

HOWARD SPRINGS WASTE TRANSFER STATION

**Surface Water Monitoring
Wet Season 2021/22**

Prepared for:

Litchfield Council
7 Bees Creek Access
Freds Pass NT 0836

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Litchfield Council (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
680.30105-R01-v1.0	17 May 2022	Emmanuelle Aliotti	Jill Woodworth	Jill Woodworth

EXECUTIVE SUMMARY

SLR Consulting Australia Pty Ltd (SLR) was commissioned by Litchfield Council to undertake a surface water monitoring at the Howard Springs waste transfer station (WTS), in accordance with the site's Environmental Management Plans (EMPs) relating to Environmental Protection Licence 278 (EPL278).

The key findings of the monitoring are:

- Several field parameters (pH, Oxidation potential reduction, Electrical conductivity, Dissolved oxygen, turbidity), nutrients (Ammonia (as N), Nitrates and Nitrites (as N) and total phosphorus (as P)), dissolved copper and *Escherichia coli* were recorded above the water quality objectives during the wet season 2021/22.
- Generally, the results of the 2021/22 surface water monitoring program were consistent with the previous (2020/21) wet season's results.
- The results showed that analytes decreased from the beginning to the end of both wet seasons.
- A trend analysis indicated a significant decrease of dissolved copper (with a R^2 value greater than 0.7) between 2020/21 to 2021/22. Note: Datasets were limited and did not allow confidence in accuracy with the trend analysis. The next monitoring program will provide sufficient data points for a more accurate view of runoff water quality from the site.

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1 Introduction

1.1 Background

SLR Consulting Australia Pty Ltd (SLR) was commissioned by Litchfield Council to undertake surface water monitoring at Howard Springs waste transfer stations (WTS) during the wet season 2021/22. The WTS is located at Howard Springs, approximately 25 km south-east of Darwin city, Northern Territory (**Figure 1**).

The Howard Springs WTS is a waste management site, open to the public for receiving and diverting waste materials. Site operations involve the separation of recyclables, resources, and reusable items prior to diversion to off-site markets to reduce the residual waste volumes sent off-site for disposal at a landfill. Howard Springs WTS site was previously used as borrow pits, prior to being constructed.

As required by the Environment Protection Licence 278 (EPL278), a surface water monitoring program was conducted in accordance with the Surface Water Management Plan contained within the site's Environmental Management Plan (EMP).

1.2 Objectives

As per the EMP, the objectives of the surface water monitoring program are to use the results for the following:

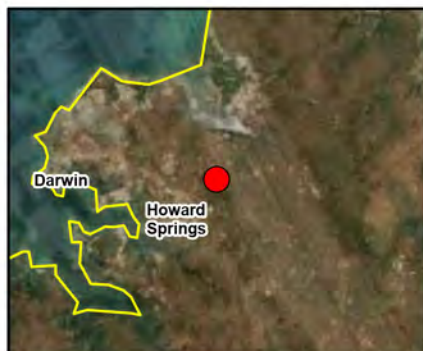
- To minimise surface water impacts and maintain environmental amenity.
- To ensure control and mitigation infrastructure is maintained.

1.3 Scope of works

The scope of works carried out and reported here were conducted to meet the conditions of EPL278. These include:

- Surface water sampling of passive discharge run-off from site after rainfall.
- Recording of field observations at the sampling site: colour, odour, depth of water, velocity of flow.
- Recording of parameters measured in the field at the time of sampling: electrical conductivity (EC), pH, dissolved oxygen (DO), temperature, turbidity and oxidation potential reduction (ORP).
- Analysis of collected surface water samples by a National Association of Testing Authority (NATA) accredited laboratory for:
 - Physico-chemical properties – EC, pH, DO, total dissolved solids (TDS), turbidity, biological demand (BOD).
 - Nutrients – total nitrogen (as N), nitrate, nitrite, total Kjeldahl nitrogen (TKN), ammonia as N, total phosphorus and total organic carbon (TOC).
 - Major ions – calcium, magnesium, sodium, potassium, chloride, sulphate and alkalinity.
 - Heavy metals – total and dissolved arsenic (As), cadmium (Cd), chromium (III and VI) (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), zinc (Zn) and total Iron (Fe).
 - Hydrocarbons – total petroleum hydrocarbons (TPH) and total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene (BTEX).

