4 November, 2022

David Ryan
129 Church Street
Mudgee
NSW 2850

Preliminary Contamination Testing Report – 323 Mortimer Street, Mudgee NSW 2850

Introduction

Macquarie Geotechnical Pty Ltd has undertaken sampling at the above site between the 14th July 2022. The purpose of the sampling is to assess a preliminary screening for general site contaminants during a geotechnical investigation.

The site is a residential block within the suburbs of north west Mudgee, the landscape is generally. Sampling was undertaken within three boreholes at locations shown in Figure 1.

Method

A vehicle mounted rig was used to sample soil from the locations. Samples were taken at intervals between 0.0m (surface) to 2.2m depth. Sampling was undertaken in accordance with the EPA Contaminated Land Guidelines – Consultants Reporting On Contaminated Land 2020) and NEPM guidelines for sampling and testing of contaminated sites.

Figure 1: Site Sample Locations

Contamination sample locations were visually inspected for any contamination. Jar samples were taken and labelled; field staff used disposable latex gloves when sampling material into clean jars. Drill rig auger bits were cleaned after each sample was acquired. Augured holes were backfilled with arisings upon completion of inspection.

During a site walkover, no observable contamination was present. During sampling no odours were present.

Results

The samples were sent away to Envirolab for preliminary screening of common contamination testing which comprised the following tests:

- 8 Heavy Metals: Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc.
- Total Petroleum Hydrocarbons (TPH)
- Polycyclic Aromatic Hydrocarbons (PAH)
- BTEX
- Asbestos

The results presented in Table 1 show the highest concentrations over the Excavated Natural Material (ENM) limits. This was chosen as it forms the lowest tier of contamination levels.

Table 1: Contamination Results Exceeding Excavated Natural Material Concentrations

Sample	Depth (m)	Lead (mg/kg)	Zinc (mg/kg)
Maximum average concentration(mg/kg)		50	150
Absolute maximum concentration (mg/kg)		100	300
BH3	0.0 – 0.4	**260**	**250**

The full suite of laboratory testing results can be found in Appendix A.

Conclusion

The findings of our inspection and works conducted on site were based on our fieldwork, site material assessment, technical assessment and local knowledge for this site.

We trust the foregoing is sufficient for your present purposes, and if you have any questions please contact the undersigned.

Yours sincerely

Craig Green
Project Engineering Geologist
BSc (Geology)

John Boyle
Geotechnical Manager
BSc (Hons) MEngSc (Geotechnical) Affil MIE Aust

References:

Australian Standard 1289 1.2.1 (1998) – Sampling - Soil
NSW EPA – Resource recovery order – Excavated Natural Material Order – 2014
EPA – Assessment of Site Contamination 2011 – Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater

Appendix A – Contamination Test Results

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

CERTIFICATE OF ANALYSIS 308500

Client Details

Client	Macquarie Geotech
Attention	David Webb
Address	3 Watt Dr, Bathurst, NSW, 2795

Sample Details

Your Reference	**D22037, 232 Mortimer St, Mudgee**
Number of Samples	4 Soil
Date samples received	20/09/2022
Date completed instructions received	20/09/2022

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

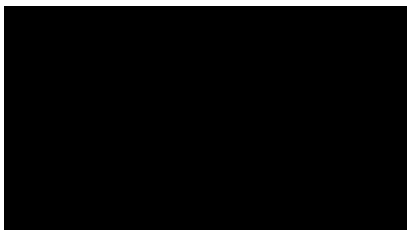
Date results requested by	27/10/2022
Date of Issue	27/10/2022

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

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

Asbestos Approved By
Analysed by Asbestos Approved Analyst: Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager
Hannah Nguyen, Metals Supervisor
Kyle Gavrily, Senior Chemist
Lucy Zhu, Asbestos Supervisor
Steven Luong, Senior Chemist



vTRH(C6-C10)/BTEXN in Soil					
Our Reference		308500-1	308500-2	308500-3	308500-4
Your Reference	UNITS	DB0-726A	DB0-726B	DB0-726C	DB0-726D
Sample ID		232 Mortimer St, Mudgee-BH01 0.6-0.8	232 Mortimer St, Mudgee-BH01 1.5-2.2	232 Mortimer St, Mudgee-BH02 0.0-0.4	232 Mortimer St, Mudgee-BH03 0.0-0.4
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	21/10/2022	21/10/2022	21/10/2022	21/10/2022
Date analysed	-	24/10/2022	24/10/2022	24/10/2022	24/10/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	82	88	81	74

svTRH (C10-C40) in Soil					
Our Reference		308500-1	308500-2	308500-3	308500-4
Your Reference	UNITS	DB0-726A	DB0-726B	DB0-726C	DB0-726D
Sample ID		232 Mortimer St, Mudgee-BH01 0.6-0.8	232 Mortimer St, Mudgee-BH01 1.5-2.2	232 Mortimer St, Mudgee-BH02 0.0-0.4	232 Mortimer St, Mudgee-BH03 0.0-0.4
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	21/10/2022	21/10/2022	21/10/2022	21/10/2022
Date analysed	-	23/10/2022	23/10/2022	23/10/2022	23/10/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	76	76	77	76

