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GROUNDWATER MONITORING

SCONE WASTE FACILITY
NOBLET ROAD
SCONE NSW

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ABBREVIATIONS

The following is a list of common abbreviations used in the Contamination Sector within environmental reports.

B(a)P	Benzo(a)Pyrene
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethyl Benzene, Xylene
CLM	Contaminated Land Management
CSM	Conceptual Site Model
DA	Development Application
DP	Deposited Plan
DQI	Data Quality Indicator
DQO	Data Quality Objective
EIL	Ecological Investigation Level
EPA	Environment Protection Authority (NSW)
EPL	Environmental Protection License
ESL	Ecological Screening Level
LOR	Limit of Reporting
LOT	Allotment
MW	Monitoring Well
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticides
OEH	Office of Environmental and Heritage
OPP	Organophosphorus Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCOC	Potential Contaminant of Concern
PCB	Polychlorinated Biphenyls
QA/QC	Quality Assurance and Quality Control
SAC	Site Acceptance Criteria
SEPP	State Environmental Planning Policy
SWL	Standing Water Level
TCLP	Toxicity Characteristic Leaching Procedure
TRH	Total Recoverable Hydrocarbons
UHSC	Upper Hunter Shire Council
VOC	Volatile Organic Compounds
WHS	Work Health Safety

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1.0 INTRODUCTION

General

Under the requirements of the NSW EPA Environmental Protection Licence (EPL) 5863, Upper Hunter Shire Council (UHSC) is required to conduct quarterly and annual groundwater monitoring of the Scone Waste Facility located on Noblet Road, Scone, NSW, 2337.

The Annual Groundwater Monitoring Report provides a snapshot and trending of analytes of the groundwater conditions at the Site in relation to the current Site Criteria and satisfies the groundwater monitoring requirements of the EPL.

The Scone Waste Facility is an active landfill, it has the potential to be a polluting activity or to adversely impact the groundwater within the immediate vicinity and down hydraulic gradient of the site if there was a leak within the landfill.

Engage Environmental Services (Engage) was commissioned by UHSC to undertake this annual round of groundwater monitoring at the site. The annual groundwater monitoring was carried out on 16th September 2024.

This report has been prepared utilising information supplied by the client, publicly accessible information, information obtained as part of the onsite fieldwork and analysis, information from Government bodies and from experience, knowledge, and current industry practice.

Briefing

The briefing provided by Upper Hunter Shire Council and contained within EPL 5863 indicates that quarterly groundwater monitoring is required at five locations on the site, monitoring wells A to E (MWA-MWE). As well as a dam located onsite. Monitoring Well D is located within the landfill and the monitoring well accesses the perched water table (leachate) within the landfill. Comparisons against established criteria and historical data allow for trending of data. Trending of data can highlight seasonal variations, increases in analyte concentrations, decreases in analyte concentrations and fluctuations within the dataset. Over a time period the dataset can reveal increasing/decreasing trends highlighting potential site issues.

Refer to **Figure 1:** *Site Layout with Sample Locations*

2.0 SITE CRITERIA AND SAMPLING FREQUENCY

The groundwater analytical suite and sampling frequency were provided by UHSC and the EPL. Each of the wells have the same sampling regime and analytical suite for sample analysis. The site criterion is sourced from the Australian and New Zealand guidelines for fresh and marine water quality (ANZW 2018) 95% trigger values and National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 2013, unless otherwise stated.

Table 1: Analytes, Site Criteria and Sampling Frequency for Groundwater Monitoring Wells.

	Analytes/Pollutant	Units	Site Criteria NEPM 2013 and ANZW 2018 Fresh Water 95%	Sampling Frequency
IONS	**Calcium**	mg/L	NA	Quarterly
	Alkalinity (total)	mg/L	NA	Quarterly
	Chloride	mg/L	NA	Quarterly
	Fluoride	mg/L	NA	Quarterly
	Potassium[1]	mg/L	410	Quarterly
	Magnesium	mg/L	NA	Quarterly
	Sulphate	mg/L	NA	Quarterly
HEAVY METALS	**Iron**	mg/L	0.3	Quarterly
	Manganese	mg/L	1.9	Quarterly
	Arsenic III & V	mg/L	0.024 (III), 0.013 (V)	Yearly
	Aluminium	mg/L	0.055 (pH> 6.5)	Yearly
	Barium	mg/L	NA	Yearly
	Cadmium	mg/L	0.0002	Yearly
	Cobalt	mg/L	0.001	Yearly
	Copper	mg/L	0.0014	Yearly
	Chromium VI	mg/L	0.001	Yearly
	Chromium III	mg/L	27	Yearly
	Lead	mg/L	0.0034	Yearly
	Mercury	mg/L	0.0006	Yearly
	Zinc	mg/L	0.008	Yearly
PHENOL	**Total phenolics**	mg/L	0.32	Quarterly
OCP	**Organochlorine Pesticide**[3] **(OCP)**	mg/L	0.00001	Quarterly
OPP	**OPPs**	mg/L	0.006	Yearly

PCB	**PCBs**	mg/L	0.00001	Yearly
Hydrocarbons	**TRH**	mg/L	0.26	Yearly
	Benzene	mg/L	0.95	Yearly
	Toluene	mg/L	0.18	Yearly
	Ethylbenzene	mg/L	0.3	Yearly
	Xylene (o+p)	mg/l	0.35	Yearly
	PAHs	mg/L	0.016	Yearly
CVCs/ VOCCs	**- Total**	mg/L	NA	Yearly
	Tetrachlorethene (TCE)	mg/L	NA	Yearly
	1,1,2-Trichloroethane	mg/L	6.5	Yearly
	Tetrachloroethene (PCE)	mg/L	0.05	Yearly
	1, 1-Dichloroethene	mg/L	0.03	Yearly
	Vinyl Chloride	mg/L	0.0003	Yearly
MISC. INORGANICS	**pH**	pH	6.5 – 8	Quarterly
	Sodium	mg/L	NA	Quarterly
	Ammonia[2]	mg/L	0.9	Quarterly
	Nitrate	mg/L	50	Quarterly
	Total organic carbon	mg/L	4	Quarterly
	Electrical conductivity	µS/cm	NA	Quarterly
	Total dissolved solids	mg/L	NA	Yearly
	Biochemical Oxygen	mg/L	NA	Yearly
	Phosphate	mg/L	0.015	Yearly

1 - World Health Organisation Guidelines for Drinking-water Quality 2009, Poor (acceptable) drinking water criteria.
2 - Criteria value may not protect key species from chronic toxicity, refer to ANZW 2018 for further guidance.
3 - A Trigger value for DDT is used in the absence of a criteria value for Total OCP. DDT has the lowest criteria of OCPs.

3.0 SAMPLING METHODOLOGY

Groundwater Sampling

The five well locations were identified on the site. The site map was cross-referenced to the markings on the monitoring wells to ensure the correct wells were being sampled. Purging and sampling of monitoring wells was conducted in accordance with the NEPM (NEPC, 2013) and the *Guidelines for the Assessment and Management of Groundwater Contamination* (NSW DECC, 2007).

Purging is the process of removing stagnant water from a well, immediately prior to sampling, causing its replacement by groundwater from the adjacent formation that is representative of actual aquifer conditions. In order to determine when a well has been adequately purged, the physical parameters (pH ± 0.1 unit, electrical conductivity ± 5%, temperature ± 0.20, reduction-oxidation (redox) ± 10%; and dissolved oxygen ± 10%.) are monitored while the groundwater is removed during purging.

The physical parameters were measured at regular intervals using a Hanna Instruments H198494 Multiparameter Water Quality Meter. Stable conditions were indicated by monitoring for three consecutive readings of the physical parameters.

Collection of samples were direct into laboratory issued sampling containers for specific analytes. Samples were obtained using a disposable bailer. Care was taken so the bailer did not contact the sample container. All samples were collected and filled into the correct sample containers, a meniscus was formed on each sampling container prior to sealing to reduce or eliminate head space. The samples were placed immediately into a chilled esky to prevent the loss of potential volatile components.

Decontamination procedures between sampling events and sampling locations was undertaken. Sampling equipment was cleaned before and after sampling to prevent cross contamination. The cleaning procedure included:

- New nitrile disposable gloves for each well;
- Washing and wipe down with phosphate free laboratory grade detergent;
- Rinsing of brush before using brush on equipment;
- Using a brush on equipment if necessary;
- Rinsing with deionised water and wipe down with new wipe if necessary; and,
- New disposable bailer used for each well.

Appropriate decontamination procedures were appropriate during groundwater sampling.

4.0 RESULTS

The five groundwater monitoring wells were sampled during the September 2024 sampling event. Results are detailed in **Tables 2** to **11**. Comparisons have been made to the previous quarterly rounds of 2023 / 2024 monitoring (December 2023, March and June 2024) also the yearly monitoring of September 2023. Refer to **Attachment 2** – NATA Accredited Laboratory Results and **Attachment 1** – Data Log.

Table 2 – Quarterly Analytes Groundwater Results and Comparison (MWA)

	Analytes	Units	Site Criteria (mg/L)	MWA Sept 2023	MWA Jan 2024	MWA March 2024	MWA June 2024	MWA Sept 2024
IONS	**Calcium**	mg/L	NA	570	570	570	540	570
	Alkalinity	mg/L	NA	540	560	530	490	550
	Chloride	mg/L	NA	8000	7200	6500	7300	6500
	Fluoride	mg/L	NA	0.1	0.1	0.2	0.2	0.1
	Potassium[1]	mg/L	410	4	4	3	3	4
	Magnesium	mg/L	NA	1100	1200	1100	1000	1100
	Sulphate	mg/L	NA	62	100	62	53	63
HEAVY METALS	**Iron**	mg/L	0.3	0.01	<LOR	<LOR	<LOR	0.03
	Manganese	mg/L	1.9	0.07	0.038	0.006	0.028	0.045
Phenols	**Total phenolics**	mg/L	0.32	<LOR	<LOR	<LOR	<LOR	<LOR
OCPs	**OCP[3]**	mg/L	0.00001	<LOR	<LOR	<LOR	<LOR	<LOR
MISC. INORGANICS	**pH**	pH	6.5 – 8	6.9	7.0	7.3	6.9	7.0
	Sodium	mg/L	NA	2000	2000	2200	1800	2100
	Ammonia[2]	mg/L	0.9	0.043	0.066	0.26	0.16	0.051
	Nitrate	mg/L	0.7	0.59	0.6	0.55	0.54	0.55
	Total Organic C	mg/L	4	**5**	**9**	**5**	4	**4**
	EC	µS/cm	NA	20000	19000	19000	19000	20000

Highlighted results exceed site criteria

<LOR = No Detection. Analyte is below the Laboratory LOR

1 - World Health Organisation Guidelines for Drinking-water Quality 2009, Poor (acceptable) drinking water criteria.

