Douglas Partners
Geotechnics / Environment / Groundwater

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EBH Environmental Services
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Project 82880.00
3 June 2022
R.036.Rev0
MJH:bjk

Attention: David Burgun

Email: david@ebhenvironmentalservices.com.au

Dear Sir,

Routine Water Monitoring - March 2022
EBH Waste Processing Facility
60 Donaldson Street, Wyong

1. Introduction

This letter report presents the results of routine water monitoring undertaken by Douglas Partners Pty Ltd (DP) at the EBH Environmental Services Pty Ltd (EBH) facility, located at 60 Donaldson Street, Wyong. The monitoring was undertaken with reference to DP's proposal 205367 dated 23 June 2021, and the EBH purchase order NW-1644 dated 30 June 2021.

It is understood that the on-site sedimentation pond collects stormwater and general site run-off which discharges toward the western boundary of the site (refer to Figure 1). Monitoring was undertaken to assess the water quality of the sedimentation pond and at the point of discharge. It should be noted that water was not discharging from the pond at the time of monitoring (23 March 2022).

The approximate monitoring locations are identified in Figures 1 and 2.

2. Scope of Works

The monitoring event comprised:

- Visual inspection of the sampling locations to identify signs of potential contamination/pollution.
- Recording general water quality parameters using a calibrated water quality meter (TPS90-FLT model). The parameters recorded comprised:
  - pH;
  - electrical conductivity (EC);
  - dissolved Oxygen (DO);
  - turbidity;
  - redox potential; and
  - temperature

- Collecting water grab samples at one location directly into laboratory-prepared bottles, capping immediately, then storage and transport to Envirolab Services Pty Ltd (Envirolab) for testing;
- Testing of the water samples for the following suite of analytes;
  - heavy metals (As, Cd, Cr, Cu, Hg, Pb, Ni & Zn);
  - heavy metals dissolved in water (filtered) (As, Cd, Cr, Cu, Hg, Pb, Ni & Zn)
  - total recoverable hydrocarbons (TRH);
  - benzene, toluene, ethyl benzene and xylene (BTEX);
  - polycyclic aromatic hydrocarbons (PAH); and
  - total suspended solids (TSS).
- Preparation of this summary report.

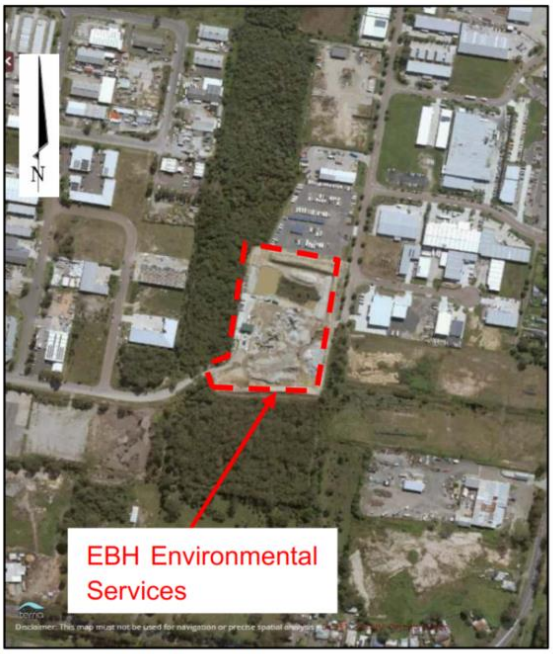

Figure 1: Site Locality

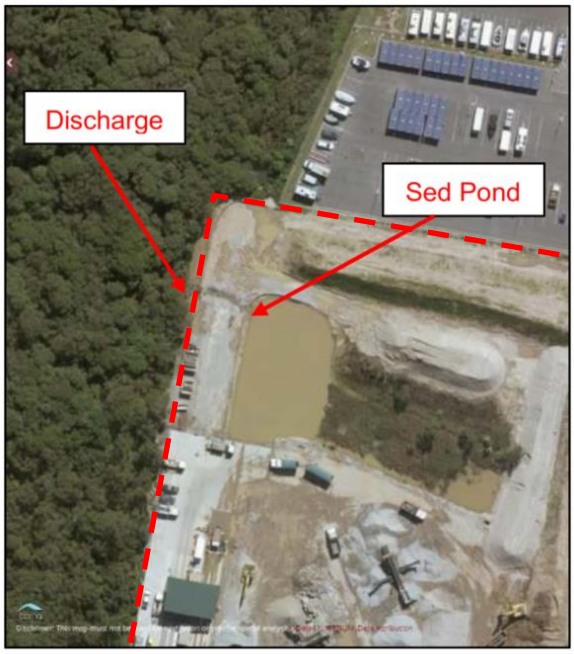

Figure 2: Monitoring locations

Images sourced from Metro Maps Photomaps, dated 17 December 2019

3. Monitoring and Laboratory Testing

The field work was undertaken on 23 March 2022 by an Environmental Scientist from DP. Visual inspection did not identify any obvious signs of potential contamination on the water surface. Water was not sufficiently discharging from the sediment pond through the rubble filled drain to enable collection of a sample from the discharge point.

