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Sediment and Groundwater Monitoring Report

18 February 2026

Johnson Property Group
Corner of Whistler Drive & Armitage Way
Cooranbong NSW 2265

Attention Mr Michael Wratten

OCTOBER 2025 GROUNDWATER AND SEDIMENT SAMPLING
TRINITY POINT MARINA, MORISSET PARK

Prepared for Johnson Property Group
Prepared by Envirolab
February 2026
REPORT 391559_R[0]

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1 INTRODUCTION

This report details the findings of groundwater and sediment sampling conducted at the Trinity Point Marina, Morisset Park NSW.

The sampling was undertaken to comply with the requirements for monitoring outlined in Sections 2.4 and 2.5 of the Construction Environmental Management Plan (CEMP, Ref [1]) for the Marina as detailed below.

Section 2.4 of the CEMP states that groundwater monitoring is to be undertaken upstream and downstream of the Underground Petroleum Storage System (UPSS) at points 'E' and 'F' as per the site Environment Protection Licence (EPL) No 20631. The groundwater monitoring locations are shown below on **Figure 1**, as extracted from the "EPL Boundary and Water Quality Sampling Points" plan provided as part of the Environmental Monitoring information on the Trinity Point Marina website (https://trinitypointmarina.com.au/about/trinity-point-marina-monitoring). Monthly groundwater monitoring, which is undertaken separately, involves the inspection of groundwater for visual assessment of the presence of oil and grease. Annual groundwater monitoring, which forms part of the scope of this assessment, requires collected samples to be analysed for total petroleum hydrocarbons (TPH). It is noted that **Figure 1** includes surface water monitoring locations, assessment of which are not included in this report.

Section 2.5 of the CEMP (Ref [1]) states that Section C13 of the Concept Approval for the Marina requires that analysis of contaminant levels in the bed sediments in the area of the proposed marina is undertaken as part of the Stage 1 Marina Environmental Performance Monitoring. The CEMP (Ref [1]) states that an assessment of baseline sediment quality data indicated that lakebed sediments at the site are generally not contaminated, although slightly elevated concentrations of arsenic and cadmium have been detected. Sediment samples were required to be collected once midway through the Stage 1 construction period and then annually for a maximum of five (5) years following commencement of operation to demonstrate that marina operations do not impact sediment quality conditions. The CEMP (Ref [1]) states that the sediment samples are to be collected from four (4) 'impact' locations within the current marina layout as were assessed during the baseline monitoring period with an additional two (2) locations positioned in adjacent non-impacted areas to provide reference data for the four (4) 'impact' locations. The two (2) non-impacted sediment locations are identified as EPL Point A and Point C on **Figure 1** below. The four (4) sediment sampling locations as extracted from the CEMP (Ref [1]) are presented on **Figure 2**.

Figure 1 *Trinity Point Marina "EPL Boundary and Water Quality Sampling Points" showing groundwater, surface water and sediment sampling locations*

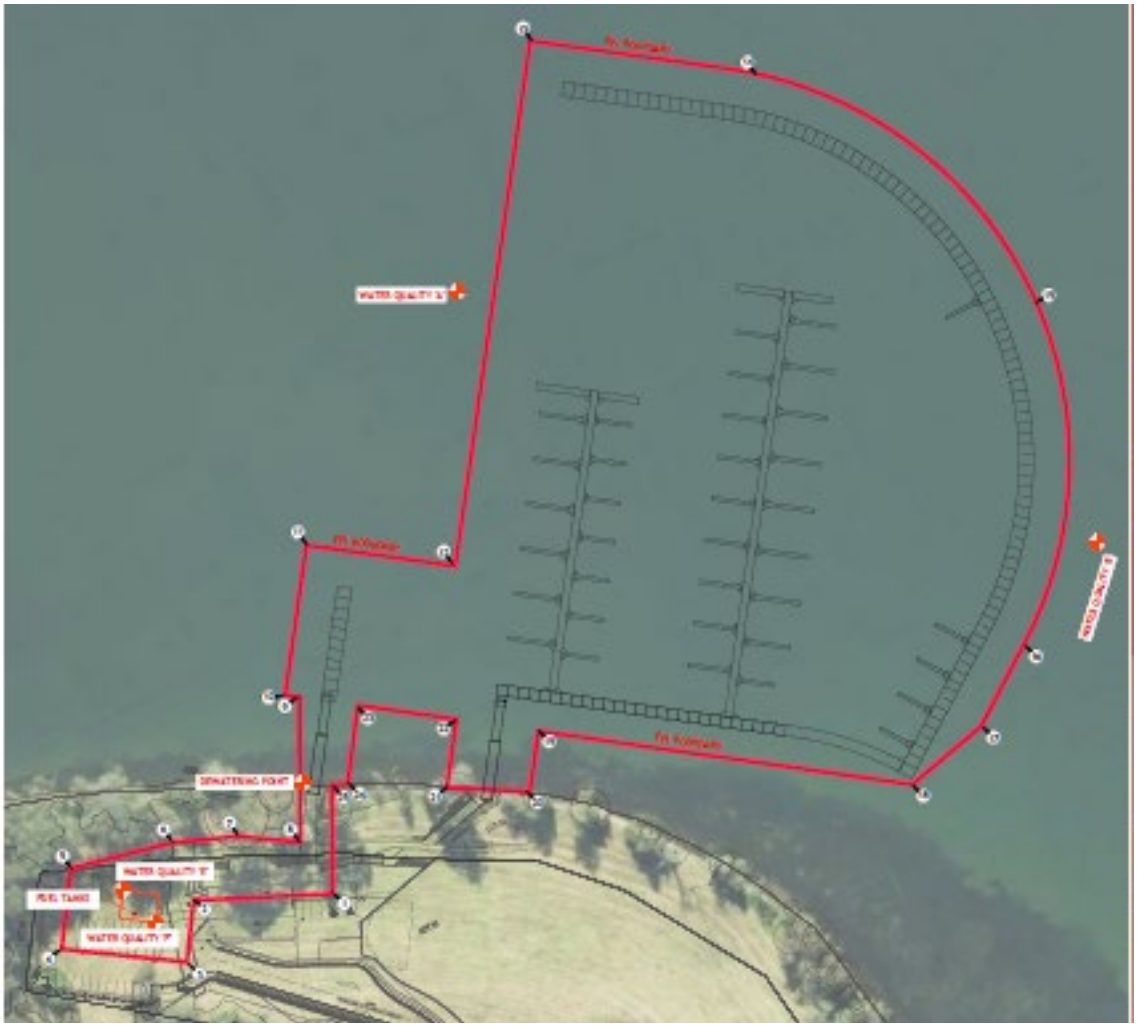

Figure 2 *Extract from CEMP (Ref [1]) identifying sediment 'impact' locations.*

It is understood that this monitoring round represents the second annual post-construction monitoring event. RCA has reviewed the sediment sampling results collected by Enviropacific in April 2019 (Ref [2]), which RCA understands were obtained to establish background contaminant levels in areas adjacent to the marina prior to occupation. These results have been incorporated into RCA's assessment. Ongoing monitoring has since been undertaken by Envirolab as of 16 December 2024.