2 - Criteria value may not protect key species from chronic toxicity, refer to ANZW 2018 for further guidance.

3 - A Trigger value for DDT is used in the absence of a criteria value for Total OCP. DDT has the lowest criteria of OCPs.

Table 3 – Yearly Analytes Groundwater Results and Comparison Sept 2023-Sept 2024 (MWA)

Sampling Parameter	Units	Threshold Criteria (mg/L)	MWA Sept 2023	MWA Sept 2024
Total dissolved solids	mg/L	NA	14000	13000
Biochemical Oxygen Demand	mg/L	NA	<LOR	<LOR
Phosphate	mg/L	0.015[G]	**0.076**	**0.073**
Arsenic III & V	mg/L	0.024 (III), 0.013	0.001	0.001
Aluminium	mg/L	0.055 (pH> 6.5)	<LOR	<LOR
Barium	mg/L	NA	0.57	0.57
Cadmium	mg/L	0.0002	<LOR	<LOR
Copper	mg/L	0.0014	**0.01**	**0.01**
Chromium VI	mg/L	0.004	<LOR	<LOR
Chromium (Total)	mg/L	27	0.004	0.005
Cobalt	mg/L	0.09	<LOR	<LOR
Lead	mg/L	0.0034	<LOR	<LOR
Mercury	mg/L	0.0006	0.00006	<0.00005
Zinc	mg/L	0.008[D]	**0.025**	**0.029**
TRH	mg/L	0.26[I]	<LOR	<LOR
Benzene	mg/L	0.95	<LOR	<LOR
Toluene	mg/L	0.18[L]	<LOR	<LOR
Ethylbenzene	mg/L	0.08[L]	<LOR	<LOR
Xylene			<LOR	<LOR
CVCs/VOCCs:				
- **Total**	mg/L	NA	<LOR	<LOR
- **Tetrachlorethene (TCE)**	mg/L	NA	<LOR	<LOR
- **1,1,2-Trichloroethane**	mg/L	6.500	<LOR	<LOR
- **Tetrachloroethene (PCE)**	mg/L	0.05[N]	<LOR	<LOR
- **1,1-Dichloroethene**	mg/L	0.03[P]	<LOR	<LOR
- **Vinyl Chloride**	mg/L	0.0003[N]	<LOR	<LOR
PCBs	mg/L	0.00003[A]	<LOR	<LOR
PAHs	mg/L	0.016[B]	<LOR	<LOR
OPPs	mg/L	0.00002[C]	<LOR	<LOR

Table 4 – Quarterly Groundwater Results and Comparison (MWB)

	Analytes	Units	Site Criteria (mg/L)	MWB Sept 2023	MWB Jan 2024	MWB March 2024	MWB June 2024	MWB Sept 2024
IONS	**Calcium**	mg/L	NA	470	480	470	410	480
	Alkalinity	mg/L	NA	440	470	450	460	490
	Chloride	mg/L	NA	5200	4700	4300	4600	4200
	Fluoride	mg/L	NA	0.2	0.3	0.3	0.3	0.3
	Potassium[1]	mg/L	410	4	3	2	3	4
	Magnesium	mg/L	NA	630	640	620	520	640
	Sulphate	mg/L	NA	110	100	93	91	97
HEAVY METALS	**Iron**	mg/L	0.3	<LOR	<LOR	<LOR	<LOR	0.03
	Manganese	mg/L	1.9	0.016	0.013	0.014	0.008	0.007
OCP	**OCP[3]**	mg/L	0.00001	<LOR	<LOR	<LOR	<LOR	<LOR
PHENOLS	**Total phenolics**	mg/L	0.32	<LOR	<LOR	<LOR	<LOR	<LOR
MISC. INORGANICS	**pH**	pH	6.5 – 8	6.9	7.1	7.5	7.1	7.0
	Sodium	mg/L	NA	1400	1400	1600	1300	1500
	Ammonia[2]	mg/L	0.9	0.037	0.03	0.033	<LOR	0.034
	Nitrate	mg/L	0.7	0.26	0.26	0.19	0.19	0.24
	Total Organic C	mg/L	4	**9**	**14**	7	7	7
	EC	µS/cm	NA	14000	13000	13000	13000	14000

Highlighted results exceed site criteria

<LOR = No Detection. Analyte is below the Laboratory LOR

1 - World Health Organisation Guidelines for Drinking-water Quality 2009, Poor (acceptable) drinking water criteria.

2 - Criteria value may not protect key species from chronic toxicity, refer to ANZW 2018 for further guidance.

3 - A Trigger value for DDT is used in the absence of a criteria value for Total OCP. DDT has the lowest criteria of OCPs.

Table 5 – Yearly Analytes Groundwater Results and Comparison Sept 2023-Sept 2024 (MWB)

Sampling Parameter	Units	Threshold Criteria (mg/L)	MWB Sept 2023	MWB Sept 2024
Total dissolved solids	mg/L	NA	10000	8700
Biochemical Oxygen Demand	mg/L	NA	<LOR	12
Phosphate	mg/L	0.015	**0.02**	**0.03**
Arsenic III & V	mg/L	0.024 (III), 0.013	0.001	0.001
Aluminium	mg/L	0.055 (pH> 6.5)	<LOR	<LOR
Barium	mg/L	NA	0.41	0.35
Cadmium	mg/L	0.0002	<LOR	<LOR
Copper	mg/L	0.0014	**0.009**	**0.007**
Chromium VI	mg/L	0.004	<LOR	<LOR
Chromium (Total)	mg/L	0.004	**0.005**	<LOR
Cobalt	mg/L	0.09	<LOR	<LOR
Lead	mg/L	0.0034	<LOR	<LOR
Mercury	mg/L	0.0006	<LOR	<LOR
Zinc	mg/L	0.008	**0.034**	**0.022**
TRH	mg/L	0.26[I]	<LOR	<LOR
Benzene	mg/L	0.95	<LOR	<LOR
Toluene	mg/L	0.18[L]	<LOR	<LOR
Ethylbenzene	mg/L	0.08[L]	<LOR	<LOR
Xylene	mg/L		<LOR	<LOR
CVCs/VOCCs:				
- **Total**	mg/L	NA	<LOR	<LOR
- **Tetrachlorethene (TCE)**	mg/L	NA	<LOR	<LOR
- **1,1,2-Trichloroethane**	mg/L	6500 (1,1,2 TCA)	<LOR	<LOR
- **Tetrachloroethene (PCE)**	mg/L	0.05	<LOR	<LOR
- **1,1-Dichloroethene**	mg/L	0.03	<LOR	<LOR
- **Vinyl Chloride**	mg/L	0.0003	<LOR	<LOR
PCBs	mg/L	0.00003	<LOR	<LOR
PAHs	mg/L	0.016	<LOR	<LOR
OPPs	mg/L	0.00002	<LOR	<LOR

Table 6 – Quarterly Groundwater Results and Comparison (MWC)

	Analytes	Units	Site Criteria (mg/L)	MWC Sept 2023	MWC Jan 2024	MWC March 2024	MWC June 2024	MWC Sept 2024
IONS	**Calcium**	mg/L	NA	390	420	420	390	420
	Alkalinity (total)	mg/L	NA	880	890	840	860	910
	Chloride	mg/L	NA	5500	5300	4600	4500	4600
	Fluoride	mg/L	NA	0.2	0.2	0.2	0.2	0.2
	Potassium[1]	mg/L	410	3	2	2	2	3
	Magnesium	mg/L	NA	550	600	600	510	600
	Sulphate	mg/L	NA	91	98	83	71	90
HEAVY METALS	**Iron**	mg/L	0.3	<LOR	<LOR	0.04	0.18	0.03
	Manganese	mg/L	1.9	1.9	1.5	1.8	1.8	1.4
PHENOLS	**Total phenolics**	mg/L	0.32	<LOR	<LOR	<LOR	<LOR	<LOR
OCP	**OCP[3]**	mg/L	0.000	<LOR	<LOR	<LOR	<LOR	<LOR
MISC. INORGANICS	**pH**	pH	6.5 – 8	6.9	7.0	7.4	6.9	6.8
	Sodium	mg/L	NA	1800	1900	2300	1700	2100
	Ammonia[2]	mg/L	0.9	<LOR	<LOR	0.021	<LOR	0.02
	Nitrate	mg/L	0.7	0.068	0.03	0.03	0.02	0.2
	Total Organic C	mg/L	4	**8**	**14**	**10**	**18**	**6**
	EC	µS/cm	NA	15000	15000	15000	15000	15000

Highlighted results exceed site criteria

<LOR = No Detection. Analyte is below the Laboratory LOR

1 - World Health Organisation Guidelines for Drinking-water Quality 2009, Poor (acceptable) drinking water criteria.

2 - Criteria value may not protect key species from chronic toxicity, refer to ANZW 2018 for further guidance.

3 - A Trigger value for DDT is used in the absence of a criteria value for Total OCP. DDT has the lowest criteria of OCPs.

