GROUNDWATER MONITORING – MAY 2025

TOLL SITE TOMAGO

Prepared for TOLL GROUP

Prepared by RCA Australia

RCA ref 12513e-223/0

JUNE 2025

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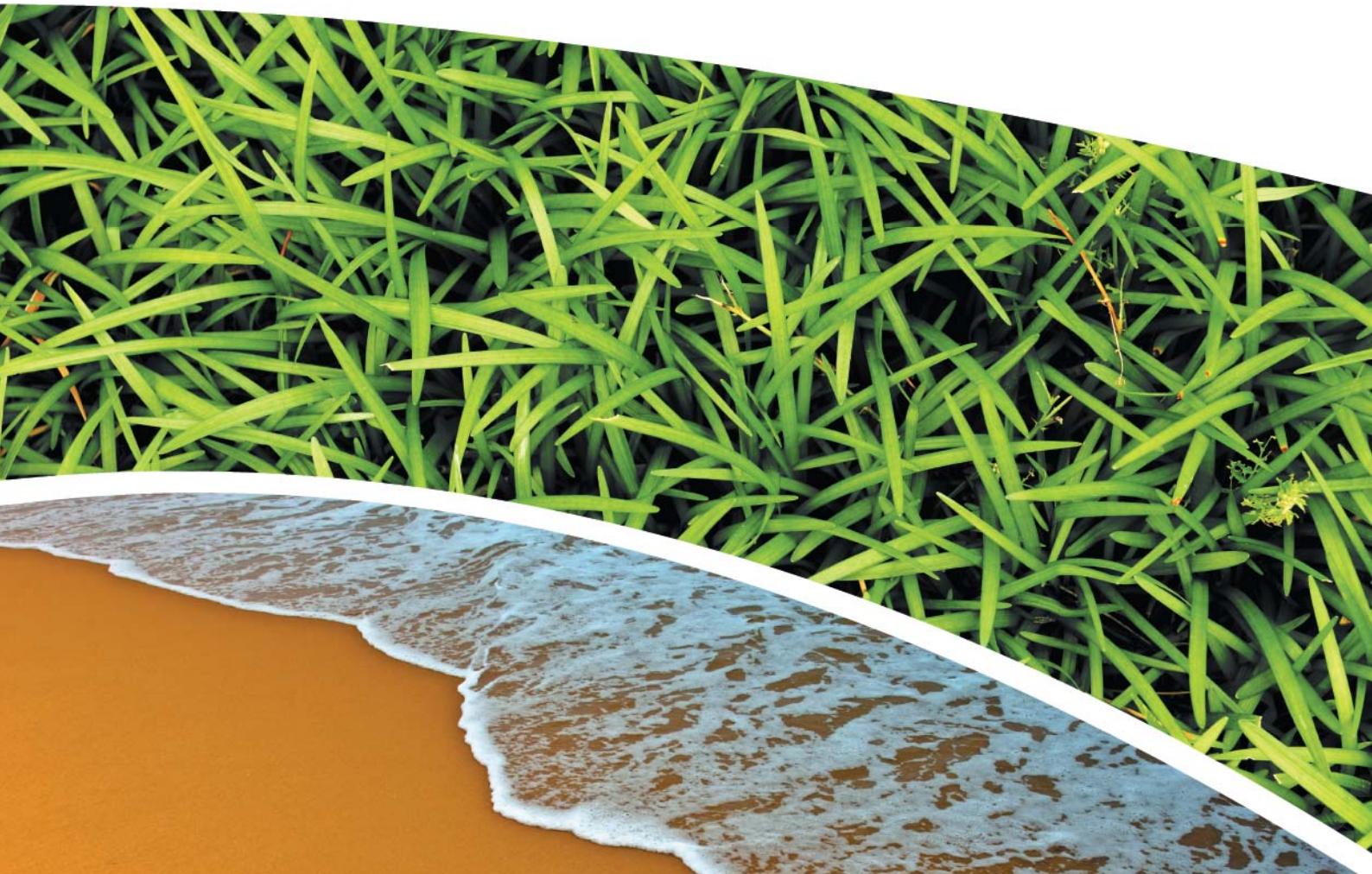

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RCA ref 12513e-223/0

25 June 2025

Toll Group
Old Punt Road
Tomago NSW 2322

Attention: Gaston-Jeane Forget
CC: Paul Nicou

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GROUNDWATER MONITORING REPORT – MAY 2025
TOLL SITE, TOMAGO

1 INTRODUCTION

This report presents the findings of a groundwater monitoring round undertaken at the Toll Group's (Toll) Tomago site as part of the continuation of a monitoring programme being implemented at the site.

A total of eleven (11) monitoring wells are located at the site, however one (1) well (MW8) has its entire screened interval situated below the groundwater surface and was replaced (by MW8a) and one (1) well (MW5) is inaccessible under a shed/ container. As such, nine (9) of the groundwater wells are used for long term monitoring. Four (4) of the wells are situated in close proximity to the current and former petroleum storage area and the remainder are situated around the site. The locations of the wells are included on **Drawing 1**, **Appendix A**.

Historical monitoring has identified the presence of hydrocarbons and metals in some wells and ammonia in all wells. The Environment Protection Licence (EPL #20125) for the site was amended, formally in March 2022, to include monitoring of selected groundwater wells at the site. The current EPL requires the following six-monthly monitoring in relation to groundwater:

- Hydrocarbons at MW1, MW2, MW3 and MW4.
- pH, electrical conductivity (EC), ammonia, nitrate and nitrite (oxidable nitrogen) and standing water level from MW1, MW2, MW3, MW4, MW6 and MW10.
- Metals at MW1, MW2, MW3, MW4 and MW10.

This report presents the findings of the May 2025 round of monitoring implemented in accordance with the EPL. It is noted that additional works were intended to be undertaken in accordance with a Sampling and Analysis Quality Plan (SAQP, Ref [1]), issued under section 8 of the EPL and endorsed by the appointed NSW EPA accredited Contaminated Land Site Auditor however that there were delays associated with the Toll approval process such that additional wells have not yet been installed.

2 SITE IDENTIFICATION AND DESCRIPTION

The site is described as 12 Old Punt Road, Tomago and Lot 7 DP562394. The site is currently used for the storage of ammonium nitrate, heavy vehicle storage and maintenance works.

Additional site details are shown in **Table 1**.

Table 1 *Site Details*

Current zoning (Ref [2])	E4 – General Industrial
Current use	Storage of Ammonium Nitrate
Size of site	2.59 ha
Land use to the: North	Light industrial – petroleum fuel dispensing facility
South	Light industrial
East	Old Punt Road, light industrial
West	Vacant, vegetated land
Nearest sensitive receptor (human health)	Adjacent residence (although considered to be used as a commercial property) and onsite workers
Nearest sensitive receptor (environmental)	Unnamed creek approximately 900 m to northwest, marsh lands approximately 700 m to the west and unnamed creek approximately 1.0 km to southwest – both of which connect to Hunter River.

Drawing 1, **Appendix A** shows the locality and the layout of the site.

3 FIELDWORK

A team of two (2) environmental professionals, experienced in the sampling and handling of potentially contaminated groundwater, undertook monitoring of nine (9) wells on 27 and 28 May 2025 as per the EPL monitoring requirements. The scope of work included:

- Field screening of volatile hydrocarbon vapours in the air space around each well and in the well head space using a photoionisation detector (PID).
    - It is noted that none of the wells have a gas sampling cap and as such field screening the air space around the wells was undertaken prior to removing the groundwater well cap. Screening of the well headspace was then carried out immediately after cap removal by inserting the PID probe directly into the well headspace. The field screening readings are indicative, noting that there was likely to be some loss of volatiles during the well cap removal process such that the PID readings may not be fully representative of the volatile hydrocarbon vapours within the well head space.

- Dipping of all accessible wells to measure the depth to the groundwater and presence of any phase separated light non-aqueous phase liquid (LNAPL). No assessment for phase separated dense non-aqueous phase liquid (DNAPL) was undertaken.
    - MW5 could not be located due to being undercover pavement or a container and MW8 was excluded from the scope. MW6 was buried under approximately 100 mm of hardstand material placed at the site since the November 2024 monitoring. Toll personnel located it via a metal detector and as such screening and dipping of MW6 was undertaken after the completion of the gauging component of the works.
- Placement of a low flow pump into the well and purging until pH and electrical conductivity (EC) readings stabilised. A new bladder and the existing designated tubing were used for each well during the water sample collection with the low flow pump.
- Following the stabilisation of pH and EC readings, additional field readings of turbidity, dissolved oxygen, temperature and salinity were recorded, and a sample was collected into laboratory prepared bottles and then placed into an insulated container on ice.
    - Samples were 0.45μm filtered prior to preservation for metals analysis.
- The samples were transported to the NATA accredited analytical laboratory and analysed for a suite of chemicals which included benzene, toluene, ethylbenzene, xylene, naphthalene (BTEXN), total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAH), metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc, mercury), ammonia and oxidisable nitrogen.

The relevant calibration sheet for the water quality meter and field sheets are attached in **Appendix B**.

PID readings at all wells were recorded at 0.0 ppm, consistent with the results from November 2024, except at MW4.

Groundwater was measured to be at between 0.0 m (i.e., at ground surface) at MW10 and 1.23 m below the surface at MW1.

Visual or olfactory indications of hydrocarbon contamination were identified at well MW4 only during sampling. LNAPL was identified in well MW4 during gauging and sampling.

Due to the use of designated tubing and bladders with the low flow pump, decontamination of the sampling equipment involved rinsing the pump housing, interface dip meter, and water quality meter (Horiba) with biodegradable detergent followed by potable water after each sample.

4 QUALITY ASSURANCE/ QUALITY CONTROL

RCA has reviewed the quality assurance and control in **Appendix C** and assessed the data as follows:

- Accuracy
    - The accuracy of the data has been assessed by internal means (surrogates, laboratory control samples, matrix spikes and method blanks) as being generally acceptable. There were minor non-compliances that were not considered significant to the characterisation of the water quality.
    - The accuracy of the data has not been assessed by external means due to the extent of the scope.

As such the accuracy of the data set is considered acceptable to the extent it was assessed.

- Precision
  - The precision of the data has been assessed by internal means (duplicates) as being generally acceptable. There was one minor non-compliance which was not considered to indicate significant uncertainty.
  - The precision of the data has been assessed by external means (intralaboratory duplicates) as being generally acceptable. There were five (5) results which indicate potential uncertainty; data substitution has been undertaken where the uncertainty was considered potentially significant.

  As such the precision of the data set is considered acceptable.
- Completeness
  - All data that was sought during the investigation was able to be retrieved.
  - Chain of custody were completed for all samples.

  As such, completeness is considered 100% for the collected samples.
- Representativeness
  - This assessment has considered groundwater contaminant concentrations on-site. The method of sampling was appropriate for the sampling of volatile compounds within water which was a potential concern at the site.

  As such the groundwater data is considered representative of the concentrations at the site.
- Comparability
  - Works were undertaken by personnel experienced in the sampling of potentially contaminated groundwater. The methodology of the majority of groundwater sampling is consistent with the majority, and the most recent, groundwater sampling techniques.
  - MW6 was gauged at a later stage that the other wells as it had been buried and needs to be found. Its water level was similar to the previous November 2024 measurement whereas the other wells in the same aquifer indicated an increase of between 0.14-0.38 m such that the water level may have been impacted by changes in groundwater that the other wells were not.
  - All samples were appropriately preserved for the requested analysis and all groundwater samples were kept on ice or in the refrigerator between sampling and analysis.
  - All laboratory analyses have been conducted by NATA accredited methodologies that comply with the international standard methods.
  - Comparable analytes shown some concurrence between analytical results. The detected concentrations show some concurrence with field observations of the presence of contamination.

  As such it is considered that the comparability of the data is appropriate with the possible exception of the MW6 water level.

It is therefore considered that the data obtained from this testing is generally accurate and adequately reliable in as far as it can be ascertained with regards to the chemical assessment.

5 RESULTS

Groundwater results from this sampling round were compared to the relevant criteria in **Appendix D**; the following presents a summary.

Groundwater depths of monitoring wells since 2017 were shown in **Figure 1** below. The groundwater monitoring well MW10 remained as 0.0 m (at ground level) since the December 2021 monitoring round. Groundwater depths for all the remaining wells generally decreased, noting the minimal difference in MW6 compared to the other wells may be due to the delay in gauging.

