

Hazardous Materials Remediation Clearance Certificate

Compliant with Safe Work Australia Code of Practice: Workplace Exposure Standard for Airborne Contaminants (2011)

Project Information

Client: Australian National University

Contact: 
Lennox Crossing, Acton ACT 2600

Project number: 2171079F

Site Details

Site: Building 75 D,G,H

Specific work area(s)/room(s): Sand Pit - Sand replacement

Description of removal works

Removal contractor: AGH Demolition and Asbestos Removal Pty Ltd

Date of removal: 6th May 2017 to 7th May 2017

Scope of work: AGH Demolition and Asbestos Removal Pty Ltd was engaged to undertake the following;

- Carry out environmental cleaning of sand held within the sand pit possibly affected by lead dust
- Importer sand was tested by a NATA as being suitable for use within the sandpit

Clearance Inspection following Removal

Inspected By: 

The sand was removed from the existing sand-pit and surrounding areas were environmentally cleaned.
Location is north exterior portion of Building 75H
The lead contaminated dust and solid waste from the

No inspection was carried out to areas that were not included in the scope.

Date and time of inspection: 7th May 2017 at 10:50hrs

Areas not accessed: N/A

Evidence of Paint/sealant application: Yes

Visual inspection satisfactory: Yes

Comments: WSP Australia inspected the area and visually determined that the hazardous containing materials mentioned above in the scope of works have been removed as far as reasonably practicable.
This inspection certificate is valid for areas which were visually accessible at the time of inspection.
The areas can now be returned to normal use.

WIP Airborne Lead Monitoring

WIP air monitoring conducted: Yes
Results of air monitoring satisfactory: Yes
Comments:

Conclusion

Based on the above findings the work area/site is considered safe for reoccupation/ next stage of works to commence.

Issued by: 

Signature: 

Date issued: 11/05/2017

Standard Limitations of a Clearance Certificate

A visual inspection was undertaken to assess whether visible asbestos material was removed. Inspections are only carried out to the areas detailed to be removed and are conducted where access is available. Specifically no inspection has been carried out to areas that may require further remediation to verify the presence of asbestos. It should be noted that no inspection can be regarded as absolute and that additional asbestos may be encountered or uncovered upon further inspection, building works, or excavation. The inspection was carried out at the time of the completion of the remediation works and was dependent upon site conditions at that time. Parsons Brinckerhoff accepts no responsibility or liability for the completeness of the removal. Comments above regarding the aspects of the inspection also form limitations. The contractor's responsibilities included:

- Ensuring that work methods and procedures comply with the relevant legislation, codes of practice and industry standards, and undertake work in according with technical specifications.
- Employing suitably trained, skilled and competent staff.
- Ensuring that contractors are inducted in safe work procedures for asbestos materials/products.
- Obtaining the necessary approvals from regulatory authorities prior to starting any asbestos removal or maintenance activities.
- Ensuring that all work is conducted in a safe and competent manner.

Appendix A

Summary and NATA Laboratory Results (Imported sand)

GRAVIMETRIC DETERMINATION AND QUANTIFICATION OF ASBESTOS IN SOIL

CAPITAL LANDSCAPING GROUP, SAND
STOCKPILE


MAY 2017

GRAVIMETRIC DETERMINATION AND QUANTIFICATION OF ASBESTOS IN SOIL

CAPITAL LANDSCAPING GROUP, SAND
STOCKPILE

REV	DATE	DETAILS
A	05/05/2017	Capital Landscaping Group Sand Stockpile_ACT-2171079F-0031-65698RevA

AUTHOR, REVIEWER AND APPROVER DETAILS

Prepared by:	Lauren Smith	Date: 05/05/2017	Signature: 
Reviewed by:	Catherine Bondoc	Date: 05/05/2017	Signature: 

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Filename: Capital Landscaping Group Sand Stockpile_ACT-2171079F-0031-65698RevA.docx

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ABBREVIATIONS

A	Amosite Asbestos Detected
ACM	Asbestos Containing Material
AF	Asbestos Fines
C	Crocidolite Asbestos Detected
CH	Chrysotile Asbestos Detected
FA	Fibrous Asbestos
NAD	No Asbestos Detected
NEPM	National Environment Protection Measures
OF	Organic Fibres Detected
PLM	Polarised Light Microscopy
SMF	Synthetic Mineral Fibres Detected
UMF	Unknown Mineral Fibres Detected

ANALYSIS METHODOLOGY

Samples received by the laboratory is analysed in accordance with section 8.2.3 *Soil Samples* of Australian Standard (AS 4964-2004). Trace analysis is conducted in accordance with section 8.4 *Trace analysis criteria* of the standard. Asbestos analysis is conducted in accordance with the standard section 8.3.3 *Analytical criteria*. The asbestos analysis process follows methodology outlined in section D *Simplified flowchart for bulk asbestos identification*.

