysis

Robert Carr and Associates Pty Ltd
PO Box 175
Carrington
NSW 2294

Attention: Fiona Brooker

NATA Accredited
Accreditation Number 1261
Site Number 18217

This document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Report	297703-S
Client Reference	8535/1
Received Date	Apr 29, 2011

Client Sample ID			**TP1A**	**TP2A**	**TP3A**	**TP4A**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
mgt-LabMark Sample No.			**S11-Ap32408**	**S11-Ap32409**	**S11-Ap32410**	**S11-Ap32411**
Date Sampled			**Apr 29, 2011**	**Apr 29, 2011**	**Apr 29, 2011**	**Apr 29, 2011**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9 Fraction by GC	10	mg/kg	< 10	< 10	< 10	< 10
TRH C10-C14 Fraction by GC	50	mg/kg	< 50	< 50	< 50	< 50
TRH C15-C28 Fraction by GC	100	mg/kg	180	< 100	< 100	< 100
TRH C29-C36 Fraction by GC	100	mg/kg	1500	< 100	< 100	< 100
TRH C10-36 (Total)	100	mg/kg	1700	< 100	< 100	< 100
BTEX						
Benzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total m+p-Xylenes	1	mg/kg	< 1	< 1	< 1	< 1
o-Xylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes(ortho.meta and para)	0.15	mg/kg	< 0.15	< 0.15	< 0.15	< 0.15
Total BTEX	1	mg/kg	< 1	< 1	< 1	< 1
4-Bromofluorobenzene (surr.)	1	%	82	97	92	102
Tributyl Tin (as Sn)	0.005	ng/g	-	-	NMI report	-
% Moisture	0.1	%	9.8	12	18	14
Polyaromatic Hydrocarbons (PAH)						
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	1.2	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	2.2	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	2.9	< 0.5	< 0.5	< 0.5
Benzo(b)fluoranthene & Benzo(k)fluoranthene	1	mg/kg	4.5	< 1	< 1	< 1
Benzo(g.h.i)perylene	0.5	mg/kg	3.0	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	2.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	0.8	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	4.8	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	1.8	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	2.7	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	4.9	< 0.5	< 0.5	< 0.5
Total PAH	1	mg/kg	31	< 1	< 1	< 1
2-Fluorobiphenyl (surr.)	1	%	78	89	89	88
p-Terphenyl-d14 (surr.)	1	%	73	88	85	81
Heavy Metals						

Client Sample ID			TP1A	TP2A	TP3A	TP4A
Sample Matrix			Soil	Soil	Soil	Soil
mgt-LabMark Sample No.			S11-Ap32408	S11-Ap32409	S11-Ap32410	S11-Ap32411
Date Sampled			Apr 29, 2011	Apr 29, 2011	Apr 29, 2011	Apr 29, 2011
Test/Reference	LOR	Unit				
Mercury	0.05	mg/kg	< 0.05	0.06	< 0.05	< 0.05
Arsenic	1	mg/kg	1.7	5.1	4.8	3.3
Cadmium	0.1	mg/kg	0.4	< 0.1	< 0.1	< 0.1
Chromium	2	mg/kg	4.7	11	8.8	40
Copper	2	mg/kg	46	21	9.2	11
Nickel	1	mg/kg	6.2	4.8	4.6	25
Zinc	5	mg/kg	15	46	53	35
Lead	2	mg/kg	19	35	49	29

Client Sample ID			TP5A	TP6A	TP7A	TP8A
Sample Matrix			Soil	Soil	Soil	Soil
mgt-LabMark Sample No.			S11-Ap32412	S11-Ap32413	S11-Ap32414	S11-Ap32415
Date Sampled			Apr 29, 2011	Apr 29, 2011	Apr 29, 2011	Apr 29, 2011
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9 Fraction by GC	10	mg/kg	< 10	< 10	< 10	< 10
TRH C10-C14 Fraction by GC	50	mg/kg	< 50	< 50	< 50	< 50
TRH C15-C28 Fraction by GC	100	mg/kg	140	110	< 100	< 100
TRH C29-C36 Fraction by GC	100	mg/kg	110	190	140	120
TRH C10-36 (Total)	100	mg/kg	250	300	140	120
BTEX						
Benzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total m+p-Xylenes	1	mg/kg	< 1	< 1	< 1	< 1
o-Xylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes(ortho.meta and para)	0.15	mg/kg	< 0.15	< 0.15	< 0.15	< 0.15
Total BTEX	1	mg/kg	< 1	< 1	< 1	< 1
4-Bromofluorobenzene (surr.)	1	%	92	96	103	94
% Moisture	0.1	%	2.6	8.7	4.8	5.6
Polyaromatic Hydrocarbons (PAH)						
Acenaphthene	0.5	mg/kg	0.8	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	2.6	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	5.2	< 0.5	1.1	1.0
Benzo(a)pyrene	0.5	mg/kg	3.7	< 0.5	1.3	1.2
Benzo(b)fluoranthene & Benzo(k)fluoranthene	1	mg/kg	7.1	< 1	2.4	2.0
Benzo(g.h.i)perylene	0.5	mg/kg	3.2	< 0.5	1.8	1.3
Chrysene	0.5	mg/kg	5.4	< 0.5	1.4	1.1
Dibenz(a.h)anthracene	0.5	mg/kg	1.2	< 0.5	0.6	0.6
Fluoranthene	0.5	mg/kg	19	< 0.5	2.7	2.1
Fluorene	0.5	mg/kg	0.8	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	3.0	< 0.5	1.5	1.2
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	12	< 0.5	0.8	< 0.5
Pyrene	0.5	mg/kg	15	< 0.5	2.3	1.9
Total PAH	1	mg/kg	79	< 1	16	12
2-Fluorobiphenyl (surr.)	1	%	89	87	75	75
p-Terphenyl-d14 (surr.)	1	%	77	81	71	71
Heavy Metals						
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.06
Arsenic	1	mg/kg	3.2	3.8	5.4	5.1
Cadmium	0.1	mg/kg	0.1	< 0.1	0.1	0.1
Chromium	2	mg/kg	7.4	9.2	6.1	5.8
Copper	2	mg/kg	15	14	20	16
Nickel	1	mg/kg	9.1	4.0	8.9	4.6
Zinc	5	mg/kg	57	47	80	80
Lead	2	mg/kg	31	19	43	73

