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Pathways Property Group
40 Chandos Street
St Leonards NSW 2065

Project 84979.01
10 August 2016
84979.01.R.001.Rev1
PMM:jlb

Attention: Andrew Farina

Email: andrew@conrite.com.au

Dear Sirs

Report on Groundwater Testing
4-10 Northwood Road, Longueville.

1. Introduction

This letter report has been prepared to present the results of a due diligence groundwater investigation at the above site. The investigation was commissioned by Pathways Property Group who has an interest in purchasing the property.

Previous contamination investigations by Douglas Partners Pty Ltd (DP) at the site in 2008 and 2015 identified some dissolved hydrocarbons (in 2011) in several of the groundwater monitoring wells installed by DP in 2008, and a potential for off-site migration of contamination was flagged in the 2015 report. It is understood that Pathways Property Group are seeking to further understand the risk associated with off-site migration of contaminated groundwater at the site.

The current investigation was carried out to re-assess the previous results and to assess the potential for off-site migration of the contamination down gradient (to the east).

2. Scope of Works

Three of the previously installed groundwater monitoring wells, identified as BH102, BH111 and BH112 (refer Drawing 1, attached) were developed, purged and sampled.

The initial plan was to install an additional three groundwater monitoring wells, particularly targeting the rear boundary. Due to issues with underground services, the scope was amended to include the installation of one additional groundwater monitoring well (BH1, Drawing 1 attached), which was subsequently developed, purged and sampled.

In addition to the groundwater sampling, the scope included the inspection for potential water seepage zones down gradient of the site, in close proximity to the site, and the recovery and testing of two soil samples (S1 and S2, Drawing 1) at the sandstone interface down gradient of the site (note that no seepage was noted on the day of sampling and therefore the soil samples are non-biased).

A total of two soil samples were collected and submitted to a NATA accredited laboratory for analysis for:

- Total recoverable hydrocarbons (TRH C_6-C_{36}); and
- Monocyclic aromatic hydrocarbons (benzene, toluene, ethylbenzene, xylene – BTEX).

A total of five groundwater samples were collected and submitted to a NATA accredited laboratory for analysis. The collected groundwater samples were analysed for the following contaminants of concern (related to the site's use as a service station):

- Total recoverable hydrocarbons (TRH C_6-C_{36});
- Monocyclic aromatic hydrocarbons (BTEX); and
- Polyaromatic Hydrocarbons (PAH).

3. Site Description

The site covers an approximate area of 2750 m^2 (0.275 hectare), and is a broadly parallelogram-shaped land parcel, with a service station shop, four bowsers, a canopy, and associated sheds and under-ground storage tanks (USTs) at the upper level, and a workshop and Telstra mobile communications tower at the rear, lower level. The property to the south is also part of the site and includes sheds, two brick commercial and residential buildings, a carport and a right of way. The workshop is at the basement of the service station shop.

The USTs are located at street level (western portion of the site) and the site dips to the east to the rear of the property.

Gore Creek, and ultimately Lane Cove River is the inferred receiving water body and that is located to the east/south-east of the site.

The site owner stated during the DP investigation in 2015 that there was a leakage incident which occurred in 2013 from one of the bowers. The exact duration of the leak is not known, but was thought to be approximately 2 days. The existing USTs were installed in 1995. No record of past leakage was noticed by the site owner and then recent pressure tests suggested that the tanks are/were not leaking. Prior to 1995, the owner did observe a small hole in the one of the old tanks during removal of the tanks but emphasised that he could not recall any historical leaks from the old tanks.

It is understood that the site has operated as a service station from at least the 1970's.

4. Field Work Observations

The groundwater field sheets are attached and show the groundwater levels and the absence of observable indicators of groundwater contamination. As noted earlier, no seepage from the embankment down gradient of the site was noted on the day of sampling.

5. Assessment Criteria

For the purposes of groundwater investigation, the groundwater investigation levels (GILs) have been derived from the National Environment Protection Measure 1999, as amended 2013 (NEPC, 2013), which are based on:

- *Australian Water Quality Guidelines* 2000 (AWQG);
- *Australian Drinking Water Guidelines* 2011 (ADWG);
- *Guidelines for Managing Risk in Recreational Waters* 2008 (GMRRW); and
- National water quality management strategy. Australian and New Zealand *Guidelines for Fresh and Marine Water Quality* 2000 (ANZECC and ARMCANZ).

The adopted GILs for the analytes included in this current and 2015 investigations and the corresponding source documents, are shown in Table 1. Drinking water thresholds have not been adopted as there is no known drinking water receptor in close proximity to the site.

The Gore Creek and, ultimately, Lane Cove River is considered likely to be the receiving body for groundwater sourced from the site. Marine Water was selected as the inferred receiving body of water is likely to be tidal in nature.