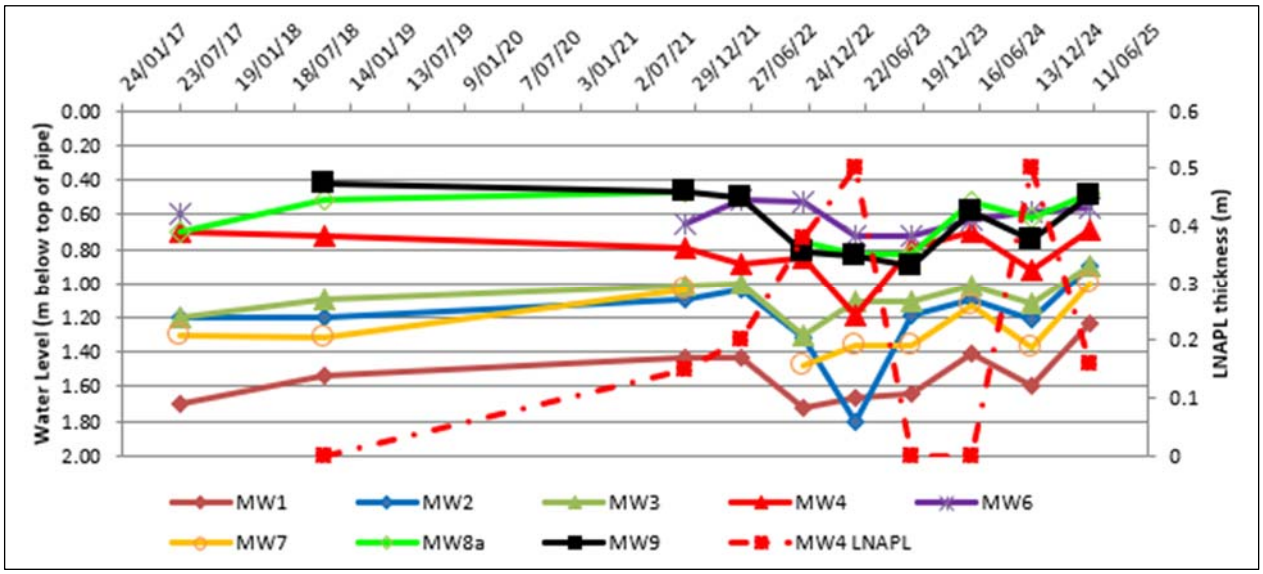


Figure 1 *Groundwater levels 2017-2025.*

Groundwater contours were generated from the water levels using surveyed data for the wells and indicate a westerly flow direction as presented on **Drawing 1**, **Appendix A**. The potential uncertainty with regards to the MW6 groundwater level was considered and would not, up to a maximum 0.3 increase, change the inferred flow direction. It is noted that RCA have excluded MW10 based on the understanding that it is representative of a different aquifer and have used the ground level of MW1 due to a change in the height of the pipe above the ground since the survey. The flow direction is consistent since November 2023.

With regards to chemical concentrations:

- pH was 3.98 at MW10 and ranged from 5.13 at MW6 to 7.27 at MW1.
- Electrical conductivity ranged from 0.92 mS/cm at MW1 to 9.84 mS/cm at MW3 and was 16.3 mS/cm at MW10.
- BTEX were not detected in monitoring wells MW1, MW2, MW3 or MW4 and as such concentrations were below the ecological (Ref [3]) and the drinking water criteria (Ref [4]). The results are generally consistent with previous results with exception of MW4 well.
- TRH was detected in monitoring wells MW1, MW3 and MW4 and as such were in excess of the ecological criterion (Ref [3]). The results of MW3 and MW4 represented an increase of 7% and 374% respectively, while results at MW1 represented a decrease of 39%. No TRH was found in MW2. All results are within the historical data ranges (refer to **Figure 2** below).

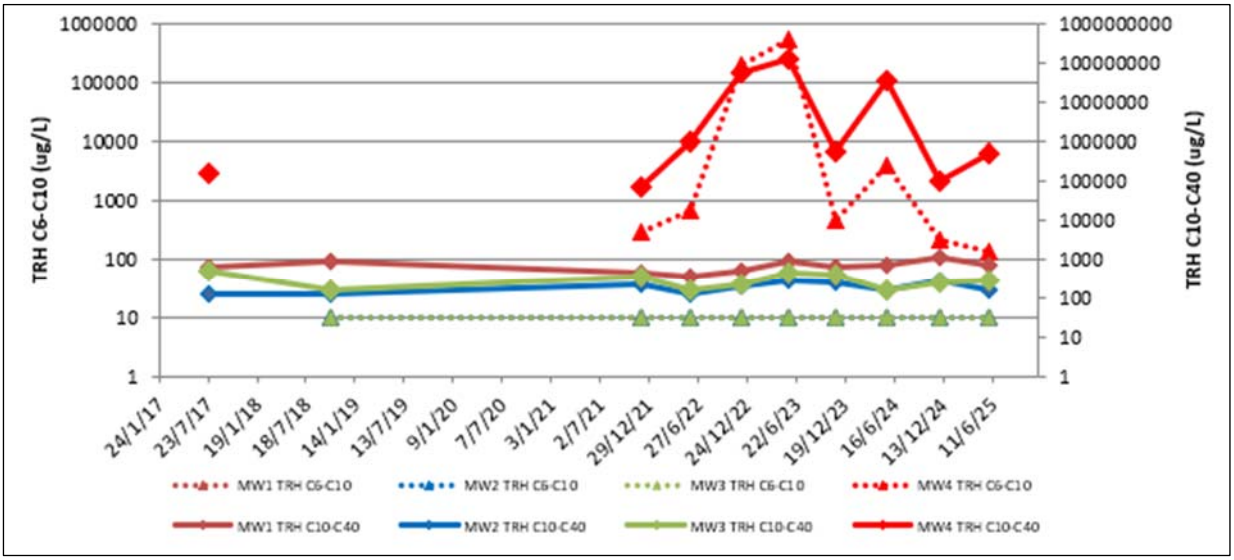


Figure 2 *TRH Concentrations 2017-2025 (noting that 2017 data do not include TRH C_6-C_{10} and that MW1, MW2 and MW3 TRH C_6-C_{10} has not been detected such that all data is represented by the MW3 series).*

- PAH compounds were not detected in any wells except for MW4 during this monitoring round. Fluoranthene and phenanthrene concentrations at MW4 exceeded the ecological criteria. Furthermore, anthracene, benzo(a)pyrene and naphthalene in this well were inferred to be in excess of the ecological criteria, although cannot be distinctly quantified due to the raised detection limit. Where quantifiable, the May 2025 results showed increases of 132% for fluorene and 142% for phenanthrene (a bioaccumulative compound) compared to the November 2024 results.

  No anthracene or benzo(a)pyrene was detected in MW1, MW2 or MW3 however the detection limits of these compounds were in excess of the ecological criterion and drinking water criterion respectively.

- Metals were detected in all five (5) monitored wells (MW1, MW2, MW3, MW4 and MW10) with the type and concentration of metals varying between wells with the exception of mercury:
  - Arsenic was detected only in MW10; all concentrations were below the ecological and drinking water criteria and are within the historical ranges.
  - Cadmium was detected only in MW10; the concentration was above the ecological criterion and less than the drinking water criterion. The concentration marginally increased from the November 2024 monitoring round however remains within the historical range.
  - Chromium was detected only in MW10; the concentration was in excess of the hexavalent chromium ecological criterion and less than the drinking water criterion. The concentration marginally increased when compared to the November 2024 monitoring result and is the highest in the historical range.
  - Copper was detected only in MW1 and MW10, and at the same concentration in both wells; the concentrations were slightly in excess of the ecological criterion and less than the drinking water criterion. The MW1 concentration remained unchanged between monitoring events, whereas the MW10 concentration slightly decreased when compared to the November 2024 monitoring result; both concentrations are within the historical ranges.

- Lead was detected only in MW4 and MW10; the concentrations, which were doubled compared to those in November 2024, were in excess of the ecological criterion at both wells and above the drinking water criterion only at MW10. Both are within the historical ranges.
- Nickel was detected in all five (5) analysed wells at varying levels; the concentrations were in excess of the ecological criterion only at MW2 and MW10. The concentrations at MW1 and MW10 increased, decreased at MW2 and MW3 and remained the same at MW4 when compared to the November 2024 monitoring results. All concentrations are within the historical ranges.
- Zinc was detected in all wells except MW4; concentrations were in excess of the ecological criterion at three (3) out of the four (4) wells. The concentrations increased at MW1 and MW10, whereas decreased at MW2 and MW3 when compared to the November 2024 monitoring results. All concentrations are within the historical ranges.

- Ammonia was detected in all wells as presented in **Figure 3**; RCA have assigned the criterion based on the pH of the water and temperature of approximately 20^{o}C at each location during this monitoring round as per **Table 2** below. Only the result at MW10 was not in excess of the relevant criteria (refer to **Appendix D**).

Table 2 *Ammonia Criterion based on pH and at 20^{o}C*

Sampling Location	Measured pH	pH on which Ammonia Criterion based	Ammonia Criterion (99% Fresh/ 95% Fresh)
MW1	7.27	7.3	220/ 680
MW2	6.0	6.0	310/ 930
MW3	6.1	6.1	300/ 920
MW4	6.1	6.1	300/ 920
MW6	5.13	6.0	310/ 930
MW10	3.99	6.0	310/ 930

The concentrations decreased at MW1, MW3 and MW4 from a range of 6.7% (MW4) to 80% (MW3), increased at MW2, MW6 and MW10 from a range of 5% (MW10) to 98% (MW2), when compared to those from November 2024 monitoring round. All results are within the historical ranges with the exception of the MW2 result, which is the highest in the historical range.

- Oxidisable nitrogen (nitrate + nitrite) was detected, and the concentrations were in excess of the ecological criterion in all wells during the May 2025 monitoring round. The results represented a substantial increase (from 172% to 4400%) compared to those in the previous November 2024 monitoring round. The concentrations at MW2, MW4, MW6 and MW10 are the highest in the historical ranges whereas those at the remaining wells are within the historical ranges.

  Ammonia and oxidisable nitrogen data are presented in **Figure 3** below.

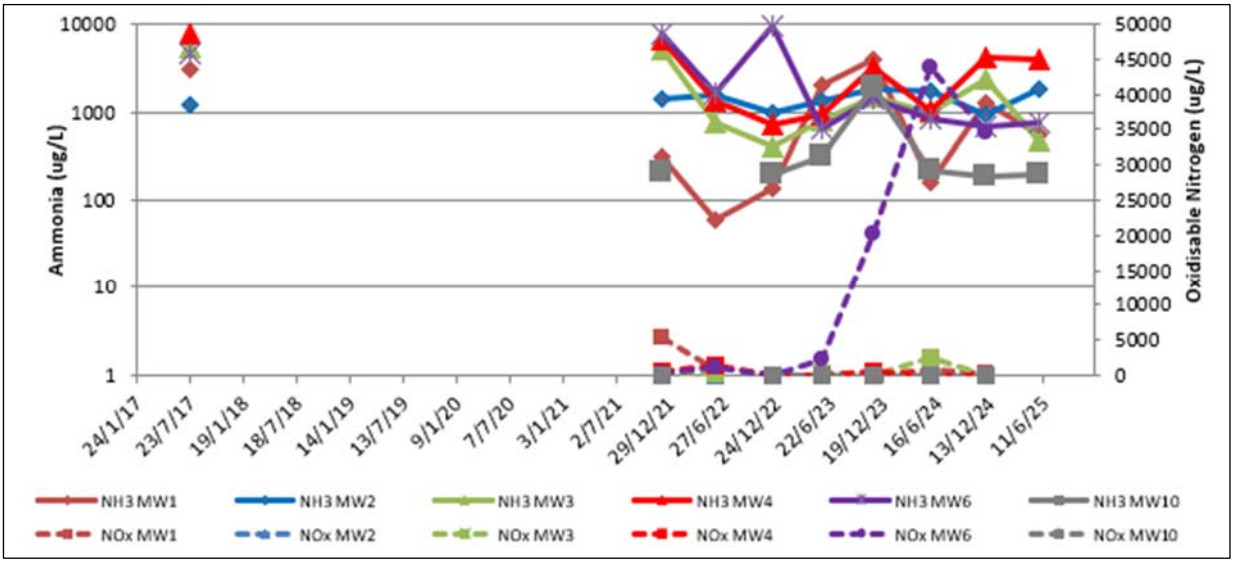


Figure 3 *Ammonia and Oxidisable Nitrogen Concentrations 2017-2025.*

6 DISCUSSION

Based on the results it is considered that groundwater is impacted by:

- Hydrocarbons in the immediate vicinity of the petroleum infrastructure and historical spill, particularly MW4 which is in close proximity (<5 m) from the refuelling area and associated bowser.
- Ammonia and oxidisable nitrogen in the northern part of the site, except for ammonia at MW10.

A historical surface hydrocarbon spill occurred at the site and MW1, MW2 and MW3 were installed as part of remediation/ validation works. While hydrocarbons have been detected in these wells, the concentrations are minor compared to those detected in MW4. The contamination is considered to be indicative of a diesel product however no specific identification analysis has been undertaken. The cause of the significant increase in the hydrocarbon concentrations at MW4 is unknown in the absence of any known leak of the site's current petroleum facilities.