Client Sample ID			TP9A	TP11A	TP11B	TP2A+TP6A (COMPOSITE)
Sample Matrix			Soil	Soil	Soil	Soil
mgt-LabMark Sample No.			S11-Ap32416	S11-Ap32417	S11-Ap32418	S11-Ap32419
Date Sampled			Apr 29, 2011	Apr 29, 2011	Apr 29, 2011	Apr 29, 2011
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9 Fraction by GC	10	mg/kg	< 10	< 10	< 10	-
TRH C10-C14 Fraction by GC	50	mg/kg	< 50	< 50	< 50	-
TRH C15-C28 Fraction by GC	100	mg/kg	< 100	< 100	3000	-
TRH C29-C36 Fraction by GC	100	mg/kg	< 100	< 100	2000	-
TRH C10-36 (Total)	100	mg/kg	< 100	< 100	5000	-
BTEX						
Benzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Toluene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Ethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total m+p-Xylenes	1	mg/kg	< 1	< 1	< 1	-
o-Xylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Xylenes(ortho.meta and para)	0.15	mg/kg	< 0.15	< 0.15	< 0.15	-
Total BTEX	1	mg/kg	< 1	< 1	< 1	-
4-Bromofluorobenzene (surr.)	1	%	90	103	113	-
Tributyl Tin (as Sn)	0.005	ng/g	-	-	NMI report	-
% Moisture	0.1	%	3.3	9.2	4.9	11
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1232	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	-	109
Organochlorine Pesticides (OC)						
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.2	mg/kg	-	-	-	< 0.2
a-BHC	0.05	mg/kg	-	-	-	< 0.05
a-Chlordane	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
g-Chlordane	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.2	mg/kg	-	-	-	< 0.2
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	90
Polyaromatic Hydrocarbons (PAH)						

Client Sample ID			TP9A	TP11A	TP11B	TP2A+TP6A (COMPOSITE)
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
mgt-LabMark Sample No.			**S11-Ap32416**	**S11-Ap32417**	**S11-Ap32418**	**S11-Ap32419**
Date Sampled			**Apr 29, 2011**	**Apr 29, 2011**	**Apr 29, 2011**	**Apr 29, 2011**
Test/Reference	LOR	Unit				
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	9.6	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	1.4	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	40	-
Benz(a)anthracene	0.5	mg/kg	1.5	< 0.5	150	-
Benzo(a)pyrene	0.5	mg/kg	1.7	0.5	120	-
Benzo(b)fluoranthene & Benzo(k)fluoranthene	1	mg/kg	2.7	< 1	220	-
Benzo(g.h.i)perylene	0.5	mg/kg	1.8	0.6	110	-
Chrysene	0.5	mg/kg	1.6	0.5	130	-
Dibenz(a.h)anthracene	0.5	mg/kg	0.6	< 0.5	41	-
Fluoranthene	0.5	mg/kg	3.4	1.2	490	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	7.8	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	1.4	0.5	96	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	1.1	-
Phenanthrene	0.5	mg/kg	1.1	< 0.5	170	-
Pyrene	0.5	mg/kg	3.0	1.0	450	-
Total PAH	1	mg/kg	19	4.3	2000	-
2-Fluorobiphenyl (surr.)	1	%	90	88	78	-
p-Terphenyl-d14 (surr.)	1	%	83	83	77	-
Heavy Metals						
Mercury	0.05	mg/kg	< 0.05	0.13	< 0.05	-
Arsenic	1	mg/kg	7.4	3.0	3.1	-
Cadmium	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Chromium	2	mg/kg	6.0	6.0	9.9	-
Copper	2	mg/kg	21	16	21	-
Nickel	1	mg/kg	14	5.9	12	-
Zinc	5	mg/kg	86	88	63	-
Lead	2	mg/kg	54	42	42	-

Client Sample ID			TS110427.7	MTB270411.2	TB110427.7	QA1
Sample Matrix			Soil	Soil	Soil	Soil
mgt-LabMark Sample No.			S11-Ap32420	S11-Ap32421	S11-Ap32422	S11-Ap32423
Date Sampled			Apr 27, 2011	Apr 27, 2011	Apr 27, 2011	Apr 29, 2011
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9 Fraction by GC	10	mg/kg	91	-	< 10	< 10
TRH C10-C14 Fraction by GC	50	mg/kg	-	-	-	< 50
TRH C15-C28 Fraction by GC	100	mg/kg	-	-	-	< 100
TRH C29-C36 Fraction by GC	100	mg/kg	-	-	-	< 100
TRH C10-36 (Total)	100	mg/kg	-	-	-	< 100
BTEX						
Benzene	0.5	mg/kg	99	-	< 0.5	< 0.5
Toluene	0.5	mg/kg	83	-	< 0.5	< 0.5
Ethylbenzene	0.5	mg/kg	72	-	< 0.5	< 0.5
Total m+p-Xylenes	1	mg/kg	72	-	< 1	< 1
o-Xylene	0.5	mg/kg	72	-	< 0.5	< 0.5
Xylenes(ortho.meta and para)	0.15	mg/kg	72	-	< 0.15	< 0.15
Total BTEX	1	mg/kg	< 1	-	< 1	< 1
4-Bromofluorobenzene (surr.)	1	%	126	-	90	87
% Moisture	0.1	%	-	< 0.1	-	14
Heavy Metals						
Mercury	0.05	mg/kg	-	< 0.05	-	-
Arsenic	1	mg/kg	-	3.9	-	-
Cadmium	0.1	mg/kg	-	< 0.1	-	-
Chromium	2	mg/kg	-	< 2	-	-
Copper	2	mg/kg	-	< 2	-	-
Nickel	1	mg/kg	-	< 1	-	-
Zinc	5	mg/kg	-	< 5	-	-
Lead	2	mg/kg	-	< 2	-	-

