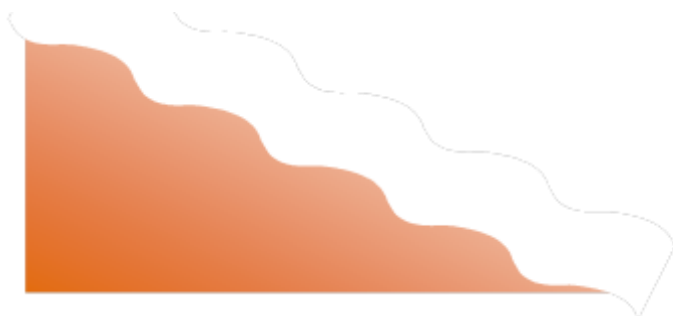
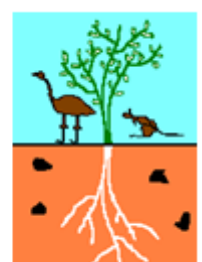


ALICE SPRINGS TURF CLUB ENVIRONMENTAL MONITORING REPORT

AUGUST 2021 – JULY 2022



Prepared By:
Low Ecological Services P/L
PO Box 3130, Alice Springs, NT 0871
Ph: (08) 89 555 222 Fax: (08) 89 555 722
Email: lowecol@lowecol.com.au
Web: www.lowecol.com.au



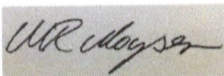
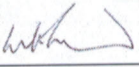
Disclaimer:

This document has been prepared by Low Ecological Services (LES) for Alice Springs Turf Club (Turf Club) in accordance with an agreement with the Turf Club. LES has prepared this document using the skill and care expected from professional scientists to provide factual and technical information and reasonable solutions to identified risks. It does not constitute legal advice.

Project:

Prepare a Monitoring Report for the Alice Springs Turf Club as per the requirements of EPL 208.

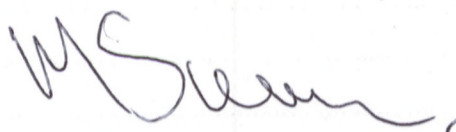
Approved by:

Approval	Name	Signature	Date
Originator:	Mac Moyses		14/01/2023
Reviewer:	Bill Low		15/01/23
Approver:	Mark Summers, CEO, ASTC.	 - 30/1/23	

Certification:

I Mark Summers, Chief Executive Officer, ASTC, have reviewed this report and I confirm that to the best of my knowledge and ability all the information provided in the report is true and accurate.

Signature:



Date:

30/1/23

Contents

1	Executive Summary	4
2	Introduction	5
3	Monitoring Objectives	5
4	Monitoring System	5
4.1	Sampling Program	5
4.2	Groundwater Sampling	6
4.2.1	Assessment Criteria	8
4.3	Surface Water Sampling	8
4.3.1	Assessment	10
4.4	Soil Sampling	10
4.5	Quality Control and Assurance	11
4.5.1	Laboratory Analyses	11
4.5.2	Laboratory Duplicate (DUP) Report	11
4.5.3	Method Blank (MB) and Laboratory Control Spike (LCS) Report	12
4.5.4	Matrix Spike (MS) Report	12
5	Groundwater Sampling Results	12
5.1	Site Observations	12
5.2	Laboratory Results	14
6	Surface Water Sampling Results	14
7	Discussion and Interpretation of Results	18
7.1	Groundwater	18
7.2	Surface Water	19
8	Conclusions and Recommendations	19
9	References	21
10	Appendices	21
	Appendix 1 – ALS Certificates of Analysis and Analytical Results for Groundwater Samples	21
	Appendix 2 – ALS Certificates of Analysis and Analytical Results for Surface Water Samples	21

List of Figures

Figure 1 Groundwater monitoring bore locations.....	7
Figure 2 Surface water sample locations for samples taken 10 November, 2021.....	9
Figure 3. Surface water sampling Site #1, St Mary's Creek.....	15
Figure 4. Surface water sampling Site #2, outside northwest corner of racetrack.....	16
Figure 5. Surface water sampling Site #3, centre of racetrack.	16
Figure 6. Surface water sampling Site #4, inside northeast corner of racetrack.	17
Figure 7. Surface water sampling Site #5, outside southeast corner of racetrack.....	17
Figure 8. Extent of standing surface water following event of 100mm rainfall 10 November, 2021. ...	18