Table 1: Groundwater Investigation Levels (in µg/L unless otherwise stated)

Analyte		GIL	Comments
Metals	Arsenic (III)	24	GIL have not been adjusted for hardness.
	Arsenic (V)	13	
	Cadmium	0.2	
	Chromium (III)	3.3	
	Chromium (VI)	1	
	Copper	1.4	
	Lead	3.4	
	Mercury (total)	0.06	
	Nickel	11	
	Zinc	8	
BTEX	Benzene	950	
	Toluene	180[a]	
	Ethylbenzene	80[a]	
	Xylene (o)	350	
	Xylene (p)	200	

Note: In cases where no high reliability trigger values are provided, the moderate or low reliability trigger values provided in ANZECC & ARMCANZ (2000) have been used as screening levels (a)

5.1 Health Screening Levels – Petroleum Hydrocarbons

The site is currently an operational service station and workshop. The proposed use of the site to a potential purchaser is unknown, however it is possible that a residential development approval could be sought. Therefore, as noted in the footnotes to Table 1A(4) of NEPC (2013), the relevant and adopted HSLs are HSL B, residential with minimal access to soil.

In addition, the HSL adopted is predicted on the following inputs prescribed in Table 2.

Table 2: Inputs to the Derivation of HSLs

Variable	Input	Comment
Potential exposure pathway	Groundwater vapour intrusion	Exposure pathway via groundwater vapour intrusion affects the adopted HSL
Soil Type	Sandy clay and clayey sand and filling (in the absence of laboratory particle analysis sand HSL have been adopted as an initial conservative screen), sand being the most conservative soil type.	Soil properties including soil saturation porosity affect risk of exposure and are therefore factored into HSLs. A conservative soil type should be selected where the soil profile is not uniform (NEPC, 2013)
Depth to Contamination	2 m to <4 m	initial screening depth

The adopted groundwater HSL for vapour intrusion, from Table 1A(4), Schedule B1 of NEPC (2013) are shown in the following Table 3.

Table 3: Groundwater Health Screening Levels (HSL) for Vapour Intrusion (µg/L)

Analyte		HSL B	Comments
TRH	$C_6 – C_{10}$ (less BTEX) [F1]	1,000	*Sand profile depth to contamination 2 m to <4 m*
	$>C_{10} – C_{16}$ (less naphthalene) [F2]	1,000	
BTEX	Benzene	800	
	Toluene	NL	
	Ethylbenzene	NL	
	Xylene	NL	

Notes:

NL – the solubility limit is defined as the groundwater concentration at which the water cannot dissolve any more of an individual chemical based on a petroleum mixture. The soil vapour which is in equilibrium with the groundwater will be at its maximum. If the derived groundwater HSL exceeds the water solubility limit, a soil-vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for a given scenario. For these scenarios no HSL is presented for these chemicals. These are denoted as not limiting 'NL'.

5.2 Contaminants with No Assessment Criteria

Where no guidance is provided in NEPC (2013) for a specific analyte, the PQL will be used as the initial screening criteria.

If concentrations are recorded above the PQL, reference criteria will be sourced from other national and international guidance as relevant and use to determine the significance of the detected analyte.

The referenced criteria are provided in the results summary tables (Table A) attached.

6. Analytical Results and Recommendations

The groundwater test results are tabulated in the attached Table A, including the results of the previous round of sampling and testing in 2015. The results confirm the elevated hydrocarbon concentrations in BH111, and to a lesser extent in BH102, BH112 and BH1. The results indicate a potential leak / spill around the USTs at the higher level of the service station or within the lower level workshop. The concentrations overall appear to have decreased since the 2015 sampling, however there is insufficient data at this stage to determine if this is an existing and ongoing trend.

The soil samples reported relatively low concentrations of hydrocarbons, however it is not known if these are petroleum sourced or the result of decomposing organics.

7. Conclusions and Recommendations

On the basis of the results from 2015 and 2016 it is clear that the groundwater beneath the site, at least at the lower level hydraulically down gradient of the USTs and workshop, has been impacted with petroleum hydrocarbons. However, the extent of this impact further down gradient from location BH111 is not known, and therefore the existing or potential for migration of contaminants off site is not known. Additional groundwater wells would be required to establish this risk, which is potentially notifiable to the EPA under the *Contaminated Land Management Act*.

Should there be a down gradient groundwater impact it is likely that the removal of the source(s) at the site, including the USTs and any hydrocarbon impacted soils (potential secondary source) would be required, followed by the monitoring of natural attenuation further down gradient (i.e. a passive remediation strategy).

Based on the findings reported in this letter report, and the previous investigation reports prepared by DP, it is considered that the site can be remediated to a condition suitable for residential and retail land use (including seniors living). The remediation requirements will need to be outlined in an appropriate Remediation Action Plan (RAP) to be prepared at DA stage, which, once implemented, would be validated prior to declaring the site suitable for this land use, which will be subject to any recommendations made in the validation report.

8. Limitations

Douglas Partners (DP) has prepared this report (or services) for this project at Longueville in accordance with DP's proposal dated 9/05/2016 and acceptance received from Andrew Farina. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive

use of Pathways Property Group 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 sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface 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 ground 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.