-
- PFAS.
 - Microbiology – *Escherichia coli*.
 - An interpretative report detailing the results of the wet season 2021/22 monitoring, including a review of historical data and provision of a trend analysis of historical data.



Howard Springs WTS Site Location

FIGURE 1

LEGEND

- Site Boundary
- ▲ Surface water sampling location
- Road/Tracks
- Drainage
- Ephemeral waterway



0 50 100
m

Coordinate System: GDA 1994 MGA Zone 52
 Scale: 1:5,000 at A4
 Project Number: 680.30105.00000
 Date: 11-May-2022
 Drawn by: JJ
 Reviewed by: EA

Data Source:
 Mineral Tenement (Production Granted) datasets:
 © Northern Territory of Australia (Department of
 Environment, Parks, and Water Security); Area of
 Interest datasets: SLR Consulting (2021).
 Imagery Sources: 50cm resolution Maxar WV03 -
 Australia 2020 Satellite Imagery Service; © ESRI,
 DigitalGlobe, GeoEye, Earthstar Geographics,
 CNES/Airbus DS, USDA, USGS, AeroGRID, IGN,
 and the GIS User Community and Nearmaps
 (<https://apps.nearmap.com/maps/#/@-12.4958860,131.0091747,14.00z,0dN/20220502>).



2 Existing Environment

2.1 Regional climate and rainfall

The Darwin region is very characteristically dominated by two distinct seasons: wet and dry seasons. While the wet season is characterised by high temperatures, humidity and increased rainfall resulting in more freshwater inputs, the dry is marked by cooler temperatures, lower humidity and little to no rainfall.

The wettest months are January and February with averages of 431 and 369 mm rain, respectively. The driest months are June and July with 1.8 and 1.1 mm average, respectively. Temperatures range from an average maximum of 33.4 °C in November, to average minimum temperatures of 30.7 °C in June and July. **Figure 2** summarises rainfall and temperature data collected from 1941 to 2022 from the Darwin Airport, Station 014015 (this is the nearest active weather station with a long history of records) (Bureau of Meteorology - BoM 2022).