Client Sample ID			TP13A	TP9A+TP13A (COMPOSITE)
Sample Matrix			Soil	Soil
mgt-LabMark Sample No.			S11-Ap32424	S11-Ap32425
Date Sampled			Apr 29, 2011	Apr 29, 2011
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons				
TRH C6-C9 Fraction by GC	10	mg/kg	< 10	-
TRH C10-C14 Fraction by GC	50	mg/kg	< 50	-
TRH C15-C28 Fraction by GC	100	mg/kg	< 100	-
TRH C29-C36 Fraction by GC	100	mg/kg	210	-
TRH C10-36 (Total)	100	mg/kg	210	-
BTEX				
Benzene	0.5	mg/kg	< 0.5	-
Toluene	0.5	mg/kg	< 0.5	-
Ethylbenzene	0.5	mg/kg	< 0.5	-
Total m+p-Xylenes	1	mg/kg	< 1	-
o-Xylene	0.5	mg/kg	< 0.5	-
Xylenes(ortho.meta and para)	0.15	mg/kg	< 0.15	-
Total BTEX	1	mg/kg	< 1	-
4-Bromofluorobenzene (surr.)	1	%	105	-
% Moisture	0.1	%	13	8.2
Polychlorinated Biphenyls (PCB)				
Aroclor-1016	0.5	mg/kg	-	< 0.5
Aroclor-1232	0.5	mg/kg	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	107
Organochlorine Pesticides (OC)				
4.4'-DDD	0.05	mg/kg	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05
4.4'-DDT	0.2	mg/kg	-	< 0.2
a-BHC	0.05	mg/kg	-	< 0.05
a-Chlordane	0.05	mg/kg	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05
b-BHC	0.05	mg/kg	-	< 0.05
d-BHC	0.05	mg/kg	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05
g-Chlordane	0.05	mg/kg	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05
Methoxychlor	0.2	mg/kg	-	< 0.2
Tetrachloro-m-xylene (surr.)	1	%	-	92
Polyaromatic Hydrocarbons (PAH)				
Acenaphthene	0.5	mg/kg	< 0.5	-

Client Sample ID			**TP13A**	**TP9A+TP13A (COMPOSITE)**
Sample Matrix			**Soil**	**Soil**
mgt-LabMark Sample No.			**S11-Ap32424**	**S11-Ap32425**
Date Sampled			**Apr 29, 2011**	**Apr 29, 2011**
Test/Reference	LOR	Unit		
Acenaphthylene	0.5	mg/kg	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-
Benzo(b)fluoranthene & Benzo(k)fluoranthene	1	mg/kg	< 1	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-
Total PAH	1	mg/kg	< 1	-
2-Fluorobiphenyl (surr.)	1	%	86	-
p-Terphenyl-d14 (surr.)	1	%	82	-
Heavy Metals				
Mercury	0.05	mg/kg	< 0.05	-
Arsenic	1	mg/kg	2.8	-
Cadmium	0.1	mg/kg	0.3	-
Chromium	2	mg/kg	6.1	-
Copper	2	mg/kg	11	-
Nickel	1	mg/kg	4.7	-
Zinc	5	mg/kg	55	-
Lead	2	mg/kg	26	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - Method: E004 Petroleum Hydrocarbons (TPH)	Sydney	May 02, 2011	14 Day
BTEX - Method: E029/E016 BTEX	Sydney	May 02, 2011	14 Day
% Moisture - Method: E005 Moisture Content	Sydney	May 02, 2011	28 Day
Polychlorinated Biphenyls (PCB) - Method: E013 Polychlorinated Biphenyls (PCB)	Sydney	May 02, 2011	14 Day
Organochlorine Pesticides (OC) - Method: E013 Organochlorine Pesticides (OC)	Sydney	May 02, 2011	14 Day
Polyaromatic Hydrocarbons (PAH) - Method: E007 Polyaromatic Hydrocarbons (PAH)	Sydney	May 02, 2011	14 Day
Mercury	Sydney	May 02, 2011	28 Day

mgt LabMark ENVIRONMENTAL LABORATORIES

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Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: Robert Carr and Associates Pty Ltd
Address: PO Box 175
Carrington
NSW 2294

Order No.:
Report #: 297703
Phone: 02 4902 9200
Fax: 0249029299

Received: Apr 29, 2011 12:00
Due: May 6, 2011 05:58
Priority: 5 Day
Contact name: Fiona Brooker

Client Job No.: 8535/1

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					% Moisture	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	TRH C6-C9 Fraction by GC	Tributyl Tin (as Sn)	Zinc	Total Recoverable Hydrocarbons	BTEX	Polychlorinated Biphenyls (PCB)	Organochlorine Pesticides (OC)	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																				
Melbourne Laboratory - NATA Site #1261														X						
Sydney Laboratory - NATA Site #1645					X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																
TP1A	Apr 29, 2011		Soil	S11-Ap32408	X	X	X	X	X	X	X	X	X		X	X	X			X
TP2A	Apr 29, 2011		Soil	S11-Ap32409	X	X	X	X	X	X	X	X	X		X	X	X			X
TP3A	Apr 29, 2011		Soil	S11-Ap32410	X	X	X	X	X	X	X	X	X	X	X	X	X			X
TP4A	Apr 29, 2011		Soil	S11-Ap32411	X	X	X	X	X	X	X	X	X		X	X	X			X
TP5A	Apr 29, 2011		Soil	S11-Ap32412	X	X	X	X	X	X	X	X	X		X	X	X			X
TP6A	Apr 29, 2011		Soil	S11-Ap32413	X	X	X	X	X	X	X	X	X		X	X	X			X
TP7A	Apr 29, 2011		Soil	S11-Ap32414	X	X	X	X	X	X	X	X	X		X	X	X			X
TP8A	Apr 29, 2011		Soil	S11-Ap32415	X	X	X	X	X	X	X	X	X		X	X	X			X
TP9A	Apr 29, 2011		Soil	S11-Ap32416	X	X	X	X	X	X	X	X	X		X	X	X			X
TP11A	Apr 29, 2011		Soil	S11-Ap32417	X	X	X	X	X	X	X	X	X		X	X	X			X
TP11B	Apr 29, 2011		Soil	S11-Ap32418	X	X	X	X	X	X	X	X	X	X	X	X	X			X