List of Tables

Table 1 Groundwater monitoring bore locations.	7
Table 2. Groundwater assessment criteria – Attachment A to EPL 208.	8
Table 3 Surface water sampling locations.	8
Table 4 Groundwater assessment criteria.....	10
Table 5. Location and description of soil sampling sites.....	11
Table 6. Groundwater quality results from three samplings during the reporting period.	13
Table 7. Groundwater samples that exceeded trigger values.	14
Table 8. Surface Water Samples taken 11/10/2021 that exceeded trigger values (highlighted).	15

1 Executive Summary

The Alice Springs Turf Club Incorporated (Turf Club) commissions Low Ecological Services (LES) to undertake environmental monitoring required under environmental protection licence (EPL) 208, specifically conditions 43, 44 and 45. This includes the Turf Club providing the Northern Territory Environmental Protection Agency (NTEPA) with a monitoring report with each annual return. This Monitoring Report has been prepared in accordance with the requirements of the NTEPA Guideline for Reporting on Environmental Monitoring.

In the 12-month period 2018-2019, the NTEPA inspected Turf Club operations and required the Club to address multiple non-compliances. Improved practices and increased environmental monitoring were carried out on the site during 2019 and 2020, including additional soil and waste oil monitoring. Following an inspection by NTEPA in the 4th quarter of 2020 the Turf Club was directed to address soil contamination resulting from spilled waste oil at the site of former waste oil storage. The source of this contamination has been removed. Investigation of the extent and risks of this contamination and remediation of the site was the subject of a separate report, *Waste Oil Contamination Investigation and Remediation Plan*, that was submitted to NT EPA 27 October, 2021.

Programmed monitoring under the Environmental Management Plan approved under EPL 208, 2017-2022 includes four groundwater sampling locations, five surface water sampling locations and ten soil sampling locations. One sampling event comprises groundwater sampling undertaken before and following an application of oil to the racetrack. Because the second application / event of the 2020-21 reporting period occurred late in that reporting period that annual monitoring report included data and analysis for samples taken 29 July 2021 following an oil application, one week beyond the normal reporting period. This 2021-22 annual report hence covers activities from 1 August 2021 to 22 July 2022. Within this period;

- Waste oil was applied to the racetrack; 19,000 litres 24.1.2022, 10,000 litres on 10.2.2022 and 19,000 litres on 24.2.2022.
- Groundwater sampling was undertaken 22 December 2021 (prior to oil application), however despite evidence of the delivery to the laboratory of samples taken at this time, these samples were not analysed. Staff changes at Low Ecological Services meant that there was no timely follow-up.
- Groundwater sampling was undertaken 7 January 2022 and again on 26 February 2022, both following waste oil applications. Some sample results exceeded stipulated trigger values for copper and zinc, however these are believed to relate to groundwater background levels rather than any contamination.
- Surface water sampling was undertaken once following a major rainfall event, on 10 November 2021. Two sites samples confirmed likely transport of racetrack oil to adjacent downslope sites through rainfall surface-flow.
- No soil sampling from either the racetrack itself (oil penetration testing) or dispersal test sites around the racetrack was undertaken during this reporting period.

Monitoring results indicate that the risk of oil migrating from the track into soil, groundwater or nearby watercourses is low. In 2019-2020 testing showed that depth of oil penetration beneath the track surface did not exceed 400mm. No ground water samples collected in this reporting period contained hydrocarbons within limits of laboratory reporting. Metal levels for some bore samples

exceeded stipulated trigger values. These are, however, likely to be naturally occurring in the local groundwater.

2 Introduction

Low Ecological Services undertakes environmental monitoring required under EPL 208 on behalf of the Alice Springs Turf Club. Conditions 43, 44 and 45 of the EPL requires the Turf Club provide the NTEPA with a monitoring report with each Annual Return. This Monitoring Report is prepared in accordance with the requirements of the NTEPA Guideline for Reporting on Environmental Monitoring.

3 Monitoring Objectives

Consistent with the EMP developed by Low Ecological Services for the Turf Club, under EPL 208 and NTEPA guidelines, the Turf Club's monitoring objectives are:

- To determine baseline environmental conditions;
- To monitor short and long term trends;
- To determine the potential environmental effects arising from management activities;
- To manage the quality and condition of groundwater, surface water and soil in the area surrounding the racecourse;
- To monitor compliance with Australian standards and other regulatory requirements; and
- To identify any required remediation and/or mitigation measures.