The highest ammonia concentration is at MW4, considered the upgradient of the sampled wells based on the inferred groundwater flow (refer **Drawing 1**, **Appendix A**) indicated that an offsite source of ammonia is possible, noting that there is significant variation within the aquifer. The receiving water is considered likely to be the Hunter River however groundwater may first discharge into the wetland area to the north and west of the site or into one of the unnamed creeks to the northwest and southwest.

The highest concentration of oxidisable nitrogen was recorded at the downgradient well (MW6), with levels approximately 50 times higher than those observed at the other wells (MW1, MW2, MW3, and MW4) within the same aquifer. As such it is inferred that there may be a localised condition at the location of MW6 which is the cause of the high concentrations. It is noted that MW6 is located in an area designed for trucks used in the transportation of ammonium nitrate. Ammonium nitrate is stored at the site however current practices are such that unless there is an accident that results in the breakage of a bulk bag there should not be any product leakage to the ground.

The metals concentrations in the groundwater are in excess of the ecological criteria, however in the absence of any specific source of metals except potentially lead in association with the petroleum contamination, it is not considered that the site is the likely source of the detected metals. Nickel and zinc are the only metals considered to represent a potential risk to the environment. No further action is considered to be necessary with regards to metals concentrations unless concentrations indicate a potential source of contamination at the site.

7 CONCLUSIONS

This report has presented the findings of groundwater monitoring undertaken at the Toll site situated in Tomago which is currently used for storage of bulk ammonium nitrate as well as storage and maintenance of the heavy vehicle fleet.

A total of six (6) groundwater monitoring wells were sampled and chemically analysed in May 2025 in accordance with the EPL requirements. The collected samples were analysed for hydrocarbons, metals and nitrogen compounds including ammonia, in general accordance with the EPL.

A layer of LNAPL with an approximate thickness of 0.16 m was identified at MW4 during field gauging and sampling, and dissolved hydrocarbon concentrations had significantly increased compared to the results from November 2024. Hydrocarbon contamination at MW1 decreased by 39%, increased 7.4% at MW3 and it was non-detected at MW3.

Ammonia was detected at all wells in excess of the pH-based ecological guidelines (Ref [3]) presented in **Table 2** except for MW10. Oxidisable nitrogen was detected and in excess of the ecological criterion in all wells. The source is considered to be historical use of the site, given that current site practices appear to be suitable for the minimisation of potential ammonia contamination from the storage of ammonium nitrate at the site, however the magnitude of the oxidisable nitrogen at MW6 is considered to indicate a localised impact which may or may not be associated with the use of the site. It is noted that the NSW EPA is satisfied with Toll's 'debagging procedure' and has incorporated its implementation to the existing EPL.

Concentrations of various metals were in excess of the ecological guidelines (Ref [3]) at all bores except for MW3. As the site is not considered the source due to the absence of any known metal-contaminating activities, no further action is required.

The next groundwater monitoring event will be required in accordance with the EPL and as such will be undertaken in November 2025. Additional works as outlined in the SAQP (Ref [1]) may be undertaken.

8 LIMITATIONS

This report has been prepared for Toll Group in accordance with an agreement with RCA Australia (RCA). The services performed by RCA have been conducted in a manner consistent with that generally exercised by members of its profession and consulting practice.

This report has been prepared for the sole use of Toll Group. The report may not contain sufficient information for purposes of other uses or for parties other than Toll Group. This report shall only be presented in full and may not be used to support objectives other than those stated in the report without written permission from RCA Australia.

The information in this report is considered accurate at the date of issue with regard to the current conditions of the site. Conditions can vary across any site that cannot be explicitly defined by investigation. Environmental conditions including contaminant concentrations can change in a limited period of time. This should be considered if the report is used following a significant period of time after the date of issue.

Yours faithfully

RCA AUSTRALIA

Dr. Anh Hoang
Environmental Scientist
BSc& MSc (Env Sci), PhD (Env Remediation)

REFERENCES

[1] RCA Australia, *Sampling and Analysis Quality Plan for Further Groundwater Assessment Works, Toll Tomago Site*, RCA ref 12513d-410/1, July 2024.

[2] Port Stephens Council, *Port Stephens Local Environment Plan 2013 under the Environmental Planning and Assessment Act 1979* as updated 22 March 2024.

[3] ANZG, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality Australian and New Zealand Governments and Australian State and Territory Governments, Canberra ACT, Australia,* August 2018. Available at www.waterquality.gov.au/anz-guidelines.

[4] National Health and Medical Research Council, *Australian Drinking Water Guidelines*, December 2024.

[5] Standards Australia, *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*, AS 4482.1-2005.

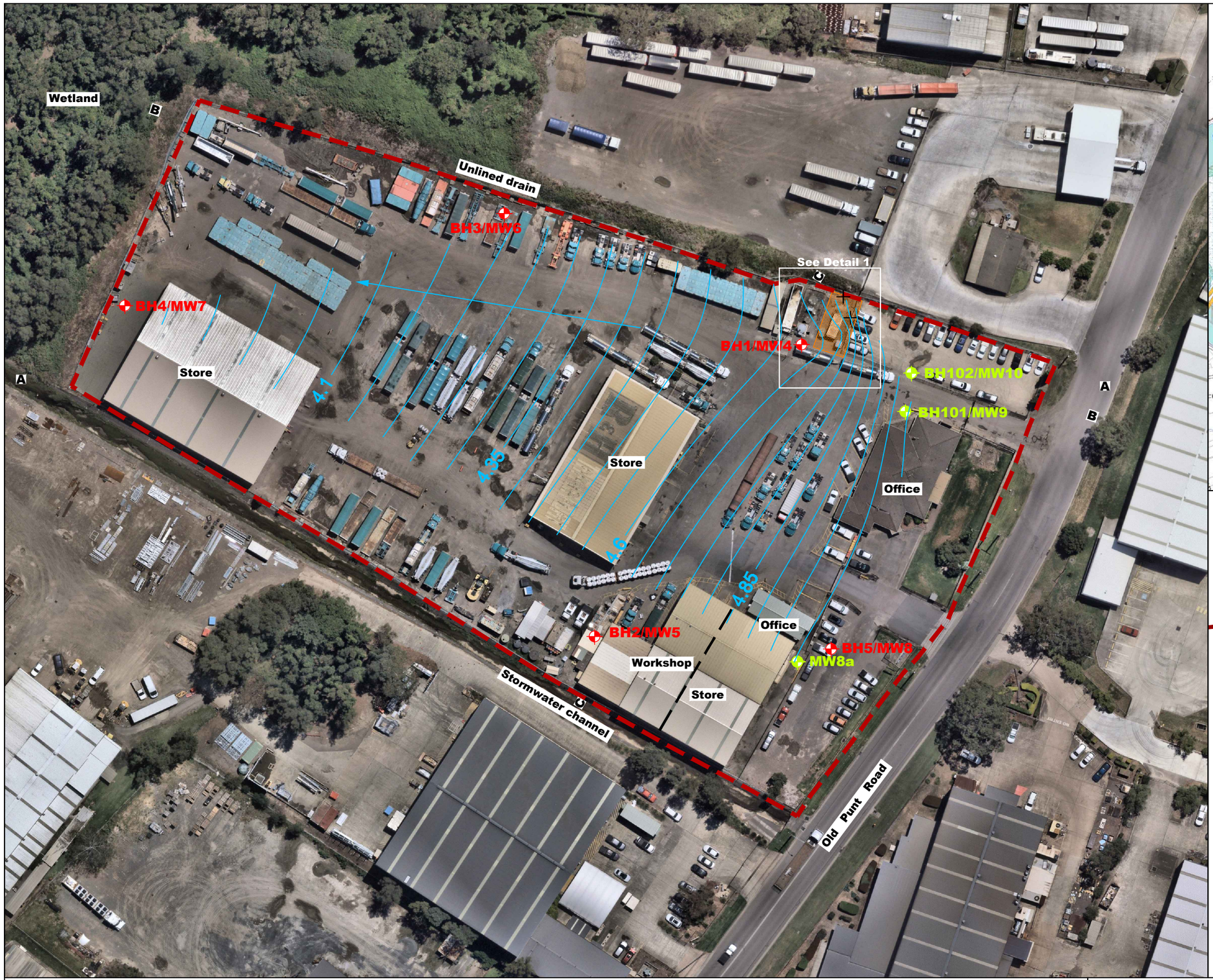
[6] NEPC, *National Environment Protection (Assessment of Site Contamination) Measure*, 1999 as amended 2013.

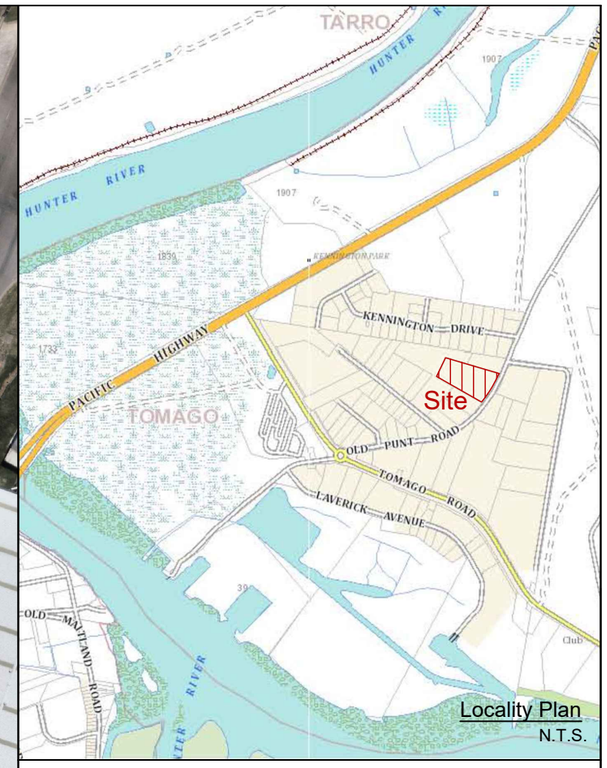
GLOSSARY

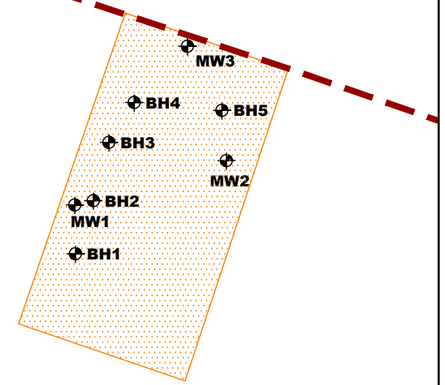
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure.
Intralaboratory	A sample split into two and sent blind to the sample laboratory for comparative analysis.
kg	kilogram, 1000 gram.
LEP	Local environment plan. A planning tool for the Local Government.
µg	microgram, 1/1000 milligram.
mg	milligram, 1/1000 gram.
NAPL	Non-aqueous phase liquid. This can be lighter than water (LNAPL), or more dense than water (DNAPL).
NEPC	National Environment Protection Council.
NHMRC	National Health and Medical Research Council.
NSW EPA	NSW Environment Protection Authority – made a separate entity in 2011 to regulate the contaminated land industry.
PID	Photoionisation detector. Measures volatile gases in air or emanating from soil or water.
PQL	Practical Quantitation Limit.
QA	Quality Assurance.
QC	Quality Control.
RPD	Relative Percentage Difference.
<u>Chemical Compounds</u>	
BTEXN	Benzene, toluene, ethylbenzene, xylene, naphthalene.
PAH	Polycyclic aromatic hydrocarbons. Multi-ring compounds found in fuels, oils and creosote. These are also common combustion products.
TPH	Total petroleum hydrocarbons.
TRH	Total recoverable hydrocarbons

Appendix A

Drawing







Detail 1

LEGEND

- Approximate location of site boundary
- Approximate location of historical diesel spill
- Approximate groundwater monitoring well location (2018)
- Approximate groundwater monitoring well location (RCA Report 12513-203/1, August 8 2017)
- Approximate soil borehole and/or groundwater monitoring well location (previous investigation GEOTSGTE20230AA)
- Inferred groundwater contours (MW1-4, MW6, MW7, MW8a, MW9 only)
- Inferred groundwater direction

Aerial image taken from Nearmap, 7 February 2025
(Used in accordance with commercial licence)

Note: Storage/parking areas slightly different than observed

0 10 20 30 40 50
metres

N

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SITE LOCALITY AND LAYOUT PLAN
GROUNDWATER MONITORING
12 OLD PUNT ROAD
TOMAGO

CLIENT	Toll Group			RCA Ref	12513e-223/0
DRAWN BY	AH	SCALE	~1 : 1000 (A3)	DRAWING No 1	REV 0
APPROVED BY	FB	DATE	24/06/2025	OFFICE	NEWCASTLE

CDT-DWG-A3H-001/1

Appendix B

Calibration Record and Field Sheets

SERVICE & CALIBRATION REPORT
Water Quality Meter

Customer Details:	Job Number	Date
RCA 92 Hill Street Carrington Attn: Kenny Yan	240944	30/09/2024

Instrument Model:	Instrument Serial Number:
HORIBA U-52/10m Multi-Parameter Water Quality Meter	1PH7HSWB 2019

Fault Report

Requires service/calibration.