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Sample Detail					% Moisture	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	TRH C6-C9 Fraction by GC	Tributyl Tin (as Sn)	Zinc	Total Recoverable Hydrocarbons	BTEX	Polychlorinated Biphenyls (PCB)	Organochlorine Pesticides (OC)	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																				
Melbourne Laboratory - NATA Site #1261														X						
Sydney Laboratory - NATA Site #1645					X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
TP2A+TP6A (COMPOSITE)	Apr 29, 2011		Soil	S11-Ap32419	X													X	X	
TS110427.7	Apr 27, 2011		Soil	S11-Ap32420									X				X			
MTB270411.2	Apr 27, 2011		Soil	S11-Ap32421	X	X	X	X	X	X	X	X			X					
TB110427.7	Apr 27, 2011		Soil	S11-Ap32422									X				X			
QA1	Apr 29, 2011		Soil	S11-Ap32423	X								X			X	X			
TP13A	Apr 29, 2011		Soil	S11-Ap32424	X	X	X	X	X	X	X	X	X		X	X	X			X
TP9A+TP13A (COMPOSITE)	Apr 29, 2011		Soil	S11-Ap32425	X													X	X	
TSLAB110427.7	Apr 27, 2011		Soil	S11-Ap32426									X				X			

mgt-LabMark Internal Quality Control Review

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis.
7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)
For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg: milligrams per Kilogram	**mg/L:** milligrams per litre
µg/l: micrograms per litre	**ppm:** Parts per million
ppb: Parts per billion	**%:** Percentage
org/100ml: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit Of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:
Results <10 times the LOR : No Limit
Results between 10-20 times the LOR : RPD must lie between 0-50%
Results >20 times the LOR : RPD must lie between 0-20%
Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD - eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor							
TRH C6-C9 Fraction by GC	mg/kg	< 10			10	Pass	
TRH C10-C14 Fraction by GC	mg/kg	< 50			50	Pass	
TRH C15-C28 Fraction by GC	mg/kg	< 100			100	Pass	
TRH C29-C36 Fraction by GC	mg/kg	< 100			100	Pass	
Method Blank							
BTEX E029/E016 BTEX							
Benzene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.5			0.5	Pass	
Total m+p-Xylenes	mg/kg	< 1			1	Pass	
o-Xylene	mg/kg	< 0.5			0.5	Pass	
Xylenes(ortho.meta and para)	mg/kg	< 0.15			0.15	Pass	
Total BTEX	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls (PCB) E013 Polychlorinated Biphen							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides (OC) E013 Organochlorine Pesticid							
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.2			0.2	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
a-Chlordane	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
g-Chlordane	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	mg/kg	< 1			1	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Mercury	mg/kg	< 0.05			0.05	Pass	
Arsenic	mg/kg	< 1			1	Pass	
Cadmium	mg/kg	< 0.1			0.1	Pass	
Chromium	mg/kg	< 2			2	Pass	
Copper	mg/kg	< 2			2	Pass	
Nickel	mg/kg	< 1			1	Pass	
Zinc	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 2			2	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor		Result 1					
TRH C6-C9 Fraction by GC	%	75			70-130	Pass	
TRH C15-C28 Fraction by GC	%	88			70-130	Pass	
LCS - % Recovery							
BTEX E029/E016 BTEX		Result 1					
Benzene	%	70			70-130	Pass	
Toluene	%	89			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
Total m+p-Xylenes	%	91			70-130	Pass	
o-Xylene	%	87			70-130	Pass	
Xylenes(ortho.meta and para)	%	90			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls (PCB) E013 Polychlorinated Biphen		Result 1					
Aroclor-1254	%	108			70-130	Pass	
Aroclor-1260	%	88			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides (OC) E013 Organochlorine Pesticid		Result 1					
4.4'-DDD	%	110			70-130	Pass	
4.4'-DDE	%	106			70-130	Pass	
4.4'-DDT	%	107			70-130	Pass	
a-BHC	%	108			70-130	Pass	
a-Chlordane	%	108			70-130	Pass	
Aldrin	%	104			70-130	Pass	
b-BHC	%	107			70-130	Pass	
d-BHC	%	87			70-130	Pass	
Dieldrin	%	113			70-130	Pass	
Endosulfan I	%	109			70-130	Pass	
Endosulfan II	%	104			70-130	Pass	
Endosulfan sulphate	%	82			70-130	Pass	
Endrin	%	107			70-130	Pass	
Endrin aldehyde	%	84			70-130	Pass	
Endrin ketone	%	103			70-130	Pass	
g-BHC (Lindane)	%	110			70-130	Pass	
g-Chlordane	%	109			70-130	Pass	
Heptachlor	%	111			70-130	Pass	
Heptachlor epoxide	%	109			70-130	Pass	
Hexachlorobenzene	%	82			70-130	Pass	
Methoxychlor	%	110			70-130	Pass	
LCS - % Recovery							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca		Result 1					
Acenaphthene	%	86			70-130	Pass	
Acenaphthylene	%	87			70-130	Pass	
Anthracene	%	87			70-130	Pass	
Benz(a)anthracene	%	78			70-130	Pass	
Benzo(a)pyrene	%	74			70-130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	%	70			70-130	Pass	
Benzo(g.h.i)perylene	%	80			70-130	Pass	
Chrysene	%	84			70-130	Pass	
Dibenz(a.h)anthracene	%	90			70-130	Pass	
Fluoranthene	%	80			70-130	Pass	
Fluorene	%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	85			70-130	Pass	
Naphthalene	%	88			70-130	Pass	
Phenanthrene	%	81			70-130	Pass	
Pyrene	%	77			70-130	Pass	
LCS - % Recovery							