This Monitoring Report details the sampling and analysis of groundwater and surface water from within, and within the vicinity of the Turf Club to identify environmental harm, if any, arising from the application of waste oil to the racetrack surface. Monitoring required under EPL 208 encompasses:

- Testing groundwater samples from four selected groundwater wells located within and downslope of the racecourse. Sampling for each application of waste oil to the racetrack;
 - Prior to application of waste oil to the track (within two weeks); and
 - Post application of waste oil to the track (within 48 hours).
- Testing of surface water samples from five locations selected from around the Turf Club post any major rainfall events, when surface water is available for sampling, annually if possible.
- Testing of soil samples from ten locations selected from around the Turf Club. This is intended, if possible, to be an annual sampling event.

4 Monitoring System

4.1 Sampling Program

The current monitoring program includes:

- Four groundwater sample locations; bores described in Table 1 and shown in Figure 1,
- Five surface water locations described in Table 3 and shown in Figure 2,
- Ten soil sampling locations described in Table 5.

Bore RN 03607 was initially sampled in the first year of the EPL but collapsed in 2018. It was substituted with RN 18252 located 200m closer to and downstream of the racecourse.

Surface water sampling depends on rainfall and availability of resources. Due to weather variability and the area's free-draining soils, significant rainfall and rapid response is necessary to obtain surface water samples.

4.2 Groundwater Sampling

The groundwater sampling program is designed to detect contamination of groundwater systems if waste oil contaminants migrate from the track through the soil profile into groundwater.

Groundwater sampling was undertaken on three occasions within the 2021-22 reporting period, however on one occasion samples were not analysed by the laboratory. Standard procedures applied for each sampling includes bore inspection to note any factors that may impact laboratory results, measuring static water level and recording electronic meter readings. Sampling uses new bailers for every sample to ensure there is no cross contamination between bores and samples. A minimum of 10 litres of water is purged / bailed out. Field data is measured during the purging to determine stability of purged water composition using a calibrated YSI (Professional PLUS) water quality meter. Field data parameters noted include:

- Water Temperature;
- Electrical Conductivity ($\mu\text{S}/\text{cm}$);
- Dissolved Oxygen (% sat);
- Dissolved Oxygen (mg/L);
- pH; and
- Turbidity.

Following purging and recording field data, samples are collected as per laboratory standards in sample containers provided and specified by the laboratory, including appropriate preservative/s for analytes as required. All samples are labelled and placed into a cooled esky and couriered to the ALS laboratory in Sydney within specified holding times.

Table 1 Groundwater monitoring bore locations.

Sample ID	Location	Parameters	Reason for Sampling
RN4541	150m West of track	Field Parameters, Laboratory Parameters, BTEX, Heavy Metals, TRH	Representative sample of groundwater in close proximity to the track
RN18251	50m South of track	Field Parameters, Laboratory Parameters, BTEX, Heavy Metals, TRH	Representative sample of groundwater in close proximity to the track
RN3098	100m East of track	Field Parameters, Laboratory Parameters, BTEX, Heavy Metals, TRH	Representative sample of groundwater in close proximity to the track
RN3067	600m East of track	N/A	Bore collapsed and is no longer tenable. Replaced by RN18252
RN18252	400m South-East of track	Field Parameters, Laboratory Parameters, BTEX, Heavy Metals, TRH	Representative sample of groundwater in close proximity to the track



Figure 1 Groundwater monitoring bore locations.

4.2.1 Assessment Criteria

Table 2. Groundwater assessment criteria – Attachment A to EPL 208.

Parameter	Units	EPA Trigger Values
Field Parameters		
pH	pH units	6.0-8.0
Temperature	°C	N/A
Turbidity	NTU	2-15
Electrical Conductivity	µS/cm	20-250
Laboratory Parameters		
Dissolved Oxygen	% Saturation	80-110
BTEX		
Benzene	mg/L	0.3
Toluene	mg/L	0.3
Ethylbenzene	mg/L	0.005
Xylenes	mg/L	0.075
Heavy Metals		
Arsenic	mg/L	0.094
Cadmium	mg/L	0.0004
Chromium	mg/L	0.006
Copper	mg/L	0.0018
Lead	mg/L	0.0056
Mercury	mg/L	0.0019
Nickel	mg/L	0.013
Zinc	mg/L	0.015
Total Recoverable Hydrocarbons (TRH)		
Total TPH C10-C36	mg/L	0.6

4.3 Surface Water Sampling

Surface water sampling is designed to detect contamination of surface water by the Turf Club through the migration of oil and contaminants from the track into the surrounding area and watercourses from rainfall and surface drainage. Surface water samples are collected opportunistically when and where surface water appears after rain. See Table 3 and Figure 2.