Repairs Carried Out

Replaced DO membrane. Refilled pH reference electrode.
Cleaned all sensors. Re-calibrated all sensors as follows:

Calibration (in accordance with manufacturer's specifications):

Parameter - unit	Before Calibration	Calibration Value	After calibration	Comment
pH (pH)	7.25	7.01	7.01	Pass
pH (pH)	3.99	4.00	4.00	Pass
ORP (mV)	227	225	225	Pass
Conductivity (mS/cm)	0.000	0.000	0.000	Pass
Conductivity (mS/cm)	0.727	0.718	0.718	Pass
Conductivity (mS/cm)	6.74	6.67	6.67	Pass
Conductivity (mS/cm)	59.1	58.6	58.6	Pass
Turbidity (NTU)	0.0	0.0	0.0	Pass
Turbidity (NTU)	2.1	8.0	8.0	Pass
Turbidity (NTU)	82.7	80.0	80.0	Pass
Turbidity (NTU)	455	400	400	Pass
D.O. zero (mg/L)	0.00	0.00	0.00	Pass
D.O. zero (mg/L)	10.14mg/L @ 21°C	9.12mg/L @21°C	9.12mg/L @21°C	Pass
Temperature (°C)	20.01°C	19.8°C	19.8°C	Pass

Sensors:

pH Glass Electrode	pH Ref Electrode	ORP Electrode	DO Electrode
345078	WGTAD2NV	NH00S3C6	X3H6CF5A

Comments:

MAKE SURE the pH reference electrode is refilled with soln #330 regularly. If the #330 soln solidifies inside the pH reference electrode, remove the liquid junction cap (flat black rubber cap with wick in the middle) and rinse out the old solution with distilled water. Then refill with fresh HORIBA soln # 330 and refit the liquid junction cap. Please read the notes on pH maintenance.

Calibration carried out by:

Tony Fincher

AUSTRALIAN SCIENTIFIC PTY LTD
11 McDougall Street, Kotara, NSW, 2289
TEL: 1800 021 083
E-mail: sales@austscientific.com.au **www.austscientific.com.au**

AES
sensing safety

Calibration and Service Report – PID

Company:	RCA Australia
Contact:	Fiona Brooker
Address:	Robert Carr & Associates P/L PO Box 175 CARRINGTON
Phone:	02 4902 9225
Fax:	02 4902 9299
Email:	fionab@rca.com.au

Manufacturer:	RAE
Instrument:	MINIRAE LITE SN: 590-000760
Model:	MINIRAE LITE
Configuration:	VOC 10.6EV
Wireless:	-
Network ID:	-
Unit ID:	-
Details:	

Serial #:	590-000760
Asset #:	
Part #:	059-A110-000
Sold:	26.05.2009
Last Cal:	16.04.2025
Job #:	180070
Cal Spec:	
Order #:	PO40001595

Item	Test	Pass/Fail	Comments	Serial Number
Battery	NiCd, NiMH, Dry cell, LiIon	P		
Charger	Power Supply	P		
	Cradle, Travel Charger	P		
Pump	Flow	P	>450ml/min	
Filter	Filter, fitting, etc	P	Replaced	
Alarms	Audible, visual, vibration	P		
Display	Operation	P		
Switches	Operation	P		
PCB	Operation	P		
Connectors	Condition	P		
Firmware	Version	P	V2.22A (Fumigation)	
Datalogger	Operation	P		
Monitor Housing	Condition	P	Cleaned	
Case	Condition / Type	-		
Sensors				
PID	Lamp	P	Cleaned	
PID	Sensor	P	Cleaned	
THP	Sensor	P		

Engineer's Report

Cleaned lamp, lamp housing and sensor electrode
Checked moisture sensitivity
Checked flowrate and stall values
Checked unit settings and PC configuration
Unit serviced and calibrated.

AES
sensing safety

Calibration and Service Report – PID

Company:	RCA Australia	**Manufacturer:**	RAE	**Serial #:**	590-000760
Contact:	Fiona Brooker	**Instrument:**	MINIRAE LITE SN: 590-000760	**Asset #:**	
Address:	Robert Carr & Associates P/L PO Box 175 CARRINGTON	**Model:**	MINIRAE LITE	**Part #:**	059-A110-000
		Configuration:	VOC 10.6EV	**Sold:**	26.05.2009
		Wireless:	-	**Last Cal:**	16.04.2025
Phone:	02 4902 9225	**Network ID:**	-	**Job #:**	180070
Fax:	02 4902 9299	**Unit ID:**	-	**Cal Spec:**	
Email:	fionab@rca.com.au	**Details:**		**Order #:**	PO40001595

Calibration Certificate

Sensor	Type	Serial No.	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID	050-0000-004. 10.6EV 1/2 INCH LAMP	S023040020M3/106J820539	Isobutylene	100ppm	WO443753-1		0	100.0
Battery	059-3053-000. MINIRAE LITE RECHARGEABLE	167J4W0210						
Toxic 1								
Toxic 2								
Toxic 3								
Toxic 4								
Toxic 5								
Toxic 6								

Calibrated/Repaired by: JERRY JI Date: 16.04.2025 Next Due: 16.10.2025

RCA AUSTRALIA
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ENGINEERING FIELD SHEET

WATER GAUGING RECORD

CLIENT: Toll Group
PROJECT: Groundwater Monitoring Programme
LOCATION: Toll Tomago Site

DATE: 27-5-25
PROJECT No: 12513e
CLIENT REF:

BORE OR LOCATION ID: MW1
TIME: 8:30 **TO** 8:35
BORE DEPTH: 3.22 (m TOP) **HEIGHT ABOVE GROUND LEVEL:** 0.77
DEPTH TO LNAPL: NA **PID SURFACE (ppm):** 0.0
DEPTH TO AQUIFER: 1.23 **PID IN WELL (ppm):** 0.0

BORE OR LOCATION ID: MW2
TIME: 8:50 **TO** 8:55
BORE DEPTH: 2.87 (m TOP) **HEIGHT ABOVE GROUND LEVEL:** 0.61
DEPTH TO LNAPL: NA **PID SURFACE (ppm):** 0.0
DEPTH TO AQUIFER: 0.9 **PID IN WELL (ppm):** 0.0

BORE OR LOCATION ID: MW3
TIME: 8:40 **TO** 8:45
BORE DEPTH: 3.7 (m TOP) **HEIGHT ABOVE GROUND LEVEL:** 0.47
DEPTH TO LNAPL: NA **PID SURFACE (ppm):** 0
DEPTH TO AQUIFER: 0.9 **PID IN WELL (ppm):** 0

BORE OR LOCATION ID: MW4
TIME: 8:10 **TO** 8:25
BORE DEPTH: 3.23 (m GL) ~~**HEIGHT ABOVE GROUND LEVEL:**~~
DEPTH TO LNAPL: 0.53 **PID SURFACE (ppm):** 0.0
DEPTH TO AQUIFER: 0.69 **PID IN WELL (ppm):** 0.0

BORE OR LOCATION ID: MW5
TIME: **TO**
BORE DEPTH: (m GL) ~~**HEIGHT ABOVE GROUND LEVEL:**~~
DEPTH TO LNAPL: **PID SURFACE (ppm):**
DEPTH TO AQUIFER: **PID IN WELL (ppm):**

RCA Australia	Sampled by: AM / DB	Date: 27.5.25

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BORE OR LOCATION ID: MW6

TIME: 13.00 **TO** 13.05

BORE DEPTH: 3.23 (m GL) **~~HEIGHT ABOVE GROUND LEVEL~~:** _____

DEPTH TO LNAPL: NA **PID SURFACE (ppm):** 0.0

DEPTH TO AQUIFER: 0.56 **PID IN WELL (ppm):** 0.0

BORE OR LOCATION ID: MW7

TIME: 9.35 **TO** 9.40

BORE DEPTH: 3.05 (m GL) **~~HEIGHT ABOVE GROUND LEVEL~~:** _____

DEPTH TO LNAPL: NA **PID SURFACE (ppm):** 0.0

DEPTH TO AQUIFER: 1.0 **PID IN WELL (ppm):** 0.0

BORE OR LOCATION ID: MW8a

TIME: 9.20 **TO** 9.25

BORE DEPTH: 1.44 (m GL) **~~HEIGHT ABOVE GROUND LEVEL~~:** _____

DEPTH TO LNAPL: NA **PID SURFACE (ppm):** 0.0

DEPTH TO AQUIFER: 0.48 **PID IN WELL (ppm):** 0.0

BORE OR LOCATION ID: MW9

TIME: 9.10 **TO** 9.15

BORE DEPTH: 2.90 (m GL) **~~HEIGHT ABOVE GROUND LEVEL~~:** _____

DEPTH TO LNAPL: NA **PID SURFACE (ppm):** 0.0

DEPTH TO AQUIFER: 0.48 **PID IN WELL (ppm):** 0.0

BORE OR LOCATION ID: MW10

TIME: 9.00 **TO** 9.05

BORE DEPTH: 2.88 (m GL) **~~HEIGHT ABOVE GROUND LEVEL~~:** _____

DEPTH TO LNAPL: NA **PID SURFACE (ppm):** 0.0

DEPTH TO AQUIFER: At surface **PID IN WELL (ppm):** 0.0

RCA Australia	Sampled by: AM / DB	Date: 27.5.21

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ENGINEERING FIELD SHEET

WATER SAMPLING RECORD

CLIENT: Toll Group
PROJECT: Groundwater Monitoring Programme
LOCATION: Toll Tomago Site
DATE: 27.5.25
PROJECT No: 12513e
CLIENT REF:
WATER METER USED: Horiba
METHOD OF SAMPLING: Low flow pump
PRESERVATION & STORAGE (TICK): Field Temp ☐ Chilled (<4°C) ☑ Frozen ☐
Un-preserved ☐ Preserved: ☐ Acid (H_2SO_4) ☐ Acid (HNO_3) ☐ Alkaline (NaOH) ☐ Filtered ☐
TESTS REQUIRED: Refer to Each Location

BORE OR LOCATION ID: MW1 **ANALYSIS NEEDED:** Ammonia, Nitrate, Nitrite, EC, Hydrocarbons, metals
TIME: 10:30 **TO** 11:30 **VOLUME PURGED:** 4L
RESULTS OF WATER QUALITY CHECK

Check No.	pH	Conductivity (mS/cm)	Turbidity	Dissolved O_2 (mg/L)	Temperature (°C)	Salinity (%)
1/ +1L	7.44	0.828	52.4	0.38	18.87	0.040
2/ +1L	7.24	0.900	58.8	1.67	18.89	0.044
3/ +1L	7.27	0.909	56.5	2.01	18.89	0.045
4/ +1L	7.27	0.917	53.2	2.36	18.82	0.045
5/						
6/						

Sample Appearance: Grey, turbid, no odour
Duplicate/Equipment Wash Identification and Other Remarks: QA here

BORE OR LOCATION ID: MW2 **ANALYSIS NEEDED:** Ammonia, Nitrate, Nitrite, EC, Hydrocarbons, metals
TIME: 12:45 **TO** 13:20 **VOLUME PURGED:** 4L
RESULTS OF WATER QUALITY CHECK

Check No.	pH	Conductivity (mS/cm)	Turbidity	Dissolved O_2 (mg/L)	Temperature (°C)	Salinity (%)
1/ +1L	6.05	5.05	121	2.3	19.52	0.276
2/ +1L	6.12	4.27	85	1.01	19.33	0.224
3/ +1L	6.12	4.04	66.9	2.62	19.27	0.212
4/ +1L	6.00	3.99	57.1	1.80	19.45	0.211
5/						
6/						

Sample Appearance: Grey, turbid, no odour
Duplicate/Equipment Wash Identification and Other Remarks:

BORE OR LOCATION ID: MW3 **ANALYSIS NEEDED:** Ammonia, Nitrate, Nitrite, EC, Hydrocarbons, metals
TIME: 11:40 **TO** 12:15 **VOLUME PURGED:** 4L
RESULTS OF WATER QUALITY CHECK

Check No.	pH	Conductivity (mS/cm)	Turbidity	Dissolved O_2 (mg/L)	Temperature (°C)	Salinity (%)
1/ +2L	6.19	3.34	590	1.13	20.03	0.276
2/ +1L	6.26	3.30	165	2.05	19.98	0.172
3/ +1L	6.29	3.39	227	2.03	19.91	0.173
4/						
5/						
6/						

Sample Appearance: Dark grey, turbid, ~~HS~~ odour
Duplicate/Equipment Wash Identification and Other Remarks: Sulphide