2 FIELDWORK

An environmental technician undertook the fieldwork on 25 September 2025. The scope of work included:

- The collection of groundwater samples from existing monitoring wells MW5 and MW6 which are identified as points 'E' and 'F' in the site EPL as shown above in **Figure 1**.
    - Both bores were dipped to determine the depth of groundwater and then purged of at least three (3) bore volumes prior to sample collection.

- Samples were collected by designated hand bailer and were analysed by a NATA accredited laboratory for total recoverable hydrocarbons (TRH[1]) and benzene, toluene, ethylbenzene, xylene (BTEX).

- The collection of six (6) sediment samples comprising the four (4) sediment sample locations identified in the CEMP as shown on **Figure 2** and two (2) sediment samples from a boat within Lake Macquarie at EPL Points A and C as shown on **Figure 1**.
    - All sediment samples were collected with a (Petite) Ponar sampler which facilitates the collection of sediment samples from below the water. The samples were collected from the surface of the sediment to approximately 0.1m below the surface.
    - Samples were analysed by a NATA accredited laboratory for metals, total organic carbon (TOC) and tributyl tin (TBT) as specified in the CEMP (Ref [1]).

There were no other indications of contamination observed during sampling of groundwater or sediment.

Field sheets are attached.

3 APPLICABLE GUIDELINE CRITERIA

3.1 GROUNDWATER

The Guidelines for the Assessment and Management of Groundwater Contamination, introduced by the NSW DECC (Ref [3]), recommend adopting the AWQ Guidelines (Ref [4]) investigation levels as groundwater investigation levels (GIL) for aquatic ecosystems, and the ADWG (Ref [6]) for drinking-water GIL. It is noted that the AWQ Guidelines (Ref [4]) have since been superseded by the ANZG Guidelines (Ref [5]). Accordingly, Envirolab has applied the most current guideline framework in preparing the 2025 reporting, consistent with the following information.

The ANZG (Ref [5]) are complex guidelines that consider not only the level of protection (e.g. 99% or 95%) but also the state of the receiving water (e.g. moderately disturbed). For the protection of aquatic ecosystems the DECC recommend the use of 95% protection for all analytes with the exception of carcinogenic analytes for which the 99% protection value should be used. The following comments are additionally made:

- Where the existing generic GIL is below the naturally occurring background concentration of a particular contaminant, the background concentration becomes the default GIL.
- Where PQL are greater than the recommended GIL the PQL is adopted as the GIL. Where background concentrations are proven to be greater than the GIL, the background concentration is adopted as the GIL.

[1] Laboratory analysis of hydrocarbons is reported as total recoverable hydrocarbons (TRH). This testing method includes all forms of hydrocarbons, not just petroleum hydrocarbons and therefore can be considered a conservative measure against the chosen TPH criteria. Further laboratory analysis using a silica gel clean up (TRH_{sg}) is considered to enable a better identification of the extent of petroleum based contamination

- Where there is insufficient data for the derivation of marine water criteria it is allowable to use freshwater criteria as low reliability criteria.

ENVIROLAB considers that the receiving water is Lake Macquarie and so has used the 95% marine water guideline criteria.

The ADWG (Ref [5]) document provides a framework for drinking water quality management and assessment. The framework provided in this document has been adopted for the evaluation of contaminants in groundwater where groundwater can be, or is being, extracted and used for drinking water purpose. It is not considered likely that groundwater would be extracted from use and as such this comparison is considered highly conservative.

Schedule B1 of the ASC NEPM (Ref [7]) provides generic health screening levels (HSL) for groundwater, for protection of human health from petroleum hydrocarbon vapours, based on the following land use scenarios:

- HSL 'A' Residential with garden/ accessible soil (home grown produce <10% fruit and vegetable intake (no poultry). This category includes children's day care centres, preschools and primary schools.
- HSL 'B' Residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats.
- HSL 'C' Public open space such as parks, playgrounds, playing fields (e.g. ovals) secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves).
- HSL 'D' Commercial/industrial such as shops, offices, factories and industrial sites.

ENVIROLAB considers that the marina comprises both public open space and commercial/industrial areas: the HSL 'D' criteria presume that there is some potential for accumulation of vapours within enclosed spaces. For the purpose of this assessment the HSL 'D' criteria which are the most conservative have been used for this assessment.

It is noted that the HSL apply to groundwater at 2m below the surface. Both monitoring wells had shallower groundwater depth and as such the HSL are not directly applicable.

3.2 SEDIMENT

Two (2) criteria for the assessment of sediment are listed in *Table 1 of the ANZG toxicant default guideline values for sediment quality* (Ref [5]). The default guideline values (DGV) indicate the concentrations below which there is a low risk of unacceptable effects occurring, and should be used, with other lines of evidence, to protect aquatic ecosystems where the DGV is exceeded or where toxicant concentrations in the sediment are trending towards the DGV. The 'upper' guideline values (GV-High) provide an indication of concentrations at which toxicity-related adverse effects would be expected to be observed. The ANZG (Ref [5]) states that the GV-High value should only be used as an indicator of potential high-level toxicity problems, not as a guideline value to ensure protection of ecosystems.

4 RESULTS

Results have been compared against the guidelines detailed in the previous section and are presented in the tables attached to this report. A summary is as follows:

- Benzene was the only exceedance in groundwaters MW5 and MW6 based off human health criteria.
- All sediment sampling site has remained below the DGV guideline limit.
- Concentrations of metals and TBT in all sediment samples were below the default guideline values.
- Results of total organic carbon were low and relatively consistent across all samples. The samples from the 'impact' locations were slightly higher than those from 'non-impact' locations. There are no guidelines for total organic carbon.
- The trend for Aluminium and iron has indicated it has remained consistent in the sediment across all sites. Sed 4 seen another increase similar to 2023 limits.
- There were no exceedances in any sediment samples. The previous years higher concentrations have all returned to established monitoring levels.
- Historical trends of analytes presented in **Appendix B**

Laboratory report sheets are attached.