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

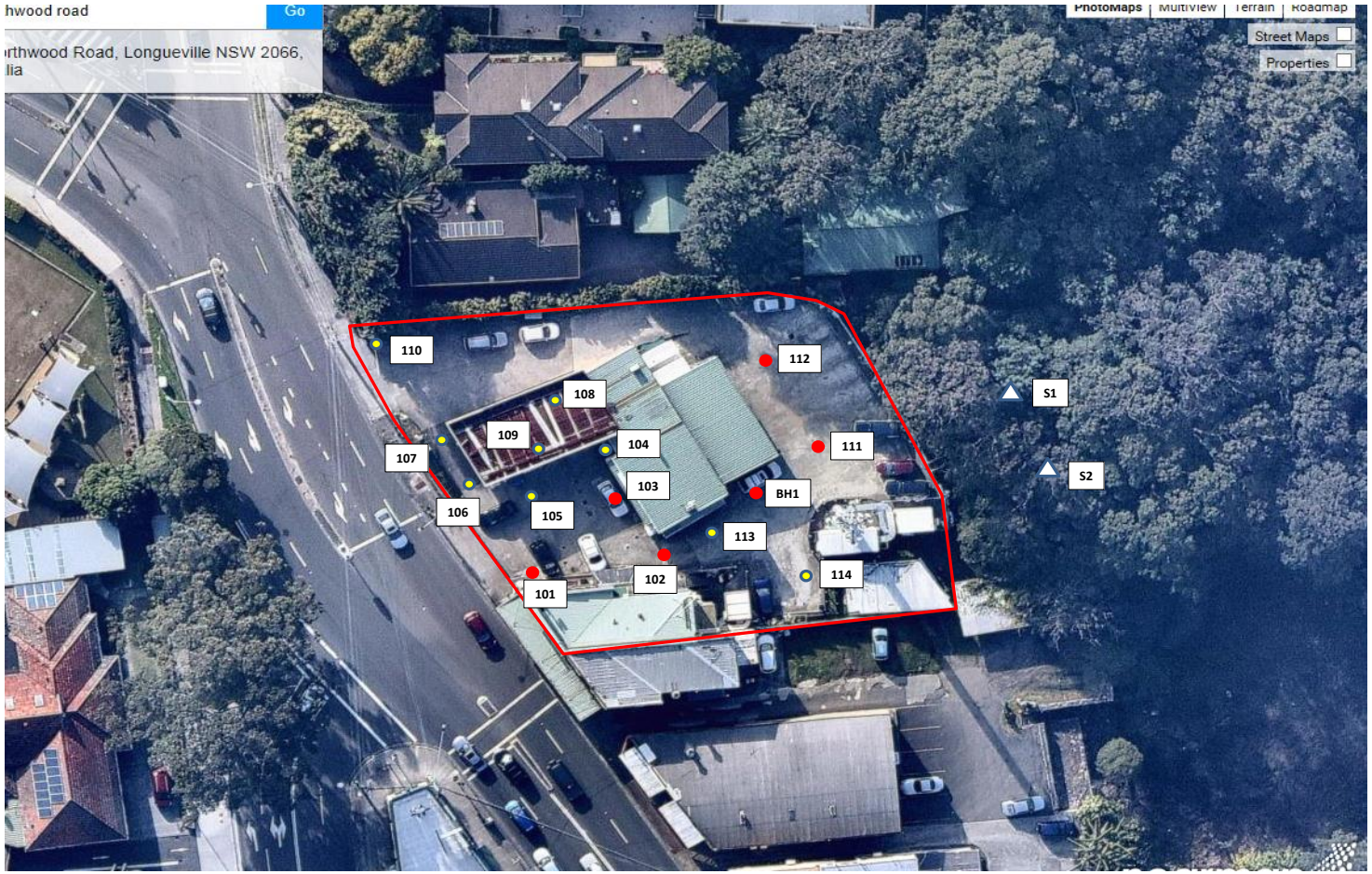
PP

Paula Maurici
Environmental Scientist

Reviewed by

Paul Gorman
Senior Associate

Attachments: Drawing 1 – site location
Field Sheets
Table A - Laboratory results
Laboratory certificates
Notes About this Report



LEGEND

- Bore Location
- Well Location
- Soil Sample

Photo: Nearmap 2016

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Pathways Property Group		TITLE: **Bore Locations** **4-10 Northwood Road, Longueville**	PROJECT No:	84979.01
	OFFICE: Sydney	DRAWN BY: PG		DRAWING No:	1
	SCALE: NA	DATE: 30.5.2016		REVISION:	0