Table 7 – Yearly Analytes Groundwater Results and Comparison Sept 2023-Sept 2024 (MWC)

Sampling Parameter	Units	Threshold Criteria (mg/L)	MWC Sept 2023	MWC Sept 2024
Total dissolved solids	mg/L	NA	9900	9000
Biochemical Oxygen Demand	mg/L	NA	16	10
Phosphate	mg/L	0.015	**0.02**	**0.04**
Arsenic III & V	mg/L	0.024 (III),	<LOR	<LOR
Aluminium	mg/L	0.055 (pH> 6.5)	<LOR	<LOR
Barium	mg/L	NA	0.4	0.4
Cadmium	mg/L	0.0002	<LOR	<LOR
Copper	mg/L	0.0014	**0.007**	**0.002**
Chromium VI	mg/L	0.004	<LOR	<LOR
Chromium (total)	mg/L	0.004	<LOR	0.004
Cobalt	mg/L	0.09	0.008	0.008
Lead	mg/L	0.0034	<LOR	<LOR
Mercury	mg/L	0.0006	<LOR	<LOR
Zinc	mg/L	0.008	**0.026**	**0.015**
TRH	mg/L	0.26[I]	<LOR	<LOR
Benzene	mg/L	0.95	<LOR	<LOR
Toluene	mg/L	0.18	<LOR	<LOR
Ethylbenzene	mg/L	0.08	<LOR	<LOR
Xylene	mg/L		<LOR	<LOR
CVCs/VOCCs:				
- **Total**	mg/L	NA	<LOR	<LOR
- **Tetrachlorethene**	mg/L	NA	<LOR	<LOR
- **1,1,2-Trichloroethane**	mg/L	6500 (1,1,2 TCA)	<LOR	<LOR
- **Tetrachloroethene**	mg/L	0.05	<LOR	<LOR
- **1,1-Dichloroethene**	mg/L	0.03	<LOR	<LOR
- **Vinyl Chloride**	mg/L	0.0003	<LOR	<LOR
PCBs	mg/L	0.00003	<LOR	<LOR
PAHs	mg/L	0.016	<LOR	<LOR
OPPs	mg/L	0.00002	<LOR	<LOR

MWD is a leachate monitoring well which provides access to the perched landfill leachate water table. The Site Criteria for this particular well is only used as a general indicator of the leachate water quality.

Table 8 – Quarterly Groundwater Results and Comparison (MWD)

	Analytes	Units	Site Criteria (mg/L)	MWD Sept 2023	MWD Jan 2024	MWD March 2024	MWD June 2024	MWD Sept 2024
IONS	**Calcium**	mg/L	NA	160	160	150	170	170
	Alkalinity (total)	mg/L	NA	1900	2000	1200	1300	1700
	Chloride	mg/L	NA	3400	2200	1100	940	1600
	Fluoride	mg/L	NA	0.2	0.3	0.3	0.3	0.3
	Potassium[1]	mg/L	410	110	120	76	67	93
	Magnesium	mg/L	NA	280	230	130	110	190
	Sulphate	mg/L	NA	51	32	100	100	76
HEAVY METALS	**Iron**	mg/L	0.3	**0.88**	**1.1**	**0.4**	0.28	**1.0**
	Manganese	mg/L	1.9	0.39	0.47	0.62	0.66	0.58
PHENOLS	**Total phenolics**	mg/L	0.32	<LOR	<LOR	<LOR	<LOR	<LOR
OCP	**OCP[3]**	mg/L	0.00001	<LOR	<LOR	<LOR	<LOR	<LOR
MISC. INORGANICS	**pH**	pH	6.5 – 8	7.8	7.6	7.8	7.4	7.5
	Sodium	mg/L	NA	1500	1400	750	590	1000
	Ammonia[2]	mg/L	0.9	**200**	**190**	**130**	**100**	**200**
	Nitrate	mg/L	0.7	<LOR	<LOR	<LOR	<LOR	0.03
	Total Organic C	mg/L	4	**240**	**270**	**89**	**100**	**110**
	EC	µS/cm	NA	3600	9700	5600	5600	8600

Highlighted results exceed site criteria

<LOR = No Detection. Analyte is below the Laboratory LOR

1 - World Health Organisation Guidelines for Drinking-water Quality 2009, Poor (acceptable) drinking water criteria.

2 - Criteria value may not protect key species from chronic toxicity, refer to ANZW 2018 for further guidance.

3 - A Trigger value for DDT is used in the absence of a criteria value for Total OCP. DDT has the lowest criteria of OCPs.

Table 9 – Yearly Analytes Groundwater Results and Comparison Sept 2023-Sept 2024 (MWD)

Sampling Parameter	Units	Threshold Criteria (mg/L)	MWD (leachate) Sept 2023	MWD (leachate) Sept 2024
Total dissolved solids	mg/L	NA	6800	4100
Biochemical Oxygen Demand	mg/L	NA	62	68
Phosphate	mg/L	0.015	**0.69**	**0.14**
Arsenic III & V	mg/L	0.024 (III),	0.008	0.007
Aluminium	mg/L	0.055 (pH> 6.5)	<LOR	<LOR
Barium	mg/L	NA	0.97	0.63
Cadmium	mg/L	0.0002	<LOR	<LOR
Copper	mg/L	0.0014	**0.005**	<LOR
Chromium VI	mg/L	0.004	<LOR	<LOR
Chromium (total)	mg/L	0.004	**0.027**	**0.018**
Cobalt	mg/L	0.09	0.021	0.01
Lead	mg/L	0.0034	<LOR	<LOR
Mercury	mg/L	0.0006	<LOR	<LOR
Zinc	mg/L	0.008	**0.03**	0.008
TRH	mg/L	0.26[1]	**6.1**	**5.6**
Benzene	mg/L	0.95	0.004	0.003
Toluene	mg/L	0.18	<LOR	<LOR
Ethylbenzene	mg/L	0.08	<LOR	<LOR
Xylene	mg/L		0.003	<LOR
CVCs/VOCCs:				
- **Total**	mg/L	NA	<LOR	<LOR
- **Tetrachlorethene (TCE)**	mg/L	NA	<LOR	<LOR
- **1,1,2-Trichloroethane**	mg/L	6.5	<LOR	<LOR
- **Tetrachloroethene (PCE)**	mg/L	0.05	<LOR	<LOR
- **1,1-Dichloroethene**	mg/L	0.03	<LOR	<LOR
- **Vinyl Chloride**	mg/L	0.0003	<LOR	<LOR
PCBs	mg/L	0.00003	<LOR	<LOR
PAHs	mg/L	0.016	0.007	**0.056**
OPPs	mg/L	0.00002	<LOR	<LOR

Table 10 –Quarterly Groundwater Results and Comparison (MWE)

	Analytes	Units	Site Criteria (mg/L)	MWE Sept 2023	MWE Jan 2024	MWE March 2024	MWE June 2024	MWE Sept 2024
IONS	**Calcium**	mg/L	NA	130	110	82	39	100
	Alkalinity	mg/L	NA	1100	1100	1400	980	1100
	Chloride	mg/L	NA	1300	1300	440	240	780
	Fluoride	mg/L	NA	0.4	0.4	0.5	0.4	0.4
	Potassium[1]	mg/L	410	1	0.9	<LOR	0.8	2
	Magnesium	mg/L	NA	140	130	91	46	100
	Sulphate	mg/L	NA	240	210	120	60	180
HEAVY METALS	**Iron**	mg/L	0.3	0.02	<LOR	0.010	0.09	**1.4**
	Manganese	mg/L	1.9	1.1	0.9	0.65	0.71	1
PHENOLS	**Total phenolics**	mg/L	0.32	<LOR	<LOR	<LOR	<LOR	<LOR
OCP	**OCP[3]**	mg/L	0.00001	<LOR	<LOR	<LOR	<LOR	<LOR
MISC. INORGANICS	**pH**	pH	6.5 – 8	7.4	7.3	7.7	7.1	7.2
	Sodium	mg/L	NA	760	830	720	440	590
	Ammonia[2]	mg/L	0.9	0.12	0.015	<LOR	0.081	0.093
	Nitrate	mg/L	0.7	0.01	<LOR	<LOR	0.008	0.066
	Total Organic C	mg/L	4	**5**	**19**	**9**	**44**	**7**
	EC	µS/c	NA	5500	5800	3700	2400	4400

Highlighted results exceed site criteria

<LOR = No Detection. Analyte is below the Laboratory LOR

1 - World Health Organisation Guidelines for Drinking-water Quality 2009, Poor (acceptable) drinking water criteria.

2 - Criteria value may not protect key species from chronic toxicity, refer to ANZW 2018 for further guidance.

3 - A Trigger value for DDT is used in the absence of a criteria value for Total OCP. DDT has the lowest criteria of OCPs

Table 11 – Yearly Analytes Groundwater Results and Comparison Sept 2023-Sept 2024 (MWE)

Sampling Parameter	Units	Threshold Criteria (mg/L)	MWE Sept 2023	MWE Sept 2024
Total dissolved solids	mg/L	NA	3200	2700
Biochemical Oxygen Demand	mg/L	NA	11	11
Phosphate	mg/L	0.015	**0.05**	0.01
Arsenic III & V	mg/L	0.024 (III), 0.013	0.008	0.005
Aluminium	mg/L	0.055 (pH> 6.5)	<LOR	<LOR
Barium	mg/L	NA	0.094	0.086
Cadmium	mg/L	0.0002	<LOR	<LOR
Copper	mg/L	0.0014	**0.004**	<LOR
Chromium VI	mg/L	0.004	<LOR	<LOR
Chromium (total)	mg/L	0.004	<LOR	0.004
Cobalt	mg/L	0.09	0.006	0.007
Lead	mg/L	0.0034	<LOR	<LOR
Mercury	mg/L	0.0006	<LOR	<LOR
Zinc	mg/L	0.008	**0.011**	0.006
TRH	mg/L	0.26[1]	<LOR	<LOR
Benzene	mg/L	0.95	<LOR	<LOR
Toluene	mg/L	0.18	<LOR	<LOR
Ethylbenzene	mg/L	0.08	<LOR	<LOR
Xylene			<LOR	<LOR
CVCs/VOCCs:				
- **Total**	mg/L	NA	<LOR	<LOR
- **Tetrachlorethene (TCE)**	mg/L	NA	<LOR	<LOR
- **1,1,2-Trichloroethane**	mg/L	6.5	<LOR	<LOR
- **Tetrachloroethene (PCE)**	mg/L	0.05	<LOR	<LOR
- **1,1-Dichloroethene**	mg/L	0.03	<LOR	<LOR
- **Vinyl Chloride**		0.0003	<LOR	<LOR
PCBs	mg/L	0.00003	<LOR	<LOR
PAHs	mg/L	0.016	<LOR	<LOR
OPPs	mg/L	0.00002	<LOR	<LOR

5.0 DISCUSSION

The inferred hydraulic gradient for the site is a down gradient towards Parsons Gully to the west. The location of the four wells surrounding the landfill place wells MWA, MWB and MWC down-hydraulic gradient and well MWE up-hydraulic gradient of the landfill. Well MWD is located within the perched landfill water table, this enables access to the leachate within the landfill.