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
		Result 1					
Mercury	%	88			70-130	Pass	
Arsenic	%	117			70-130	Pass	
Cadmium	%	100			70-130	Pass	
Chromium	%	103			70-130	Pass	
Copper	%	105			70-130	Pass	
Nickel	%	101			70-130	Pass	
Zinc	%	113			70-130	Pass	
Lead	%	105			70-130	Pass	
[Duplicate of S11-Ap32408]							
Total Recoverable Hydrocarbons		Result 1	Result 2	RPD			
TRH C6-C9 Fraction by GC	mg/kg	< 10	< 10	<1	30%	Pass	
TRH C10-C14 Fraction by GC	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C15-C28 Fraction by GC	mg/kg	180	200	10	30%	Pass	
TRH C29-C36 Fraction by GC	mg/kg	1500	1400	1.9	30%	Pass	
[Duplicate of S11-Ap32408]							
BTEX		Result 1	Result 2	RPD			
Benzene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Toluene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ethylbenzene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Total m+p-Xylenes	mg/kg	< 1	< 1	<1	30%	Pass	
o-Xylene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Xylenes(ortho.meta and para)	mg/kg	< 0.15	< 0.15	<1	30%	Pass	
[Duplicate of S11-Ap32408]							
Polyaromatic Hydrocarbons (PAH)		Result 1	Result 2	RPD			
Acenaphthene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	mg/kg	1.2	1.1	15	30%	Pass	
Benz(a)anthracene	mg/kg	2.2	1.9	16	30%	Pass	
Benzo(a)pyrene	mg/kg	2.9	2.6	12	30%	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	mg/kg	4.5	3.9	13	30%	Pass	
Benzo(g.h.i)perylene	mg/kg	3	2.8	4	30%	Pass	
Chrysene	mg/kg	2.5	2.3	6	30%	Pass	
Dibenz(a.h)anthracene	mg/kg	0.8	0.9	4	30%	Pass	
Fluoranthene	mg/kg	4.8	4.1	15	30%	Pass	
Fluorene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	1.8	2.2	20	30%	Pass	
Naphthalene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	mg/kg	2.7	2.5	9	30%	Pass	
Pyrene	mg/kg	4.9	4.4	10	30%	Pass	
[Duplicate of S11-Ap32408]							
		Result 1	Result 2	RPD			
Mercury	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Arsenic	mg/kg	1.7	2.1	24	30%	Pass	
Cadmium	mg/kg	0.4	0.2	<1	30%	Pass	
Chromium	mg/kg	4.7	4.6	2	30%	Pass	
Copper	mg/kg	46	40	13	30%	Pass	
Nickel	mg/kg	6.2	6.6	6	30%	Pass	
Zinc	mg/kg	15	14	8	30%	Pass	
Lead	mg/kg	19	17	9	30%	Pass	
[Duplicate of S11-Ap32417]							
		Result 1	Result 2	RPD			
Mercury	mg/kg	0.13	0.14	14	30%	Pass	
Arsenic	mg/kg	3	3.2	9	30%	Pass	
Cadmium	mg/kg	< 0.1	0.2	<1	30%	Pass	
Chromium	mg/kg	6	5.5	9	30%	Pass	
Copper	mg/kg	16	12	30	30%	Pass	
Lead	mg/kg	42	41	2	30%	Pass	
[Duplicate of S11-Ap32418]							
Total Recoverable Hydrocarbons		Result 1	Result 2	RPD			
TRH C6-C9 Fraction by GC	mg/kg	< 10	< 10	<1	30%	Pass	
TRH C10-C14 Fraction by GC	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C15-C28 Fraction by GC	mg/kg	3000	3100	4.2	30%	Pass	
TRH C29-C36 Fraction by GC	mg/kg	2000	2200	7.3	30%	Pass	
[Duplicate of S11-Ap32418]							
BTEX		Result 1	Result 2	RPD			

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Benzene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Toluene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ethylbenzene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Total m+p-Xylenes	mg/kg	< 1	< 1	<1	30%	Pass	
o-Xylene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Xylenes(ortho.meta and para)	mg/kg	< 0.15	< 0.15	<1	30%	Pass	
[Duplicate of S11-Ap32418]							
Polyaromatic Hydrocarbons (PAH)		Result 1	Result 2	RPD			
Acenaphthene	mg/kg	9.6	11	13	30%	Pass	
Acenaphthylene	mg/kg	1.4	1.3	3	30%	Pass	
Anthracene	mg/kg	40	42	3	30%	Pass	
Benz(a)anthracene	mg/kg	150	150	2	30%	Pass	
Benzo(a)pyrene	mg/kg	120	140	17	30%	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	mg/kg	220	250	12	30%	Pass	
Benzo(g.h.i)perylene	mg/kg	110	130	18	30%	Pass	
Chrysene	mg/kg	130	140	4	30%	Pass	
Dibenz(a.h)anthracene	mg/kg	41	49	17	30%	Pass	
Fluoranthene	mg/kg	490	500	3	30%	Pass	
Fluorene	mg/kg	7.8	8.4	8	30%	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	96	110	17	30%	Pass	
Naphthalene	mg/kg	1.1	1.1	3	30%	Pass	
Phenanthrene	mg/kg	170	180	3	30%	Pass	
Pyrene	mg/kg	450	460	3	30%	Pass	
[Duplicate of S11-My30136 - BATCH]							
Polychlorinated Biphenyls (PCB)		Result 1	Result 2	RPD			
Aroclor-1016	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1232	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
[Duplicate of S11-Ap32270 - BATCH]							
Organochlorine Pesticides (OC)		Result 1	Result 2	RPD			
4.4'-DDD	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
a-BHC	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-Chlordane	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-Chlordane	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
[Spike of S11-Ap32408] - % Recovery							
Total Recoverable Hydrocarbons		Result 1					
TRH C6-C9 Fraction by GC	%	91			70 - 130	Pass	
TRH C15-C28 Fraction by GC	%	80			70 - 130	Pass	
[Spike of S11-Ap32408] - % Recovery							
BTEX		Result 1					
Benzene	%	83			70 - 130	Pass	
Toluene	%	98			70 - 130	Pass	
Ethylbenzene	%	91			70 - 130	Pass	
Total m+p-Xylenes	%	97			70 - 130	Pass	
o-Xylene	%	87			70 - 130	Pass	
Xylenes(ortho.meta and para)	%	94			70 - 130	Pass	