Table 3 Surface water sampling locations.

Sample ID	Location	Location description	Reason for Sampling
#1	23° 45.315'S 133° 52.433'E	St Mary's Creek	To analyse standing water in the channel of St Mary's creek for potential run-off waste oil contamination.

#2	23° 45.044'S 133° 52.489'E	Northern outside of track	To analyse run-off pooling northwest of the track in the vicinity of St Marys Creek.
#3	23° 45.215'S 133° 52.584'E	Centre of racetrack	To analyse run-off pooling in centre of the racetrack
#4	23° 45.092'S 133° 52.638'E	Inside of racetrack, north-east corner.	To analyse run-off pooling near the inside of the track / northeast area.
#5	23° 45.342'S 133° 52.714'E	Outside of racetrack, flooded area southeast corner.	To analyses run-off in flooded area south-eastern corner of racetrack.



Figure 2 Surface water sample locations for samples taken 10 November, 2021.

4.3.1 Assessment

Results of surface water sampling assessed against criteria are presented in Table 6.

Table 4 Groundwater assessment criteria.

Parameter	Units	Trigger Values in EPL 208 Attachment B	Australian Drinking Water Guidelines 2011
Laboratory Parameters			
pH	pH units	6.0-8.0	
Temperature	°C	N/A	
Turbidity	NTU	2-15	
Electrical Conductivity	µS/cm	20-250	
Dissolved Oxygen	% Saturation	80-110	
BTEX			
Benzene	mg/L	0.3	
Toluene	mg/L	0.3	
Ethylbenzene	mg/L	0.005	
Xylenes	mg/L	0.075	
Heavy Metals			
Arsenic	mg/L	0.094	0.01
Cadmium	mg/L	0.0004	0.002
Chromium	mg/L	0.006	0.05
Copper	mg/L	0.0018	2
Lead	mg/L	0.0056	0.01
Mercury	mg/L	0.0019	0.001
Nickel	mg/L	0.013	0.02
Zinc	mg/L	0.015	3
Total Recoverable Hydrocarbons (TRH)			
Total TPH C10-C36	mg/L	0.6	

4.4 Soil Sampling

Table 5 describes soil sampling locations and rationale. Soil sampling as set out in the Environmental Management Plan was not carried out within this reporting period.

Table 5. Location and description of soil sampling sites.

Site Code	Description	Latitude	Longitude
S01_TC	Drain on south-eastern edge of Racetrack	-23.755726°	133.879837°
S02_TC	Drain on south-western edge of Racetrack, heading into St Marys Creek	-23.756480°	133.874159°
S03_TC	Low point on edge of south-western racetrack edge	-23.756094°	133.874604°
S04_TC	St Marys Creek, downslope of waste oil storage area	-23.754096°	133.873041°
S05_TC	Bank of St Marys Creek adjacent to waste oil storage area	-23.753999°	133.873317°
S06_TC	Inside of Racetrack on north-eastern edge of Racetrack	-23.751111°	133.877296°
S07_TC	Outside of north-eastern edge of Racetrack	-23.751405°	133.876753°
S08_TC	Outside edge of northern-western edge of Racetrack. Between Racetrack and the women's shelter	-23.750698°	133.875140°
S09_TC	Centre of Racetrack	-23.753598°	133.876436°
S10_TC	Directly inside of Racetrack surface	-23.752708°	133.874443°

4.5 Quality Control and Assurance

All samples were collected in appropriate laboratory supplied sampling containers, as per laboratory requirements. The sample containers were placed into an ice chilled esky and transported to the laboratory under standard chain of custody (COC) procedures to a National Association of Testing authorities (NATA) accredited laboratory (ALS in Sydney) for analysis within required holding times.

Disposable and/or dedicated sampling equipment is used where required between each sample and sampling location. Where sampling equipment is of a non-disposable nature, decontamination of sampling equipment is carried out between each sample and sampling location.

4.5.1 Laboratory Analyses

The analytical procedures used by the ALS Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In-house procedures are employed in the absence of documented standards or upon client request.

Upon sampling and analysis, the NATA accredited ALS laboratory conducts the following quality control procedures as part of their internal Quality Control Report:

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

4.5.2 Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intra-laboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level

of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

4.5.3 Method Blank (MB) and Laboratory Control Spike (LCS) Report

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

4.5.4 Matrix Spike (MS) Report

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

5 Groundwater Sampling Results

5.1 Site Observations

Water quality field measurements are presented below in Table 6. Readings that exceed trigger values are highlighted. A synopsis of these results is presented here.