The following is a summary of the significant results for September 2024 in relation to the Site Criteria. Key increasing trends, decreasing trends and exceedances of the threshold criteria are indicated.

MWA

MWA is located in the northwest section of the site and is considered to be a down-hydraulic gradient monitoring well. There is farmland adjoining to the north and west of this location. The following changes have occurred in the water quality of MWA:

- Phosphate has decreased from 0.076mg/L in September 2023 to 0.073mg/L in September 20243, above the criteria of 0.015mgL.
- Iron has increased from below limit of reporting in June 2024 to 0.03mg/L in September 2024, below the criteria of 0.3mg/L.
- Copper has remained constant between the September 2023 and September 2024 monitoring periods at 0.01mg/L in, above the criteria of 0.0014mg/L.
- Zinc has increased from 0.025mg/L in September 2023 to 0.029 mg/L in September 2024, above the site criteria of 0.008mg/.
- Total Organic Carbon has fluctuated over the monitoring period with 5mg/L recorded in September 2023 and March 2024 and 9mg/L January 2024 above the site criteria of 4mg/L. June and September 2024 recorded 4mg/L equal to the site criteria of 4mg/L.
- pH results during the September 2023 and September 2024 monitoring periods have remained between pH6.9-7.3.
- Manganese has increased from 0.028mg/L in June to 0.045mg/L in September 2024.
- Sodium has increased from 1800mg/L in June 2024 to 2100mg/L in September 2024.
- Mercury has decreased from 0.0006mg/L in September 2023 to below limit of reporting in September 2024.
- Alkalinity has increased from 490mg/L in June 2023 to 550mg/L in September 2024.

- Chloride has decreased from 7300mg/L in June 2024 to 6500mg/L in September 2024.

All other analytes reported concentrations consistent with previous monitoring data.

MWB

MWB is located in the southwest section of the site and is considered to be a down-hydraulic gradient monitoring well. There is farmland to the south and west of this location. The well has remained relatively stable.

- Total Organic Carbon has decreased over the monitoring period with 9mg/L recorded in September 2023, 14mg/L in January 2024 and 7mg/L recorded in March, June and September 2024 all above the site criteria of 4mg/L.
- The concentration of Ammonia has increased from below the limit of reporting in June to 0.034 mg/ in September 2024.
- Phosphate has increased between September 2023 and September 2024 with a concentration of 0.02mg/L and 0.03mg/L above the site criteria of 0.015mg/L.
- Zinc concentration decreased from 0.034mg/L in September 2023 to 0.022mg/L in September 2024, above site criteria of 0.008mg/L.
- Total Chromium has decreased from 0.005mg/L in September 2023 to below the limit of reporting in September 2024.
- Copper concentration has decreased from 0.009 mg/L in September 2023 to 0.007 mg/L in September 2024 above the criteria of 0.0014.
- Iron concentrations has increased from below the limit of reporting in June 2024 to 0.03 mg/L in September 2024.
- Biochemical Oxygen demand has increased from below the limit of reporting in September 2023 to 12 mg/L in September 2024.
- Chromium has decreased from 0.005 mg/L in September 2023 above the criteria of 0.004 mg/L to below the limit of reporting in September 2024.

All other analytes reported concentrations consistent with previous monitoring data.

MWC

MWC is located on the southern boundary of the site, down hydraulic gradient of the landfill and onsite dam. There is farmland to the south of well, along with a stand of vegetation immediately south of the well. This well has shown increasing turbidity with sedimentation in observations from the field.

There were 4 concentrations which exceeded the site criteria. The following changes have occurred in the water quality of MWC:

- Manganese concentration has decreased from 1.8mg/L in June to 1.4mg/L in September 2024.
- Total Organic Carbon has fluctuated over the monitoring period with 8mg/L recorded in September 2023, 14mg/L in January 2024, 10mg/L recorded in March, 18mg/L in June and 6mg/L recorded in September 2024 all above the site criteria of 4mg/L.
- Phosphate concentration has increased between September 2023 and September 2024 with a concentration of 0.02mg/L and 0.04mg/L above the site criteria of 0.015mg/L.
- Calcium concentration increased from 390mg/L in June 2024 to 420mg/L in September 2024.
- Chloride concentration increased from 4500mg/L in June to 4600mg/L in September 2024.
- Magnesium concentration increased from 510mg/L in June to 600mg/L in September 2024.
- Zinc concentration decreased from 0.026mg/L in September 2023 to 0.015mg/L in September 2024 above the site criteria of 0.008mg/L.
- Nitrate concentrations have increased from 0.02mg/L in June to 0.2mg/L in September 2024.
- BOD has decreased from 16mg/L in September 2023 to 10mg/L in September 2024.
- Copper concentrations have decreased from 0.007 mg/L in September 2023 to 0.002 mg/L in September 2024.

All other analytes reported concentrations consistent with previous monitoring data.

MWD

The water collected and analysed from well MWD is landfill leachate and as such the Site Criteria is not used to compare the results against. The results of MWD are used as an indicator of current conditions within the landfill with trends and seasonal variations apparent. MWD is also to be used as a comparison to the external monitoring wells.

The following changes occurred in the water quality of the landfill leachate well MWD:

- The concentration of Ammonia has increased from 100mg/L in June to 200 mg/ in September 2024.
- Iron concentration has increased from 0.28mg/L in June 2024 to 1mg/L in September 2024, above the criteria of 0.3mg/L.

- Phosphate concentration has decreased from 0.69mg/L in September 2023 to 0.14mg/L, in September 2024.
- Zinc concentration has decreased from 0.03 mg/L in September 2023 to 0.008 mg/L in September 2024 equal to the site criteria of 0.008mg/L.
- Total dissolved solids have decreased from 6800mg/L in September 2023 to 4100mg/L in September 2024.
- Copper concentration has decreased from 0.005mg/L September 2023 to below the limit of reporting in September 2024.
- Chloride concentration has increased from 940mg/L in June to 1600mg/L in September 2024.
- Potassium concentration has increased from 67mg/L in June to 93mg/L in September 2024.
- Magnesium concentration has increased from 110mg/L in June to 190mg/L in September 2024.
- Sulphate concentration has decreased from 100mg/L in June to 76mg/L in September 2024.
- Sodium concentration has increased from 590mg/L in June to 1000mg/L in September 2024.
- Nitrate concentration has increased from below the limit of reporting in June to 0.03mg/L in September 2024.
- Electrical Conductivity has increased from 5600 µS/cm in June to 8600 µS/cm in September 2024.
- Polycyclic Aromatic Hydrocarbons (PAH) concentration has increased from 0.007mg/L in September 2023 to 0.056mg/L in September 2024 above the site criteria.
- Naphthalene concentration has decreased from 0.009 mg/L in September 2023 to 0.004mg/L in September 2024.
- Chlorobenzene concentration has decreased from 0.02 mg/L in September 2023 to 0.009mg/L in September 2024.
- TRH C10-40 concentration has decreased from 6.1 mg/L in September 2023 to 2.6mg/L in September 2024.

MWE

MWE is located on the eastern boundary of the site and is an up-gradient groundwater monitoring well. There are a series of dams to the east of the well. The following changes have occurred in the water quality of MWE:

- Total Organic Carbon has fluctuated over the monitoring period with 5mg/L recorded in September 2023, 19mg/L in January 2024, 9mg/L recorded in March, 44mg/L in June and 7mg/L recorded in September 2024 all above the site criteria of 4mg/L.
- Zinc concentration has decreased from 0.011 mg/L in September 2023 to 0.006 mg/L in September 2024 equal to the site criteria of 0.008mg/L.
- Sulphate concentration decreased from 0.05mg/L in September 2023 to 0.01mg/L in September 2024 below the site criteria of 0.015 mg/L.
- Copper concentration decreased from 0.004mg/L in September 2023 to below the limit of reporting in September 2024.
- Chromium concentration increased from below the limit of reporting in September 2023 to 0.004mg/L in September 2024.
- Phosphate concentration decreased from 60mg/L in June to 180mg/L in September 2024.
- Magnesium concentration increased from 46mg/L in June to 100mg/L in September 2024.
- Chloride concentration have increased from 240mg/L in June to 780mg/L in September 2024.
- Calcium concentration increased from 39mg/L in June to 100mg/L in September 2024.
- Potassium concentration increased from 0.8mg/L in June to 2mg/L in September 2024.
- Iron concentration increased from 0.09mg/L in June to 1.4mg/L in September 2024 above the site criteria of 0.3mg/L.
- Sodium concentration increased from 440mg/L in June to 590mg/L in September 2024.
- Nitrate concentration increased from 0.008mg/L in June to 0.066mg/L in September 2024.

All other analytes reported concentrations consistent with previous monitoring data.

The following analytes exceeded the Threshold Criteria during the September 2024 sampling event, excluding the Leachate Monitoring well (MWD):

- Copper, Phosphate and Zinc in MWA, MWB and MWC;
- Total Organic Carbon in MWB and MWC; and
- Iron and Total Organic Carbon in MWE.

Refer to **Attachment 1** – Data Log.

Site and Maintenance

The weather conditions and surrounding land uses are likely impacting the local groundwater conditions.

6.0 CONCLUSIONS

There are seasonal fluctuations observed with regional groundwater conditions. The recent weather conditions of increased rainfall throughout 2023-2024 compared to previous years may have influenced the groundwater conditions. Trending of these analytes over time may indicate a seasonal fluctuation, an anomaly or highlight an issue on the site (or surrounding area). The trending of analytes occurs in the annual groundwater monitoring report with a running comparison in the quarterly monitoring reports.

The results and discussion of the laboratory sample analysis from the Scone Waste Facility during the September 2024 sampling event displayed several ongoing exceedances of the Site Criteria. The MWE is considered an upgradient monitoring well and is an indicator of surrounding groundwater conditions.

The following analytes exceeded the Threshold Criteria during the September 2024 sampling event, excluding the Leachate Monitoring well (MWD);

- Copper, Phosphate and Zinc in MWA, MWB and MWC;
- Total Organic Carbon in MWB, MWC and MWE; and
- Iron in MWE.