5 DISCUSSION AND CONCLUSION

The concentrations observed in the groundwater samples upgradient and downgradient of the UPSS were all below the laboratory detection limit and indicate that there has been no detectable impact to the groundwater from the UPSS.

Whilst the September 2025 results show a return to previous concentrations in most metals , the concentrations reported in the sediment samples were all below the default guideline values and as such not considered to be potential for adverse environmental impact from the concentrations.

The cause of some slightly increased concentrations is unknown and may be related to sediment movement within Lake Macquarie, new sediment being deposited on the base of the Lake from flood events or different sampling methodology between events. It is not considered that there would be significant biodegradation effects for the analysed compounds.

Based on these results Envirolab makes no further recommendations for sediment samples are required until the next annual monitoring event be undertaken as per the requirements of the CEMP (Ref [1]). However, due to groundwater concentrations exceeding the relevant human-health guidelines, resampling on a six-monthly basis is recommended. This would help determine whether the exceedance represents a one-off occurrence.

Yours Sincerely

EVIROLAB SERVICES

Laura Schofield
Environmental Laboratory Manager
Envirolab Services - Newcastle

6 REFERENCES

[1] Haskoning Australia Pty Ltd, *Trinity Point Marina – CEMP*, December 2015

[2] Enviropacific, *Annual Sediment Sampling and analysis Report*, January 2021

[3] DECC, *Contaminated Sites – Guidelines for the Assessment and Management of Contaminated Groundwater*, March 2007.

[4] ANZECC, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, October 2000.

[5] 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.

[6] National Health and Medical Research Council, *Australian Drinking Water Guidelines*, 2011. Amended June 2025

[7] NEPC, *National Environment Protection (Assessment of Site Contamination) Measure*, 1999 as amended 2014.

7 GLOSSARY

ANZG / ANZECC	Australian and New Zealand Environmental Conservation Council.
> DECC	NSW Department of Environment and Climate Change.
> DECCW	NSW Department of Environment, Climate Change and Water.
DLWC	Department of Land and Water Conservation.
ADWG	Australian Drinking Water Guidelines
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
mg	microgram, 1/1000 milligram.
mg	milligram, 1/1000 gram.
NHMRC	National Health and Medical Research Council.
DGV	Default guideline values
NSW EPA	NSW Environment Protection Authority – made a separate entity in 2011 to regulate the contaminated land industry.
HSL	Health Screening Level
PPE	Personal Protective Equipment.
PQL	Practical Quantitation Limit.
QA	Quality Assurance.
QC	Quality Control.
RPD	Relative Percentage Difference.

APPENDIX A

FIELD SHEET

Ground Water Sampling Field Sheet

Client: JPG **Job Number:** 391559

Technician: LS ST **Date Sampled:** 25/9/2025

Meter(s) Used: ENV10459 - N/A

Sample Number	Bore ID	Time Sampled	Depth to Aquifer (m)	Pipe Height (m)	Depth to Aquifer from Surface (m)	Temp (°C)	pH	Other Analysis (Include Measurement Units)			
391559-7	MW5	9.20	1.15	0.0	1.15	18					
391559-8	MW6	9:43	1.00	0.0	1.00	18					

Comments:

BOREHOLE PURGING LOG SHEET – TRINITY POINT

Bore No.	Date	Start Time	End Time	Depth to Water Surface (m) x	Depth Bore Bottom (m) y	Water Column (m) z	Calculated Water Volume (L)* v	Calculated Volume to Purge (L) p	Actual Volume Purged (L)	Start Colour of Water	End Colour of Water	Purged By:	Comments
				x (value)	y (value)	$z = (y-x)$	$v = z \times 9.50$	$p = v \times 3$					
MW5	25/9/25	9:20	9:42	1.15	2.69	1.54	14.63	43.89	45	Blackish	clear	SJ	NIL - slight odour.
MW6	25/9/25	9:43	9:55	1.00	3.05	2.05	19.47	58.4	59	clear	clear	SJ.	NIL

*Calculated water volume based on 1 linear meter of 50mm bore pipe using equation $V = \pi r^2 h$. Where V = volume in Litres.

Note bore pipe ≈ 100 mm diameter.

SAMPLING DETAIL SHEET

Job No: 391559
Client Reference: Sediment - Trinity Point
Date: 25/9/25
Location: Sed 1
Material Description: Silty Sand
Date Sampled: 25/9/2025
Sampling Method: Petite Ponar

Job No: 391559
Client Reference: Sediment - Trinity Point
Date: 25/9/25
Location: Sed 2
Material Description: Silty Sand
Date Sampled: 25/9/2025
Sampling Method: Petite Ponar

Job No: 391559
Client Reference: Sediment - Trinity Point
Date: 25/9/25
Location: Sed 3
Material Description: Silty Sand
Date Sampled: 25/9/2025
Sampling Method: Petite Ponar

Job No: 391559
Client Reference: Sediment - Trinity Point
Date: 25/9/2025
Location: Sed 4
Material Description: Silty Sand
Date Sampled: 25/9/25
Sampling Method: Petite Ponar

Job No: 391559
Client Reference: Sediment - Trinity Point
Date: 25/9/2025
Location: Point A
Material Description: Silty Sand
Date Sampled: 25/9/2025
Sampling Method: Petite Ponar

Job No: 391559
Client Reference: sediment - Trinity Point
Date: 25/9/2025
Location: Point C
Material Description: Silty sand
Date Sampled: 25/9/2025
Sampling Method: Petite Ponar

Appendix B

Cumulative Data

Sample Identification	PQL	Guideline[A]		Sed-1	Sed-1	Sed-1	Sed-1	Sed-1	Sed-1	Sed-2	Sed-2	Sed-2	Sed-2
Date		DGV	GV-High	19/8/20	26/5/21	22/6/22	19/7/23	25/10/24	25/9/25	19/8/20	26/5/21	22/6/22	19/7/23
Sample Profile				Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Sample Purpose				Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring
Sample collected by				RCA-SK	RCA-SK	RCA-SK	RCA-SK	RCA-SK	ENVIROLAB LS	RCA-SK	RCA-SK	RCA-SK	RCA-SK
Metals													
Aluminium	50			3560	7460	11800	12400	11000	9,800	3980	7560	8810	8800
Antimony	5	2	25	<5	<5	<5	<0.50	<10	<10	<5	<5	<5	<5
Arsenic	5	20	70	10	9	6	9.35	8	9	11	12	11	12.8
Cadmium	1	1.5	10	<1	1	1	1.3	1	1	<1	<1	<1	0.5
Chromium	2	80	370	9	11	14	19.3	20	14	5	10	10	12.4
Cobalt	2			3	4	4	6.2	59	5	4	6	5	6.5
Copper	5	65	270	33	44	**83**	**68.7**	5	51	19	35	30	42.7
Iron	50			7090	14600	15300	18800	19000	16,000	8630	15400	12200	14500
Lead	5	50	220	12	13	14	20.7	19	16	7	14	10	13.2
Manganese	5			58	163	158	217	190	160	121	192	151	187
Nickel	2	21	52	4	6	7	8.8	9	6	3	6	4	5.6
Selenium	5			<5	<5	<5	2.6	3	2	<5	<5	<5	1.2
Silver	2	1	4	<2	<2	<2	<0.1	<1	<1	<2	<2	<2	<0.1
Vanadium	5			11	26	31	36	36	27	11	24	19	21
Zinc	5	200	410	78	97	132	153	140	99	53	94	78	90.6
Mercury	0.1	0.15	1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Organometallics													
Tributyltin	0.5	9	70	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Organics													
Total Organic Carbon	0.02			1.61	2	4.46	4.64		3	2	1.63	1.96	1.6