- Groundwater temperatures were within a narrow range from 26.2°C to 27.4°C;
- Electrical conductivity ranged from 0.50 µS/cm to 4.36 µS/cm; (Trigger value 20-250 µS/cm)
- Dissolved oxygen (DO) concentrations ranged from 22.9 % sat to 71.1 % saturation; (Trigger value 80-110%)
- Field pH levels ranged from 7.42 to 8.0; (Trigger value 6.0 – 8.0)
- Turbidity levels ranged from 5.7 NTU to 84.3 NTU. (trigger value 2 – 15)

Table 6. Groundwater quality results from three samplings during the reporting period.

Bore No.	Date Sampled	Depth to Water (m)	Water Temp (°C)	Elec. Cond. (µS/cm)	DO (% sat)	DO (mg/L)	pH	Turbidity (NTU)	Comments
RN 4541	22/12/2021	18.47	26.3	2.31	48	3.49	7.80	27.8	Clear. No sheen or odour
	07/01/2022	18.35	27.3	2.30	22.9	1.75	7.50	26.0	Clear. No sheen or odour.
	26/02/2022	12.58	27.2	2.12	30.0	2.4	7.42	84.3	Clear. No sheen or odour. 200mm rainfall at end of January. 5 metre rise in last measured depth to water.
RN 18251	22/12/2021	17.75	26.2	4.2	43.0	3.3	7.5	4.11	Clear. No sheen or odour.
	07/01/2022	17.65	26.5	4.28	32.8	2.0	7.59	5.53	Clear, earthy odour.
	26/02/2022	16.5	25.8	4.36	23.0	2.52	7.60	5.7	Clear, earthy odour.
RN 3098	22/12/2021	16.14	26.2	0.50	52.0	3.9	7.88	53.3	A few solid particles. Clear. No Sheen or odour.
	07/01/2022	16.36	27.4	0.95	32.8	2.57	8.0	46.5	Clear, no sheen or odour.
	26/02/2022	13.88	26.4	0.97	32.0	2.51	7.76	17.3	No sheen. Slight sulphurous odour
RN 18252	22/12/2021	17.90	26.9	3.10	71.1	6.68	7.52	3.06	Clear. No sheen or odour.
	07/01/2022	17.80	26.0	1.85	44.9	3.44	7.52	3.51	Clear. No sheen or odour.
	26/02/2022	17.54	25.8	3.00	57.0	4.47	7.61	34.3	Clear. No odour or sheen.

5.2 Laboratory Results

Laboratory reports (analytical results) for the three sets of groundwater / bore samples are presented in full in Appendix 1. All analytes sampled for; including heavy metals, BTEX and TRH were below the limit of reporting (LOR) or the adopted trigger values, except for copper and zinc. Exceedances of the trigger values for copper and zinc are presented in Table 7 and discussed in Section 7.1.

Table 7. Groundwater samples that exceeded trigger values.

Sampling Date	Bore	Copper (mg/L)	Zinc (mg/L)
Trigger value		0.0018	0.015
22/12/2021	RN 4541	Field measurements were conducted and samples taken, however samples were not lab-analysed.	
	RN 18251		
	RN 3098		
	RN 18252		
7/01/2022	RN 4541		
	RN 18251		0.022
	RN 3098		
	RN 18252	0.011	0.029
26/02/2022	RN 4541	0.008	0.023
	RN 18251		0.032
	RN 3098		0.036
	RN 18252	0.013	.045

6 Surface Water Sampling Results

Surface water sampling was carried out following a significant rainfall event. A low pressure system over southern parts of the NT on 9 and 10 November generated moderate to heavy falls. Alice Springs reported a 100.2 mm on 10 November. Laboratory reports (analytical results) for the surface water samples collected on 11 November, 2021 are presented in full in Appendix 2.

- There were no exceedances of trigger values for metals in any of these samples.
- Site #4 located at a point a few metres inside the racetrack where it was apparent that a large amount of rainfall had drained off the racetrack surface unsurprisingly recorded a measurable reading of TPH in the C10-C36 fraction, at 5920 micrograms / litre, this well exceeding the stipulated trigger value of 0.6 mg/litre.
- Site #5 located outside the southeastern section of the racetrack within a widely flooded area recorded 310 micrograms / litre TPH in the C10-C36 Fraction.
- Field measurements of sampled surface water returned no results that triggered further inquiry.