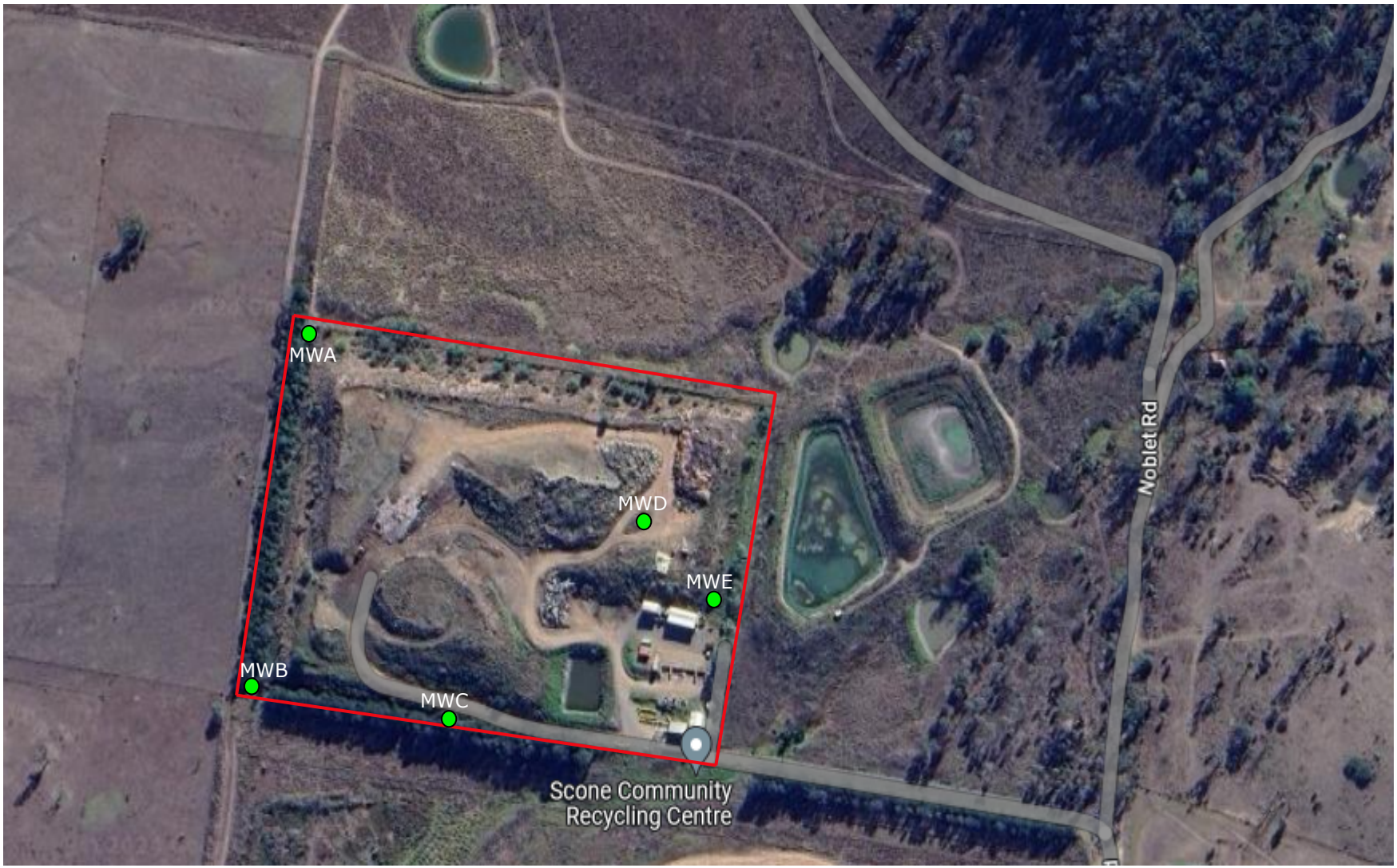
Continued sampling and data collection will allow robust trending and statistical analysis of data to occur.

The next water sampling event will be a quarterly monitoring event which will be undertaken in December 2024.

REFERENCES

- *Australian and New Zealand Guidelines for the Management of Contaminated Sites* (ANZECC/NHMRC 1992);
- *Australia and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZW, 2018);
- *Australian Drinking Water Guidelines, National Water Quality Management Strategy* 2011;
- *Contaminated Land Management Act 1997* (NSW);
- *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA 2011);
- *Contaminated Sites: Guidelines on Duty to Report Contamination under the Contamination Land Management Act 1997* (NSW DECC, 2009);
- *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination* (NSW DEC, 2007);
- *Contaminated Sites: Guidelines on Significant Risk of Harm from Contaminated Land and the Duty to Report* (NSW EPA 1999);
- *Contaminated Sites: Sampling Design Guidelines* (NSW EPA 1995);
- *Environmental Guidelines: Solid Waste Landfills* (NSW EPA, 1996);
- *Environmental Guidelines Solid Waste Landfills* Second edition, (NSW EPA 2016);
- *Health - Based Soil Investigation Levels,* Imray, P & Langley, A*, National Environmental Health Forum Monographs, Soil Series No. 2 (2nd Ed), South Australian Health Commission* (NEHF 1998);
- *National Environment Protection (Assessment of Site Contamination) Measure (No.1)* (NEPM, 2013) as amended;
- *Storage and Handling of Dangerous Goods Code of Practice 2005*;
- *Work Health and Safety Act 2011* (NSW) and associated regulations.

FIGURE 1



Legend

Sample Location

Site boundary

Image: SiX Maps NSW Gov.

N

ENGAGE Environmental Services Pty Limited
113 Reservoir Rd
Glendale NSW 2285
0478 362005
admin@engage-es.com.au

Title: Sampling Locations Noblet Road, Scone

Client	Project No.	Figure No	Date
UHSC	E2424	1	1/02/2024
	Scale	Compiled	Revision
	NA	DB	1

Attachment 1 Data log

ENGAGE ENVIRONMENTAL SERVICES			Threshold Criteria	NA	NA	NA	NA	0.3	NA		0.00001	NA	6.5–8	NA	0.9
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L
			Analytes	Calcium	Alkalinity	Chloride	Fluoride	Iron	Magnesium	Manganese	Organochlorine pesticides (OCP)	Potassium	pH	Sodium	Ammonia
			Monitoring frequency	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly
MWA	362034	16/09/2024	Annual	570	550	6500	0.1	0.03	1100	0.045	<0.0002	4	7	2100	0.051
MWB	362034	16/09/2024	Annual	480	490	4200	0.3	0.03	640	0.007	<0.0002	4	7	1500	0.034
MWC	362034	16/09/2024	Annual	420	910	4600	0.2	0.03	600	1.4	<0.0002	3	6.8	2100	0.02
MWD	362034	16/09/2024	Annual	170	1700	1600	0.3	1	190	0.58	<0.0002	93	7.5	1000	200
MWE	362034	16/09/2024	Annual	100	1100	780	0.4	1.4	100	1	<0.0002	2	7.2	590	0.093

0.7	NA	4	0.32	NA	NA	NA	0.015	0.024 (III) 0.013 (V)	0.055 (pH> 6.5)	NA	0.0002	0.09	0.0014	0.001	NA
mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Nitrate	Sulfate	Total organic carbon	Total phenolics	Electrical conductivity (EC)	Total dissolved solids	Biochemical oxygen demand	Phosphate	Arsenic III & V	Aluminium	Barium	Cadmium	Cobalt	Copper	Chromium VI	Chromium (total)
Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly
0.55	63	4	<0.05	20000	13000	<10	0.073	0.001	<0.01	0.57	<0.0001	<0.001	0.01	<0.005	0.005
0.24	97	7	<0.05	14000	8700	12	0.03	0.001	<0.01	0.35	<0.0001	<0.001	0.007	<0.005	0.01
0.2	90	6	<0.05	15000	9000	10	0.04	<0.01	<0.01	0.4	<0.0001	0.008	0.002	<0.005	0.004
0.03	76	110	<0.05	8600	4100	68	0.14	0.007	<0.01	0.63	<0.0001	0.01	<0.001	<0.005	0.018
0.066	180	7	<0.05	4400	2700	11	0.01	0.005	<0.01	0.086	<0.0001	0.007	<0.001	<0.005	0.004

0.0034	0.0006	0.008	0.016	0.26	0.95	0.18	0.08	0.35	NA	6500	0.05	0.03	0.0003	0.00003	0.00002
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Lead	Mercury	Zinc	PAHs	TRH	Benzene	Toluene	Ethylbenzene	total xylene	Tetrachloroethene (TCE)	1,1,1-Trichloroethane (TCA)	Tetrachloroethene (PCE)	1,2-Dichloroethene	Vinyl Chloride	PCBs	OPPs
Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly
<0.001	<0.00005	0.029	ND	<0.01	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.01	<0.002	<0.0002
<0.001	<0.00005	0.022	ND	<0.01	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.01	<0.002	<0.0002
<0.001	<0.00005	0.015	ND	<0.01	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.01	<0.002	<0.0002
<0.001	<0.00005	0.008	0.0056	2.6	0.003	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.01	<0.002	<0.0002
<0.001	<0.00005	0.006	ND	<0.01	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.01	<0.002	<0.0002

Attachment 2 NATA Accredited Laboratory Results

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CERTIFICATE OF ANALYSIS 362034

Client Details

Client	Engage Environmental Services
Attention	Stephen Challinor
Address	113 Reservoir Rd, GLENDALE, NSW, 2285

Sample Details

Your Reference	**E2424-0924 - UHSC**
Number of Samples	5 Water
Date samples received	18/09/2024
Date completed instructions received	18/09/2024

Analysis Details

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

Samples were analysed as received from the client. Results relate specifically to the samples as received.