Douglas Partners
Geotechnics / Environment / Groundwater

Groundwater Field Sheet

Project and Bore Installation Details					
Bore / Standpipe ID:	**BH1**				
Project Name:	Longueville Groundwater Assessment				
Project Number:	84979.01				
Site Location:	4-10 Northwood Road, Longueville				
Bore Easting:		Northing:			
Installation Date:					
GW Level (during drilling):	m bgl				
Well Depth:	m bgl				
Screened Interval:	m bgl				
Contaminants/Comments:					
Bore Development Details					
Date/Time:	13/05/2016				
Purged By:	RJL				
GW Level (pre-purge):	2.47 m bgl				
GW Level (post-purge):	3.71 m bgl				
PSH observed:	no				
Observed Well Depth:	5.93 m bgl				
Estimated Bore Volume:	25 L				
Total Volume Purged:	80 L				
Equipment:	Twister				
Micropurge and Sampling Details					
Date/Time:	18/05/2016				
Sampled By:	RJL				
Weather Conditions:	slightly overcast				
GW Level (pre-purge):	2.51 m bgl				
GW Level (post sample):	2.58 m bgl				
PSH observed:	no				
Observed Well Depth:	5.93 m bgl				
Estimated Bore Volume:	25 L				
Total Volume Purged:	1 L				
Equipment:	Geopump				
Water Quality Parameters					
Time / Volume	Temp (^{o}C)	DO (mg/L)	EC (µS or mS/cm)	pH	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1 ^{o}C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10 mV**
6.45 am	21	2.71	253	6.28	-65
6.46 am	21.3	3.04	252	6.04	-69
6.47 am	21.4	3.21	252	5.9	-70
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS		
Sample Details					
Sampling Depth (rationale):	4 m bgl,				
Sample Appearance (e.g. colour, siltiness, odour):	clear				
Sample ID:	BH1				
QA/QC Samples:					
Sampling Containers and filtration:	500mL glass, 2 x 40mL glass vials (HCl)				
Comments / Observations:	hydrogen sulphide odour				

Douglas Partners
Geotechnics / Environment / Groundwater

Groundwater Field Sheet

Project and Bore Installation Details					
Bore / Standpipe ID:	**102**				
Project Name:	Longueville Groundwater Assessment				
Project Number:	84979.01				
Site Location:	4-10 Northwood Road, Longueville				
Bore Easting:			Northing:		
Installation Date:	19/11/2007				
GW Level (during drilling):		m bgl			
Well Depth:	5	m bgl			
Screened Interval:	1 m - 5	m bgl			
Contaminants/Comments:					
Bore Development Details					
Date/Time:	13/05/2016				
Purged By:	RJL				
GW Level (pre-purge):	2.41	m bgl			
GW Level (post-purge):	4.52	m bgl			
PSH observed:	no				
Observed Well Depth:	4.97	m bgl			
Estimated Bore Volume:	18	L			
Total Volume Purged:	8	L			
Equipment:	Twister				
Micropurge and Sampling Details					
Date/Time:	18/05/2016				
Sampled By:	RJL				
Weather Conditions:	slightly overcast				
GW Level (pre-purge):	2.45	m bgl			
GW Level (post sample):	2.91	m bgl			
PSH observed:	no				
Observed Well Depth:	4.52	m bgl			
Estimated Bore Volume:	18	L			
Total Volume Purged:	1	L			
Equipment:	Geopump				
Water Quality Parameters					
Time / Volume	Temp (^{o}C)	DO (mg/L)	EC (µS or mS/cm)	pH	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1 ^{o}C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10 mV**
6.25 am	21.8	3.8	300	9.04	-58
6.26 am	22.1	3.99	394	8.6	-57
6.27 am	22.2	4.07	289	8.5	-53
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS		
Sample Details					
Sampling Depth (rationale):	3.5	m bgl,			
Sample Appearance (e.g. colour, siltiness, odour):	clear				
Sample ID:	102				
QA/QC Samples:					
Sampling Containers and filtration:	500mL glass, 2 x 40mL glass vials (HCl)				
Comments / Observations:					

Douglas Partners
Geotechnics / Environment / Groundwater

Groundwater Field Sheet

Project and Bore Installation Details					
Bore / Standpipe ID:	**111**				
Project Name:	Longueville Groundwater Assessment				
Project Number:	84979.01				
Site Location:	4-10 Northwood Road, Longueville				
Bore Easting:			Northing:		
Installation Date:	19/11/2007				
GW Level (during drilling):		m bgl			
Well Depth:	6	m bgl			
Screened Interval:	1 m - 6	m bgl			
Contaminants/Comments:					
Bore Development Details					
Date/Time:	13/05/2016				
Purged By:	RJL				
GW Level (pre-purge):	2.18	m bgl			
GW Level (post-purge):	5.02	m bgl			
PSH observed:	no				
Observed Well Depth:	5.72	m bgl			
Estimated Bore Volume:	25	L			
Total Volume Purged:	10	L			
Equipment:	Twister				
Micropurge and Sampling Details					
Date/Time:	18/05/2016				
Sampled By:	RJL				
Weather Conditions:	slightly overcast				
GW Level (pre-purge):	2.18	m bgl			
GW Level (post sample):	2.45	m bgl			
PSH observed:	no				
Observed Well Depth:	5.72	m bgl			
Estimated Bore Volume:	25	L			
Total Volume Purged:	1	L			
Equipment:	Geopump				
Water Quality Parameters					
Time / Volume	Temp (^{o}C)	DO (mg/L)	EC (µS or mS/cm)	pH	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1 ^{o}C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10 mV**
7.06 am	20.1	3.06	355	5.9	-120
7.07 am	21.4	3.75	369	5.86	-134
7.08 am	21.7	3.72	374	5.88	-138
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS		
Sample Details					
Sampling Depth (rationale):	4	m bgl,			
Sample Appearance (e.g. colour, siltiness, odour):	clear				
Sample ID:	111				
QA/QC Samples:					
Sampling Containers and filtration:	500mL glass, 2 x 40mL glass vials (HCl)				
Comments / Observations:					