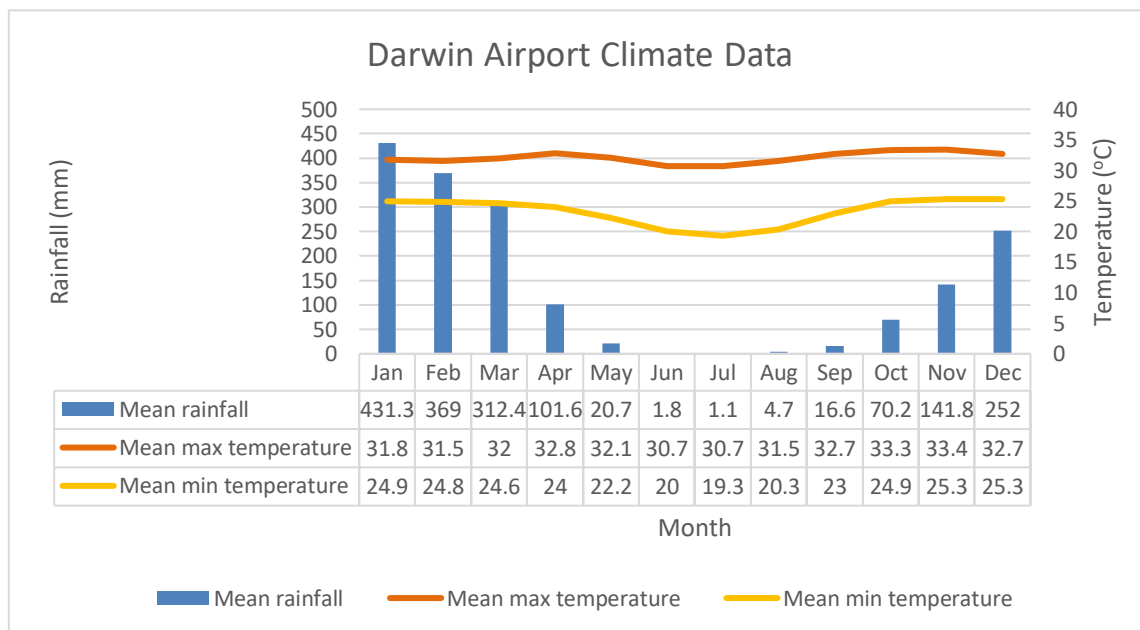


Figure 2 Darwin Airport Station 014015 mean monthly climate Data

2.2 Topography

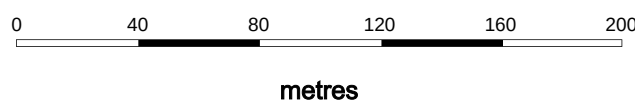
A review of the Howard Springs, Northern Territory, 1:2,500 Orthographic map (sheet number: 5173-33332) indicates that the ground elevation of the site is characterised by a gradual grade from north-west to south-east and located at an elevation of approximately from 40 m above Australian Height Datum (m AHD) to 31 m AHD (**Figure 3**). The eastern boundary of the site where surface runoff flows off the site is 33 m AHD.

1:2 500
5173-33332

5173-33332
NORTHERN TERRITORY



1:2 500



CONTOUR INTERVAL : 1 metre
HORIZONTAL DATUM : GDA94
VERTICAL DATUM : AHD
PROJECTION : Transverse Mercator

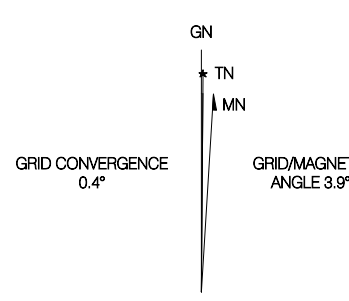
CURRENCY OF TOPOGRAPHY : 1-Jul-2016
CURRENCY OF CADASTRE : 13/09/2017
SOURCE MAP SCALE : 1:2500
ZONE UTM : 52

This map was produced on the Geocentric Datum of Australia (GDA 94).

For most practical purposes GDA94 coordinates and satellite derived (GPS) coordinates based on the World Geocentric System 1984 (WGS84) are the same.
This map has been compiled without field verification. The representation of a road or track on this map is not necessarily evidence of a Public Right of Way.

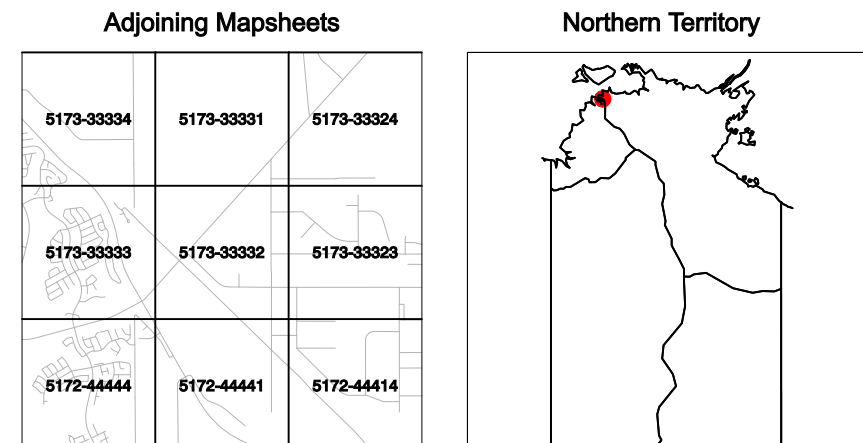
Horizontal Accuracy: Expected accuracy of well defined detail is within 0.5mm at source map scale.
Vertical Accuracy: 90% of elevations are correct to within one half the contour interval at source map scale.

Compilation : By digital photogrammetric methods without field verification
This map has been automatically generated and may contain errors.



True north, grid north and magnetic north are shown diagrammatically for the centre of this map. Magnetic north is correct for 2009 and moves easterly about 0.1" every ten years.