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

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

Report Details

Date results requested by	25/09/2024
Date of Issue	25/09/2024

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

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Jack Wallis, Senior Chemist
Steven Luong, Senior Chemist
Tabitha Roberts, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

VHC's in water						
Our Reference		362034-1	362034-2	362034-3	362034-4	362034-5
Your Reference	UNITS	MWA	MWB	MWC	MWD	MWE
Date Sampled		16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Type of sample		Water	Water	Water	Water	Water
Date Extracted	-	20/09/2024	20/09/2024	20/09/2024	20/09/2024	20/09/2024
Date Analysed	-	23/09/2024	23/09/2024	23/09/2024	23/09/2024	23/09/2024
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	9	<1
Bromoform	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1

VHC's in water						
Our Reference	UNITS	362034-1	362034-2	362034-3	362034-4	362034-5
Your Reference		MWA	MWB	MWC	MWD	MWE
Date Sampled		16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Type of sample		Water	Water	Water	Water	Water
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	5	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	100	101	101	100	101
Surrogate Toluene-d8	%	94	98	96	100	97
Surrogate 4-Bromofluorobenzene	%	82	81	84	88	92

vTRH(C6-C10)/BTEXN in Water						
Our Reference		362034-1	362034-2	362034-3	362034-4	362034-5
Your Reference	UNITS	MWA	MWB	MWC	MWD	MWE
Date Sampled		16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	20/09/2024	20/09/2024	20/09/2024	20/09/2024	20/09/2024
Date analysed	-	23/09/2024	23/09/2024	23/09/2024	23/09/2024	23/09/2024
TRH C_6 - C_9	µg/L	<10	<10	<10	26	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	28	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	25	<10
Benzene	µg/L	<1	<1	<1	3	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	4	<1
Surrogate Dibromofluoromethane	%	100	101	101	100	101
Surrogate Toluene-d8	%	94	98	96	100	97
Surrogate 4-Bromofluorobenzene	%	82	81	84	88	92

svTRH (C10-C40) in Water						
Our Reference		362034-1	362034-2	362034-3	362034-4	362034-5
Your Reference	UNITS	MWA	MWB	MWC	MWD	MWE
Date Sampled		16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	23/09/2024	23/09/2024	23/09/2024	23/09/2024	23/09/2024
Date analysed	-	23/09/2024	24/09/2024	24/09/2024	24/09/2024	24/09/2024
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	560	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	1,900	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	140	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	2,600	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	770	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	760	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	1,800	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	2,600	<50
Surrogate o-Terphenyl	%	88	99	86	106	88

PAHs in Water						
Our Reference		362034-1	362034-2	362034-3	362034-4	362034-5
Your Reference	UNITS	MWA	MWB	MWC	MWD	MWE
Date Sampled		16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	23/09/2024	23/09/2024	23/09/2024	24/09/2024	23/09/2024
Date analysed	-	23/09/2024	23/09/2024	23/09/2024	24/09/2024	23/09/2024
Naphthalene	µg/L	<0.1	<0.1	<0.1	5.6	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	5.6	<0.1
Surrogate p-Terphenyl-d14	%	64	72	68	82	74

Organochlorine Pesticides in Water						
Our Reference		362034-1	362034-2	362034-3	362034-4	362034-5
Your Reference	UNITS	MWA	MWB	MWC	MWD	MWE
Date Sampled		16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	23/09/2024	23/09/2024	23/09/2024	24/09/2024	23/09/2024
Date analysed	-	23/09/2024	23/09/2024	23/09/2024	24/09/2024	23/09/2024
alpha-BHC	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
HCB	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
gamma-BHC	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
gamma-Chlordane	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
alpha-Chlordane	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endosulfan I	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
pp-DDE	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endosulfan II	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
pp-DDD	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
pp-DDT	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate 4-Chloro-3-NBTF	%	72	74	63	94	69

OP Pesticides in Water						
Our Reference		362034-1	362034-2	362034-3	362034-4	362034-5
Your Reference	UNITS	MWA	MWB	MWC	MWD	MWE
Date Sampled		16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	23/09/2024	23/09/2024	23/09/2024	24/09/2024	23/09/2024
Date analysed	-	23/09/2024	23/09/2024	23/09/2024	24/09/2024	23/09/2024
Dichlorvos	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Mevinphos	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Phorate	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Diazinon	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Disulfoton	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyriphos-methyl	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-Methyl	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyriphos	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Fenthion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos ethyl	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Fenamiphos	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Phosalone	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Coumaphos	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate 4-Chloro-3-NBTF	%	68	72	63	94	68

PCBs in Water						
Our Reference		362034-1	362034-2	362034-3	362034-4	362034-5
Your Reference	UNITS	MWA	MWB	MWC	MWD	MWE
Date Sampled		16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	23/09/2024	23/09/2024	23/09/2024	24/09/2024	23/09/2024
Date analysed	-	23/09/2024	23/09/2024	23/09/2024	24/09/2024	23/09/2024
Aroclor 1016	µg/L	<2	<2	<2	<2	<2
Aroclor 1221	µg/L	<2	<2	<2	<2	<2
Aroclor 1232	µg/L	<2	<2	<2	<2	<2
Aroclor 1242	µg/L	<2	<2	<2	<2	<2
Aroclor 1248	µg/L	<2	<2	<2	<2	<2
Aroclor 1254	µg/L	<2	<2	<2	<2	<2
Aroclor 1260	µg/L	<2	<2	<2	<2	<2
Surrogate 2-Fluorobiphenyl	%	75	77	67	76	76

Total Phenolics in Water						
Our Reference		362034-1	362034-2	362034-3	362034-4	362034-5
Your Reference	UNITS	MWA	MWB	MWC	MWD	MWE
Date Sampled		16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	19/09/2024	19/09/2024	19/09/2024	19/09/2024	19/09/2024
Date analysed	-	19/09/2024	19/09/2024	19/09/2024	19/09/2024	19/09/2024
Total Phenolics (as Phenol)	mg/L	0.1	<0.05	<0.05	<0.05	<0.05

All metals in water-dissolved						
Our Reference		362034-1	362034-2	362034-3	362034-4	362034-5
Your Reference	UNITS	MWA	MWB	MWC	MWD	MWE
Date Sampled		16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	19/09/2024	19/09/2024	19/09/2024	19/09/2024	19/09/2024
Date analysed	-	19/09/2024	19/09/2024	19/09/2024	19/09/2024	19/09/2024
Aluminium-Dissolved	µg/L	<10	<10	<10	<10	<10
Arsenic-Dissolved	µg/L	1	1	<1	7	5
Barium-Dissolved	µg/L	570	350	400	630	86
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Cobalt-Dissolved	µg/L	<1	<1	8	10	7
Chromium-Dissolved	µg/L	5	10	4	18	4
Copper-Dissolved	µg/L	10	7	2	<1	<1
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Zinc-Dissolved	µg/L	29	22	15	8	6
Iron-Dissolved	µg/L	30	30	30	1,000	1,400
Manganese-Dissolved	µg/L	45	7	1,400	580	1,000

Ion Balance						
Our Reference		362034-1	362034-2	362034-3	362034-4	362034-5
Your Reference	UNITS	MWA	MWB	MWC	MWD	MWE
Date Sampled		16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024
Date analysed	-	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024
Calcium - Dissolved	mg/L	570	480	420	170	100
Potassium - Dissolved	mg/L	4	4	3	93	2
Sodium - Dissolved	mg/L	2,100	1,500	2,100	1,000	590
Magnesium - Dissolved	mg/L	1,100	640	600	190	100
Hardness (calc) equivalent $CaCO_3$	mg/L	5,900	3,800	3,500	1,200	680
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	550	490	910	1,700	1,100
Carbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as $CaCO_3$	mg/L	550	490	910	1,700	1,100
Sulphate, SO4	mg/L	63	97	90	76	180
Chloride, Cl	mg/L	6,500	4,200	4,600	1,600	780
Ionic Balance	%	3.0	4.0	4.0	-5.0	-9.0

Miscellaneous Inorganics						
Our Reference	UNITS	362034-1	362034-2	362034-3	362034-4	362034-5
Your Reference		MWA	MWB	MWC	MWD	MWE
Date Sampled		16/09/2024	16/09/2024	16/09/2024	16/09/2024	16/09/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024
Date analysed	-	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024
Hexavalent Chromium, Cr^{6+} Low Level	mg/L	<0.001	0.005	<0.001	<0.001	<0.001
Ammonia as N in water	mg/L	0.051	0.034	0.020	200	0.093
BOD	mg/L	<10	12	10	68	11
Fluoride, F	mg/L	0.1	0.3	0.2	0.3	0.4
Total Organic Carbon	mg/L	4	7	6	110	7
Total Dissolved Solids (grav)	mg/L	13,000	8,700	9,000	4,100	2,700
Phosphate as P in water	mg/L	0.073	0.03	0.04	0.14	0.01
Nitrate as N in water	mg/L	0.55	0.24	0.20	0.03	0.066
Electrical Conductivity	µS/cm	20,000	14,000	15,000	8,600	4,400
pH	pH Units	7.0	7.0	6.8	7.5	7.2

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation below:- TDS = EC * 0.6
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-060	Phosphate determined colourimetrically based on EPA365.1 and APHA latest edition 4500 P E. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-079	TOC determined using a TOC analyser using the combustion method. Dissolved requires filtering prior to determination. Analysis using APHA latest edition 5310B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Inorg-091	BOD - Analysed in accordance with APHA latest edition 5210 D and in house INORG-091.