Table 8. Surface Water Samples taken 11/10/2021 that exceeded trigger values (highlighted).

Site	Temp °C	Electrical Conductivity (mS/cm)	DO (%sat)	DO (mg/l)	pH	Turbidity (NTU)	TPH C10 - C35 µg/L	Comment
#1	21.3	0.019	82.5	7.39	7.33	184	<LoR	Creek pool
#2	27.0	0.034	84.6	6.74	7.75	67.9	<LoR	Puddle
#3	28.9	0.023	86.4	6.65	7.85	319	<LoR	Puddle
#4	30.0	0.041	88.7	6.52	7.23	49.8	5920	Sheen on water
#5	26.7	0.025	81.5	6.74	6.99	243.	310	Flooded area



Figure 3. Surface water sampling Site #1, St Mary's Creek.



Figure 4. Surface water sampling Site #2, outside northwest corner of racetrack.



Figure 5. Surface water sampling Site #3, centre of racetrack.



Figure 6. Surface water sampling Site #4, inside northeast corner of racetrack.



Figure 7. Surface water sampling Site #5, outside southeast corner of racetrack.



Figure 8. Extent of standing surface water following event of 100mm rainfall 10 November, 2021.

7 Discussion and Interpretation of Results

7.1 Groundwater

Field Measurements:

All field measurements exceeded the trigger value for electrical conductivity for the four bores sampled on each of three occasions sampled. Previous annual monitoring reports have questioned whether the stipulated trigger values are appropriate for this project. The EPL208 (Attachment B) trigger values 20-250 $\mu\text{S}/\text{cm}$ for electrical conductivity are very low values for groundwater. In A *preliminary overview of groundwater quality in the Northern Territory*, (McDonald, 1993) an average value of 3549 $\mu\text{S}/\text{cm}$ is reported for arid zone water bores taken from a total of 12,508 samples.

Metals results:

Analytical results for copper and zinc have consistently exceeded specified trigger values in each of the four previous monitoring periods. In this reporting period, ground water samples exceeded trigger values for 3 of 8 samples for copper and 6 of 8 samples for zinc. It is noteworthy that all results for copper were well below the Groundwater Investigation Level of 2mg/L for drinking water given in NEPM 2013 and all results for zinc were well below the Australian Drinking Water Guidelines 2011, of 3mg/L for Zinc.

The broadly consistent levels of copper and zinc in all bores suggests that these are naturally occurring groundwater levels rather than a result of waste oil residue from racetrack treatments. Bore RN003098 is appropriate as a control site as it is located lateral to the groundwater flow direction in the area and RN18252 is located 430m from the site. An additional control site bore that is located upstream and some distance from the racetrack would be beneficial to the monitoring program to derive baseline or control “clean” groundwater chemistry data. Consequently bore RN003685 north

of the racetrack on the western bank of the Todd River has been added to the monitoring program through the EMP adopted from 2022.

7.2 Surface Water

Analysis of surface water samples found none to contain metals in excess of specified trigger values. Only one sample from Site #4 registered a presence of dissolved metal above the limit of reporting; 0.022 mg/l of zinc which is likely to be associated with the recorded presence of 5290 mcg/l TRH. It is unsurprising that larger rainfall events resulting in sheet flow across the sloping racetrack will produce small, measurable amounts of hydrocarbon 'rinse' being deposited close to the racetrack. The low frequency of such events suggests that the probability of any significant deposition and accumulation of hydrocarbon over time is low. There is a high probability however that these small amounts of hydrocarbon in surface soil carried by surface water will self-attenuate through microbial action in relatively short timeframes.

8 Conclusions and Recommendations

Environmental monitoring conducted August 2020 – July 2021 included three ground water monitoring events in which laboratory analysis was available for two samplings. These coincided with applications of waste oil to the racetrack surface. These was one surface water sampling following a high rainfall event.

- Exceedances of trigger values provided in Attachment B – 2018/2020 Groundwater Monitoring Schedule as part of the Turf Clubs EPL 208 were identified during groundwater monitoring for 3 of 8 samples for copper and 6 of 8 samples for zinc. Results for copper were well below the Groundwater Investigation Level of 2mg/L for drinking water given in NEPM 2013 and all results for zinc were well below the Australian Drinking Water Guidelines 2011, of 3mg/L for Zinc. The distribution of the exceedances over the bores sampled indicates that these values are normal background levels for this area. The results data is consistent with that previously collected.
- Surface water samples were shown to contain hydrocarbons washed from the nearby racetrack at two sites of five site sampled. Significantly there was no reading for water sampled from St Mary's Creek. One sample exceeded the trigger value for presence of hydrocarbon, being site #4 adjacent the inside of the racetrack near the northeast corner. Given the rainfall wash across the sloping track observed at the time this result was expected. However, the environmental risk of significant near-track contamination is considered to be low. A quantity of dissolved zinc in excess of specified trigger levels (for groundwater under Appendix 2, EPL208, 2017-22) was recorded for the same sample, this very likely being associated with the TRH present.