RCA Australia	Sampled by: AH/DB	Date: 27.5.25

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BORE OR LOCATION ID: MW4 **ANALYSIS NEEDED:** Ammonia, Nitrate, Nitrite, EC, Hydrocarbons, metals
TIME: 14:20 **TO** 15:40 **VOLUME PURGED:** 3L
RESULTS OF WATER QUALITY CHECK **Do not sample if LNAPL present**

Check No.	pH	Conductivity (mS/cm)	Turbidity	Dissolved O_2 (mg/L)	Temperature (°C)	Salinity (%)
1/ +1L	6.05	15.5	738	1.24	20.98	0.895
2/ +1L	6.08	10.1	421	0.52	20.91	0.592
3/ +1L	6.10	9.84	337	0.27	20.66	0.560
4/						
5/						
6/						

Sample Appearance: Dark grey, turbid, sheen & strong h.c odour
Duplicate/Equipment Wash Identification and Other Remarks: Blank

BORE OR LOCATION ID: MW6 **ANALYSIS NEEDED:** Ammonia, Nitrate, Nitrite, EC.
TIME: 10:21 **TO** 11:00 **VOLUME PURGED:** 6L
RESULTS OF WATER QUALITY CHECK

28.5.25

Check No.	pH	Conductivity (mS/cm)	Turbidity	Dissolved O_2 (mg/L)	Temperature (°C)	Salinity (%)
1/ +2L	5.14	9.43	>1000	0.91	19.19	0.517
2/ +1L	5.13	7.48	798	0.74	19.9	0.489
3/ +1L	5.15	6.93	>1000	1.05	18.95	0.359
4/ +1L	5.13	6.67	>1000	0.78	19.20	0.368
5/ +1L	5.13	6.61	>1000	0.56	19.48	0.423
6/						

Sample Appearance: Dark yellow/orange, turbid, no odour
Duplicate/Equipment Wash Identification and Other Remarks:

BORE OR LOCATION ID: MW10 **ANALYSIS NEEDED:** Ammonia, Nitrate, Nitrite, EC, metals
TIME: 13:45 **TO** 14:15 **VOLUME PURGED:** 5L
RESULTS OF WATER QUALITY CHECK

Check No.	pH	Conductivity (mS/cm)	Turbidity	Dissolved O_2 (mg/L)	Temperature (°C)	Salinity (%)
1/ +2L	4.03	16.5	>1000	1.2	21.9	0.967
2/ +2L	3.97	16.4	>1000	0.7	22.04	0.959
3/ +1L	3.98	16.3	>1000	0.45	22.20	0.951
4/						
5/						
6/						

Sample Appearance: Brown, turbid, no odour
Duplicate/Equipment Wash Identification and Other Remarks:

RCA Australia	Sampled by: AH/DB	Date: 27.5.25 28.5.25 (MW6)

Appendix C

Quality Assurance Review and Laboratory Report Sheets

One (1) water intralaboratory duplicate sample was submitted blind to the laboratory for analysis with the batch of samples. This represents a percentage of greater than 10%, in accordance with the frequency recommended for soil samples by the Australian Standard AS 4482.1 (Ref [5]) and RCA protocol.

One trip blank and one trip spike were submitted with the batch of samples by field personnel in accordance with the frequency recommended for soil samples by the Australian Standard AS 4482.1 (Ref [5]) and RCA protocol.

RCA omitted the field blank due to the low potential for cross contamination from the field conditions during the sampling process and the equipment wash due to the low potential for cross contamination from the designated sampling equipment.

Results, as shown further in this **Appendix**, indicate all the water analyses with RPD of less than 30% except for five (5) results:

- MW1/ QA had elevated RPD for TRH >C_{16}-C_{34}, copper, nickel and ammonia. The sample is described as grey and turbid such that sample heterogeneity is considered the likely cause of the elevated RPD. There is some uncertainty associated with this sample; however, the sample reported the highest concentrations and therefore the uncertainty is considered to be conservative, except for:
    - The nickel result in the duplicate was more than 50% of the most stringent criterion and as such the duplicate result was used for characterisation.
    - The ammonia result in the duplicate was more than 2.5 times of the most stringent criterion and as such the duplicate result was used for characterisation.

There was no detectable concentrations within the trip blank, which is considered acceptable.

Recoveries of 80 to 105% were recorded for the trip spike, which are considered acceptable.

ALS was chosen as the primary laboratory; ALS is NATA accredited and are experienced in the analytical requirements for potentially contaminated groundwater. ALS undertook internal quality assurance testing. Results are contained within the laboratory report sheets, included in this **Appendix**. **Table 3** presents a summary of their review.

Table 3 *Internal Quality Assurance Review*

	Number Samples (including QA)	Laboratory Duplicates	Spikes	Laboratory Control Samples	Laboratory Blanks
Requirement		**10%**	**5%**	**One every batch**	**One every batch**
Water					
Metals (As, Cd, Cr, Cu, Ni, Pb, Zn)	6	1 (3)	1 (1)	2	2
Mercury	6	1 (1)	0 (1)	1	1
Ammonia	7	1 (1)	1 (0)	1	1
Oxidisable Nitrogen	7	1 (0)	1 (0)	1	1
TRH C_6-C_{10}	6	1 (1)	0 (1)	1	1
TRH >C_{10}-C_{40}	5	1 (0)	1 (0)	1	1
BTEXN	7	1 (1)	0 (1)	1	1
PAH	5	2 (0)	2 (0)	2	2

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

Examination of the above table indicates that ALS have undertaken laboratory quality assurance testing in accordance with the ASC NEPM (Ref [6]).

With regards to the results of the quality assurance testing:

- Recoveries of surrogates were within acceptance criteria of 70-130% with the exception of the PAH surrogates for MW4 which could not be determined. This is considered to be due to the TRH concentrations which are present and not indicative of uncertainty in the PAH results.

  It is noted that phenolic surrogates are reported (due to the concurrent PAH analytical method) and indicate a result below 70%. However, as no phenols analysis was undertaken these results are not considered relevant to the site characterisation.

- Relative percentage differences for duplicates were below the acceptance criterion of 30% with the exception of:

  - Sample MW4 acenaphthene with RPD 51.2%, fluorene with RPD 93.6%, phenanthrene with RPD 99.0% and pyrene with RPD 66.9%. This sample is described as turbid and the cause of the high RPD is therefore considered to be sample heterogeneity. Although the variability introduces some uncertainty, the primary sample consistently reported the higher concentrations. Since the primary results are used in the assessment and the variability does not suggest underestimation of potential risk, the uncertainty is considered conservative and not significant.

  It is noted that there were anonymous samples with high RPD for copper (62.1%) and zinc (36.1%). These samples were not collected by RCA and as such RCA cannot comment as to the potential reason for the high RPD, however do not consider that the poor RPD necessarily reflects uncertainty on the remainder of the samples in the batch.

- No laboratory blank result was detected above the practical quantification limit (PQL).

- Laboratory control spikes recoveries were within acceptance criteria of 70-130% with exception of:
  - The four (4) PAH results which had recoveries ranges between 66.9% to 69.3%. These are considered minor non-compliance and are not significant.
  - TRH >C_{10}-C_{16} had the recovery of 67.6% which is considered minor non-compliance and therefore is not significant.
- Matrix spike recoveries were within the within acceptance criteria of 70-130% with the exception of:
  - TRH C_{10}-C_{40} in MW4 for which a result could not be determined. The detected concentrations were between one (1) and three (3) orders of magnitude above the spiked concentrations such that the absence of a measurable spike recoveries are not considered to represent uncertainty in the result. It is noted that the laboratory raised the PQL to account for the potential uncertainty in the sample.
  - PAH in MW4 was not determined. The two (2) compounds for which the spike is undertaken (acenaphthene and pyrene) were not detected however there were significant concentrations of other PAH compounds (up to 231 μg/L) such that the absence of the recovery of the spiked concentrations (20 μg/L) is not considered to represent an uncertainty. It is noted that the laboratory raised the PQL to account for the potential uncertainty in the sample.
- Holding times were within laboratory specified time frames with the exception of the trip blank and the trip spike which were prepared by the laboratory on 12 May 2025 and not analysed, as there was a delay in fieldwork due to an extreme weather event, until 30 May 2025 such that it was four (4) days out of holding times. As the blank was prepared to not have any detectable concentrations, it is not considered this this non-compliance is significant. The recoveries of the trip spike indicate that there was no significant loss of volatiles from the original spiked concentration and as such the non-compliance is not considered significant.

Quality Assurance Type	Primary PQL		Intralaboratory Duplicate		RPD %	Trip Blank	Trip Spike
Sample Identification			MW1	QA		TRIP BLANK	TRIP SPIKE
Date			27/05/2025			12/05/2025	
Sample Description			Grey, turbid, no odour.			Water	Water
Sample Purpose			Monitoring			Quality Assurance	Quality Assurance
Sample Collected by			RCA - AH/DB			Laboratory	Laboratory
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)							
Benzene	1		0.5	0.5	*0.0*	<1	85%
Toluene	2		1	1	*0.0*	<2	80%
Ethylbenzene	2		1	1	*0.0*	<2	80%
meta- & para-Xylene	2		1	1	*0.0*	<2	80%
Ortho-xylene	2		1	1	*0.0*	<2	85%
Polycyclic Aromatic Hydrocarbons (PAH)							
Napthalene	5		2.5	2.5	*0.0*	<5	105%
Total Recoverable Hydrocarbons (TRH)							
TRH C_6-C_{10}	20		10	10	*0.0*	<20	--
TRH >C_{10}-C_{16}	100		50	50	*0.0*	--	--
TRH >C_{16}-C_{34}	100		590	50	**168.8**	--	--
TRH >C_{34}-C_{40}	100		50	50	*0.0*	--	--
Polycyclic Aromatic Hydrocarbons (PAH)							
Acenaphthene	0.1		0.05	0.05	*0.0*	--	--
Acenaphthylene	0.1		0.05	0.05	*0.0*	--	--
Anthracene	0.1		0.05	0.05	*0.0*	--	--
Benz(a)anthracene	0.1		0.05	0.05	*0.0*	--	--
Benzo(a) pyrene	0.05		0.025	0.025	*0.0*	--	--
Benzo(b)&(j)fluoranthene	0.1		0.05	0.05	*0.0*	--	--
Benzo(g,h,i)perylene	0.1		0.05	0.05	*0.0*	--	--
Benzo(k)fluoranthene	0.1		0.05	0.05	*0.0*	--	--
Chrysene	0.1		0.05	0.05	*0.0*	--	--
Dibenz(a,h)anthracene	0.1		0.05	0.05	*0.0*	--	--
Fluoranthene	0.1		0.05	0.05	*0.0*	--	--
Fluorene	0.1		0.05	0.05	*0.0*	--	--
Indeno(1,2,3-c,d)pyrene	0.1		0.05	0.05	*0.0*	--	--
Naphthalene	0.1		0.05	0.05	*0.0*	--	--
Phenanthrene	0.1		0.05	0.05	*0.0*	--	--
Pyrene	0.1		0.05	0.05	*0.0*	--	--
Metals							
Arsenic	1		0.5	0.5	*0.0*	--	--
Cadmium	0.1		0.05	0.05	*0.0*	--	--
Chromium	1		0.5	0.5	*0.0*	--	--
Copper	1		2	0.5	**120.0**	--	--
Lead	1		0.5	0.5	*0.0*	--	--
Mercury	0.1		0.05	0.05	*0.0*	--	--
Nickel	1		4	6	**40.0**	--	--
Zinc	5		26	15	**53.7**	--	--
Nutrients							
Ammonia as N	10		390	560	**35.8**	--	--
Nitrite + Nitrate as N	10		1730	1350	*24.7*	--	--

Note all units in µg/L except for trip spikes results in % recovery

PQL = Practical Quantitation Limit.

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

***BOLD identifies** where RPD results >30%*

***BOLD identifies** where blanks > PQL*

***BOLD identifies** where spikes outside of 70-130% recovery range*

CERTIFICATE OF ANALYSIS

Work Order	: **ES2515744**	Page	: 1 of 10
Client	: **ROBERT CARR & ASSOCIATES P/L**	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Contact	: Danae Hambly
Address	: PO BOX 175 CARRINGTON NSW, AUSTRALIA 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Project	: 12513e	Date Samples Received	: 28-May-2025 11:55
Order number	: ----	Date Analysis Commenced	: 29-May-2025
C-O-C number	: ----	Issue Date	: 05-Jun-2025 11:02
Sampler	: AH/DB		
Site	: ----		
Quote number	: NSW Custom BQ 2024		
No. of samples received	: 9		
No. of samples analysed	: 9		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP080: The result for sample ES2515744-004 was confirmed by re-analysis.
- EP080: Samples not received in a suitable time frame to conduct the analysis within the recommended holding time.
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEXN only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- EP075(SIM) :Particular samples required dilution due to sample matrix . LOR values have been adjusted accordingly.
- EP071: Particular samples required dilution due to sample matrix . LOR values have been adjusted accordingly.
- EP132: Where reported, Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.