Method ID	Methodology Summary
Inorg-118	Hexavalent Chromium (Cr6+) - determined firstly by separation using ion chromatography followed by the colourimetric analytical finish. Water samples are ideally field filtered into alkali preserved containers prior to receipt for dissolved Cr6+ analysis. Unfiltered water samples into alkali preserved containers (or pH adjusted to pH 8-9 on receipt) can be classified as Total (unfiltered) Cr6+. Please note, for 'Total/Unfiltered' Trivalent Chromium in waters [calculated], these results may be exaggerated due to the digestive limitation of 'Total/Unfiltered' Hexavalent Chromium in NaOH at pH 8-9 compared to more comprehensive digestion for Total Chromium using the mineral acids HNO3 and HCl. Solid (includes soils, filters, paints, swabs for example) samples are extracted in a buffered catalysed solution prior to the analytical finish above. Water extractable options are available (e.g. as an option for filters) on request. Impingers may need pH adjusting to pH 8-9 prior to IC-colourimetric analytical finish.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.
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-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VHC's in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date Extracted	-			20/09/2024	4	20/09/2024	23/09/2024		20/09/2024	[NT]
Date Analysed	-			23/09/2024	4	23/09/2024	23/09/2024		23/09/2024	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	4	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	4	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	4	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	4	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	4	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	4	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	4	<1	<1	0	102	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	4	<1	<1	0	104	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	4	<1	<1	0	104	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	4	<1	<1	0	98	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	4	<1	<1	0	111	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	4	<1	<1	0	105	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	4	<1	<1	0	104	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	4	<1	<1	0	101	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	4	9	8	12	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	4	5	6	18	[NT]	[NT]

QUALITY CONTROL: VHC's in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	101	4	100	100	0	98	[NT]
Surrogate Toluene-d8	%		Org-023	96	4	100	101	1	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	84	4	88	93	6	100	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			20/09/2024	4	20/09/2024	23/09/2024		20/09/2024	[NT]
Date analysed	-			23/09/2024	4	23/09/2024	23/09/2024		23/09/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	4	26	33	24	104	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	4	28	36	25	104	[NT]
Benzene	µg/L	1	Org-023	<1	4	3	4	29	104	[NT]
Toluene	µg/L	1	Org-023	<1	4	<1	<1	0	103	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	4	<1	<1	0	104	[NT]
m+p-xylene	µg/L	2	Org-023	<2	4	<2	<2	0	104	[NT]
o-xylene	µg/L	1	Org-023	<1	4	<1	<1	0	106	[NT]
Naphthalene	µg/L	1	Org-023	<1	4	4	5	22	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	101	4	100	100	0	98	[NT]
Surrogate Toluene-d8	%		Org-023	96	4	100	101	1	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	84	4	88	93	6	100	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	362034-2
Date extracted	-			23/09/2024	1	23/09/2024	23/09/2024		23/09/2024	23/09/2024
Date analysed	-			23/09/2024	1	23/09/2024	23/09/2024		23/09/2024	24/09/2024
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	<50	<50	0	120	101
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	114	87
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	114	114
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	<50	<50	0	120	101
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	114	87
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	114	114
Surrogate o-Terphenyl	%		Org-020	100	1	88	101	14	113	99

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	362034-2
Date extracted	-			23/09/2024	1	23/09/2024	23/09/2024		23/09/2024	23/09/2024
Date analysed	-			24/09/2024	1	23/09/2024	23/09/2024		24/09/2024	23/09/2024
Naphthalene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	65	60
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	62	63
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	67	61
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	73	60
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	67
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	70	66
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	74
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	67	61
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	80	1	64	76	17	87	75

QUALITY CONTROL: Organochlorine Pesticides in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	362034-2
Date extracted	-			23/09/2024	1	23/09/2024	23/09/2024		23/09/2024	23/09/2024
Date analysed	-			24/09/2024	1	23/09/2024	23/09/2024		24/09/2024	23/09/2024
alpha-BHC	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	71	65
HCB	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	74	66
gamma-BHC	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Heptachlor	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	73	69
delta-BHC	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Aldrin	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	61	66
Heptachlor Epoxide	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	80	73
gamma-Chlordane	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	70	67
Dieldrin	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	75	67
Endrin	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	78	68
Endosulfan II	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
pp-DDD	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	81	73
Endrin Aldehyde	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	75	69
Methoxychlor	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	92	1	72	69	4	78	72

QUALITY CONTROL: OP Pesticides in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	362034-2
Date extracted	-			23/09/2024	1	23/09/2024	23/09/2024		23/09/2024	23/09/2024
Date analysed	-			24/09/2024	1	23/09/2024	23/09/2024		24/09/2024	23/09/2024
Dichlorvos	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	74	70
Mevinphos	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Phorate	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Dimethoate	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Diazinon	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Disulfoton	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Parathion-Methyl	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Ronnel	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	65	62
Fenitrothion	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	97	78
Malathion	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	82	65
Chlorpyriphos	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	67	65
Fenthion	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Parathion	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	87	75
Bromophos ethyl	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Methidathion	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Fenamiphos	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Ethion	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	85	67
Phosalone	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Azinphos-methyl (Guthion)	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Coumaphos	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	92	1	68	67	1	78	72

QUALITY CONTROL: PCBs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	362034-2
Date extracted	-			23/09/2024	1	23/09/2024	23/09/2024		23/09/2024	23/09/2024
Date analysed	-			24/09/2024	1	23/09/2024	23/09/2024		24/09/2024	23/09/2024
Aroclor 1016	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	79	70
Aroclor 1260	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	78	1	75	76	1	79	77

QUALITY CONTROL: Total Phenolics in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			19/09/2024	1	19/09/2024	19/09/2024		19/09/2024	[NT]
Date analysed	-			19/09/2024	1	19/09/2024	19/09/2024		19/09/2024	[NT]
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	1	0.1	0.1	0	97	[NT]

QUALITY CONTROL: All metals in water-dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	362034-3
Date prepared	-			20/09/2024	2	19/09/2024	19/09/2024		20/09/2024	20/09/2024
Date analysed	-			20/09/2024	2	19/09/2024	19/09/2024		20/09/2024	20/09/2024
Aluminium-Dissolved	µg/L	10	Metals-022	<10	2	<10	<10	0	98	90
Arsenic-Dissolved	µg/L	1	Metals-022	<1	2	1	2	67	103	104
Barium-Dissolved	µg/L	1	Metals-022	<1	2	350	360	3	94	91
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	2	<0.1	<0.1	0	104	104
Cobalt-Dissolved	µg/L	1	Metals-022	<1	2	<1	<1	0	95	96
Chromium-Dissolved	µg/L	1	Metals-022	<1	2	10	9	11	97	101
Copper-Dissolved	µg/L	1	Metals-022	<1	2	7	7	0	93	89
Lead-Dissolved	µg/L	1	Metals-022	<1	2	<1	<1	0	108	88
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	2	<0.05	<0.05	0	105	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	2	22	21	5	98	96
Iron-Dissolved	µg/L	10	Metals-022	<10	2	30	30	0	94	92
Manganese-Dissolved	µg/L	5	Metals-022	<5	2	7	9	25	95	94

QUALITY CONTROL: Ion Balance					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			18/09/2024	[NT]	[NT]	[NT]	[NT]	18/09/2024	[NT]
Date analysed	-			18/09/2024	[NT]	[NT]	[NT]	[NT]	18/09/2024	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	99	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	114	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	97	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	120	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	362034-2
Date prepared	-			18/09/2024	1	18/09/2024	18/09/2024		18/09/2024	18/09/2024
Date analysed	-			18/09/2024	1	18/09/2024	18/09/2024		18/09/2024	18/09/2024
Hexavalent Chromium, Cr^{6+} Low Level	mg/L	0.001	Inorg-118	<0.001	1	<0.001	<0.001	0	87	102
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	1	0.051	0.055	8	105	110
BOD	mg/L	5	Inorg-091	<5	1	<10	[NT]		84	[NT]
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	1	0.1	0.1	0	101	92
Total Organic Carbon	mg/L	1	Inorg-079	<1	1	4	4	0	110	86
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	1	13000	[NT]		89	[NT]
Phosphate as P in water	mg/L	0.005	Inorg-060	<0.005	1	0.073	0.074	1	106	95
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	1	0.55	0.56	2	108	93
Electrical Conductivity	µS/cm	1	Inorg-002	<1	1	20000	[NT]		108	[NT]
pH	pH Units		Inorg-001	[NT]	1	7.0	[NT]		100	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

MISC_INORG:The BOD PQL has been raised due to the limited amount of sample available for testing.

Attachment 3 Groundwater Field Data Sheets

GROUNDWATER MONITORING FIELD DATA SHEET

Project: E2424-0924 Scone	**Sample ID: MWA**
Client: UHSC	**Sampler:** DB
Site Address: Noblet Road Scone	**Date:** 16.9.24

Well Information

Monument damaged: Rusty	YES / **NO** / N/A	Well ID visible:	YES / **NO** / N/A
Locked well casing:	YES / **NO** / N/A	Cap on PVC casing:	**YES** / NO / N/A
Cement footing damaged:	YES / **NO** / N/A	Water in monument casing:	YES / **NO** / N/A
Standing water, vegetation around monument:	YES / **NO** / N/A	Internal obstruction in casing:	YES / **NO** / N/A
Well Damaged:	YES / **NO** / N/A	Odours from groundwater:	YES / **NO** / N/A
Casing above ground: .....0.77.....	m agl	**Weather Conditions**:	
Standing water level: ..... 6.568.....	m bgl	Temperature >15 ☐ 15-20 X	
Total well depth: 15.66	m bgl	20-25 ☐ 25-30 ☐	
Initial well volume: .....9.092.....	L		
Water level after purging: .....8.202.....	m bgl	Clear X Partly cloudy ☐	Overcast☐
Volume of water purged: .....1.634.....	L		
Water level at time of sampling: .....8.484.....	m bgl	Calm ☐ Slight breeze X	Moderate breeze ☐
Well purged dry:	YES / **NO**	Windy ☐	
Purging equipment:	Bailer		
Sample equipment:	Bailer	Fine X Showers ☐	Rain ☐

Note: 50mm internal diameter pipe = 1.96 L/m.

Water Quality Details:

Time am / pm	DO (mg/L^{-1})	EC (µS cm^{-1})	pH	Redox (mV)	Temp (°C)	Salinity	Comments
12:07m	2.99	18.56	6.57	29.6	22.43	11.01	Water clear no smell or sheen
12:09pm	3.26	18.60	6.64	26.6	21.20	11.02	
12:11pm	2.69	18.52	6.58	32.9	20.77	11.0	
12:13pm	2.49	18.58	6.55	37.9	20.91	11.03	

Water Quality and General Comments:

Water was clear no odour or sheen or hydrocarbons. Vegetation around monument and no standing water around monument.

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GROUNDWATER MONITORING FIELD DATA SHEET

Project: E2424-0924 Scone	**Sample ID: MWB**
Client: UHSC	**Sampler:** DB
Site Address: Noblet Road Scone	**Date:** 16.9.24

Well Information

Monument damaged: Rusty	YES / **NO** / N/A	Well ID visible:	YES / **NO** / N/A
Locked well casing:	YES / **NO** / N/A	Cap on PVC casing:	**YES** / NO / N/A
Cement footing damaged:	YES / NO / **N/A**	Water in monument casing:	YES / **NO** / N/A
Standing water, vegetation around monument:	YES / **NO** / N/A	Internal obstruction in casing:	YES / **NO** / N/A
Well Damaged: Rusty	YES / **NO** / N/A	Odours from groundwater:	YES / **NO** / N/A
Casing above ground: .....0.8.....	m agl	**Weather Conditions**:	
Standing water level: ..... 6.575.....	m bgl	Temperature >15 ☐ 15-20 X	
Total well depth: 14.04	m bgl	20-25 ☐ 25-30 ☐	
Initial well volume: .....7.465.....	L		
Water level after purging: .....7.373.....	m bgl	Clear X Partly cloudy☐ Overcast ☐	
Volume of water purged: .....0.798.....	L		
Water level at time of sampling: .....7.125.....	m bgl	Calm ☐ Slight breeze X Moderate breeze ☐	
Well purged dry:	YES / **NO**	Windy ☐	
Purging equipment:	Bailer		
Sample equipment:	Bailer	Fine X Showers ☐ Rain ☐	

Note: 50mm internal diameter pipe = 1.96 L/m.