It is concluded that:

- Groundwater turbidity levels, while exceeding trigger values are notionally 'natural' and do not present issues of concern relating to the application waste oil on the racetrack.

- Levels of metals in groundwater, where they exceed trigger values for copper and zinc are most likely natural background levels that do not present issues of concern relating to the application waste oil on the racetrack.
- While high rainfall events resulting in surface water flow very likely results in carriage of hydrocarbon from racetrack-deposited waste oil to nearby down-slope sites, the risk of significant hydrocarbon contamination for the area's soil (and groundwater) is very low.

Recommendations

EPL208 and the associated Environmental Management Plan, incorporating Monitoring was reviewed in 2022. Changes to the monitoring program to improve understanding of risks to the surrounding environment and to human health that may arise from repeated applications of waste oil to the racetrack include:

- Sampling groundwater from an additional bore located ~ 100m upstream of the racecourse to give a better understanding of groundwater chemistry in the surrounding area and to provide another control site for comparing monitoring bores.
- Disassociating groundwater sampling from racetrack oil applications and conducting two groundwater testings each year in October and April of each year. The past schedule of sampling in the two weeks prior to treatment, and again within 48 hours after track treatment, is not meaningful given the much longer timescales in which contaminants may leach into groundwater in this arid environment.
- When available, surface water samples should be taken from areas located well away from vehicle tracks and areas that have been treated with waste oil or where waste oil may have spilled.
- Soil sampling to determine the depth of waste oil penetration in the previous reporting period to 22 July 2020 provided baseline data on waste oil infiltration below the track surface after 43 years of repeated waste oil applications. This testing will for the term of the next EMP, be carried out biennially.
- Groundwater trigger values for field parameters provided in Attachment A- 2018/2020 of the EPL 208 will no longer apply.

9 References

- Council, N. E. (2013). *National Environment Protection (Assessment of Site Contamination) Measure*.
- McDonald, J. C. (1993). *A preliminary overview of groundwater quality in the Northern Territory*.
Journal of Australian Geology and Geophysics .
- Natural Resource Management Ministerial Council. (2011). *Australian Drinking Water Guidelines 6*.
Canberra: National Health and Medical Research Council .
- Office of Parliamentary Counsel. (2013). *Environmental Protection (Assessment of Site Contamination) Measure* . Canberra.

10 Appendices

Appendix 1 – ALS Certificates of Analysis and Analytical Results for Groundwater Samples

Work order ES2200947 for samples taken 7 January, 2022.

Work order ES2206932 for samples taken 26 February, 2022.

Appendix 2 – ALS Certificates of Analysis and Analytical Results for Surface Water Samples

Work order ES2140722 for samples taken 10 November, 2021.

CERTIFICATE OF ANALYSIS

Work Order : **ES2200947**
Client : **LOW ECOLOGICAL SERVICES**
Contact : MR BILL LOW
Address : PO BOX 3130
ALICE SPRINGS NT, AUSTRALIA 0871
Telephone : +61 08 89 555 222
Project : Turf Club
Order number : ----
C-O-C number : ----
Sampler : Bill and Elli
Site : ----
Quote number : EN/333
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 5
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 13-Jan-2022 12:15
Date Analysis Commenced : 17-Jan-2022
Issue Date : 20-Jan-2022 11:30



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

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

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

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

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				RN4541	RN018251	RN3098	RN18252	----
Sampling date / time				07-Jan-2022 10:40	07-Jan-2022 11:20	07-Jan-2022 11:40	07-Jan-2022 12:30	----
Compound	CAS Number	LOR	Unit	ES2200947-001	ES2200947-002	ES2200947-003	ES2200947-004	-----
				Result	Result	Result	Result	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	0.011	----
Nickel	7440-02-0	0.001	mg/L	<0.001	0.002	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	0.010	0.022	<0.005	0.029	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	----
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	----
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	----