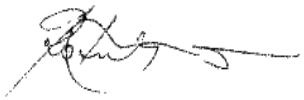
Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
[Spike of S11-My30136 - BATCH] - % Recovery							
Polychlorinated Biphenyls (PCB)		Result 1					
Aroclor-1254	%	105			70 - 130	Pass	
Aroclor-1260	%	88			70 - 130	Pass	
[Spike of S11-Ap32270 - BATCH] - % Recovery							
Organochlorine Pesticides (OC)		Result 1					
4.4'-DDD	%	115			70 - 130	Pass	
4.4'-DDE	%	116			70 - 130	Pass	
4.4'-DDT	%	103			70 - 130	Pass	
a-BHC	%	120			70 - 130	Pass	
a-Chlordane	%	113			70 - 130	Pass	
Aldrin	%	108			70 - 130	Pass	
b-BHC	%	102			70 - 130	Pass	
d-BHC	%	86			70 - 130	Pass	
Dieldrin	%	119			70 - 130	Pass	
Endosulfan I	%	116			70 - 130	Pass	
Endosulfan II	%	113			70 - 130	Pass	
Endosulfan sulphate	%	117			70 - 130	Pass	
Endrin	%	112			70 - 130	Pass	
Endrin aldehyde	%	113			70 - 130	Pass	
Endrin ketone	%	111			70 - 130	Pass	
g-BHC (Lindane)	%	107			70 - 130	Pass	
g-Chlordane	%	114			70 - 130	Pass	
Heptachlor	%	108			70 - 130	Pass	
Heptachlor epoxide	%	118			70 - 130	Pass	
Hexachlorobenzene	%	83			70 - 130	Pass	
Methoxychlor	%	119			70 - 130	Pass	
[Spike of S11-Ap32408] - % Recovery							
Polyaromatic Hydrocarbons (PAH)		Result 1					
Acenaphthene	%	111			70 - 130	Pass	
Acenaphthylene	%	116			70 - 130	Pass	
Anthracene	%	104			70 - 130	Pass	
Benz(a)anthracene	%	94			70 - 130	Pass	
Benzo(a)pyrene	%	92			70 - 130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	%	91			70 - 130	Pass	
Benzo(g.h.i)perylene	%	88			70 - 130	Pass	
Chrysene	%	105			70 - 130	Pass	
Dibenz(a.h)anthracene	%	97			70 - 130	Pass	
Fluoranthene	%	101			70 - 130	Pass	
Fluorene	%	111			70 - 130	Pass	
Indeno(1.2.3-cd)pyrene	%	92			70 - 130	Pass	
Naphthalene	%	117			70 - 130	Pass	
Phenanthrene	%	101			70 - 130	Pass	
Pyrene	%	96			70 - 130	Pass	
[Spike of S11-Ap32409] - % Recovery							
		Result 1					
Mercury	%	97			70 - 130	Pass	
Arsenic	%	101			70 - 130	Pass	
Cadmium	%	91			70 - 130	Pass	
Chromium	%	80			70 - 130	Pass	
Copper	%	79			70 - 130	Pass	
Nickel	%	89			70 - 130	Pass	
Lead	%	125			70 - 130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Authorised By



Dr. Bob Symons
NATA Signatory

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

Australian Government

National Measurement Institute

REPORT OF ANALYSIS

Report No. RN855493

Client	: MGT-LABMARK ENVIRONMENTAL PTY LTD	Job No.	: MGTL02/110502
	UNIT F6, BUILDING F	Quote No.	: QT-01665
	16 MARS ROAD	Order No.	:
	LANE COVE WEST NSW 2066	Date Sampled	:
		Date Received	: 2-MAY-2011
Attention	: LEANNE KNOWLES	Sampled By	:
Project Name	:		
Your Client Services Manager	: BRIAN WOODWARD	Phone	: (02) 94490151

Lab Reg No.	Sample Ref	Sample Description
N11/013292	TP3A	SOIL 11AP32410
N11/013293	TP11B	SOIL 11AP32418

Lab Reg No.		N11/013292	N11/013293			
Sample Reference	Units	TP3A	TP11B			Method
Organotins						
Monobutyltin as Sn	ng/g	1.0	< 0.5			NR_35
Dibutyltin as Sn	ng/g	< 0.5	< 0.5			NR_35
Tributyltin as Sn	ng/g	< 0.5	< 0.5			NR_35
Surrogate Tripropyltin Rec.	%	105	114			NR_35
Dates						
Date extracted		10-MAY-2011	10-MAY-2011			
Date analysed		14-MAY-2011	14-MAY-2011			

Luke Baker, Analyst
Organics - NSW
Accreditation No. 198

17-MAY-2011

Lab Reg No.		N11/013292	N11/013293			
Sample Reference	Units	TP3A	TP11B			Method
Trace Elements						
Total Solids	%	88.9	95.7			NT2_49

Nasir Shikdar, Analyst
Inorganics - NSW
Accreditation No. 198

17-MAY-2011

National Measurement Institute

REPORT OF ANALYSIS

Report No. RN855493

All results are expressed on a dry weight basis. This reporr supersedes report RN855415: Client details amended.

This report is issued in accordance with NATA's accreditation requirements.
Accreditated for compliance with ISO/IEC 17025.
This report shall not be reproduced except in full.
Results relate only to the sample(s) tested.

This Report supersedes reports: RN853655 RN855379

297703

CHAIN OF CUSTODY RECORD

E4342257B4

mgt LabMark ENVIRONMENTAL LABORATORIES

CLIENT DETAILS

Company Name : RCA
Office Address : 92 Hill St Carrington NSW 2294

Contact Name : Nathan Hills
Project Manager : Fiona Brooker
e.mail for results : fionab@rca.com.au/danielleW@rca.com.au

Purchase Order :
PROJECT Number : 8535/1
Courier Consignment # :

COC Number :
mgt QUOTE ID :

Special Directions & Comments :

TP6a + 2a double sample col. please composite one of each and analyse OCP/PCB.

Analytes

	Sample ID	Date	Matrix	Combo 7	OCP	PCB	TRH + BTEX	Metals 8	# TBT										Container 1LP	250P	125P	1LA	VIAL	100mL A	OTHER
1	TP1a	29/4/11	Soil	X																					
2	TP2a																								
3	TP3a								X																
4	TP4a																								
5	TP5a																								
6	TP6a																								
7	TP7a																								
8	TP8a																								
9	TP9a																								
10	TP11a																								
11	TP11b								X																
12	TP~~2~~9a + TP6a				X	X			(composite)																
13	TS110427.7						X																		
14	MTB270411-2							X																	

11Ap32408
11Ap32409
11Ap32410
11Ap32411
11Ap32412
11Ap32413
11Ap32414
11Ap32415
11Ap32416
11Ap32417
11Ap32418
11Ap32419
11Ap32420
11Ap32421

Relinquished By: Nathan Hills
Date & Time : 29/4/11
Signature: Nathan Hills

Laboratory Staff -
Received By: Sowla mgtLabmark
Date & Time : 29/4/11 @ 4:35pm
Signature: SR
Report Number :

Lab Notes :

Turn around Time : 5 Days
24 Hrs 48 Hrs 5 Days (10 Days)
Comments

Method Of Shipment
☐ Courier
☐ Hand Delivered
☐ Postal

Laboratory Address: mgt-LabMark
Unit 1/ 8 Leighton Place
Asquith 2077
NSW, Australia
Phone : +612 9476 6533
Fax : +612 9476 9219
Contact : Bob Symons
e.mail : Bob.Symons@labmark.com.au

NOTES :