For the monitoring event, the prevailing weather conditions were overcast. Reference to the Bureau of Meteorology rainfall data for Norah Head, located approximately 12 km east of the site, reported approximately 15 mm of rainfall in the week prior to commencement of monitoring activities.

Envirolab Services Pty Ltd, a laboratory certified by the National Association of Testing Authorities (NATA), was the primary laboratory employed to conduct the sample analysis. The laboratory is required to carry out routine in-house QC procedures to ensure accuracy, precision and repeatability of analyses.

The water monitoring and laboratory test results are summarised below in Table 1. Analytical methods used are shown on the attached laboratory certificate.

Table 1: Results of Surface Water Analysis (All results in µg/L unless otherwise stated) (March 2022)

Analyte / Parameter	Sed Pond	Sed Pond Filtered	Discharge	Laboratory PQL	ANZG 2018	
					Marine Water	Fresh Water
Field Parameters						
Dissolved Oxygen (ppm)	6.5	-	Not Tested - Insufficient Discharge for Sampling	NA	NC	NC
Electrical Conductivity (µS/cm)	652	-		NA	NC	NC
pH (1) (2)	8.2	-		NA	7.0-8.5 (1)	6.5-8.5 (2)
Redox Potential (mV)	144	-		NA	NC	NC
Turbidity (NTU)	28.9	-		NA	NC	1-50 NTU (2)
Total Suspended Solids (mg/L)	**54**	-		10	NC	< 50 mg/L (3)
TRH						
F1 (TRH C_6-C_{10} less BTEX)	<PQL	NT		10	NC	NC
F2 (TRH C_{10}-C_{16} less naphthalene)	<PQL	NT		50	NC	NC
F3 (TRH C_{16}-C_{34})	<PQL	NT		100	NC	NC
F4 (TRH C_{34}-C_{40})	<PQL	NT		100	NC	NC
BTEX						
Benzene	<PQL	NT		1	500	950
Toluene	<PQL	NT		1	180	180
Ethyl Benzene	<PQL	NT		1	80	80
Xylene (4)	<PQL	NT		3	75	75
Naphthalene	<PQL	NT		1	50	16
PAHs						
Total PAHs	<PQL	NT		0.1	NC	NC
Naphthalene	<PQL	NT		0.2	50	16
Benzo(a)pyrene	<PQL	NT		0.1	0.1	0.1
Metals						
Arsenic	3	3		1	NC	24
Cadmium	<PQL	<PQL		0.1	0.7	0.2
Chromium (III)	9	7		1	27	6.8*
Copper	**6**	**4**		1	1.3	3.1*
Lead	3	<PQL		1	4.4	3.4
Mercury	<PQL	<PQL		0.05	0.1	0.06
Nickel	2	1		1	7	11
Zinc	7	3		1	8	8

Notes:

(1) - Trigger Values for physical and chemical stressors for south-east Australia for Slightly Disturbed Ecosystems (Table 3.3.2)-Estuaries

(2) - Trigger values for pH and turbidity (freshwater) have been obtained from ANZEC (2000)

(3) Based on typical council disposal requirements. These criteria should be checked against background concentrations

(4) - m-xylene (conservative)

* Hardness adjusted value

PQL - Practical Quantitation Limits

NC - No Criteria

NA - Not applicable

NT - Not tested

Exceedes Marine Water GIL

Exceedes Fresh Water GIL

4. Discussion of Results

The monitoring location generally reported water quality results within the primary guidelines values (i.e. those for freshwater – ANZG, 2018). The following exceedances were reported:

- Copper concentrations (6 µg/L and 4 µg/L) exceeds the freshwater criteria of 1.3 µg/L and the hardness-adjusted criteria of 3.1 µg/L. DP notes that based on current advice, it is now recommended that the copper guideline value is not modified using the hardness correction algorithm. Furthermore, it is understood that the guideline value for copper is currently under revision and a new guideline value is expected to be released for comment later in 2022; and
- The TSS result (54 mg/L) marginally exceeded the freshwater criteria (50 mg/L). The use of flocculants should be considered to reduce TSS concentrations.