Douglas Partners
Geotechnics / Environment / Groundwater

Groundwater Field Sheet

Project and Bore Installation Details					
Bore / Standpipe ID:	**112**				
Project Name:	Longueville Groundwater Assessment				
Project Number:	84979.01				
Site Location:	4-10 Northwood Road, Longueville				
Bore Easting:			Northing:		
Installation Date:	19/11/2007				
GW Level (during drilling):		m bgl			
Well Depth:	5.8	m bgl			
Screened Interval:	1 m - 5.8	m bgl			
Contaminants/Comments:					
Bore Development Details					
Date/Time:	13/05/2016				
Purged By:	RJL				
GW Level (pre-purge):	2.21	m bgl			
GW Level (post-purge):	4.98	m bgl			
PSH observed:	no				
Observed Well Depth:	5.49	m bgl			
Estimated Bore Volume:	24	L			
Total Volume Purged:	10	L			
Equipment:	Twister				
Micropurge and Sampling Details					
Date/Time:	18/05/2016				
Sampled By:	RJL				
Weather Conditions:	slightly overcast				
GW Level (pre-purge):	2.2	m bgl			
GW Level (post sample):	2.8	m bgl			
PSH observed:	no				
Observed Well Depth:	5.49	m bgl			
Estimated Bore Volume:	24	L			
Total Volume Purged:	2	L			
Equipment:	Geopump				
Water Quality Parameters					
Time / Volume	Temp (^{o}C)	DO (mg/L)	EC (µS or mS/cm)	pH	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1 ^{o}C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10 mV**
7.24 am	22	3.42	345	4.9	209
7.25 am	21.9	3.51	353	4.8	220
7.26 am	21.9	3.52	357	4.75	222
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS		
Sample Details					
Sampling Depth (rationale):	4	m bgl,			
Sample Appearance (e.g. colour, siltiness, odour):	clear				
Sample ID:	112				
QA/QC Samples:					
Sampling Containers and filtration:	500mL glass, 2 x 40mL glass vials (HCl)				
Comments / Observations:					

Table A: Results of Groundwater Analysis (All results in µg/L unless otherwise stated)

Sample ID	Sampling Date	Heavy Metals								Total Recoverable Hydrocarbons (TRH)								Monocyclic Aromatic Hydrocarbons (BTEX)					Napthelene
		Arsenic	Cadmium	Chromium[1]	Copper	Lead	Mercury	Nickel	Zinc	C6-C9 (TOTAL)	C6-C10 (TOTAL)	(C6-C9 less BTEX) F1	C10-C14	C15-C28	C29-C36	(C10-C36 less Napthalene) F2	C10-C36 (Total)	Benzene	Toluene	Ethyl- benzene	m+p xylene	o-xylene	
101	29.7.15	<1	<0.1	<1	**7**	<1	<0.05	4	**39**	<10	<10	<10	<50	<100	<100	<50	<250	<1	<1	<1	<2	<1	<1
102	29.7.15	1	<0.1	<1	1	<1	<0.05	**13**	9	710	840	450	960	<100	<100	490	960	81	8	**170**	120	11	**70**
	18.5.16	-	-	-	-	-	-	**-**	-	200	250	180	130	<100	<100	120	130	13	<1	49	4	<1	10
111	29.7.15	5	<0.1	2	<1	<1	<0.05	<1	9	46,000	58,000	**22000**	8500	220	<100	**3,200**	8,720	**960**	**16000**	**2500**	**11000**	**5100**	**360**
	18.5.16	-	-	-	-	-	-	**-**	-	27,000	33,000	**15000**	3700	<100	<100	**1,500**	3,700	690	**8600**	**1300**	**5000**	**2200**	**130**
112	29.7.15	<1	<0.1	3	**16**	3	<0.05	5	**21**	450	600	280	130	<100	<100	61	130	39	35	51	120	72	3
	18.5.16	-	-	-	-	-	-	**-**	-	360	520	260	110	<100	<100	85	110	34	24	53	89	60	4
BH1	18.5.16	-	-	-	-	-	-	**-**	-	110	250	180	<50	<100	<100	<50	<250	44	<1	8	20	6	<1
PQL		1	0.1	1	1	1	0.1	1	1	10							250	1	1	1		2	
NEPM (2013) GIL[2]		24 as As(III) 13 as As(V)	0.2 (S) 0.5 (M)	3.3 (S) & 8.3 (M) as Cr(III)	1.4 (S) 3.5 (M)	3.4 (S) 13.6 (M)	0.06	11 (S) 28 (M)	8 (S) 20 (M)	-	-	-	-	-	-	-	-	950	180*	80*	200 as p-xylene 75 as m-xylene	350	16
HSL B [3]		-	-	-	-	-	-	-	-	-	-	1000	-	-	-	1000	-	800	NL	NL	NL	NL	NL