Analytical Results

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	MW1	MW2	MW3	MW4	MW6
				Sampling date / time	27-May-2025 11:30	27-May-2025 13:20	27-May-2025 12:15	27-May-2025 15:00	27-May-2025 11:00
					ES2515744-001	ES2515744-002	ES2515744-003	ES2515744-004	ES2515744-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L		**0.002**	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L		**0.004**	**0.015**	**0.008**	**0.002**	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	**0.004**	----
Zinc	7440-66-6	0.005	mg/L		**0.026**	**0.011**	**0.020**	<0.005	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.39**	**1.82**	**0.48**	**3.89**	**0.74**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		**0.02**	<0.01	**0.03**	**0.76**	**0.04**
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**1.71**	**0.24**	**1.31**	**0.59**	**94.4**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**1.73**	**0.24**	**1.34**	**1.35**	**94.4**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		----	----	----	<47.6	----
Acenaphthylene	208-96-8	1.0	µg/L		----	----	----	<47.6	----
Acenaphthene	83-32-9	1.0	µg/L		----	----	----	**80.4**	----
Fluorene	86-73-7	1.0	µg/L		----	----	----	**231**	----
Phenanthrene	85-01-8	1.0	µg/L		----	----	----	**384**	----
Anthracene	120-12-7	1.0	µg/L		----	----	----	<47.6	----
Fluoranthene	206-44-0	1.0	µg/L		----	----	----	**60.3**	----
Pyrene	129-00-0	1.0	µg/L		----	----	----	**95.5**	----
Benz(a)anthracene	56-55-3	1.0	µg/L		----	----	----	<47.6	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW1	MW2	MW3	MW4	MW6
				Sampling date / time	27-May-2025 11:30	27-May-2025 13:20	27-May-2025 12:15	27-May-2025 15:00	27-May-2025 11:00
Compound	CAS Number	LOR	Unit		ES2515744-001	ES2515744-002	ES2515744-003	ES2515744-004	ES2515744-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Chrysene	218-01-9	1.0	µg/L		----	----	----	<47.6	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		----	----	----	<47.6	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		----	----	----	<47.6	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		----	----	----	<47.6	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		----	----	----	<47.6	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		----	----	----	<47.6	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		----	----	----	<47.6	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		----	----	----	851	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		----	----	----	<23.8	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	100	----
C10 - C14 Fraction	----	50	µg/L		60	<50	70	113000	----
C15 - C28 Fraction	----	100	µg/L		600	<100	210	371000	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<2860	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		660	<50	280	484000	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	130	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	130	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	232000	----
>C16 - C34 Fraction	----	100	µg/L		590	<100	180	248000	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<2860	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		590	<100	180	480000	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	232000	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW1	MW2	MW3	MW4	MW6
				Sampling date / time	27-May-2025 11:30	27-May-2025 13:20	27-May-2025 12:15	27-May-2025 15:00	27-May-2025 11:00
Compound	CAS Number	LOR	Unit		ES2515744-001	ES2515744-002	ES2515744-003	ES2515744-004	ES2515744-005
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	----
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	**55**	----
EP132B: Polynuclear Aromatic Hydrocarbons									
3-Methylcholanthrene	56-49-5	0.1	µg/L		<0.1	<0.1	<0.1	----	----
2-Methylnaphthalene	91-57-6	0.1	µg/L		<0.1	<0.1	<0.1	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Acenaphthene	83-32-9	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Acenaphthylene	208-96-8	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Anthracene	120-12-7	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Benz(a)anthracene	56-55-3	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Benzo(a)pyrene	50-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Benzo(e)pyrene	192-97-2	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Benzo(k)fluoranthene	207-08-9	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Chrysene	218-01-9	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Coronene	191-07-1	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Fluoranthene	206-44-0	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Fluorene	86-73-7	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Naphthalene	91-20-3	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perylene	198-55-0	0.1	µg/L		<0.1	<0.1	<0.1	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW1	MW2	MW3	MW4	MW6
				Sampling date / time	27-May-2025 11:30	27-May-2025 13:20	27-May-2025 12:15	27-May-2025 15:00	27-May-2025 11:00
Compound	CAS Number	LOR	Unit		ES2515744-001	ES2515744-002	ES2515744-003	ES2515744-004	ES2515744-005
					Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Phenanthrene	85-01-8	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Pyrene	129-00-0	0.1	µg/L		<0.1	<0.1	<0.1	----	----
^ Sum of PAHs	----	0.05	µg/L		<0.05	<0.05	<0.05	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		----	----	----	Not Determined	----
2-Chlorophenol-D4	93951-73-6	1.0	%		----	----	----	Not Determined	----
2.4.6-Tribromophenol	118-79-6	1.0	%		----	----	----	0.10	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		----	----	----	Not Determined	----
Anthracene-d10	1719-06-8	1.0	%		----	----	----	Not Determined	----
4-Terphenyl-d14	1718-51-0	1.0	%		----	----	----	Not Determined	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		81.2	107	111	112	----
Toluene-D8	2037-26-5	2	%		83.4	104	109	123	----
4-Bromofluorobenzene	460-00-4	2	%		82.6	113	115	124	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		90.8	76.6	76.6	----	----
Anthracene-d10	1719-06-8	0.1	%		88.7	75.0	77.5	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		89.8	76.5	76.5	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW10	QA	TB	TS	----
				Sampling date / time	27-May-2025 14:15	27-May-2025 00:00	12-May-2025 00:00	12-May-2025 00:00	----
Compound	CAS Number	LOR	Unit		ES2515744-006	ES2515744-007	ES2515744-008	ES2515744-009	--------
					Result	Result	Result	Result	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.004**	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0003**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L		**0.005**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.002**	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.152**	**0.006**	----	----	----
Lead	7439-92-1	0.001	mg/L		**0.011**	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.252**	**0.015**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.20**	**0.56**	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	**0.11**	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.07**	**1.24**	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.07**	**1.35**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		----	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L		----	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		----	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L		----	<50	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		----	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		----	<20	<20	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		----	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L		----	<100	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW10	QA	TB	TS	----
				Sampling date / time	27-May-2025 14:15	27-May-2025 00:00	12-May-2025 00:00	12-May-2025 00:00	----
Compound	CAS Number	LOR	Unit		ES2515744-006	ES2515744-007	ES2515744-008	ES2515744-009	--------
					Result	Result	Result	Result	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C16 - C34 Fraction	----	100	µg/L		----	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		----	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		----	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		----	<1	<1	17	----
Toluene	108-88-3	2	µg/L		----	<2	<2	16	----
Ethylbenzene	100-41-4	2	µg/L		----	<2	<2	16	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		----	<2	<2	16	----
ortho-Xylene	95-47-6	2	µg/L		----	<2	<2	17	----
^ Total Xylenes	----	2	µg/L		----	<2	<2	33	----
^ Sum of BTEX	----	1	µg/L		----	<1	<1	82	----
Naphthalene	91-20-3	5	µg/L		----	<5	<5	21	----
EP132B: Polynuclear Aromatic Hydrocarbons									
3-Methylcholanthrene	56-49-5	0.1	µg/L		----	<0.1	----	----	----
2-Methylnaphthalene	91-57-6	0.1	µg/L		----	<0.1	----	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L		----	<0.1	----	----	----
Acenaphthene	83-32-9	0.1	µg/L		----	<0.1	----	----	----
Acenaphthylene	208-96-8	0.1	µg/L		----	<0.1	----	----	----
Anthracene	120-12-7	0.1	µg/L		----	<0.1	----	----	----
Benz(a)anthracene	56-55-3	0.1	µg/L		----	<0.1	----	----	----
Benzo(a)pyrene	50-32-8	0.05	µg/L		----	<0.05	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.1	µg/L		----	<0.1	----	----	----
Benzo(e)pyrene	192-97-2	0.1	µg/L		----	<0.1	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L		----	<0.1	----	----	----
Benzo(k)fluoranthene	207-08-9	0.1	µg/L		----	<0.1	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW10	QA	TB	TS	----
				Sampling date / time	27-May-2025 14:15	27-May-2025 00:00	12-May-2025 00:00	12-May-2025 00:00	----
Compound	CAS Number	LOR	Unit		ES2515744-006	ES2515744-007	ES2515744-008	ES2515744-009	--------
					Result	Result	Result	Result	----
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Chrysene	218-01-9	0.1	µg/L		----	<0.1	----	----	----
Coronene	191-07-1	0.1	µg/L		----	<0.1	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L		----	<0.1	----	----	----
Fluoranthene	206-44-0	0.1	µg/L		----	<0.1	----	----	----
Fluorene	86-73-7	0.1	µg/L		----	<0.1	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L		----	<0.1	----	----	----
Naphthalene	91-20-3	0.1	µg/L		----	<0.1	----	----	----
Perylene	198-55-0	0.1	µg/L		----	<0.1	----	----	----
Phenanthrene	85-01-8	0.1	µg/L		----	<0.1	----	----	----
Pyrene	129-00-0	0.1	µg/L		----	<0.1	----	----	----
^ Sum of PAHs	----	0.05	µg/L		----	<0.05	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.05	µg/L		----	<0.05	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		----	**110**	**114**	**113**	----
Toluene-D8	2037-26-5	2	%		----	**103**	**106**	**106**	----
4-Bromofluorobenzene	460-00-4	2	%		----	**111**	**116**	**112**	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		----	**64.0**	----	----	----
Anthracene-d10	1719-06-8	0.1	%		----	**63.1**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		----	**66.4**	----	----	----

Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144

QUALITY CONTROL REPORT

Work Order	: **ES2515744**	Page	: 1 of 10
Client	: **ROBERT CARR & ASSOCIATES P/L**	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Contact	: Danae Hambly
Address	: PO BOX 175 CARRINGTON NSW, AUSTRALIA 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Project	: 12513e	Date Samples Received	: 28-May-2025
Order number	: ----	Date Analysis Commenced	: 29-May-2025
C-O-C number	: ----	Issue Date	: 05-Jun-2025
Sampler	: AH/DB		
Site	: ----		
Quote number	: NSW Custom BQ 2024		
No. of samples received	: 9		
No. of samples analysed	: 9		

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

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6617700)									
ES2515327-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.004	0.008	62.1	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.013	0.014	0.0	No Limit
ES2515735-005	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.005	0.006	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.019	0.019	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.198	0.187	5.6	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6617702)									
ES2515744-003	MW3	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.008	0.008	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6617702) - continued									
ES2515744-003	MW3	EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.020	0.020	0.0	No Limit
ES2515960-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.016	0.023	36.1	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6617701)									
ES2515713-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2515744-007	QA	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 6619727)									
ES2515807-049	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.07	0.08	0.0	No Limit
ES2515744-001	MW1	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.39	0.39	0.0	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6613234)									
ES2515744-001	MW1	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.02	0.02	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6619726)									
ES2515744-001	MW1	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.73	1.73	0.0	0% - 20%
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6614016)									
ES2515744-004	MW4	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5 (47.6)*	µg/L	<47.6	<47.6	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1 (47.6)*	µg/L	<47.6	<47.6	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1 (47.6)*	µg/L	<47.6	<47.6	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1 (47.6)*	µg/L	80.4	<47.6	51.2	No Limit
		EP075(SIM): Fluorene	86-73-7	1 (47.6)*	µg/L	231	83.8	93.6	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1 (47.6)*	µg/L	384	130	99.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1 (47.6)*	µg/L	<47.6	<47.6	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1 (47.6)*	µg/L	60.3	<47.6	23.5	No Limit
		EP075(SIM): Pyrene	129-00-0	1 (47.6)*	µg/L	95.5	<47.6	66.9	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1 (47.6)*	µg/L	<47.6	<47.6	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1 (47.6)*	µg/L	<47.6	<47.6	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1 (47.6)*	µg/L	<47.6	<47.6	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1 (47.6)*	µg/L	<47.6	<47.6	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1 (47.6)*	µg/L	<47.6	<47.6	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1 (47.6)*	µg/L	<47.6	<47.6	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1 (47.6)*	µg/L	<47.6	<47.6	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6614015)									