LOCALITY DIAGRAM



ORTHOGRAPHIC MAP

1:2 500
5173-33332

3 Methodology

3.1 Sampling location

As per the EMP, the sampling location was chosen to monitor water quality at specific stage of passive release from run-off rainfalls from the site. Therefore, surface water samples were collected at the south-east WTS boundary in a drainage line that leads to a non-perennial first order ephemeral waterway, located approximately 15 m from the site boundary (refer to **Figure 1**).

3.2 Sampling methodology

Surface water sampling was undertaken in accordance with the site Surface Water Management and Monitoring Plan developed in accordance with:

- Australian Standard (AS) 5667.1:1998 Water Quality Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples.
- Australian Standard (AS) 5667.6:1998 Water Quality – Sampling – Guidance on sampling of rivers and streams.
- The Australian & New Zealand Guidelines for fresh & Marine Water quality (ANZG2018).

Surface water samples were collected in December, January, February and March, targeting significant rainfalls to correspond with a time when surface runoff from the site is occurring. Samples were collected using a handled grab sampler and dedicated laboratory sample bottles from surface runoff, preferably with a flow. In-situ physico-chemical parameters were also recorded in addition to the completion of field records and observations. Protective gloves were worn at all times to minimise sample contamination risks. Additional observations were record such as erosion and sedimentation.

3.3 Assessment criteria

Surface water quality is assessed against the water quality objectives (WQOs) derived from the two following sources:

- ANZG (2018): Freshwater default 95% species protection.
- Darwin Harbour Water Quality Objectives (2010) (DHWQO): Freshwater rivers and streams.
- National health and Medical Research Council (NHMRC) Guidelines for Managing Risks in Recreational Water (2008).

The WQOs for metals do not apply to total metals but only to dissolved metals (bioavailable content). However, the total metal concentrations do provide an indication of metals in the system that are not bioavailable and indicates how the total organic carbon (TOC) complexes with the bioavailable fraction to reduce the toxicity.

There is no trigger value within the ANZG or DHWQO for unspecified chromium (Cr III + VI). Therefore, for conservative purposes, the trigger value for Cr VI 0.001 mg/L is used as the WQO for the assessment.

The NHMRC guidelines for Managing Risks in Recreational Water are not applicable for the Howard Springs WTS and the triggers values are provided as guidelines only. DHWQO provides trigger values for pathogens such as *Escherichia coli*, which is used as the WQO for the assessment.

The WQOs used for the assessment are outlined in **Table 1**.

Table 1 Water Quality Objectives

Parameter	Units	ANZG 2018 Freshwater 95% species protection	DHWQO 2010 Freshwater rivers and streams
Dissolved Oxygen (DO)	% saturation	-	50-100
Electrical Conductivity (EC)	µS/cm	-	200
Oxidation Reduction Potential (ORP)	mV	-	-
pH	pH units	-	6-8.5
Temperature	°C	-	-
Total Dissolved Solids (TDS)	mg/L	-	-
Turbidity	NTU	-	20
Bicarbonate Alkalinity as CaCO ₃	mg/L	-	-
Carbonate Alkalinity as CaCO ₃	mg/L	-	-
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-
Total Alkalinity as CaCO ₃	mg/L	-	-
Chloride	mg/L	-	-
Sulfate as SO ₄	mg/L	-	-
Calcium	mg/L	-	-
Magnesium	mg/L	-	-
Potassium	mg/L	-	-
Sodium	mg/L	-	-
Ammonia (NH ₄ -N)	µg/L	900	-
Nitrate (NO ₃)	µg/L	-	-
Nitrite (NO ₂)	µg/L	-	-
Nitrite + Nitrate (as NO _x)	µg/L	-	8
Total Kjeldahl Nitrogen (TKN)	µg/L	-	-
Total Nitrogen (TN)	µg/L	-	-
Total Phosphorus (TP)	µg/L	-	10
Biological Oxygen Demand	mg/L	-	-
<i>Escherichia coli</i>	CFU/100ml	-	200
Total Organic Carbon (TOC)	µg/L	-	-
Arsenic ¹	µg/L	13	-
Cadmium ¹	µg/L	0.2	-
Chromium ^{1,2}	µg/L	1	-
Copper ¹	µg/L	1.4	-
Iron ¹	µg/L	-	-