Notes

*	Low reliability trigger value (section 8.3.7 of ANZECC 2000). Insufficient data for reliable trigger value. Interim working value used for screening purposes.
1	Low reliability trigger value (section 8.3.7 of ANZECC 2000) for chromium VI
2	NEPC 2013 Guideline - derived from numerous sources - see report section 6
3	HSL B groundwater health screening levels for vapour intrusion - Residential with minimal soil access (NEPC 2013) - sandy material 2->4m
-	Not Tested
NA	Not Applicable
BOLD	Exceedence of GIL or HSL
NL	Not limiting

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envirolab.com.au

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

CERTIFICATE OF ANALYSIS 146836

Client:
Douglas Partners Pty Ltd
96 Hermitage Rd
West Ryde
NSW 2114

Attention: Richard Lamont, Paul Gorman

Sample log in details:

Your Reference:	**84979.01, Groundwater Assessment**
No. of samples:	2 soils 4 waters
Date samples received / completed instructions received	18/05/16 / 18/05/16

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:	23/05/16 / 23/05/16
Date of Preliminary Report:	Not Issued

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

Results Approved By:

Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil			
Our Reference:	UNITS	146836-5	146836-6
Your Reference	---------- -	S1	S2
Date Sampled	----------	18/05/2016	18/05/2016
Type of sample		Soil	Soil
Date extracted	-	19/05/2016	19/05/2016
Date analysed	-	19/05/2016	20/05/2016
TRHC$_6$ - C$_9$	mg/kg	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
naphthalene	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	80	96

svTRH (C10-C40) in Soil			
Our Reference:	UNITS	146836-5	146836-6
Your Reference	----------	S1	S2
	-		
Date Sampled	----------	18/05/2016	18/05/2016
Type of sample		Soil	Soil
Date extracted	-	19/05/2016	19/05/2016
Date analysed	-	20/05/2016	20/05/2016
$TRHC_{10}$ - C_{14}	mg/kg	<50	<50
$TRHC_{15}$ - C_{28}	mg/kg	160	100
$TRHC_{29}$ - C_{36}	mg/kg	390	260
$TRH>C_{10}$-C_{16}	mg/kg	<50	<50
$TRH>C_{10}$ - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
$TRH>C_{16}$-C_{34}	mg/kg	400	250
$TRH>C_{34}$-C_{40}	mg/kg	280	200
Surrogate o-Terphenyl	%	82	82

Moisture			
Our Reference:	UNITS	146836-5	146836-6
Your Reference	----------	S1	S2
	-		
Date Sampled	----------	18/05/2016	18/05/2016
Type of sample		Soil	Soil
Date prepared	-	19/05/2016	19/05/2016
Date analysed	-	20/05/2016	20/05/2016
Moisture	%	14	19

vTRH(C6-C10)/BTEXN in Water					
Our Reference:	UNITS	146836-1	146836-2	146836-3	146836-4
Your Reference	----------	BH1	102	111	112
	-				
Date Sampled	----------	18/05/2016	18/05/2016	18/05/2016	18/05/2016
Type of sample		Water	Water	Water	Water
Date extracted	-	18/05/2016	18/05/2016	18/05/2016	18/05/2016
Date analysed	-	19/05/2016	19/05/2016	19/05/2016	19/05/2016
TRHC$_6$ - C$_9$	µg/L	110	200	27,000	360
TRHC$_6$ - C$_{10}$	µg/L	130	250	33,000	520
TRHC$_6$ - C$_{10}$ less BTEX (F1)	µg/L	51	180	15,000	260
Benzene	µg/L	44	13	690	34
Toluene	µg/L	<1	<1	8,600	24
Ethylbenzene	µg/L	8	49	1,300	53
m+p-xylene	µg/L	20	4	5,000	89
o-xylene	µg/L	6	<1	2,200	60
Naphthalene	µg/L	<1	21	180	5
Surrogate Dibromofluoromethane	%	102	105	101	91
Surrogate toluene-d8	%	96	93	74	105
Surrogate 4-BFB	%	96	102	96	105

svTRH (C10-C40) in Water					
Our Reference:	UNITS	146836-1	146836-2	146836-3	146836-4
Your Reference	----------	BH1	102	111	112
Date Sampled	- ----------	18/05/2016	18/05/2016	18/05/2016	18/05/2016
Type of sample		Water	Water	Water	Water
Date extracted	-	19/05/2016	19/05/2016	19/05/2016	19/05/2016
Date analysed	-	19/05/2016	19/05/2016	19/05/2016	19/05/2016
TRHC$_{10}$ - C$_{14}$	µg/L	<50	130	3,700	110
TRHC$_{15}$ - C$_{28}$	µg/L	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	µg/L	<100	<100	<100	<100
TRH>C$_{10}$ - C$_{16}$	µg/L	<50	140	1,600	90
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	µg/L	<50	120	1,500	85
TRH>C$_{16}$ - C$_{34}$	µg/L	<100	<100	<100	<100
TRH>C$_{34}$ - C$_{40}$	µg/L	<100	<100	<100	<100
Surrogate o-Terphenyl	%	97	95	95	99