297703

CHAIN OF CUSTODY RECORD

mgt LabMark ENVIRONMENTAL LABORATORIES

CLIENT DETAILS

Company Name :	Contact Name :	Purchase Order :	COC Number :
Office Address :	Project Manager :	PROJECT Number : 8535/1	mgt QUOTE ID :
	e.mail for results :	Courier Consignment # :	

Special Directions & Comments : TP9a + TP13a double samples vol. please Composite - analyse for OCP/PCB (added from Project no. 8535/2 as instr. by client Nathan Hills) — SR 29/4/11

Laboratory Address: mgt-LabMark, Unit 1/ 8 Leighton Place, Asquith 2077, NSW, Australia, Phone : +612 9476 6533, Fax : +612 9476 8219, Contact : Bob Symons, e.mail : Bob.Symons@labmark.com.au

	Sample ID	Date	Matrix	Analytes: TRH + BTEX	Combo 7	OCP	PCB	Container: 1LP	250P	125P	1LA	VIAL	100mL A	OTHER
11Ap32422	1 TB110427.7	29/4/11	Soil	X										
11Ap32423	2 QA	↓	↓	X										
	3													
11Ap32424	4 TP13a	29/4/11	soil		X			added from Project no. 8535/2 as instr by client Nathan Hills — SR 29/4/11						
	5													
11Ap32425	6 TP9a + TP13a	29/4/11	soil			X	X	(Composite) added from Project 8535/2 as instr. by client Nathan Hill — SR 29/4/11						
	7													
	8													
	9													
	10													
	11													
	12													
	13													
	14													

Relinquished By: Nathan Hills
Date & Time : 29/4/11
Signature:

Laboratory Staff -
Received By: Sarita mgt Lahmafi
Date & Time : 29/4/11 @ 4:35pm SR
Signature:
Report Number :

Lab Notes :

Turn around Time : 24 Hrs 48 Hrs 5 Days 10 Days

Comments

Method Of Shipment: ☐ Courier ☐ Hand Delivered ☐ Postal

NOTES :

Appendix E

Exposure Scenarios

Table 6-E
E. PARKLANDS/RECREATIONAL LAND USE

Default Exposure Ratio:	**0.5**
Exposure Period:	2 hours/day 365 days/year 70 years' occupancy duration
Assumptions:	Soil contact opportunities arise during recreational activities. Children will usually be the key exposure concern. Refer Langley & Sabordo (1996) for specific exposure factors
Exclusions:	Home-grown fruit, vegetables, poultry etc Groundwater consumption Volatile contaminants, unless already accounted for in setting HIL for that contaminant
Direct Soil Exposure Pathways:	Direct soil and dust ingestion Direct soil dermal contact Direct soil particulate inhalation
Indirect Soil Exposure Pathways:	Nil applicable.

Table 6-F
F. COMMERCIAL/INDUSTRIAL LAND USE

Default Exposure Ratio:	**0.2**
Exposure Period:	8 hours/day 5 days/week 48 weeks/year 30 years' duration
Assumptions:	Soil contact opportunities arise during course of site utilisation by public and workers. Adults will usually be the key exposure concern allowing a lower default exposure ratio than for Parklands/Recreational Land Use. No residential land use occurring.(**NB** creches and day-care centres belong in category A). Refer Langley & Sabordo (1996) for specific exposure factors
Exclusions:	Home-grown fruit, vegetables, poultry etc. Groundwater consumption Volatile contaminants, unless already accounted for in setting HIL for that contaminant
Direct Soil Exposure Pathways:	Direct soil ingestion Direct soil dermal contact Direct soil particulate inhalation
Indirect Soil Exposure Pathways:	Nil applicable