After confirmation, the relative degree of contamination is required to be assessed for the potential risk to health. This is done in accordance to the method outlined within Clause 4.1.7 of the *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia – May 2009*. This method provides a validated criteria in determining the degree of contamination. This method primarily refers to the visual inspection of the soil surface and the manual collection of Asbestos Containing Materials (ACM) and soil samples. Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.

The screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres (Respirable Fibres). Loose respirable fibres are detected under criteria set by Australian Standard (AS 4964-2004), section 8.4 *Trace analysis criteria*, with an implied detection and reporting limit of 0.1g/kg.

Non-Friable (ACM) weight is calculated based on the assumption of 15% asbestos by weight in non-friable ACM products used in Australia. Fibrous Asbestos (AF) and Asbestos Fines (AF) making up the Friable Asbestos weight is calculated based on the assumption of 100% asbestos by weight. Soil density is based on observations on site and it may range between 1.55 kg/L to 1.7 kg/L depending on the type of soil and locality.

METHOD SPECIFIC DEFINITION

- Asbestos Containing Materials (ACM) - comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin (e.g. asbestos fencing and vinyl tiles). This term is restricted to material that cannot pass a 7 mm x 7 mm sieve.
- Fibrous Asbestos (AF) - comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded (non-friable) or was previously bonded and is now significantly degraded (crumbling).
- Asbestos Fines (AF) - AF includes free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve.

All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.

ANALYSIS RESULTS

Unit		Limit of Reporting	Sample: PB238174	Sample: PB238175	Sample: PB238176
Total Soil Weight	kg	0.001	1.038	0.945	1.105
Asbestos Type Detected	N/A	-	NAD	NAD	NAD
Free Fibres (Respirable Fibres) in <2mm Sample	g/kg	0.1	No	No	No
ACM in >7mm Sample	g	0.001	<0.001	<0.001	<0.001
AF/FA in <7mm Sample	g	0.001	<0.001	<0.001	<0.001
ACM Weight (as 15% Asbestos in ACM >7mm)	%w/w	0.01	<0.01	<0.01	<0.01
Asbestos in soil (as 100% Asbestos in AF/FA <7mm)	%w/w	0.001	<0.001	<0.001	<0.001

LEGEND:

- NAD No Asbestos Detected
- CH Chrysotile Asbestos Detected
- A Amosite Asbestos Detected
- C Crocidolite Asbestos Detected
- UMF Unknown Mineral Fibres Detected
- SMF Synthetic Mineral Fibres Detected
- OF Organic Fibres Detected

GRAVIMETRIC DETERMINATION AND
QUANTIFICATION OF ASBESTOS IN SOIL
Capital Landscaping Group, Sand Stockpile

Appendix A

AS 4964 LABORATORY CERTIFICATES

Certificate of Analysis

ABN 80 078 004 798

NCSI Certified Quality System ISO 9001

LOCATION: Capital Landscaping Group, Sand Stockpile **CERTIFICATE NO:** ACT-2171079F-0031-65711

CLIENT: Australian National University **DATE(S) SAMPLED:** 4/05/2017

CLIENT ADDRESS: Lennox Crossing, Acton ACT 2600 **DATE RECEIVED:** 4/05/2017

TELEPHONE: 044858446 **DATE ANALYSED:** 5/05/2017

EMAIL: millerga@pbworld.com **ORDER NUMBER:** n/a

CONTACT: Glenn Beattie **SAMPLED BY:** Garry Miller

TEST METHOD: Qualitative identification of Asbestos fibre in bulk and soil samples at WSP Parsons Brinckerhoff Corporate Laboratories, by polarised light microscopy, including dispersion staining techniques using AS4964 (2004) and supplementary in house laboratory procedure (LP1 - Identification of Asbestos Fibres). This document is issued in accordance with NATA's requirements under NATA accreditation No. 17199, 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 standard.

Lab No	Sample ID	Sample Description	Sample Dimensions	Identification Type
001	PB238174	Sand	1038 gm	OF, NAD
002	PB238175	Sand	945 gm	OF, NAD
003	PB238176	Sand	1105 gm	OF, NAD

LEGEND:

- NAD - No Asbestos Detected
- CH - Chrysotile Asbestos Detected
- A - Amosite Asbestos Detected
- C - Crocidolite Asbestos Detected
- UMF - Unknown Mineral Fibres Detected
- SMF - Synthetic Mineral Fibres Detected
- OF - Organic Fibres Detected

Hand picked refers to small discrete amounts of asbestos distributed unevenly in a large body of non asbestos material.