All results are in units of mg/kg except Total Organic Carbon which is in %.

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] ANZG Toxicant default guideline values for sediment quality, Table 1

DGV = Detault Guideline Value

GV-High = Upper Guideline Value

Results shown in **BOLD** are in excess of the DGV

Results shown in shading are in excess of the GV-High

Tributyltin ug/kg

Sample Identification	PQL	Guideline[A]		Sed-2	Sed-2	Sed-3	Sed-3	Sed-3	Sed-3	Sed-3	Sed-3	Sed-4	Sed-4
Date		DGV	GV-High	25/10/24	25/9/25	19/8/20	26/5/21	22/6/22	19/7/23	25/10/24	25/9/25	26/5/21	19/7/23
Sample Profile				Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Sample Purpose				Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring
Sample collected by				RCA-SK	ENVIROLAB LS	RCA-SK	RCA-SK	RCA-SK	RCA-SK	RCA-SK	ENVIROLAB LS	RCA-SK	RCA-SK
Metals													
Aluminium	50			7400	6,200	4380	9990	11700	5800	9900	13,000	5340	16400
Antimony	5	2	25	<10	<10	<5	<5	<5	<0.5	<10	<10	<5	<0.50
Arsenic	5	20	70	15	8	8	12	8	8.3	10	10	7	15.2
Cadmium	1	1.5	10	0.4	<0.4	<1	<1	<1	0.5	0.6	0.5	<1	1.1
Chromium	2	80	370	10	10	5	13	13	8.5	13	16	7	23.1
Cobalt	2			6	4	3	6	5	4.6	6	6	4	9.5
Copper	5	65	270	37	32	16	39	48	26.1	47	59	26	**67.1**
Iron	50			14000	11,000	8140	18500	15800	9040	16000	21,000	10200	26600
Lead	5	50	220	12	11	7	16	14	9.2	14	19	8	27.2
Manganese	5			190	140	116	247	218	142	220	260	154	**365**
Nickel	2	21	52	5	5	2	7	6	4.3	6	7	4	10.2
Selenium	5			<2	<2	<5	<5	<5	1.1	2	<2	<5	2.3
Silver	2	1	4	<1	<1	<2	<2	<2	<0.1	<1	<1	<2	<0.1
Vanadium	5			19	18	12	30	26	15	26	31	18	40
Zinc	5	200	410	76	65	52	102	112	63.8	99	120	64	175
Mercury	0.1	0.15	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Organometallics													
Tributyltin	0.5	9	70	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Organics													
Total Organic Carbon	0.02				1.6	1.69	1.99	2.5	1.55		3.8	1.35	2.18

All results are in units of mg/kg except Total Organic Carbon which is in %.

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is

[A] ANZG Toxicant default guideline values for sediment quality, Table 1

DGV = Detault Guideline Value

GV-High = Upper Guideline Value

Results shown in **BOLD** are in excess of the DGV

Results shown in shading are in excess of the GV-High

Tributyltin ug/kg

Sample Identification	PQL	Guideline[A]		Sed-4	Sed-4	Point A	Point A	Point A	Point A	Point A	Point A	Point A	Point A	Point B
Date		DGV	GV-High	25/10/24	25/9/25	17/4/19	17/4/19	19/8/20	26/5/21	22/6/22	19/7/23	25/10/24	25/9/25	17/4/19
Sample Profile				Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Sample Purpose				Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring
Sample collected by				RCA-SK	ENVIROLAB LS	Enviropacific	Enviropacific	RCA-SK	RCA-SK	RCA-SK	RCA-SK	RCA-SK	ENVIROLAB LS	Enviropacific
Metals														
Aluminium	50			5100	13000	11200	7530	2870	4260	5620	8740	4000	3600	10700
Antimony	5	2	25	<10	<10	<0.5	<0.5	<5	<5	<5	<0.50	<10	<10	<0.5
Arsenic	5	20	70	7	9	17.7	11.2	7	10	13	17.2	15	19	19.6
Cadmium	1	1.5	10	<0.4	0.5	0.8	0.7	<1	<1	<1	0.5	<0.4	0.4	0.6
Chromium	2	80	370	8	17	16.5	12.6	4	6	7	13.6	8	6	17.8
Cobalt	2			31	6	6.9	5.5	2	3	4	6	4	4	7.5
Copper	5	65	270	4	55	52.4	41.6	11	20	15	36.6	18	12	67.4
Iron	50			8900	21000	25000	18400	6800	9320	11800	19100	12000	13000	25100
Lead	5	50	220	9	19	22.3	19.2	6	8	8	14.6	9	8	25.4
Manganese	5			130	290	323	243	58	85	85	427	85	89	401
Nickel	2	21	52	4	7	7.3	5.8	<2	4	3	7.3	3	3	8.1
Selenium	5			<2	<2	2	1.9	<5	<5	<5	1.5	<2	<2	2
Silver	2	1	4	<1	<1	0.1	<0.1	<2	<2	<2	<0.1	<1	<1	<0.1
Vanadium	5			15	31	35.6	28.9	12	14	17	34	22	14	36.1
Zinc	5	200	410	55	120	128	93	35	50	46	87.8	46	34	147
Mercury	0.1	0.15	1	<0.1	<0.1	0.07	0.06	<0.1	<0.1	<0.1	0.06	<0.1	<0.1	0.08
Organometallics														
Tributyltin	0.5	9	70	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Organics														
Total Organic Carbon	0.02				3.9	2.46	1.56	0.88	1.28	0.76	0.369		0.8	2.33

All results are in units of mg/kg except Total Organic Carbon which is in %.