It should be noted that water was not sufficiently discharging from the sediment pond through the rubble filled drain to enable collection of a sample from the discharge point.

DP recommends that future monitoring rounds include surface water sampling from background areas to establish local background conditions. DP considers it may be necessary to revise the monitoring criteria for metals (Table 1), based on the background / baseline data set (i.e. establishment of site-specific trigger values). Increasing the monitoring frequency and / or use of statistical analysis may also be required, should there be exceedances of the criteria in the future.

5. References

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

6. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at 60 Donaldson Street, Wyong in accordance with DP's proposal dated 24 June 2021 and acceptance received from EBH dated 30 June 2021. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of EBH Environmental Services Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the water conditions on the site only at the specific sampling and/or testing locations, and then only at the time the work was carried out. Water conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in water conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully
Douglas Partners Pty Ltd

Matthew Harrison
Engineering Geologist

Reviewed by

Brent Kerry
Environmental Engineer / Senior Associate

Attachments:

Notes About This Report
Surface Water Sampling Form
Laboratory Certificates of Analysis & Chain of Custody Sheets

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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SURFACE WATER SAMPLING FORM

Project: Recovered Aggregate Assessment Program	**Project No:** 82880.00
Client: EBH Environmental Services Pty Ltd	
Location: 60 Donaldson Street, North Wyong	
Sampling Method:	

Sedpond discharg

Sample ID:	Sed Pond	~~SPF~~		SPF		
Sampling Date	23.3.22	23.3.22				
Time of Sampling	1:26			filtered		
Temperature (°C)	26			Sample		
pH (record to one decimal place)	8.2			of		
EC (µS/cm)	652			Sed Pond		
Dissolved Oxygen (% Sat)	6.5					
Dissolved Oxygen (~~mg/L~~)						
Turbidity (NTU)	28.9					
Redox (mV)	144					
TDS (mg/L)	–					
Odour	–					
Colour	–					
Observations						

Discharge

Notes:

No discharge from Sed Pond

Supervisor: AJH	Date: 23.3.22

Water quality meter calibration details (please tick calibration liquids used):

Meter ID							
Buffer (pH 4)	☐	Use-by Date		Conductivity Standard (2.76 mS/cm)	☐	Use-by Date	
Buffer (pH 6.88)	☐	Use-by Date		Total Dissolved Solids Standard (2 ppk)	☐	Use-by Date	
Buffer (pH 9)	☐	Use-by Date		Rapid Cal Solution	☐	Use-by Date	

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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 291762

Client Details

Client	Douglas Partners Tuggerah
Attention	Brent Kerry
Address	Unit 5, 3 Teamster Close, Tuggerah, NSW, 2259

Sample Details

Your Reference	**82880.00, EBH Wyong**
Number of Samples	2 Water
Date samples received	24/03/2022
Date completed instructions received	24/03/2022

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.

Report Details

Date results requested by	31/03/2022
Date of Issue	31/03/2022

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 ***

Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water		
Our Reference		291762-1
Your Reference	UNITS	Sed Pond
Date Sampled		23/03/2022
Type of sample		Water
Date extracted	-	24/03/2022
Date analysed	-	25/03/2022
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	95
Surrogate toluene-d8	%	94
Surrogate 4-BFB	%	102

svTRH (C10-C40) in Water		
Our Reference		291762-1
Your Reference	UNITS	Sed Pond
Date Sampled		23/03/2022
Type of sample		Water
Date extracted	-	30/03/2022
Date analysed	-	31/03/2022
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	100

PAHs in Water		
Our Reference		291762-1
Your Reference	UNITS	Sed Pond
Date Sampled		23/03/2022
Type of sample		Water
Date extracted	-	30/03/2022
Date analysed	-	30/03/2022
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	80

HM in water - total		
Our Reference		291762-1
Your Reference	UNITS	Sed Pond
Date Sampled		23/03/2022
Type of sample		Water
Date prepared	-	25/03/2022
Date analysed	-	25/03/2022
Arsenic-Total	µg/L	3
Cadmium-Total	µg/L	<0.1
Chromium-Total	µg/L	9
Copper-Total	µg/L	6
Lead-Total	µg/L	3
Mercury-Total	µg/L	<0.05
Nickel-Total	µg/L	2
Zinc-Total	µg/L	7