Notes:

If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

The results contained within this report relate only to the sample(s) submitted for testing. PB accepts no responsibility for the initial collection, packaging or transportation of samples submitted by external persons. This document may not be reproduced except in full.



ACCREDITED FOR
**TECHNICAL
COMPETENCE**

Approved Identifier

Name: Sapna Dutta



Approved Signatory

Name: Catherine Bondoc



AUTHORISATION DATE

5/05/2017



ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES1710689**
Client : **WSP Australia Pty Ltd**
Contact : **JASON WATSON**
Address : **ABN: 80 078 004 798 GPO BOX 5394
SYDNEY NSW, AUSTRALIA 2001**
Telephone : **---**
Project : **2171079F**
Order number : **---**
C-O-C number : **---**
Sampler : **CAITLIN MORRIS**
Site : **---**
Quote number : **EN/008/16**
No. of samples received : **3**
No. of samples analysed : **3**

Page : **1 of 7**
Laboratory : **Environmental Division Sydney**
Contact : **Loren Schiavon**
Address : **277-289 Woodpark Road Smithfield NSW Australia 2164**
Telephone : **+61 2 8784 8503**
Date Samples Received : **05-May-2017 09:20**
Date Analysis Commenced : **05-May-2017**
Issue Date : **09-May-2017 10:28**



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



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Work Order : ES1710689
Client : WSP Australia Pty Ltd
Project : 2171079F

General Comments

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

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

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

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

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

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

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

LOR = Limit of reporting

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

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1,2,3-cd)pyrene (0.1), Dibenzo(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR.
Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.



Analytical Results

Sub-Matrix: SAND (Matrix: SOIL)				Client sample ID					
Compound	Client sampling date / time		Unit	SP1/1		SP1/2		SP1/3	
	CAS Number	LOR		04-May-2017 00:00		04-May-2017 00:00		04-May-2017 00:00	
				ES1710689-001	Result	ES1710689-002	Result	ES1710689-003	Result
EA002 : pH (Soils)									
pH Value	---	0.1	pH Unit	7.5		7.3		7.0	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	---	1	%	7.6		2.9		<1.0	
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	<5		<5		<5	
Cadmium	7440-43-9	1	mg/kg	<1		<1		<1	
Chromium	7440-47-3	2	mg/kg	<2		<2		3	
Copper	7440-50-8	5	mg/kg	<5		<5		<5	
Lead	7439-92-1	5	mg/kg	<5		<5		<5	
Nickel	7440-02-0	2	mg/kg	<2		<2		<2	
Zinc	7440-66-6	5	mg/kg	<5		<5		<5	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1		<0.1		<0.1	
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg	<0.05		<0.05		<0.05	
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05		<0.05		<0.05	
beta-BHC	319-85-7	0.05	mg/kg	<0.05		<0.05		<0.05	
gamma-BHC	58-89-9	0.05	mg/kg	<0.05		<0.05		<0.05	
delta-BHC	319-86-8	0.05	mg/kg	<0.05		<0.05		<0.05	
Heptachlor	76-44-8	0.05	mg/kg	<0.05		<0.05		<0.05	
Aldrin	309-00-2	0.05	mg/kg	<0.05		<0.05		<0.05	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05		<0.05		<0.05	
^ Total Chlordane (sum)	---	0.05	mg/kg	<0.05		<0.05		<0.05	
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05		<0.05		<0.05	
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05		<0.05		<0.05	
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05		<0.05		<0.05	
Dieldrin	60-57-1	0.05	mg/kg	<0.05		<0.05		<0.05	
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05		<0.05		<0.05	
Endrin	72-20-8	0.05	mg/kg	<0.05		<0.05		<0.05	
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05		<0.05		<0.05	
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05		<0.05		<0.05	
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05		<0.05		<0.05	
Endrin aldehyde	7421-83-4	0.05	mg/kg	<0.05		<0.05		<0.05	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05		<0.05		<0.05	