PAHs in Water Our Reference: Your Reference	UNITS ----------	146836-1 BH1	146836-2 102	146836-3 111	146836-4 112
Date Sampled	- ----------	18/05/2016	18/05/2016	18/05/2016	18/05/2016
Type of sample		Water	Water	Water	Water
Date extracted	-	19/05/2016	19/05/2016	19/05/2016	19/05/2016
Date analysed	-	19/05/2016	19/05/2016	19/05/2016	19/05/2016
Naphthalene	µg/L	<1	10	130	4
Acenaphthylene	µg/L	<1	<1	<1	<1
Acenaphthene	µg/L	<1	12	<1	<1
Fluorene	µg/L	<1	1	<1	<1
Phenanthrene	µg/L	<1	<1	<1	<1
Anthracene	µg/L	<1	<1	<1	<1
Fluoranthene	µg/L	<1	<1	<1	<1
Pyrene	µg/L	<1	<1	<1	<1
Benzo(a)anthracene	µg/L	<1	<1	<1	<1
Chrysene	µg/L	<1	<1	<1	<1
Benzo(b,j+k)fluoranthene	µg/L	<2	<2	<2	<2
Benzo(a)pyrene	µg/L	<1	<1	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1	<1	<1	<1
Dibenzo(a,h)anthracene	µg/L	<1	<1	<1	<1
Benzo(g,h,i)perylene	µg/L	<1	<1	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5	<5	<5
Total +ve PAH's	µg/L	NIL (+)VE	23	130	3.6
Surrogate p-Terphenyl-d14	%	102	101	94	105