Water Quality Details:

Time am / pm	DO (mg/L^{-1})	EC (µS cm^{-1})	pH	Redox (mV)	Temp (°C)	Salinity	Comments
12:52pm	3.02	12.88	6.85	49.2	21.83	7.39	Clear water, no sheen
12:54pm	3.914	12.75	6.71	52.9	20.7	7.34	
12:56pm	3.48	12.76	6.71	54.5	20.4	7.36	

Water Quality and General Comments:

Water was clear no odour or sheen or hydrocarbons. Vegetation around monument and no standing water around monument.

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GROUNDWATER MONITORING FIELD DATA SHEET

Project: E2424-0924 Scone	**Sample ID: MWC**
Client: UHSC	**Sampler:** DB
Site Address: Noblet Road Scone	**Date:** 16.09.24

Well Information

Monument damaged: Rusty	YES / **NO** / N/A	Well ID visible:	YES / **NO** / N/A
Locked well casing:	YES / **NO** / N/A	Cap on PVC casing:	**YES** / NO / N/A
Cement footing damaged:	YES / NO / **N/A**	Water in monument casing:	YES / **NO** / N/A
Standing water, vegetation around monument:	YES / **NO** / N/A	Internal obstruction in casing:	YES / **NO** / N/A
Well Damaged:	YES / **NO** / N/A	Odours from groundwater:	YES / **NO** / N/A
Casing above ground: .....0.75.....	m agl	**Weather Conditions**:	
Standing water level: ..... 5.392.....	m bgl	Temperature >15 ☐ 15-20 X	
Total well depth: 12.6	m bgl	20-25 ☐ 25-30 ☐ >30 ☐	
Initial well volume: .....7.208.....	L		
Water level after purging: .....5.532.....	m bgl	Clear X Partly cloudy ☐ Overcast X	
Volume of water purged: .....0.14.....	L		
Water level at time of sampling: .....5.638.....	m bgl	Calm ☐ Slight breeze X Moderate breeze ☐	
Well purged dry:	YES / **NO**	Windy ☐	
Purging equipment:	Bailer		
Sample equipment:	Bailer	Fine X Showers ☐ Rain ☐	

Note: 50mm internal diameter pipe = 1.96 L/m.

Water Quality Details:

Time am / pm	DO (mg/L^{-1})	EC (µS cm^{-1})	pH	Redox (mV)	Temp (°C)	Salinity	Comments
1:27pm	2.36	14.36	6.67	47.6	21.02	8.34	Clear water
1:29pm	1.54	14.1	6.57	46.6	20.37	8.11	
1:31pm	2.93	14.05	6.61	45.3	20.12	8.01	

Water Quality and General Comments:

Water was clear top pf column, brown tinge as you go deeper into column, no odour or sheen or hydrocarbons. Vegetation around monument and no standing water around monument.

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GROUNDWATER MONITORING FIELD DATA SHEET

Project: E2424-0924 Scone	**Sample ID: MWD Leachate well**
Client: UHSC	**Sampler:** DB
Site Address: Noblet Road Scone	**Date:** 16.09.24

Well Information

Monument damaged:	YES / NO / **N/A**	Well ID visible:	YES / **NO** / N/A
Locked well casing:	YES / NO / **N/A**	Cap on PVC casing:	YES / NO / **N/A**
Cement footing damaged:	YES / NO / **N/A**	Water in monument casing:	YES / **NO** / N/A
Standing water, vegetation around monument:	**YES** / NO / N/A	Internal obstruction in casing:	YES / **NO** / N/A
Well Damaged: Rusty	YES / NO / **N/A**	Odours from groundwater:	**YES** / NO / N/A
Casing above ground: .....N/A.....	m agl	**Weather Conditions**:	
Standing water level: ..... 9.748.....	m bgl	Temperature >15 ☐ 15-20 ☐	
Total well depth: 12.96	m bgl	20-25 X 25-30 ☐ >30 ☐	
Initial well volume: .....3.212.....	L		
Water level after purging: .....10.348.....	m bgl	Clear ☐ Partly cloudy X Overcast ☐	
Volume of water purged: .....0.6.....	L		
Water level at time of sampling: .....9.933.....	m bgl	Calm ☐ Slight breeze X Moderate breeze ☐	
Well purged dry:	YES / **NO**	Windy ☐	
Purging equipment:	Bailer		
Sample equipment:	Bailer	Fine X Showers ☐ Rain ☐	

Note: 50mm internal diameter pipe = 1.96 L/m.

Water Quality Details:

Time am / pm	DO (mg/L^{-1})	EC (µS cm^{-1})	pH	Redox (mV)	Temp (°C)	Salinity	Comments
2:42pm	1.69	6979	7.13	-158.5	25.29	3.82	
2:44pm	2.19	7677	7.13	-148.9	26.16	4.23	
2.46pm	1.83	7715	7.13	-150.4	26.1	4.26	

Water Quality and General Comments:

Water was green tinged with methane odour and minor sediment, no sheen or hydrocarbons. Vegetation around monument and no standing water around monument. Monitoring well was cut to ground level. Well, was surrounded by tyres.

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GROUND WATER MONITORING FIELD DATA SHEET

Project: E2424-0924 Scone	**Sample ID: MWE**
Client: UHSC	**Sampler:** DB
Site Address: Noblet Road Scone	**Date:** 16.09.24

Well Information

Monument damaged: Rusty	YES / **NO** / N/A	Well ID visible:	YES / **NO** / N/A
Locked well casing:	YES / **NO** / N/A	Cap on PVC casing:	**YES** / NO / N/A
Cement footing damaged:	YES / NO / **N/A**	Water in monument casing:	YES / **NO** / N/A
Standing water, vegetation around monument:	YES / **NO** / N/A	Internal obstruction in casing:	YES / **NO** / N/A
Well Damaged: Rusty	YES / **NO** / N/A	Odours from groundwater:	YES / **NO** / N/A
Casing above ground: .....0.68.....	m agl	**Weather Conditions**:	
Standing water level: ..... 4.123.....	m bgl	Temperature >15 ☐ 15-20 ☐	
Total well depth: 9.46	m bgl	20-25 ☐ 25-30 X >30 ☐	
Initial well volume: .....5.337.....	L		
Water level after purging: .....4.654.....	m bgl	Clear ☐ Partly cloudy X Overcast ☐	
Volume of water purged: .....0.531.....	L		
Water level at time of sampling: .....4.722.....	m bgl	Calm ☐ Slight breeze X Moderate breeze ☐	
Well purged dry:	YES / **NO**	Windy ☐	
Purging equipment:	Bailer		
Sample equipment:	Bailer	Fine X Showers ☐ Rain ☐	

Note: 50mm internal diameter pipe = 1.96 L/m.

Water Quality Details:

Time am / pm	DO (mg/L^{-1})	EC (µS cm^{-1})	pH	Redox (mV)	Temp (°C)	Salinity	Comments
2:05pm	3.54	31.8	6.91	-89.1	20.45	1.62	Clear water
2:07pm	4.2	3167	6.85	-97.3	19.71	1.66	
2:09pm	6.75	2464	6.86	-91.2	19.24	1.28	
2:11pm	2.55	2749	6.84	-90.9	19.06	1.43	

Water Quality and General Comments:

Water was clear, no sheen or hydrocarbons. Vegetation around monument and no standing water around monument.

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Attachment 4 Water Quality Meter Calibration Certificate

Hanna Instruments Pty Ltd
18 Fiveways Boulevard
Keysborough VIC 3173

Ph: (03) 9769 0666

Certificate #: HC00492/2024

CALIBRATION CERTIFICATE

Meter part #: HI98194
pH probe part #: HI7698194-1
EC probe # HI7698194-3
DO probe # HI7698494-5

Meter S/N: M04200028111
pH probe S/N: J79355
EC probe S/N: J88036
DO probe S/N: 03110092

Customer: Engage Environmental
Contact #: Stephen Challinor

Calibration Date: 11/09/2024
Calibration Time: 11:30

pH BUFFERS USED FOR CALIBRATION			CALIBRATION DATA	
Item Code	Buffer description	Buffer Lot Number & Expiry	Original pH value	Calibrated pH value
HI7004	pH Buffer 4.01	Lot 9535 Expiry 11/2028	pH 3.95	pH 4.01
HI7007	pH Buffer 7.01	Lot 9507 Expiry 11/2028	pH 7.06	pH 7.01
HI7010	pH Buffer 10.01	Lot 9751 Expiry 01/2026	pH 9.95	pH 10.01

EC STANDARDS USED FOR CALIBRATION			CALIBRATION DATA	
Item Code	Standard description	Standard Lot Number & Expiry	Original EC value	Calibrated EC value
HI7039	5000 uS/cm	Lot 7204 Expiry 11/2026	5490 uS/cm	5000 uS/cm

DO STANDARDS USED FOR CALIBRATION			CALIBRATION DATA	
Item Code	Standard description	Standard Lot Number & Expiry	Original DO value	Calibrated DO value
N/A	100% DO	N/A	96.90%	100.00%

pH CALIBRATION RESULTS	
Offset	-14.8
Slope A (%)	98%
Slope B (%)	95%

DO CALIBRATION RESULTS	
Point 1	100%

EC CALIBRATION RESULTS	
EC Point	5000 uS/cm
Cell	4.295 / cm

Comments or Remarks :

ATC (Automatic Temperature Compensation) to 25°C was applied during calibration
HANNA buffers and standards were used for calibration of the meter. HANNA buffers and standards are standardised with high precision meters calibrated to NIST references.

Attila
Service Personnel