PAHs in Soil					
Our Reference		308500-1	308500-2	308500-3	308500-4
Your Reference	UNITS	DB0-726A	DB0-726B	DB0-726C	DB0-726D
Sample ID		232 Mortimer St, Mudgee-BH01 0.6-0.8	232 Mortimer St, Mudgee-BH01 1.5-2.2	232 Mortimer St, Mudgee-BH02 0.0-0.4	232 Mortimer St, Mudgee-BH03 0.0-0.4
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	21/10/2022	21/10/2022	21/10/2022	21/10/2022
Date analysed	-	21/10/2022	21/10/2022	21/10/2022	21/10/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	80	78	72	75

Acid Extractable metals in soil						
Our Reference		308500-1	308500-2	308500-3	308500-4	308500-5
Your Reference	UNITS	DB0-726A	DB0-726B	DB0-726C	DB0-726D	DB0-726A - [TRIPLICATE]
Sample ID		232 Mortimer St, Mudgee-BH01 0.6-0.8	232 Mortimer St, Mudgee-BH01 1.5-2.2	232 Mortimer St, Mudgee-BH02 0.0-0.4	232 Mortimer St, Mudgee-BH03 0.0-0.4	232 Mortimer St, Mudgee-BH01 0.6-0.8
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022
Date analysed	-	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022
Arsenic	mg/kg	<4	<4	<4	17	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	0.4	<0.4
Chromium	mg/kg	10	10	6	14	8
Copper	mg/kg	6	8	6	27	5
Lead	mg/kg	12	8	16	260	10
Mercury	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Nickel	mg/kg	6	10	6	8	6
Zinc	mg/kg	29	21	63	250	26

Moisture					
Our Reference		308500-1	308500-2	308500-3	308500-4
Your Reference	UNITS	DB0-726A	DB0-726B	DB0-726C	DB0-726D
Sample ID		232 Mortimer St, Mudgee-BH01 0.6-0.8	232 Mortimer St, Mudgee-BH01 1.5-2.2	232 Mortimer St, Mudgee-BH02 0.0-0.4	232 Mortimer St, Mudgee-BH03 0.0-0.4
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	20/10/2022	20/10/2022	20/10/2022	20/10/2022
Date analysed	-	21/10/2022	21/10/2022	21/10/2022	21/10/2022
Moisture	%	13	7.7	25	22

Misc Inorg - Soil					
Our Reference		308500-1	308500-2	308500-3	308500-4
Your Reference	UNITS	DB0-726A	DB0-726B	DB0-726C	DB0-726D
Sample ID		232 Mortimer St, Mudgee-BH01 0.6-0.8	232 Mortimer St, Mudgee-BH01 1.5-2.2	232 Mortimer St, Mudgee-BH02 0.0-0.4	232 Mortimer St, Mudgee-BH03 0.0-0.4
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	26/10/2022	26/10/2022	26/10/2022	26/10/2022
Date analysed	-	26/10/2022	26/10/2022	26/10/2022	26/10/2022
pH 1:5 soil:water	pH Units	7.1	7.4	7.4	6.6
Electrical Conductivity 1:5 soil:water	µS/cm	110	90	98	170

Asbestos ID - soils					
Our Reference		308500-1	308500-2	308500-3	308500-4
Your Reference	UNITS	DB0-726A	DB0-726B	DB0-726C	DB0-726D
Sample ID		232 Mortimer St, Mudgee-BH01 0.6-0.8	232 Mortimer St, Mudgee-BH01 1.5-2.2	232 Mortimer St, Mudgee-BH02 0.0-0.4	232 Mortimer St, Mudgee-BH03 0.0-0.4
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	25/10/2022	25/10/2022	25/10/2022	25/10/2022
Sample mass tested	g	Approx. 35g	Approx. 40g	Approx. 30g	Approx. 30g
Sample Description	-	Grey fiine-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.

Method ID	Methodology Summary
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date extracted	-			21/10/2022	1	21/10/2022	21/10/2022		21/10/2022	[NT]
Date analysed	-			24/10/2022	1	24/10/2022	24/10/2022		24/10/2022	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	88	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	88	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	85	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	88	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	87	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	90	[NT]
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	90	[NT]
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	92	1	82	64	25	93	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date extracted	-			21/10/2022	1	21/10/2022	21/10/2022		21/10/2022	[NT]
Date analysed	-			23/10/2022	1	23/10/2022	23/10/2022		23/10/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	111	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	84	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	114	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	111	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	84	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	114	[NT]
Surrogate o-Terphenyl	%		Org-020	78	1	76	76	0	85	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date extracted	-			21/10/2022	1	21/10/2022	21/10/2022		21/10/2022	[NT]
Date analysed	-			21/10/2022	1	21/10/2022	21/10/2022		21/10/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	126	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	119	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	127	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	124	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	77	1	80	75	6	94	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date prepared	-			25/10/2022	1	25/10/2022	25/10/2022		25/10/2022	[NT]
Date analysed	-			25/10/2022	1	25/10/2022	25/10/2022		25/10/2022	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	<4	4	0	105	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	100	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	10	10	0	106	[NT]
Copper	mg/kg	1	Metals-020	<1	1	6	6	0	105	[NT]
Lead	mg/kg	1	Metals-020	<1	1	12	19	45	102	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	105	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	6	6	0	102	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	29	28	4	105	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date prepared	-			26/10/2022	1	26/10/2022	26/10/2022		26/10/2022	[NT]
Date analysed	-			26/10/2022	1	26/10/2022	26/10/2022		26/10/2022	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	7.1	7.1	0	100	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	1	110	110	0	104	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 308500-1 for Pb. Therefore a triplicate result has been issued as laboratory sample number 308500-5.