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			19/05/2016	[NT]	[NT]	LCS-2	19/05/2016
Date analysed	-			19/05/2016	[NT]	[NT]	LCS-2	19/05/2016
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-2	106%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-2	106%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-2	100%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-2	98%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-2	108%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-2	111%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-2	97%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	97	[NT]	[NT]	LCS-2	87%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			19/05/2016	[NT]	[NT]	LCS-2	19/05/2016
Date analysed	-			19/05/2016	[NT]	[NT]	LCS-2	19/05/2016
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-2	116%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-2	118%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-2	108%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-2	116%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-2	118%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-2	108%
Surrogate o-Terphenyl	%		Org-003	78	[NT]	[NT]	LCS-2	92%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			18/05/2016	146836-1	18/05/2016 || 19/05/2016	LCS-W2	18/05/2016
Date analysed	-			19/05/2016	146836-1	19/05/2016 || 19/05/2016	LCS-W2	19/05/2016
TRHC$_6$ - C$_9$	µg/L	10	Org-016	<10	146836-1	110 || 110 || RPD: 0	LCS-W2	99%
TRHC$_6$ - C$_{10}$	µg/L	10	Org-016	<10	146836-1	130 || 120 || RPD: 8	LCS-W2	99%
Benzene	µg/L	1	Org-016	<1	146836-1	44 || 43 || RPD: 2	LCS-W2	96%
Toluene	µg/L	1	Org-016	<1	146836-1	<1 || <1	LCS-W2	94%
Ethylbenzene	µg/L	1	Org-016	<1	146836-1	8 || 8 || RPD: 0	LCS-W2	98%
m+p-xylene	µg/L	2	Org-016	<2	146836-1	20 || 20 || RPD: 0	LCS-W2	103%
o-xylene	µg/L	1	Org-016	<1	146836-1	6 || 6 || RPD: 0	LCS-W2	99%
Naphthalene	µg/L	1	Org-013	<1	146836-1	<1 || <1	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	107	146836-1	102 || 99 || RPD: 3	LCS-W2	101%
Surrogate toluene-d8	%		Org-016	92	146836-1	96 || 100 || RPD: 4	LCS-W2	102%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Surrogate 4-BFB	%		Org-016	92	146836-1	96 || 99 || RPD: 3	LCS-W2	103%
QUALITY CONTROL svTRH (C10-C40) in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			19/05/2016	146836-1	19/05/2016 || 19/05/2016	LCS-W1	19/05/2016
Date analysed	-			19/05/2016	146836-1	19/05/2016 || 19/05/2016	LCS-W1	19/05/2016
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	146836-1	<50 || <50	LCS-W1	124%
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	146836-1	<100 || <100	LCS-W1	126%
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	146836-1	<100 || <100	LCS-W1	105%
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	146836-1	<50 || <50	LCS-W1	124%
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	146836-1	<100 || <100	LCS-W1	126%
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	146836-1	<100 || <100	LCS-W1	105%
Surrogate o-Terphenyl	%		Org-003	87	146836-1	97 || 97 || RPD: 0	LCS-W1	116%
QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			19/05/2016	146836-1	19/05/2016 || 19/05/2016	LCS-W1	19/05/2016
Date analysed	-			19/05/2016	146836-1	19/05/2016 || 19/05/2016	LCS-W1	19/05/2016
Naphthalene	µg/L	1	Org-012	<1	146836-1	<1 || <1	LCS-W1	71%
Acenaphthylene	µg/L	1	Org-012	<1	146836-1	<1 || <1	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012	<1	146836-1	<1 || <1	[NR]	[NR]
Fluorene	µg/L	1	Org-012	<1	146836-1	<1 || <1	LCS-W1	81%
Phenanthrene	µg/L	1	Org-012	<1	146836-1	<1 || <1	LCS-W1	90%
Anthracene	µg/L	1	Org-012	<1	146836-1	<1 || <1	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012	<1	146836-1	<1 || <1	LCS-W1	85%
Pyrene	µg/L	1	Org-012	<1	146836-1	<1 || <1	LCS-W1	89%
Benzo(a)anthracene	µg/L	1	Org-012	<1	146836-1	<1 || <1	[NR]	[NR]
Chrysene	µg/L	1	Org-012	<1	146836-1	<1 || <1	LCS-W1	71%
Benzo(b,j +k)fluoranthene	µg/L	2	Org-012	<2	146836-1	<2 || <2	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012	<1	146836-1	<1 || <1	LCS-W1	85%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012	<1	146836-1	<1 || <1	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012	<1	146836-1	<1 || <1	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012	<1	146836-1	<1 || <1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	112	146836-1	102 || 99 || RPD: 3	LCS-W1	98%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	146836-4	18/05/2016 || 19/05/2016
Date analysed	-	146836-4	19/05/2016 || 19/05/2016
TRHC$_6$ - C$_9$	µg/L	146836-4	360 || 400 || RPD: 11
TRHC$_6$ - C$_{10}$	µg/L	146836-4	520 || 570 || RPD: 9
Benzene	µg/L	146836-4	34 || 37 || RPD: 8
Toluene	µg/L	146836-4	24 || 24 || RPD: 0
Ethylbenzene	µg/L	146836-4	53 || 57 || RPD: 7
m+p-xylene	µg/L	146836-4	89 || 96 || RPD: 8
o-xylene	µg/L	146836-4	60 || 64 || RPD: 6
Naphthalene	µg/L	146836-4	5 || 5 || RPD: 0
Surrogate Dibromofluoromethane	%	146836-4	91 || 94 || RPD: 3
Surrogate toluene-d8	%	146836-4	105 || 103 || RPD: 2
Surrogate 4-BFB	%	146836-4	105 || 104 || RPD: 1

QUALITY CONTROL svTRH (C10-C40) in Water	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	146836-2	19/05/2016
Date analysed	-	[NT]	[NT]	146836-2	19/05/2016
TRHC$_{10}$ - C$_{14}$	µg/L	[NT]	[NT]	146836-2	72%
TRHC$_{15}$ - C$_{28}$	µg/L	[NT]	[NT]	146836-2	70%
TRHC$_{29}$ - C$_{36}$	µg/L	[NT]	[NT]	146836-2	60%
TRH>C$_{10}$ - C$_{16}$	µg/L	[NT]	[NT]	146836-2	72%
TRH>C$_{16}$ - C$_{34}$	µg/L	[NT]	[NT]	146836-2	70%
TRH>C$_{34}$ - C$_{40}$	µg/L	[NT]	[NT]	146836-2	60%
Surrogate o-Terphenyl	%	[NT]	[NT]	146836-2	95%

QUALITY CONTROL PAHs in Water	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	146836-2	19/05/2016
Date analysed	-	[NT]	[NT]	146836-2	19/05/2016
Naphthalene	µg/L	[NT]	[NT]	146836-2	77%
Acenaphthylene	µg/L	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	[NT]	[NT]	146836-2	81%
Phenanthrene	µg/L	[NT]	[NT]	146836-2	91%
Anthracene	µg/L	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	[NT]	[NT]	146836-2	86%
Pyrene	µg/L	[NT]	[NT]	146836-2	91%
Benzo(a)anthracene	µg/L	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	[NT]	[NT]	146836-2	73%
Benzo(b,j+k)fluoranthene	µg/L	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	[NT]	[NT]	146836-2	88%

QUALITY CONTROL PAHs in Water	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Indeno(1,2,3-c,d)pyrene	µg/L	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	[NT]	[NT]	146836-2	94%

Report Comments:

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

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

Quality Control Definitions

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

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

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

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

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

Laboratory Acceptance Criteria

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

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

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.