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is

[A] ANZG Toxicant default guideline values for sediment quality, Table 1

DGV = Detault Guideline Value

GV-High = Upper Guideline Value

Results shown in **BOLD** are in excess of the DGV

Results shown in shading are in excess of the GV-High

Tributyltin ug/kg

Sample Identification	PQL	Guideline[A]		Point C	Point C	Point C	Point C	Point C	Point C	Point C
Date		DGV	GV-High	17/4/19	19/8/20	26/5/21	22/6/22	17/7/23	25/10/24	25/9/25
Sample Profile				Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Sample Purpose				Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring
Sample collected by				Enviropacific	RCA-SK	RCA-SK	RCA-SK	RCA-SK	RCA-SK	ENVIROLAB LS
Metals										
Aluminium	50			10400	1940	15700	7860	12000	8800	17000
Antimony	5	2	25	<0.5	<5	<5	<5	<0.5	<10	<10
Arsenic	5	20	70	15.8	<5	19	8	9.87	12	19
Cadmium	1	1.5	10	0.9	<1	<1	<1	0.7	0.6	0.8
Chromium	2	80	370	17.3	2	19	9	16.3	12	21
Cobalt	2			7.4	<2	8	4	6.3	6	8
Copper	5	65	270	53.4	10	44	26	50.2	44	56
Iron	50			22500	3280	28500	9860	17100	16000	28000
Lead	5	50	220	25.6	<5	20	10	16.9	14	29
Manganese	5			348	43	408	106	267	240	400
Nickel	2	21	52	7.6	<2	10	4	7.3	6	9
Selenium	5			2.4	<5	<5	<5	1.5	<2	<2
Silver	2	1	4	<0.1	<2	<2	<2	<0.1	<1	<1
Vanadium	5			39.3	5	48	19	27	22	43
Zinc	5	200	410	138	25	152	64	120	88	160
Mercury	0.1	0.15	1	0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Organometallics										
Tributyltin	0.5	9	70	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Organics										
Total Organic Carbon	0.02			2.36	0.96	1.92	0.98	2.07		2.9

All results are in units of mg/kg except Total Organic Carbon which is in %.

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is

[A] ANZG Toxicant default guideline values for sediment quality, Table 1

DGV = Detault Guideline Value

GV-High = Upper Guideline Value

Results shown in **BOLD** are in excess of the DGV

Results shown in shading are in excess of the GV-High

Tributyltin ug/kg

Sample Identification	PQL	Human Health (Vapour Based) Guideline [A]		MW5	MW5	MW5
Sample Depth (m) [B]		HSL 'D'		1.13	1.02	1.9
Date		SAND 2-<4m	SAND 4-<8m	26/5/21	22/6/22	19/7/23
Dominant Stratum [C]				Sand	Sand	Sand
Sample Purpose				Monitoring	Monitoring	Monitoring
Sample collected by				RCA-SK	RCA-SK	RCA-SK
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)						
Benzene	1	5000	5000	<1	<1	<1
Toluene	2	NL	NL	<2	<2	<2
Ethylbenzene	2	NL	NL	<2	<2	<2
meta- and para-Xylene	2			<2	<2	<2
ortho-Xylene	2			<2	<2	<2
Total Xylenes	4	NL	NL	2	<2	<2
Polycyclic Aromatic Hydrocarbons (PAH)						
Naphthalene	5	NL	NL	<5	<5	<5
Total Recoverable Hydrocarbons (TRH)						
TRH C_6-C_{10}	20			<20	<20	<20
TRH >C_{10}-C_{16}	100			<100	<100	<100
TRH >C_{16}-C_{34}	100			<100	<100	<100
TRH >C_{34}-C_{40}	100			<100	<100	<100
F1	20	6000	6000	<20	<20	<20
F2	100	NL	NL	<50	<50	<50

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

F1 = TRH C_6-C_{10} minus BTEX. F1 PQL deemed equal TRH C_6-C_{10}.

F2 = TRH >C_{10}-C_{16} minus naphthalene. F2 PQL deemed = TRH >C_{10}-C_{16}.

[A] ASC NEPM 1999 (as amended 2013) Vapour Based Health Screening Level (HSL) 'C' (Parks/Open space)

[B] Sample depths presented are as encountered prior to commencement of sampling

[C] Note that this is a generalisation for the purpose of comparing to the HSL criteria. Where two strata equally represented, most c

NL designates 'Not Limiting' indicating that the pore water concentration required to constitute a vapour risk is higher than the sol compound based on a petroleum mixture. Vapour is therefore not a risk for this compound.

Results for TRH have been compared to TPH guidelines.

Results shown in shading are in excess of the HSL

Where summation required (Xylene, F1, F2) calculation includes components reported as non detected as 1/2 PQL.

Sample Identification	PQL	Human Health (Vapour Based) Guideline [A]		MW5	MW5	MW6
Sample Depth (m) [B]		HSL 'D'		1.05	1.15	0.96
Date		SAND 2-<4m	SAND 4-<8m	23/10/24	25/9/25	26/5/21
Dominant Stratum [C]				Sand	Sand	Sand
Sample Purpose				Monitoring	Monitoring	Monitoring
Sample collected by				RCA-SK	ENVIROLAB LS	RCA-SK
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)						
Benzene	1	5000	5000	<1	6	<1
Toluene	2	NL	NL	<2	<1	<2
Ethylbenzene	2	NL	NL	<2	<1	<2
meta- and para-Xylene	2			<2	<2	<2
ortho-Xylene	2			<2	<1	<2
Total Xylenes	4	NL	NL	<2	<2	2
Polycyclic Aromatic Hydrocarbons (PAH)						
Naphthalene	5	NL	NL	<1	<1	<5
Total Recoverable Hydrocarbons (TRH)						
TRH C_6-C_{10}	20			<10	25	<20
TRH >C_{10}-C_{16}	100			<50	<50	<100
TRH >C_{16}-C_{34}	100			<100	<100	<100
TRH >C_{34}-C_{40}	100			<100	<100	<100
F1	20	6000	6000	<10	19	<20
F2	100	NL	NL	<50	<50	<50

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 comn that presented by laboratory

F1 = TRH C_6-C_{10} minus BTEX. F1 PQL deemed equal TRH C_6-C_{10}.

F2 = TRH >C_{10}-C_{16} minus naphthalene. F2 PQL deemed = TRH >C_{10}-C_{16}.

[A] ASC NEPM 1999 (as amended 2013) Vapour Based Health Screening Level (HSL

[B] Sample depths presented are as encountered prior to commencement of sampling

[C] Note that this is a generalisation for the purpose of comparing to the HSL criteria. :onservative criterion used

NL designates 'Not Limiting' indicating that the pore water concentration required to ubility capacity for that compound based on a petroleum mixture. Vapour is therefore not a risk for this con

Results for TRH have been compared to TPH guidelines.