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6614015) - continued									
ES2515744-004	MW4	EP071: C15 - C28 Fraction	----	100 (2860)*	µg/L	371000	327000	12.7	0% - 20%
		EP071: C10 - C14 Fraction	----	50 (2860)*	µg/L	113000	111000	1.7	0% - 20%
		EP071: C29 - C36 Fraction	----	50 (2860)*	µg/L	<2860	<2860	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6614238)									
EN2508859-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2515744-007	QA	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6614015)									
ES2515744-004	MW4	EP071: >C10 - C16 Fraction	----	100 (2860)*	µg/L	232000	221000	4.5	0% - 20%
		EP071: >C16 - C34 Fraction	----	100 (2860)*	µg/L	248000	213000	15.5	0% - 20%
		EP071: >C34 - C40 Fraction	----	100 (2860)*	µg/L	<2860	<2860	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6614238)									
EN2508859-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2515744-007	QA	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 6614238)									
EN2508859-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2515744-007	QA	EP080: Benzene	71-43-2	1	µg/L	<1	1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6614006)									
ES2515744-001	MW1	EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP132: 3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Acenaphthene	83-32-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Acenaphthylene	208-96-8	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Anthracene	120-12-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6614006) - continued									
ES2515744-001	MW1	EP132: Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Fluoranthene	206-44-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Fluorene	86-73-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Naphthalene	91-20-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Phenanthrene	85-01-8	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Pyrene	129-00-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6617700)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	95.9	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.2	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.5	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.6	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	91.2	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	95.9	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.2	81.0	117
EG020F: Dissolved Metals by ICP-MS (QCLot: 6617702)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.4	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.3	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.4	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	99.5	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.2	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.5	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	81.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 6617701)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	91.3	83.0	105
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6619727)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	102	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6613234)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	104	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6619726)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	105	91.0	113
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6614016)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	80.5	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	79.8	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	77.6	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	79.7	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	70.9	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	67.8	64.3	116

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6614016) - continued								
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	73.6	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	72.7	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	75.1	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	76.1	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	84.6	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	74.9	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	70.1	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	69.3	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	66.9	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	67.9	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6614015)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	61.9	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	87.5	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	108	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6614238)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	88.5	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6614015)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	67.6	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	96.9	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	115	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6614238)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	83.1	75.0	127
EP080: BTEXN (QCLot: 6614238)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	88.2	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	90.1	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	93.6	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	101	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	95.2	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	106	75.5	124
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 6614006)								
EP132: 3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	2 µg/L	99.6	60.0	120
EP132: 2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	2 µg/L	87.6	59.0	123
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	2 µg/L	125	36.0	144

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 6614006) - continued								
EP132: Acenaphthene	83-32-9	0.1	µg/L	<0.1	2 µg/L	89.6	64.0	122
EP132: Acenaphthylene	208-96-8	0.1	µg/L	<0.1	2 µg/L	93.3	64.0	126
EP132: Anthracene	120-12-7	0.1	µg/L	<0.1	2 µg/L	91.8	65.0	127
EP132: Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	2 µg/L	100	64.0	130
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	93.5	64.0	126
EP132: Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.1	µg/L	<0.1	2 µg/L	96.5	62.0	126
EP132: Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	2 µg/L	93.0	62.0	126
EP132: Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	2 µg/L	92.1	56.0	126
EP132: Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	2 µg/L	92.1	68.0	130
EP132: Chrysene	218-01-9	0.1	µg/L	<0.1	2 µg/L	96.4	66.0	130
EP132: Coronene	191-07-1	0.1	µg/L	<0.1	2 µg/L	94.9	35.0	133
EP132: Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	2 µg/L	93.1	58.0	128
EP132: Fluoranthene	206-44-0	0.1	µg/L	<0.1	2 µg/L	94.5	65.0	127
EP132: Fluorene	86-73-7	0.1	µg/L	<0.1	2 µg/L	90.7	64.0	124
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	2 µg/L	93.4	57.0	127
EP132: Naphthalene	91-20-3	0.1	µg/L	<0.1	2 µg/L	85.8	54.0	128
EP132: Perylene	198-55-0	0.1	µg/L	<0.1	2 µg/L	91.9	66.0	130
EP132: Phenanthrene	85-01-8	0.1	µg/L	<0.1	2 µg/L	92.7	65.0	129
EP132: Pyrene	129-00-0	0.1	µg/L	<0.1	2 µg/L	93.4	66.0	128

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6617700)							
ES2515534-001	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	101	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	94.5	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	91.7	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	97.1	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	104	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	93.6	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	93.5	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6617702)							
ES2515744-004	MW4	EG020A-F: Arsenic	7440-38-2	1 mg/L	81.4	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.125 mg/L	93.6	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	71.8	70.0	130
		EG020A-F: Copper	7440-50-8	0.25 mg/L	71.9	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	86.8	70.0	130
		EG020A-F: Nickel	7440-02-0	0.25 mg/L	91.2	70.0	130
		EG020A-F: Zinc	7440-66-6	0.25 mg/L	84.8	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6617701)							
ES2515686-023	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	88.3	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6619727)							
ES2515744-001	MW1	EK055G: Ammonia as N	7664-41-7	0.5 mg/L	107	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6613234)							
ES2515744-001	MW1	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	114	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6619726)							
ES2515744-001	MW1	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	115	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6614016)							
ES2515744-004	MW4	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	# Not Determined	70.0	130
		EP075(SIM): Pyrene	129-00-0	20 µg/L	# Not Determined	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6614015)							
ES2515744-004	MW4	EP071: C10 - C14 Fraction	----	200 µg/L	# Not Determined	70.0	130
		EP071: C15 - C28 Fraction	----	250 µg/L	# Not Determined	71.0	130
		EP071: C29 - C36 Fraction	----	200 µg/L	# Not Determined	67.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6614238)							
EN2508859-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	79.5	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6614015)							
ES2515744-004	MW4	EP071: >C10 - C16 Fraction	----	250 µg/L	# Not Determined	70.0	130
		EP071: >C16 - C34 Fraction	----	350 µg/L	# Not Determined	75.0	130
		EP071: >C34 - C40 Fraction	----	150 µg/L	# Not Determined	67.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6614238)							
EN2508859-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	72.4	70.0	130
EP080: BTEXN (QCLot: 6614238)							
EN2508859-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	84.3	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	85.4	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	85.6	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	85.4	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	80.5	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	81.5	70.0	130
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 6614006)							
ES2515744-001	MW1	EP132: 3-Methylcholanthrene	56-49-5	2 µg/L	86.7	59.0	115
		EP132: 2-Methylnaphthalene	91-57-6	2 µg/L	75.4	46.0	120
		EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	2 µg/L	104	21.0	135
		EP132: Acenaphthene	83-32-9	2 µg/L	76.1	62.0	114
		EP132: Acenaphthylene	208-96-8	2 µg/L	79.5	61.0	119
		EP132: Anthracene	120-12-7	2 µg/L	77.5	68.0	116
		EP132: Benz(a)anthracene	56-55-3	2 µg/L	85.3	67.0	122
		EP132: Benzo(a)pyrene	50-32-8	2 µg/L	79.8	72.0	114
		EP132: Benzo(b+j)fluoranthene	205-99-2 205-82-3	2 µg/L	81.8	69.0	119
		EP132: Benzo(e)pyrene	192-97-2	2 µg/L	78.8	71.0	119
		EP132: Benzo(g.h.i)perylene	191-24-2	2 µg/L	79.0	49.0	133
		EP132: Benzo(k)fluoranthene	207-08-9	2 µg/L	77.4	71.0	124
		EP132: Chrysene	218-01-9	2 µg/L	81.5	70.0	118
		EP132: Coronene	191-07-1	2 µg/L	82.2	29.0	138
		EP132: Dibenz(a.h)anthracene	53-70-3	2 µg/L	79.2	60.0	122
		EP132: Fluoranthene	206-44-0	2 µg/L	81.4	65.0	121
		EP132: Fluorene	86-73-7	2 µg/L	76.8	63.0	118
		EP132: Indeno(1.2.3.cd)pyrene	193-39-5	2 µg/L	80.4	57.0	123
		EP132: Naphthalene	91-20-3	2 µg/L	73.6	53.0	115
		EP132: Perylene	198-55-0	2 µg/L	77.3	71.0	118
		EP132: Phenanthrene	85-01-8	2 µg/L	78.2	67.0	120
		EP132: Pyrene	129-00-0	2 µg/L	80.5	70.0	117

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2515744**	Page	: 1 of 9
Client	: **ROBERT CARR & ASSOCIATES P/L**	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Telephone	: +61-2-8784 8555
Project	: 12513e	Date Samples Received	: 28-May-2025
Site	: ----	Issue Date	: 05-Jun-2025
Sampler	: AH/DB	No. of samples received	: 9
Order number	: ----	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES2515744--004	MW4	**Acenaphthene**	83-32-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES2515744--004	MW4	**Pyrene**	129-00-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Petroleum Hydrocarbons	ES2515744--004	MW4	**C10 - C14 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Petroleum Hydrocarbons	ES2515744--004	MW4	**C15 - C28 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Petroleum Hydrocarbons	ES2515744--004	MW4	**C29 - C36 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	ES2515744--004	MW4	**>C10 - C16 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	ES2515744--004	MW4	**>C16 - C34 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	ES2515744--004	MW4	**>C34 - C40 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Regular Sample Surrogates

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075(SIM)S: Phenolic Compound Surrogates	ES2515744-004	MW4	**2.4.6-Tribromophenol**	118-79-6	0.10 %	17.0-125 %	**Recovery less than lower data quality objective**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EP080/071: Total Petroleum Hydrocarbons						
Amber VOC Vial - Sulfuric Acid						
TB	30-May-2025	26-May-2025	**4**	30-May-2025	26-May-2025	**4**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions						
Amber VOC Vial - Sulfuric Acid						
TB	30-May-2025	26-May-2025	**4**	30-May-2025	26-May-2025	**4**
EP080: BTEXN						
Amber VOC Vial - Sulfuric Acid						
TB, TS	30-May-2025	26-May-2025	**4**	30-May-2025	26-May-2025	**4**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Natural (EG020A-F)							
MW1, MW2, MW3, MW4, MW10, QA	**27-May-2025**	**----**	----	----	**02-Jun-2025**	23-Nov-2025	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Natural (EG035F)							
MW1, MW2, MW3, MW4, MW10, QA	**27-May-2025**	**----**	----	----	**03-Jun-2025**	24-Jun-2025	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW1, MW2, MW3, MW4, MW6, MW10, QA	**27-May-2025**	**----**	----	----	**03-Jun-2025**	24-Jun-2025	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
MW1, MW2, MW3, MW4, MW6, MW10, QA	**27-May-2025**	**----**	----	----	**29-May-2025**	29-May-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
MW1, MW2, MW3, MW4, MW6, MW10, QA	**27-May-2025**	**----**	----	----	**03-Jun-2025**	24-Jun-2025	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
MW4	**27-May-2025**	**30-May-2025**	03-Jun-2025	✓	**03-Jun-2025**	09-Jul-2025	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
MW1, MW2, MW3, QA	**27-May-2025**	**30-May-2025**	03-Jun-2025	✓	**02-Jun-2025**	09-Jul-2025	✓
Amber Glass Bottle - Unpreserved (EP071)							
MW4	**27-May-2025**	**30-May-2025**	03-Jun-2025	✓	**03-Jun-2025**	09-Jul-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
TB	**12-May-2025**	**30-May-2025**	26-May-2025	×	**30-May-2025**	26-May-2025	×
Amber VOC Vial - Sulfuric Acid (EP080)							
MW1	**27-May-2025**	**30-May-2025**	10-Jun-2025	✓	**02-Jun-2025**	10-Jun-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
MW2, MW3, MW4, QA	**27-May-2025**	**30-May-2025**	10-Jun-2025	✓	**30-May-2025**	10-Jun-2025	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
MW1, MW2, MW3, QA	**27-May-2025**	**30-May-2025**	03-Jun-2025	✓	**02-Jun-2025**	09-Jul-2025	✓
Amber Glass Bottle - Unpreserved (EP071)							
MW4	**27-May-2025**	**30-May-2025**	03-Jun-2025	✓	**03-Jun-2025**	09-Jul-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
TB	**12-May-2025**	**30-May-2025**	26-May-2025	×	**30-May-2025**	26-May-2025	×
Amber VOC Vial - Sulfuric Acid (EP080)							
MW1	**27-May-2025**	**30-May-2025**	10-Jun-2025	✓	**02-Jun-2025**	10-Jun-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
MW2, MW3, MW4, QA	**27-May-2025**	**30-May-2025**	10-Jun-2025	✓	**30-May-2025**	10-Jun-2025	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
TB, TS	**12-May-2025**	**30-May-2025**	26-May-2025	×	**30-May-2025**	26-May-2025	×
Amber VOC Vial - Sulfuric Acid (EP080)							
MW1	**27-May-2025**	**30-May-2025**	10-Jun-2025	✓	**02-Jun-2025**	10-Jun-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
MW2, MW3, MW4, QA	**27-May-2025**	**30-May-2025**	10-Jun-2025	✓	**30-May-2025**	10-Jun-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP132) MW3	**27-May-2025**	**30-May-2025**	03-Jun-2025	✓	**02-Jun-2025**	09-Jul-2025	✓
Amber Glass Bottle - Unpreserved (EP132) MW1, MW2, QA	**27-May-2025**	**30-May-2025**	03-Jun-2025	✓	**30-May-2025**	09-Jul-2025	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	4	30	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	WATER	In house: Referenced to USEPA 3640 (GPC Cleanup), 8270 GCMS Capiliary column, SIM mode. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	WATER	In house: Referenced to USEPA 3510 (Extraction) / In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ **Brisbane:** 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne:** 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Adelaide:** 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ **Perth:** 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Launceston:** 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	RCA Australia	**TURNAROUND REQUIREMENTS :** ☐ Standard TAT **(List due date):** 4-6-2025 (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	**FOR LABORATORY USE ONLY (Circle)**
OFFICE:	92 Hill Street, Carrington		Custody Seal Intact? Yes No N/A
RCA Ref No:	12513e	**ALS QUOTE NO.:** EN/222/24	**COC SEQUENCE NUMBER (Circle)** COC: 1 OF: 1
			Free ice/ frozen ice bricks present upon receipt? Yes No N/A
PROJECT MANAGER: Fiona Brooker	**CONTACT PH:** 0408 687 529		Random Sample Temperature on Receipt: 4.0 °C
SAMPLER: AH/ DB	**SAMPLER MOBILE:** 0410 230 644		Other comment:
COC Emailed to ALS? (NO)	**EDD FORMAT (or default):**		
Email Reports to: administrator@rca.com.au + enviro@rca.com.au			
Email Invoice to: as above			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
AH	IR	Cassie	
DATE/TIME: ~~31/01/2020~~ 28.5.25 – 11:50	DATE/TIME: 28.5.25 1155	DATE/TIME: 28. 1700	DATE/TIME: 28/5/25 1930