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID

				RN4541	RN018251	RN3098	RN18252	----
Sampling date / time				07-Jan-2022 10:40	07-Jan-2022 11:20	07-Jan-2022 11:40	07-Jan-2022 12:30	----
Compound	CAS Number	LOR	Unit	ES2200947-001	ES2200947-002	ES2200947-003	ES2200947-004	-----
				Result	Result	Result	Result	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	114	99.8	117	109	----
Toluene-D8	2037-26-5	2	%	102	108	104	108	----
4-Bromofluorobenzene	460-00-4	2	%	115	109	117	115	----



Surrogate Control Limits

Sub-Matrix: **WATER**

		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

CERTIFICATE OF ANALYSIS

Work Order : **ES2206932**
Client : **LOW ECOLOGICAL SERVICES**
Contact : MR BILL LOW
Address : PO BOX 3130
ALICE SPRINGS NT, AUSTRALIA 0871
Telephone : +61 08 89 555 222
Project : Turf Club
Order number : ----
C-O-C number : ----
Sampler : BILL LOW
Site : ----
Quote number : EN/333
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 5
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 01-Mar-2022 12:15
Date Analysis Commenced : 04-Mar-2022
Issue Date : 09-Mar-2022 17:51



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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW



General Comments

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

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

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

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

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

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

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

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				RN2541 Received as RN4541	RN18251	RN3098	RN18252	----
Sampling date / time				26-Feb-2022 15:30	26-Feb-2022 16:00	26-Feb-2022 16:30	26-Feb-2022 17:00	----
Compound	CAS Number	LOR	Unit	ES2206932-001	ES2206932-002	ES2206932-003	ES2206932-004	-----
				Result	Result	Result	Result	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	0.005	0.002	0.004	----
Copper	7440-50-8	0.001	mg/L	0.008	<0.001	<0.001	0.013	----
Nickel	7440-02-0	0.001	mg/L	<0.001	0.002	<0.001	0.003	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	0.023	0.032	0.036	0.045	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	----
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	----
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	----



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID

				RN2541 Received as RN4541	RN18251	RN3098	RN18252	----
Sampling date / time				26-Feb-2022 15:30	26-Feb-2022 16:00	26-Feb-2022 16:30	26-Feb-2022 17:00	----
Compound	CAS Number	LOR	Unit	ES2206932-001	ES2206932-002	ES2206932-003	ES2206932-004	-----
				Result	Result	Result	Result	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	116	118	107	106	----
Toluene-D8	2037-26-5	2	%	124	122	107	110	----
4-Bromofluorobenzene	460-00-4	2	%	110	111	103	105	----

Page : 5 of 5
Work Order : ES2206932
Client : LOW ECOLOGICAL SERVICES
Project : Turf Club



Surrogate Control Limits

Sub-Matrix: **WATER**

		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

CERTIFICATE OF ANALYSIS

Work Order : **ES2140722**
Client : **LOW ECOLOGICAL SERVICES**
Contact : BILL
Address : PO BOX 3130
ALICE SPRINGS NT, AUSTRALIA 0871
Telephone : ----
Project : Turf Club
Order number : ----
C-O-C number : ----
Sampler : Danesh and Mac
Site : ----
Quote number : EN/333
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 5
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 11-Nov-2021 09:00
Date Analysis Commenced : 12-Nov-2021
Issue Date : 17-Nov-2021 16:51



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

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

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

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

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID

				#1	#2	#3	#4	#5
Sampling date / time				10-Nov-2021 10:30	10-Nov-2021 10:50	10-Nov-2021 11:15	10-Nov-2021 11:40	10-Nov-2021 12:00
Compound	CAS Number	LOR	Unit	ES2140722-001	ES2140722-002	ES2140722-003	ES2140722-004	ES2140722-005
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	0.001	<0.001
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	0.022	<0.005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	380	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	4190	240
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	1350	70
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	5920	310
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	780	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	4880	260
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	370	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	6030	260
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	780	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID

				#1	#2	#3	#4	#5
Sampling date / time				10-Nov-2021 10:30	10-Nov-2021 10:50	10-Nov-2021 11:15	10-Nov-2021 11:40	10-Nov-2021 12:00
Compound	CAS Number	LOR	Unit	ES2140722-001	ES2140722-002	ES2140722-003	ES2140722-004	ES2140722-005
				Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	105	107	108	112	110
Toluene-D8	2037-26-5	2	%	102	95.2	93.9	101	99.1
4-Bromofluorobenzene	460-00-4	2	%	114	104	106	109	109



Surrogate Control Limits

Sub-Matrix: **WATER**

		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128