Results shown in shading are in excess of the HSL

Where summation required (Xylene, F1, F2) calculation includes components report

Sample Identification	PQL	Human Health (Vapour Based) Guideline [A]		MW6	MW6
Sample Depth (m) [B]		HSL 'D'		1.4	1.02
Date		SAND 2-<4m	SAND 4-<8m	22/6/22	19/7/23
Dominant Stratum [C]				Sand	Sand
Sample Purpose				Monitoring	Monitoring
Sample collected by				RCA-SK	RCA-SK
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)					
Benzene	1	5000	5000	<1	<1
Toluene	2	NL	NL	<2	<2
Ethylbenzene	2	NL	NL	<2	<2
meta- and para-Xylene	2			<2	<2
ortho-Xylene	2			<2	<2
Total Xylenes	4	NL	NL	<2	<2
Polycyclic Aromatic Hydrocarbons (PAH)					
Naphthalene	5	NL	NL	<5	<5
Total Recoverable Hydrocarbons (TRH)					
TRH C_6-C_{10}	20			<20	<20
TRH >C_{10}-C_{16}	100			<100	<100
TRH >C_{16}-C_{34}	100			<100	<100
TRH >C_{34}-C_{40}	100			<100	<100
F1	20	6000	6000	<20	<20
F2	100	NL	NL	<50	<50

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 com

F1 = TRH C_6-C_{10} minus BTEX. F1 PQL deemed equal TRH C_6-C_{10}.
F2 = TRH >C_{10}-C_{16} minus naphthalene. F2 PQL deemed = TRH >C_{10}-C_{16}.

[A] ASC NEPM 1999 (as amended 2013) Vapour Based Health Screening Level (HSL

[B] Sample depths presented are as encountered prior to commencement of sampling

[C] Note that this is a generalisation for the purpose of comparing to the HSL criteria.

NL designates 'Not Limiting' indicating that the pore water concentration required to compound based on a petroleum mixture. Vapour is therefore not a risk for this con

Results for TRH have been compared to TPH guidelines.
Results shown in shading are in excess of the HSL
Where summation required (Xylene, F1, F2) calculation includes components report

Sample Identification	PQL	Human Health (Vapour Based) Guideline [A]		MW6	MW6
Sample Depth (m) [B]		HSL 'D'		1.00	1.00
Date		SAND 2-<4m	SAND 4-<8m	23/10/24	25/9/25
Dominant Stratum [C]				Sand	Sand
Sample Purpose				Monitoring	Monitoring
Sample collected by				RCA-SK	ENVIROLAB LS
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)					
Benzene	1	5000	5000	<1	3
Toluene	2	NL	NL	<2	<1
Ethylbenzene	2	NL	NL	<2	<1
meta- and para-Xylene	2			<2	<2
ortho-Xylene	2			<2	<1
Total Xylenes	4	NL	NL	<2	<2
Polycyclic Aromatic Hydrocarbons (PAH)					
Naphthalene	5	NL	NL	<1	<1
Total Recoverable Hydrocarbons (TRH)					
TRH C_6-C_{10}	20			<10	13
TRH >C_{10}-C_{16}	100			<50	<50
TRH >C_{16}-C_{34}	100			<100	<100
TRH >C_{34}-C_{40}	100			<100	<100
F1	20	6000	6000	<10	<10
F2	100	NL	NL	<50	<50

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 com

F1 = TRH C_6-C_{10} minus BTEX. F1 PQL deemed equal TRH C_6-C_{10}.
F2 = TRH >C_{10}-C_{16} minus naphthalene. F2 PQL deemed = TRH >C_{10}-C_{16}.

[A] ASC NEPM 1999 (as amended 2013) Vapour Based Health Screening Level (HSL

[B] Sample depths presented are as encountered prior to commencement of sampling

[C] Note that this is a generalisation for the purpose of comparing to the HSL criteria.

NL designates 'Not Limiting' indicating that the pore water concentration required to compound based on a petroleum mixture. Vapour is therefore not a risk for this con

Results for TRH have been compared to TPH guidelines.

Results shown in shading are in excess of the HSL

Where summation required (Xylene, F1, F2) calculation includes components report

Sample Identification	PQL	**Aquatic Ecosystem Guideline [A]**	**Human Health (Ingestion) Guideline [B]**	MW5	MW5
Sample Depth (m) [C]		95% Marine		1.13	1.02
Date				26/5/21	22/6/22
			Sample Purpose	Monitoring	Monitoring
			Sample collected by	RCA-SK	RCA-SK
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)					
Benzene	1	700	1	<1	<1
Toluene	2	*180*	800	<2	<2
Ethylbenzene	2	*5*	300	<2	<2
meta- and para-Xylene	2	*275*		<2	<2
ortho-Xylene	2	*350*		<2	<2
Total Xylenes	4		600	2	2
Total Recoverable Hydrocarbons (TRH)					
TRH C_6-C_{10}	20			<20	<20
TRH >C_{10}-C_{16}	100			<100	<100
TRH >C_{16}-C_{34}	100			<100	<100
TRH >C_{34}-C_{40}	100			<100	<100
TRH C_6-C_{40}	320	*7*		160	<100

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 presente laboratory

[A] % Protection Level for Receiving Water Type.

[B] Australian Drinking Water Guidelines, 2011.

[C] Sample depths presented are as encountered prior to commencement of sampling

Ecological guidelines in *italics* are low level reliability guidelines

Results for TRH have been compared to TPH 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) calculation includes components reported as non detected as 1/2 PQL.

Sample Identification	PQL	MW5	MW5	MW5	MW6
Sample Depth (m) [C]		1.09	1.05	1.15	1.02
Date		19/7/23	23/10/24	23/10/24	19/7/23
		Monitoring	Monitoring	Monitoring	Monitoring
		RCA-SK	RCA-SK	ENVIROLAB LS	RCA-SK
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)					
Benzene	1	<1	<1	6	<1
Toluene	2	<2	<2	<1	<2
Ethylbenzene	2	<2	<2	<1	<2
meta- and para-Xylene	2	<2	<2	<2	<2
ortho-Xylene	2	<2	<2	<1	<2
Total Xylenes	4	2	2	2	2
Total Recoverable Hydrocarbons (TRH)					
TRH C_6-C_{10}	20	<20	<10	25	<20
TRH >C_{10}-C_{16}	100	<100	<50	<100	<100
TRH >C_{16}-C_{34}	100	<100	<100	<100	<100
TRH >C_{34}-C_{40}	100	<100	<100	<100	<100
TRH C_6-C_{40}	320	<100	160	<100	<100

All results are in units of µg/L

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit. Where PQL is for a summation, Pted by laboratory

[A] % Protection Level for Receiving Water Type.