Analytical Results

Sub-Matrix: SAND (Matrix: SOIL)		Client sample ID			Client sampling date / time		Unit		SP1/1	SP1/2	SP1/3	
Compound	CAS Number	LOR	Unit	Result		Result		Result				
EP068A: Organochlorine Pesticides (OC) - Continued												
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2		<0.2		<0.2		<0.2	
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Methoxychlor	72-43-5	0.2	mg/kg				<0.2		<0.2		<0.2	
^A Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
^A Sum of DDD + DDE + DDT	72-54-8/72-55-9/5	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
	0-2											
EP068B: Organophosphorus Pesticides (OP)												
Dichlorvos	62-73-7	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Monocrotophos	8923-22-4	0.2	mg/kg		<0.2		<0.2		<0.2		<0.2	
Dimethoate	60-51-5	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Diazinon	333-41-5	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2		<0.2		<0.2		<0.2	
Malathion	121-75-5	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Fenthion	55-38-9	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Parathion	56-38-2	0.2	mg/kg		<0.2		<0.2		<0.2		<0.2	
Phirphos-ethyl	23505-41-1	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Prothiofos	34843-46-4	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Ethion	563-12-2	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Carbophenothion	786-19-6	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
Azinphos Methyl	88-50-0	0.05	mg/kg		<0.05		<0.05		<0.05		<0.05	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons												
Naphthalene	91-20-3	0.5	mg/kg		<0.5		<0.5		<0.5		<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5		<0.5		<0.5		<0.5	
Acenaphthene	83-32-9	0.5	mg/kg		<0.5		<0.5		<0.5		<0.5	
Fluorene	86-73-7	0.5	mg/kg		<0.5		<0.5		<0.5		<0.5	
Phenanthrene	85-01-8	0.5	mg/kg		<0.5		<0.5		<0.5		<0.5	
Anthracene	120-12-7	0.5	mg/kg		<0.5		<0.5		<0.5		<0.5	
Fluoranthene	206-44-0	0.5	mg/kg		<0.5		<0.5		<0.5		<0.5	
Pyrene	129-00-0	0.5	mg/kg		<0.5		<0.5		<0.5		<0.5	



Analytical Results

Sub-Matrix: SAND (Matrix: SOIL)		Client sample ID				
		Client sampling date / time				
Compound	CAS Number	LOR	Unit	SP1/1	SP1/2	SP1/3
				04-May-2017 00:00	04-May-2017 00:00	04-May-2017 00:00
				ES1710689-001	ES1710689-002	ES1710689-003
				Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued						
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5
Benzo(b,h)fluoranthene	205-98-2	0.5	mg/kg	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5
Indeno(1,2,3,cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons				<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)				<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)				0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)				1.2	1.2	1.2
EP080/074: Total Petroleum Hydrocarbons						
C6 - C9 Fraction	—	10	mg/kg	<10	<10	<10
C10 - C14 Fraction	—	50	mg/kg	<50	<50	<50
C15 - C28 Fraction	—	100	mg/kg	<100	<100	<100
C29 - C36 Fraction	—	100	mg/kg	<100	<100	<100
^ C10 - C36 Fraction (sum)			—	<50	<50	<50
EP080/074: Total Recoverable Hydrocarbons - NEPM 2013 Fractions						
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)				<10	<10	<10
>C10 - C16 Fraction	—	50	mg/kg	<50	<50	<50
>C16 - C34 Fraction	—	100	mg/kg	<100	<100	<100
>C34 - C40 Fraction	—	100	mg/kg	<100	<100	<100
^ >C10 - C40 Fraction (sum)				<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)			—	<50	<50	<50
EP080: BTEXN						
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SAND (Matrix: SOIL)		Client sample ID				
		Client sampling date / time				
Compound	CAS Number	LOR	Unit	SP1/1	SP1/2	SP1/3
				Result	Result	Result
EP080: BTEXN - Continued						
^ Sum of BTEX		0.2	mg/kg	<0.2	<0.2	
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	04-May-2017 00:00
Naphthalene	91-20-3	1	mg/kg	<1	<1	ES1710689-003
EP068S: Organochlorine Pesticide Surrogate						
Dibromo-DDE	21655-73-2	0.05	%	104	79.5	90.8
EP068T: Organophosphorus Pesticide Surrogate						
DEF	78-48-8	0.05	%	100	89.8	85.3
EP075(SIM)S: Phenolic Compound Surrogates						
Phenol-d6	13127-88-3	0.5	%	87.7	83.8	94.9
2-Chlorophenol-D4	93951-73-6	0.5	%	82.2	79.9	90.6
2,4,6-Tribromophenol	118-79-6	0.5	%	78.9	86.3	79.1
EP075(SIM)T: PAH Surrogates						
2-Fluorobiphenyl	321-60-8	0.5	%	91.1	87.5	87.3
Anthracene-d10	1719-06-8	0.5	%	98.2	103	95.8
4-Terphenyl-d14	1718-51-0	0.5	%	98.8	93.6	88.5
EP080S: TPH(V)/BTEX Surrogates						
1,2-Dichloroethane-D4	17060-07-0	0.2	%	100	97.9	92.5
Toluene-D8	2037-28-5	0.2	%	105	103	108
4-Bromofluorobenzene	480-00-4	0.2	%	101	99.0	97.4