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

E-MAILED

LAB OF ORIGIN: NEWCASTLE

ALS USE ONLY	SAMPLE DETAILS (MATRIX: Solid(S) Water(W))			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price). Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required)								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES	W05 TRH, BTEXN, 8 Dissolved Metals	EP132B - UT PAH	PAH	Please report Naphthalene results in both BTEXN and PAH suites	EK055G Ammonia	NT-04 Nitrite + Nitrate	W-18 - TRH C6-C9/ BTEX	W-02 - 8 Dissolved Metals	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	MW1	27.5.25 – 11:30	w	2*500mL AG, 2*100mL AG, 2* purple vials, 1* prple plastic, 1* red plastic (filtered), 1*500mL green plastic	9	X	X		X	X	X			
	MW2	27.5.25 – 13:20	w	1*500mL AG, 1*100mL AG, 2* purple vials, 1* prple plastic, 1* red plastic (filtered), 1*500mL green plastic	7	X	X		X	X	X			
	MW3	27.5.25 – 12:15	w	1*500mL AG, 1*100mL AG, 2* purple vials, 1* prple plastic, 1* red plastic (filtered), 1*500mL green plastic	7	X	X		X	X	X			
	MW4	27.5.25 – 15:00	w	1*500mL AG, 1*100mL AG, 2* purple vials, 1* prple plastic, 1* red plastic (filtered), 1*500mL green plastic	7	X		X	X	X	X			
	MW6	28.5.25 – 11:00	w	1*500mL green plastic, 1*purple plactic	2					X	X			
	MW10	27.5.25 – 14:15	w	1*500mL green plastic, 1*purple plactic, 1*red plactic (filtered)	3					X	X		X	
	QA	27.5.25	w	1*500mL AG, 1*100mL AG, 2* purple vials, 1* prple plastic, 1* red plastic (filtered), 1*500mL green plastic	7	X	X		X	X	X			
	TB	12.5.25	w	1*purple vial	1							X		
	TS	12.5.25	w	1*purple vial	1							X		
					44	5	4	1	5	7	7	2	1	

Environmental Division Sydney
Work Order Reference
ES2515744

Telephone : + 61-2-8784 8555

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2515744**

Client	: **ROBERT CARR & ASSOCIATES P/L**	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Contact	: Danae Hambly
Address	: PO BOX 175 CARRINGTON NSW, AUSTRALIA 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: fionab@rca.com.au	E-mail	: danae.hambly@alsglobal.com
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 4902 9299	Facsimile	: +61-2-8784 8500
Project	: 12513e	Page	: 1 of 3
Order number	: ----	Quote number	: EN2023ROBCAR0002 (NSW Custom BQ 2024)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: AH/DB		

Dates

Date Samples Received	: 28-May-2025 11:55	Issue Date	: 29-May-2025
Client Requested Due Date	: 04-Jun-2025	Scheduled Reporting Date	: **04-Jun-2025**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 4.0'c - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Volatile organic compound analysis may be compromised as sample containers contained headspace. Please contact ALS for further information.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method Sample ID	Sample Container Received	Preferred Sample Container for Analysis
Dissolved Mercury by FIMS : EG035F		
MW1	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
MW2	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
MW3	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
MW4	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
MW10	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
QA	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
Dissolved Metals by ICP-MS - Suite A : EG020A-F		
MW1	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
MW2	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
MW3	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
MW4	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
MW10	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
QA	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EP132B(PAH) Ultra Trace Polynuclear Aromatic Compounds	WATER - NT-04 Nitrite and Nitrate	WATER - W-02 8 Metals	WATER - W-05 TRH/BTEXN/8 Metals	WATER - W-18 TRH(C6 - C9)/BTEXN	WATER - W-26 TRH/BTEXN/PAH/8 Metals
ES2515744-001	27-May-2025 11:30	MW1	✓	✓	✓		✓		
ES2515744-002	27-May-2025 13:20	MW2	✓	✓	✓		✓		
ES2515744-003	27-May-2025 12:15	MW3	✓	✓	✓		✓		
ES2515744-004	27-May-2025 15:00	MW4	✓		✓				✓
ES2515744-005	27-May-2025 11:00	MW6	✓		✓				
ES2515744-006	27-May-2025 14:15	MW10	✓		✓	✓			
ES2515744-007	27-May-2025 00:00	QA	✓	✓	✓		✓		
ES2515744-008	12-May-2025 00:00	TB						✓	

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP080 BTEXN
ES2515744-009	12-May-2025 00:00	TS	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EP080: TRH Volatiles/BTEX							
TB	Amber VOC Vial - Sulfuric Acid	26-May-2025	26-May-2025	28-May-2025	✘	28-May-2025	✘
TS	Amber VOC Vial - Sulfuric Acid	26-May-2025	26-May-2025	28-May-2025	✘	28-May-2025	✘

Requested Deliverables

ADMINISTRATOR

- *AU Certificate of Analysis - NATA (COA)	Email	administrator@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	administrator@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	administrator@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	administrator@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
- Chain of Custody (CoC) (COC)	Email	administrator@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	administrator@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	administrator@rca.com.au

ALL INVOICES

- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au

ENVIRO

- *AU Certificate of Analysis - NATA (COA)	Email	enviro@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	enviro@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	enviro@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	enviro@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	enviro@rca.com.au
- Chain of Custody (CoC) (COC)	Email	enviro@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	enviro@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	enviro@rca.com.au

FIONA BROOKER

- *AU Certificate of Analysis - NATA (COA)	Email	fionab@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	fionab@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	fionab@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	fionab@rca.com.au
- Chain of Custody (CoC) (COC)	Email	fionab@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	fionab@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	fionab@rca.com.au

Appendix D

Summary of Results

Sample Identification	PQL	Aquatic Ecosystem Guideline [A]		Human Health (Ingestion) Guideline [B]	MW1	MW2	MW3	MW4	MW6	MW10
Sample Depth (m) [C]		99% Fresh	95% Fresh		1.23	0.90	0.90	0.69	0.56	0.00
Date					27/05/2025	27/05/2025	27/05/2025	27/05/2025	28/05/2025	27/05/2025
Sample Description					Grey, turbid and no odour.	Grey, turbid and no odour.	Dark grey, turbid and sulphide odour.	Turbid, dark grey, oily sheen and strong hydrocarbon odour.	Turbid, Dark yellow / orange and no odour.	Turbid, brown and no odour.
Sample Purpose					Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring
Sample collected by					RCA - AH/DB	RCA - AH/DB	RCA - AH/DB	RCA - AH/DB	RCA - AH/DB	RCA - AH/DB
General Waster Quality (field readings)										
pH					7.27	6	6.1	6.1	5.13	3.98
Electrical Conductivity (mS/cm)					0.917	3.99	9.84	9.84	6.61	16.3
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)										
Benzene	1		950	1	<1	<1	<1	<1	--	--
Toluene	2		*180*	800	<2	<2	<2	<2	--	--
Ethylbenzene	2		*80*	300	<2	<2	<2	<2	--	--
meta- and para-Xylene	2		*275*		<2	<2	<2	<2	--	--
ortho-Xylene	2		350		<2	<2	<2	<2	--	--
Total Xylenes	4			600	2	2	2	2	--	--
Total Recoverable Hydrocarbons (TRH)										
TRH C_6-C_{10}	20				<20	<20	<20	130	--	--
TRH >C_{10}-C_{16}	100				<100	<100	<100	232000	--	--
TRH >C_{16}-C_{34}	100				590	<100	180	248000	--	--
TRH >C_{34}-C_{40}	100				<100	<100	<100	<2860	--	--
TRH C_6-C_{40}	320	*7*	*7*		**700**	160	**290**	**487280**	--	--
Polycyclic Aromatic Hydrocarbons (PAH)										
Acenaphthene	0.1				<0.1	<0.1	<0.1	80.4	--	--
Acenaphthylene	0.1				<0.1	<0.1	<0.1	<47.6	--	--
Anthracene[D]	0.1	*0.01*			<0.1	<0.1	<0.1	<47.6	--	--
Benz(a)anthracene	0.1				<0.1	<0.1	<0.1	<47.6	--	--
Benzo(a) pyrene[D]	0.05	*0.1*		0.01	<0.05	<0.05	<0.05	<47.6	--	--
Benzo(b)&(j)fluoranthene	0.1				<0.1	<0.1	<0.1	<47.6	--	--
Benzo(g,h,i)perylene	0.1				<0.1	<0.1	<0.1	<47.6	--	--
Benzo(k)fluoranthene	0.1				<0.1	<0.1	<0.1	<47.6	--	--
Chrysene	0.1				<0.1	<0.1	<0.1	<47.6	--	--
Dibenz(a,h)anthracene	0.1				<0.1	<0.1	<0.1	<47.6	--	--
Fluoranthene[D]	0.1	*1*			<0.1	<0.1	<0.1	60.3	--	--
Fluorene	0.1				<0.1	<0.1	<0.1	231	--	--
Indeno(1,2,3-c,d)pyrene	0.1				<0.1	<0.1	<0.1	<47.6	--	--
Naphthalene	0.1		16		<0.1	<0.1	<0.1	<47.6	--	--
Phenanthrene[D]	0.1	*0.6*			<0.1	<0.1	<0.1	384	--	--
Pyrene	0.1				<0.1	<0.1	<0.1	95.5	--	--
Metals					#					
Arsenic	1		13	10	<1	<1	<1	<1	--	4
Cadmium	0.1		0.2	2	<0.1	<0.1	<0.1	<0.1	--	**0.3**
Chromium	1		1	50	<1	<1	<1	<1	--	**5**
Copper	1		1.4	2000	**2**	<1	<1	<1	--	**2**
Lead	1		3.4	10	<1	<1	<1	**4**	--	**11**
Mercury[D]	0.1	0.06	0.6	1	<0.1	<0.1	<0.1	<0.1	--	<0.1
Nickel	1		11		6	**15**	8	2	--	**152**
Zinc	5		8		**26**	**11**	2	<5	--	**252**
Non Metallic Inorganics					#					
Ammonia as N (at 20 °C)	10	pH dependent	pH dependent		560	**1820**	480	**3890**	740	200
Nitrate + Nitrite[E]	10	40			**1730**	**240**	**1340**	**1350**	**94400**	**70**

All results are in units of µg/L

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is summed and may be different from that presented by laboratory

[A] % Protection Level for Receiving Water Type.

[B] Australian Drinking Water Guidelines.

[C] Sample depths presented are as encountered at top of pipe or at ground level if pipe below ground prior to commencement of sampling

[D] Bioaccummulative Compounds

[E] Guidelines for Lowland (Coastal) Rivers in NSW

Ecological guidelines in *italics* are low level reliability guidelines

Ecological arsenic guideline based on As (V) for fresh, the lowest of presented guidelines.

Drinking Water arsenic guidelines are based on total arsenic

Guidelines for chromium are based on Cr (VI)

Ecological guidelines for mercury are based on inorganic mercury

Drinking water guidelines for mercury are based on total mercury

Results for TRH have been compared to TPH guidelines

Results shown in shading are in excess of the 99% aquatic ecosystems guidelines

Results shown in **BOLD** are in excess of the 95% aquatic ecosystems guidelines

Results shown in underline are in excess of the human health (ingestion) guideline

Where summation required (Xylene, TRH, PAH) calculation includes components reported as non detected as 1/2 PQL

Duplicate result used for nickel and ammonia due to poor RPD