[B] Australian Drinking Water Guidelines, 2011.

[C] Sample depths presented are as encountered prior to commenceme

Ecological guidelines in *italics* are low level reliability guidelines

Results for TRH have been compared to TPH guidelines.

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

Results shown in underline are in excess of the human health (ingestic

Where summation required (Xylene,TRH) calculation includes compon

Sample Identification	PQL	MW6	MW6
Sample Depth (m) [C]		1.00	1.00
Date		23/10/24	25/9/25
		Monitoring	Monitoring
		RCA-SK	ENVIROLAB LS
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)			
Benzene	1	<1	3
Toluene	2	<2	<1
Ethylbenzene	2	<2	<2
meta- and para-Xylene	2	<2	<2
ortho-Xylene	2	<2	<1
Total Xylenes	4	<2	<2
Total Recoverable Hydrocarbons (TRH)			
TRH C_6-C_{10}	20	<10	13
TRH >C_{10}-C_{16}	100	<50	<50
TRH >C_{16}-C_{34}	100	<100	<100
TRH >C_{34}-C_{40}	100	<100	<100
TRH C_6-C_{40}	320	<100	<100

All results are in units of µg/L

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQ
laboratory

[A] % Protection Level for Receiving Water Type.

[B] Australian Drinking Water Guidelines, 2011.

[C] Sample depths presented are as encountered prior to commenceme

Ecological guidelines in *italics* are low level reliability guidelines

Results for TRH have been compared to TPH guidelines.

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

Results shown in underline are in excess of the human health (ingestic

Where summation required (Xylene,TRH) calculation includes compon

Appendix C

Certificate of Analysis

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
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CERTIFICATE OF ANALYSIS 391559

Client Details

Client	Johnson Property Group
Attention	Michael Wratten
Address	Trinity Point Development Unit Trust, PO Box 288, MORISSET, NSW, 2264

Sample Details

Your Reference	**Trinity Point**
Number of Samples	6 Soil, 2 Water
Date samples received	25/09/2025
Date completed instructions received	26/09/2025

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client unless as indicated below in the method summaries. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	03/10/2025
Date of Issue	02/10/2025

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Results Approved By
Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

Tributyl Tin in Soil						
Our Reference		391559-1	391559-2	391559-3	391559-4	391559-5
Your Reference	UNITS	Sed 1	Sed 2	Sed 3	Sed 4	Point A
Date Sampled		25/09/2025	25/09/2025	25/09/2025	25/09/2025	25/09/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/09/2025	29/09/2025	29/09/2025	29/09/2025	29/09/2025
Date analysed	-	30/09/2025	30/09/2025	30/09/2025	30/09/2025	30/09/2025
Tributyltin as Sn	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate Tripropyltin	%	77	83	82	81	81

Tributyl Tin in Soil		
Our Reference		391559-6
Your Reference	UNITS	Point C
Date Sampled		25/09/2025
Type of sample		Soil
Date extracted	-	29/09/2025
Date analysed	-	30/09/2025
Tributyltin as Sn	µg/kg	<0.5
Surrogate Tripropyltin	%	76

Acid Extractable metals in soil						
Our Reference		391559-1	391559-2	391559-3	391559-4	391559-5
Your Reference	UNITS	Sed 1	Sed 2	Sed 3	Sed 4	Point A
Date Sampled		25/09/2025	25/09/2025	25/09/2025	25/09/2025	25/09/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/09/2025	29/09/2025	29/09/2025	29/09/2025	29/09/2025
Date analysed	-	29/09/2025	29/09/2025	29/09/2025	29/09/2025	29/09/2025
Aluminium	mg/kg	9,800	6,200	13,000	13,000	3,600
Iron	mg/kg	16,000	11,000	21,000	21,000	13,000
Antimony	mg/kg	<10	<10	<10	<10	<10
Arsenic	mg/kg	9	8	10	9	19
Cadmium	mg/kg	1	<0.4	0.5	0.5	<0.4
Chromium	mg/kg	14	10	16	17	6
Copper	mg/kg	51	32	59	55	12
Cobalt	mg/kg	5	4	6	6	4
Lead	mg/kg	16	11	19	19	8
Manganese	mg/kg	160	140	260	290	89
Nickel	mg/kg	6	5	7	7	3
Selenium	mg/kg	2	<2	<2	<2	<2
Silver	mg/kg	<1	<1	<1	<1	<1
Vanadium	mg/kg	27	18	31	31	14
Zinc	mg/kg	99	65	120	120	34
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Acid Extractable metals in soil		
Our Reference		391559-6
Your Reference	UNITS	Point C
Date Sampled		25/09/2025
Type of sample		Soil
Date prepared	-	29/09/2025
Date analysed	-	29/09/2025
Aluminium	mg/kg	17,000
Iron	mg/kg	28,000
Antimony	mg/kg	<10
Arsenic	mg/kg	19
Cadmium	mg/kg	0.8
Chromium	mg/kg	21
Copper	mg/kg	56
Cobalt	mg/kg	8
Lead	mg/kg	29
Manganese	mg/kg	400
Nickel	mg/kg	9
Selenium	mg/kg	<2
Silver	mg/kg	<1
Vanadium	mg/kg	43
Zinc	mg/kg	160
Mercury	mg/kg	<0.1

Moisture						
Our Reference		391559-1	391559-2	391559-3	391559-4	391559-5
Your Reference	UNITS	Sed 1	Sed 2	Sed 3	Sed 4	Point A
Date Sampled		25/09/2025	25/09/2025	25/09/2025	25/09/2025	25/09/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/09/2025	29/09/2025	29/09/2025	29/09/2025	29/09/2025
Date analysed	-	30/09/2025	30/09/2025	30/09/2025	30/09/2025	30/09/2025
Moisture	%	61	51	66	68	30

Moisture		
Our Reference		391559-6
Your Reference	UNITS	Point C
Date Sampled		25/09/2025
Type of sample		Soil
Date prepared	-	29/09/2025
Date analysed	-	30/09/2025
Moisture	%	72

Misc Inorg - Soil						
Our Reference		391559-1	391559-2	391559-3	391559-4	391559-5
Your Reference	UNITS	Sed 1	Sed 2	Sed 3	Sed 4	Point A
Date Sampled		25/09/2025	25/09/2025	25/09/2025	25/09/2025	25/09/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/09/2025	29/09/2025	29/09/2025	29/09/2025	29/09/2025
Date analysed	-	29/09/2025	29/09/2025	29/09/2025	29/09/2025	29/09/2025
Total Organic Carbon in soil/solids	mg/kg	30,000	16,000	38,000	39,000	8,400