HM in water - dissolved		
Our Reference		291762-2
Your Reference	UNITS	SPF
Date Sampled		23/03/2022
Type of sample		Water
Date prepared	-	25/03/2022
Date analysed	-	25/03/2022
Arsenic-Dissolved	µg/L	3
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	7
Copper-Dissolved	µg/L	4
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	1
Zinc-Dissolved	µg/L	3

Miscellaneous Inorganics		
Our Reference		291762-1
Your Reference	UNITS	Sed Pond
Date Sampled		23/03/2022
Type of sample		Water
Date prepared	-	28/03/2022
Date analysed	-	28/03/2022
Total Suspended Solids	mg/L	54

Method ID	Methodology Summary
Inorg-019	Suspended Solids - determined gravimetricially by filtration of the sample. The samples are dried at 104+/-5°C.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
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-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	88	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	88	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	92	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate toluene-d8	%		Org-023	93	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate 4-BFB	%		Org-023	101	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			30/03/2022	[NT]	[NT]	[NT]	[NT]	30/03/2022	[NT]
Date analysed	-			31/03/2022	[NT]	[NT]	[NT]	[NT]	31/03/2022	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	75	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	70	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	78	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	75	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	70	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	78	[NT]
Surrogate o-Terphenyl	%		Org-020	82	[NT]	[NT]	[NT]	[NT]	72	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			30/03/2022	[NT]	[NT]	[NT]	[NT]	30/03/2022	[NT]
Date analysed	-			30/03/2022	[NT]	[NT]	[NT]	[NT]	30/03/2022	[NT]
Naphthalene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Acenaphthylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	77	[NT]
Fluorene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Phenanthrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Benzo(a)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-022/025	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	82	[NT]	[NT]	[NT]	[NT]	85	[NT]

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	291762-1
Date prepared	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	25/03/2022
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	25/03/2022
Arsenic-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	104
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	104
Chromium-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	102
Copper-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	98
Lead-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	99
Mercury-Total	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	113	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	99
Zinc-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	103

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date prepared	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	113	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			28/03/2022	[NT]	[NT]	[NT]	[NT]	28/03/2022	[NT]
Date analysed	-			28/03/2022	[NT]	[NT]	[NT]	[NT]	28/03/2022	[NT]
Total Suspended Solids	mg/L	5	Inorg-019	<5	[NT]	[NT]	[NT]	[NT]	84	[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.

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.

CHAIN OF CUSTODY

Douglas Partners
Geotechnics / Environment / Groundwater

Client: Douglas Partners	Project Number 82880.00	To:	Envirolab Services
Contact Person: Brent Kerry	Project Name: EBH Wyong	Contact Person:	Aileen Hie
Project Mgr: Brent Kerry	PO No.:	Address:	12 Ashley Street
	lab Quote No. : 2016-2017 List		Chatswood NSW 2068
Address: 5/3 Teanster Cl	Date results required: Standard TAT	Phone:	02 9910 6200
Tuggerah NSW 2259		Fax:	02 9910 6201
	Note: Inform lab in advance if urgent turnaround is required - surcharges apply	Email:	ahie@envirolab.com.au
Phone: 4351 1422 Mob:	Report format: Esdat/PDF / Excel	Laboratory Report No:	
Email: brent.kerry@douglaspartners.com.au	Comments:	Lab Comments:	

Sample Information						Tests Required											Comments
Lab Sample ID	Field Sample ID	Depth	Date sampled	Container Type	Type of sample	Combo 3	TSS	HM	OCP	TRH/BTEX	CEC	pH	Scr Suite	COMBO #7A	COMBO #7	Asbestos ID	Provide as much information about the sample as you can
1	Sed Pond	surface	23/03/2022	Bottles	Water	X	X										
2	SPF	surface	23/03/2022	Bottles	Water			X									SPF sample field filtered

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 291762
Date Received: 24/03/22
Time Received: 1045
Received by: CJ
Temp: Cool/Ambient
Cooling: Icepack
Security: Intact/Broken/None

Relinquished by: Douglas Partners	Sample Receipt	*Lab use only:*
Courier (by whom) TNT	Received by (Company): ECS 540	Samples Received: Cool or Ambient (circle one)
Condition of Sample at dispatch Cool or Ambient (circle) cool	Print Name: Christine	Temperature Received at: 15° (if applicable)
Temperature (if Applicable):	Date & Time: 24/03/22 1045	Transported by: Hand delivered / courier
Print Name: Brent Kerry	Signature:	
Date & Time: 23/3/22		
Signature:		