Appendix F

Summary of Results

Sample Identification	PQL	Guideline*			TP1A	TP2A	TP3A	TP4A	TP5A	TP6A	TP7A	TP8A	TP11A	TP11B	TP2A+TP6A (COMPOSITE)
Sample Depth (m)		HIL 'E' [A]	HIL 'F' [A]	S/Stn [B]	0.3-0.4	0.1-0.2	0.2-0.3	0.2-0.3	0.2-0.3	0.2-0.3	0.2-0.3	0.2-0.3	0.3-0.4	0.7-0.8	--
Date					29/4/11	29/4/11	29/4/11	29/4/11	29/4/11	29/4/11	29/4/11	29/4/11	29/4/11	29/4/11	29/4/11
Sample Profile					concrete and brick cobbles, tile fragments in clayey sand matrix, brown/beige	clayey sand, brown, with fine to coarse gravel	gravel, fine to coarse, concrete and brick cobbles, tile fragments in clayey sand matrix, brown	clayey sand, brown, with concrete and brick cobbles, tile fragments and fine to coarse gravel	clayey sand, brown, with fine to coarse gravel throughout	clayey sand, brown, with concrete and brick cobbles and fine to coarse gravel throughout	silty sand, dark brown/black, with fine to coarse gravel and extremely weathered sandstone	clayey sand, brown, with concrete and brick cobbles and fine to coarse gravel	clayey sand, brown, with concrete and brick cobbles and fine to coarse gravel	clayey sand, dark brown/black with fine to coarse gravel	composite
Sample Purpose					Investigation	Investigation	Investigation	Investigation	Investigation	Investigation	Investigation	Investigation	Investigation	Investigation	Investigation
Sample collected by					NH	NH	NH	NH	NH	NH	NH	NH	NH	NH	NH
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)															
Benzene	0.5			1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	--
Toluene	0.5			1.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	--
Ethylbenzene	0.5			3.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	--
meta- and para-Xylene	1				< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	--
ortho-Xylene	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	--
Total Xylenes	1.5			14	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	--
Total Petroleum Hydrocarbons (TPH)															
TPH C6-C9	10			65	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	--
TPH C10-C14	50				< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	--
TPH C15-C28	100				180	< 100	< 100	< 100	140	110	< 100	< 100	< 100	3000	--
TPH C29-C36	100				1500	< 100	< 100	< 100	110	190	140	120	< 100	2000	--
TPH C10-C36	250			1000	**1705**	125	125	125	275	325	215	195	125	**5025**	--
Polycyclic Aromatic Hydrocarbons (PAH)															
Naphthalene	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.1	--
Acenaphthylene	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.4	--
Acenaphthene	0.5				< 0.5	< 0.5	< 0.5	< 0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	9.6	--
Fluorene	0.5				< 0.5	< 0.5	< 0.5	< 0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	7.8	--
Phenanthrene	0.5				2.7	< 0.5	< 0.5	< 0.5	12	< 0.5	0.8	< 0.5	< 0.5	170	--
Anthracene	0.5				1.2	< 0.5	< 0.5	< 0.5	2.6	< 0.5	< 0.5	< 0.5	< 0.5	40	--
Fluoranthene	0.5				4.8	< 0.5	< 0.5	< 0.5	19	< 0.5	2.7	2.1	1.2	490	--
Pyrene	0.5				4.9	< 0.5	< 0.5	< 0.5	15	< 0.5	2.3	1.9	1	450	--
Benz(a)anthracene	0.5				2.2	< 0.5	< 0.5	< 0.5	5.2	< 0.5	1.1	1	< 0.5	150	--
Chrysene	0.5				2.5	< 0.5	< 0.5	< 0.5	5.4	< 0.5	1.4	1.1	0.5	130	--
Benzo(b)&(k)fluoranthene	0.5				4.5	< 1	< 1	< 1	7.1	< 1	2.4	2	< 1	220	--
Benzo(a) pyrene	1	2	5		**2.9**	< 0.5	< 0.5	< 0.5	**3.7**	< 0.5	1.3	1.2	0.5	**120**	--
Indeno(1,2,3-c,d)pyrene	0.5				1.8	< 0.5	< 0.5	< 0.5	3	< 0.5	1.5	1.2	0.5	96	--
Dibenz(a,h)anthracene	0.5				0.8	< 0.5	< 0.5	< 0.5	1.2	< 0.5	0.6	0.6	< 0.5	41	--
Benzo(g,h,i)perylene	0.5				3	< 0.5	< 0.5	< 0.5	3.2	< 0.5	1.8	1.3	0.6	110	--
Sum of reported PAH	8	40	100		32.3	4	4	4	**79.5**	4	17.15	13.9	6.8	**2036.9**	--
Metals															
Arsenic	1	200	500		1.7	5.1	4.8	3.3	3.2	3.8	5.4	5.1	3	3.1	--
Cadmium	0.1	40	100		0.4	< 0.1	< 0.1	< 0.1	0.1	< 0.1	0.1	0.1	< 0.1	< 0.1	--
Chromium	2	200	500		4.7	11	8.8	40	7.4	9.2	6.1	5.8	6	9.9	--
Copper	2	2000	5000		46	21	9.2	11	15	14	20	16	16	21	--
Nickel	1	600	3000		6.2	4.8	4.6	25	9.1	4	8.9	4.6	5.9	12	--
Lead	2	600	1500		19	35	49	29	31	19	43	73	42	42	--
Zinc	5	14000	35000		15	46	53	35	57	47	80	80	88	63	--
Mercury	0.05	30	75		< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	0.13	< 0.05	--
Organochlorine Pesticides (OCP)															
alpha-BHC					--	--	--	--	--	--	--	--	--	--	<0.05
HCB					--	--	--	--	--	--	--	--	--	--	<0.05
b-BHC					--	--	--	--	--	--	--	--	--	--	<0.05
g-BHC (Lindane)					--	--	--	--	--	--	--	--	--	--	<0.05
d-BHC					--	--	--	--	--	--	--	--	--	--	<0.05
Heptachlor		10	25		--	--	--	--	--	--	--	--	--	--	<0.05
Aldrin					--	--	--	--	--	--	--	--	--	--	<0.05
Heptachlor epoxide					--	--	--	--	--	--	--	--	--	--	<0.05
Chlordane - trans					--	--	--	--	--	--	--	--	--	--	<0.05
Endosulfan 1					--	--	--	--	--	--	--	--	--	--	<0.05
Chlordane - cis					--	--	--	--	--	--	--	--	--	--	<0.05
Dieldrin					--	--	--	--	--	--	--	--	--	--	<0.05
DDE					--	--	--	--	--	--	--	--	--	--	<0.05
Endrin					--	--	--	--	--	--	--	--	--	--	<0.05
Endosulfan 2					--	--	--	--	--	--	--	--	--	--	<0.05
DDD					--	--	--	--	--	--	--	--	--	--	<0.05
Endosulfan sulfate					--	--	--	--	--	--	--	--	--	--	<0.05
DDT					--	--	--	--	--	--	--	--	--	--	<0.2
Methoxychlor					--	--	--	--	--	--	--	--	--	--	<0.2
Endrin aldehyde					--	--	--	--	--	--	--	--	--	--	<0.05
Endrin ketone					--	--	--	--	--	--	--	--	--	--	<0.05
DDT+DDD+DDE		200	500		--	--	--	--	--	--	--	--	--	--	0.15
Aldrin + Dieldrin		10	25		--	--	--	--	--	--	--	--	--	--	0.05
Chlordane		50	125		--	--	--	--	--	--	--	--	--	--	0.05
Polychlorinated Biphenyls (PCB)															
Aroclor 1016					--	--	--	--	--	--	--	--	--	--	< 0.5
Aroclor 1232					--	--	--	--	--	--	--	--	--	--	< 0.5
Aroclor 1242					--	--	--	--	--	--	--	--	--	--	< 0.5
Aroclor 1248					--	--	--	--	--	--	--	--	--	--	< 0.5
Aroclor 1254					--	--	--	--	--	--	--	--	--	--	< 0.5
Aroclor 1260					--	--	--	--	--	--	--	--	--	--	< 0.5
Total PCBs		10	25		--	--	--	--	--	--	--	--	--	--	1.5
Tributyltin (TBT)															
Tributyltin (TBT) an SN					--	--	<0.0000005	--	--	--	--	--	--	<0.0000005	--

All results are in units of mg/kg.

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit.

[A] NEPM 1999 HIL 'E' (Parks/Open space), HIL 'F' (Commercial/Industrial)

[B] NSWEPA Guidelines for Assessing Service Station Sites, 1994

[*] Guideline adjusted for number of discrete samples within composite

Guidelines reported for Chromium are for Chromium VI

Results shown in **BOLD** are in excess of the HIL E or the Service Stations acceptance criteria

Results shown in shading are in excess of the HIL F acceptance criteria

Where summation required (Xylene, TPH, PAH, OCP, PCB) calculation includes components reported as non detected as 1/2 PQL. Underlined summations are those not detected