Misc Inorg - Soil		
Our Reference		391559-6
Your Reference	UNITS	Point C
Date Sampled		25/09/2025
Type of sample		Soil
Date prepared	-	29/09/2025
Date analysed	-	29/09/2025
Total Organic Carbon in soil/solids	mg/kg	29,000

vTRH(C6-C10)/BTEXN in Water			
Our Reference	UNITS	391559-7	391559-8
Your Reference		MW5	MW6
Date Sampled		25/09/2025	25/09/2025
Type of sample		Water	Water
Date extracted	-	30/09/2025	30/09/2025
Date analysed	-	01/10/2025	01/10/2025
TRH C_6 - C_9	µg/L	18	<10
TRH C_6 - C_{10}	µg/L	25	13
TRH C_6 - C_{10} less BTEX (F1)	µg/L	19	<10
Benzene	µg/L	6	3
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Naphthalene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	102	102
Surrogate Toluene-d8	%	102	101
Surrogate 4-Bromofluorobenzene	%	107	108

svTRH (C10-C40) in Water			
Our Reference		391559-7	391559-8
Your Reference	UNITS	MW5	MW6
Date Sampled		25/09/2025	25/09/2025
Type of sample		Water	Water
Date extracted	-	29/09/2025	29/09/2025
Date analysed	-	29/09/2025	29/09/2025
TRH C_{10} - C_{14}	µg/L	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50
Surrogate o-Terphenyl	%	84	88

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
INORG-137	Total Carbon Nitrogen Sulfur by high temperature catalytic combustion with IR detection. Total Nitrogen may also be determine from TKN+NOx by calculation.
Metals-020	Determination of various metals/elements by ICP-AES. Total Phosphate determined stochiometrically from Phosphorus (assumed to be present as Phosphate). Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation. Submission of low masses of sample e.g. for dust samples, may result in raised PQLs. Where molecular anion forms are calculated from an element (e.g. SO4 from S or PO4 from P stoichiometrically), the assumption is that the element is only present in that molecular anion form.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
ORG-25	Determination of Organometallic Compounds by derivatisation and analysis by GC-MSMS.

QUALITY CONTROL: Tributyl Tin in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	391559-2
Date extracted	-			29/09/2025	1	29/09/2025	29/09/2025		29/09/2025	29/09/2025
Date analysed	-			30/09/2025	1	30/09/2025	30/09/2025		30/09/2025	30/09/2025
Tributyltin as Sn	µg/kg	0.5	ORG-25	<0.5	1	<0.5	<0.5	0	132	130
Surrogate Tripropyltin	%		ORG-25	72	1	77	80	4	71	84

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	391559-2
Date prepared	-			29/09/2025	1	29/09/2025	29/09/2025		29/09/2025	29/09/2025
Date analysed	-			29/09/2025	1	29/09/2025	29/09/2025		29/09/2025	29/09/2025
Aluminium	mg/kg	10	Metals-020	<10	1	9800	9900	1	109	#
Iron	mg/kg	10	Metals-020	<10	1	16000	16000	0	109	#
Antimony	mg/kg	10	Metals-020	<10	1	<10	<10	0	96	85
Arsenic	mg/kg	4	Metals-020	<4	1	9	9	0	104	102
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	1	1	0	95	86
Chromium	mg/kg	1	Metals-020	<1	1	14	14	0	97	94
Copper	mg/kg	1	Metals-020	<1	1	51	51	0	100	100
Cobalt	mg/kg	1	Metals-020	<1	1	5	5	0	97	90
Lead	mg/kg	1	Metals-020	<1	1	16	16	0	98	92
Manganese	mg/kg	1	Metals-020	<1	1	160	160	0	101	91
Nickel	mg/kg	1	Metals-020	<1	1	6	6	0	96	90
Selenium	mg/kg	2	Metals-020	<2	1	2	2	0	99	98
Silver	mg/kg	1	Metals-020	<1	1	<1	<1	0	98	110
Vanadium	mg/kg	1	Metals-020	<1	1	27	27	0	98	97
Zinc	mg/kg	1	Metals-020	<1	1	99	100	1	95	88
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	112	109

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			29/09/2025	1	29/09/2025	29/09/2025		29/09/2025	[NT]
Date analysed	-			29/09/2025	1	29/09/2025	29/09/2025		29/09/2025	[NT]
Total Organic Carbon in soil/solids	mg/kg	100	INORG-137	<100	1	30000	30000	0	91	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			30/09/2025	8	30/09/2025	01/10/2025		30/09/2025	[NT]
Date analysed	-			01/10/2025	8	01/10/2025	01/10/2025		01/10/2025	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	8	<10	<10	0	100	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	8	13	<10	26	100	[NT]
Benzene	µg/L	1	Org-023	<1	8	3	2	40	96	[NT]
Toluene	µg/L	1	Org-023	<1	8	<1	<1	0	99	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	8	<1	<1	0	102	[NT]
m+p-xylene	µg/L	2	Org-023	<2	8	<2	<2	0	102	[NT]
o-xylene	µg/L	1	Org-023	<1	8	<1	<1	0	102	[NT]
Naphthalene	µg/L	1	Org-023	<1	8	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	99	8	102	102	0	99	[NT]
Surrogate Toluene-d8	%		Org-023	98	8	101	99	2	102	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	106	8	108	107	1	102	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	391559-8
Date extracted	-			29/09/2025	7	29/09/2025	29/09/2025		29/09/2025	29/09/2025
Date analysed	-			29/09/2025	7	29/09/2025	29/09/2025		29/09/2025	29/09/2025
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	7	<50	<50	0	94	100
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	7	<100	<100	0	109	112
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	7	<100	<100	0	100	98
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	7	<50	<50	0	94	100
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	7	<100	<100	0	109	112
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	7	<100	<100	0	100	98
Surrogate o-Terphenyl	%		Org-020	86	7	84	96	13	105	113

Result Definitions

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

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volumes) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

For Dust Deposit Gauge (DDG) analysis the sampling, sampling period and funnel exposure area do not fall under Envirolab's NATA accreditation (unless the Newcastle laboratory where responsible for the sampling), hence the annotation on the DDG units of reporting.

Urine Analysis - The BEI values listed are taken from the 2022 edition of "TLVs and BEIs Threshold Limits" by ACGIH.

Report Comments

8 metals in soil:
-# Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.
- The PQL has been raised for Se due to the high moisture content in all samples, resulting in a high dilution factor.