Surrogate Control Limits

Sub-Matrix: SAND		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21855-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	86	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Appendix B

Air Monitoring NATA Laboratory Results



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Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS

166561

Client:

WSP Australia Pty Limited
GPO Box 5394
Sydney
NSW 2001

Attention: Warren Lal, Garry Miller

Sample log in details:

Your Reference:	2171079F / ANU Child Care	
No. of samples:	7 Filters	
Date samples received / completed instructions received	08/05/17	/ 08/05/17

Analysis Details:

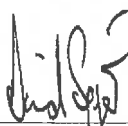
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.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

Report Details:

Date results requested by: / Issue Date:	11/05/17	/	11/05/17
Date of Preliminary Report:	Not Issued		

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Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:



David Springer
General Manager

Envirolab Reference: 166561
Revision No: R 00



Lead on filter Our Reference: Your Reference	UNITS ----- -	166561-1 17/20 (CBR-05)	166561-2 16/20 (CBR-06)	166561-3 15/20 (CBR-01)	166561-4 20/20 (CBR-07)	166561-5 18/20 (CBR-02)
Date Sampled Type of sample	----- Filter	6/05/2017 Filter	6/05/2017 Filter	6/05/2017 Filter	6/05/2017 Filter	6/05/2017 Filter
Date prepared	-	10/05/2017	10/05/2017	10/05/2017	10/05/2017	10/05/2017
Date analysed	-	10/05/2017	10/05/2017	10/05/2017	10/05/2017	10/05/2017
Lead	µg/filter	<1	<1	<1	<1	<1

Lead on filter Our Reference: Your Reference	UNITS ----- -	166561-6 19/20 (ID-54)	166561-7 18/18 (ID-52)
Date Sampled Type of sample	----- Filter	6/05/2017 Filter	6/05/2017 Filter
Date prepared	-	10/05/2017	10/05/2017
Date analysed	-	10/05/2017	10/05/2017
Lead	µg/filter	<1	<1

Total Suspended Particulates						
Our Reference:	UNITS	166561-1	166561-2	166561-3	166561-4	166561-5
Your Reference	-----	17/20 (CBR-05)	16/20 (CBR-06)	15/20 (CBR-01)	20/20 (CBR-07)	18/20 (CBR-02)
Date Sampled	-	6/05/2017	6/05/2017	6/05/2017	6/05/2017	6/05/2017
Type of sample	-----	Filter	Filter	Filter	Filter	Filter
Date prepared	-	06/05/2017	06/05/2017	06/05/2017	06/05/2017	06/05/2017
Date analysed	-	09/05/2017	09/05/2017	09/05/2017	09/05/2017	09/05/2017
Weight of Filter (before)	g	0.01774	0.01804	0.01765	0.01793	0.01802
Weight of Filter (after)	g	0.01799	0.01804	0.01765	0.01793	0.01802
Total Suspended Particulates	g	0.00025	0.00000	0.00000	0.00000	0.00000

Total Suspended Particulates			
Our Reference:	UNITS	166561-6	166561-7
Your Reference	-----	19/20 (ID-54)	18/18 (ID-52)
Date Sampled	-	6/05/2017	6/05/2017
Type of sample	-----	Filter	Filter
Date prepared	-	06/05/2017	06/05/2017
Date analysed	-	09/05/2017	09/05/2017
Weight of Filter (before)	g	0.01799	0.00631
Weight of Filter (after)	g	0.01801	0.00631
Total Suspended Particulates	g	0.00002	0.00000

Method ID	Methodology Summary
Metals-006	Determination of various metals on filters by ICP-AES/MS and or CV/AAS.
Inorg-100	Filter/Media Mass - determined gravimetrically.

Client Reference: 2171079F / ANU Child Care

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Lead on filter						Base Duplicate %RPD		
Date prepared	-			10/05/2017	[NT]	[NT]	LCS-5	10/05/2017
Date analysed	-			10/05/2017	[NT]	[NT]	LCS-5	10/05/2017
Lead	µg/filter	1	Metals-006	<1	[NT]	[NT]	LCS-5	112%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank				
Total Suspended Particulates								
Date prepared	-			[NT]				
Date analysed	-			[NT]				

Report Comments:

Asbestos ID was analysed by Approved Identifier:
Asbestos ID was authorised by Approved Signatory:

Not applicable for this job
Not applicable for this job

INS: Insufficient sample for this test
NR: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
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.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

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 (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.