Parameter	Units	ANZG 2018 Freshwater 95% species protection	DHWQO 2010 Freshwater rivers and streams
Lead ¹	µg/L	3.4	-
Mercury ¹	µg/L	0.6	-
Nickel ¹	µg/L	11	-
Zinc ¹	µg/L	8	-
Benzene	µg/L	950	-
Toluene	µg/L	180	-
Ethylbenzene	µg/L	80	-
Meta-Xylene	µg/L	75	-
Ortho-Xylene	µg/L	350	-
Para-Xylene	µg/L	200	-
Sum of BTEX	µg/L	-	-
Total Petroleum Hydrocarbons (TPH)	µg/L	-	-
PFAS	µg/L	-	-

Note 1: dissolved fraction.

Note 2: trigger value Cr VI 0.001 mg/L used for the assessment.

3.4 Analytical program

All samples were analysed by a NATA accredited laboratory ALS Group: ALS Environmental Sydney (ALS).

The analytical program outlined in the EMP is summarised in **Table 2** Error! Reference source not found..

Table 2 Analytical Program

Sample Location	In situ/lab physico-chemical parameters	Nutrients	Total and Dissolved Metals	Major Ions and Cations	Hydrocarbons	PFAS
	pH, Temp, EC, Redox, DO, Turbidity, TDS*, BOD*	TN, TKN, Nitrate, Nitrite, TP, TOC	As, Cd, Cr, Cu, Hg, Pb, Ni and Zn Total Fe	Ca, Mg, Na, K, SO ₄ , Cl, CO ₃ & HCO ₃	TPH, TRH and BTEX	Full suite 28 analytes
Berry Springs (BS)	✓	✓	✓	✓	✓	✓
Humpty Doo (HD)	✓	✓	✓	✓	✓	✓
Howard Springs (HS)	✓	✓	✓	✓	✓	✓

* Only laboratory analysis

4 Results and Discussion

4.1 *In-Situ* parameters

Sample collections were targeted after or during heavy rains to ensure sufficient runoff for sampling in 2021 and 2022. However, insufficient water was available during the first sampling round in November 2021. Therefore, only three data sets are used for the assessment against the WQOs. Photo monitoring of the sampling site is shown in **Figure 4** for each monitoring occasion. The photos show that there is no defined drainage channel leaving the site.

Over the wet season 2021/22, the turbidity of surface water runoff samples ranged from turbid to highly turbid with a yellow brown colour. A slight flow was observed as the surface water runoff left the site; however, as mentioned above there was no defined drainage channel for surface water leaving the site which may account for the high turbidity observed. No particular odour was noted during the field sampling.

Exceedances against the WQOs for field water quality measurements for the wet season 2021/22 are outlined in **Table 3** together with the historical data. A trend analysis of these parameters are displayed in **Figure 5**. Trends are considered significant if the R^2 value is greater than 0.7.

The key findings are:

- Where assessment WQOs exist, pH, EC, DO and turbidity exceeded the WQOs at various times during the wet season 2020/21. High concentrations of turbidity are expected in surface water runoff in the Top End after rain events occurring in the wet seasons.
- It has been observed that ORP, DO and turbidity were decreasing during the wet season (**Figure 5**).
- Field parameters pH, temperature and EC were increasing during the wet season 2021/22.

Table 3 Howard Springs WTS field physico-chemical parameter

Analytes	pH	Temperature	Oxidation /Reduction Potential	Electrical Conductivity	Dissolved Oxygen	Turbidity
Units	pH Unit	(°C)	mV)	(µS/cm)	(% saturation)	(NTU)
Darwin Harbour WQOs 2010 - freshwater rivers and streams	6-7.5	-	-	200	50-100	20
16-Dec-20	5.4	27	160	47	94	>1,000
28-Jan-21	6.7	27	-3.2	481	64	203
02-Nov-21	N/A - DRY					
20-Dec-21	5.3	26	301	92	95	1,216
02-Feb-22	6.3	29	-93	794	45	17
23-Mar-22	7.2	29	-98	674	32.8	203

Note: Shaded cells denote where parameters were reported outside of water quality objectives



20 December 2021

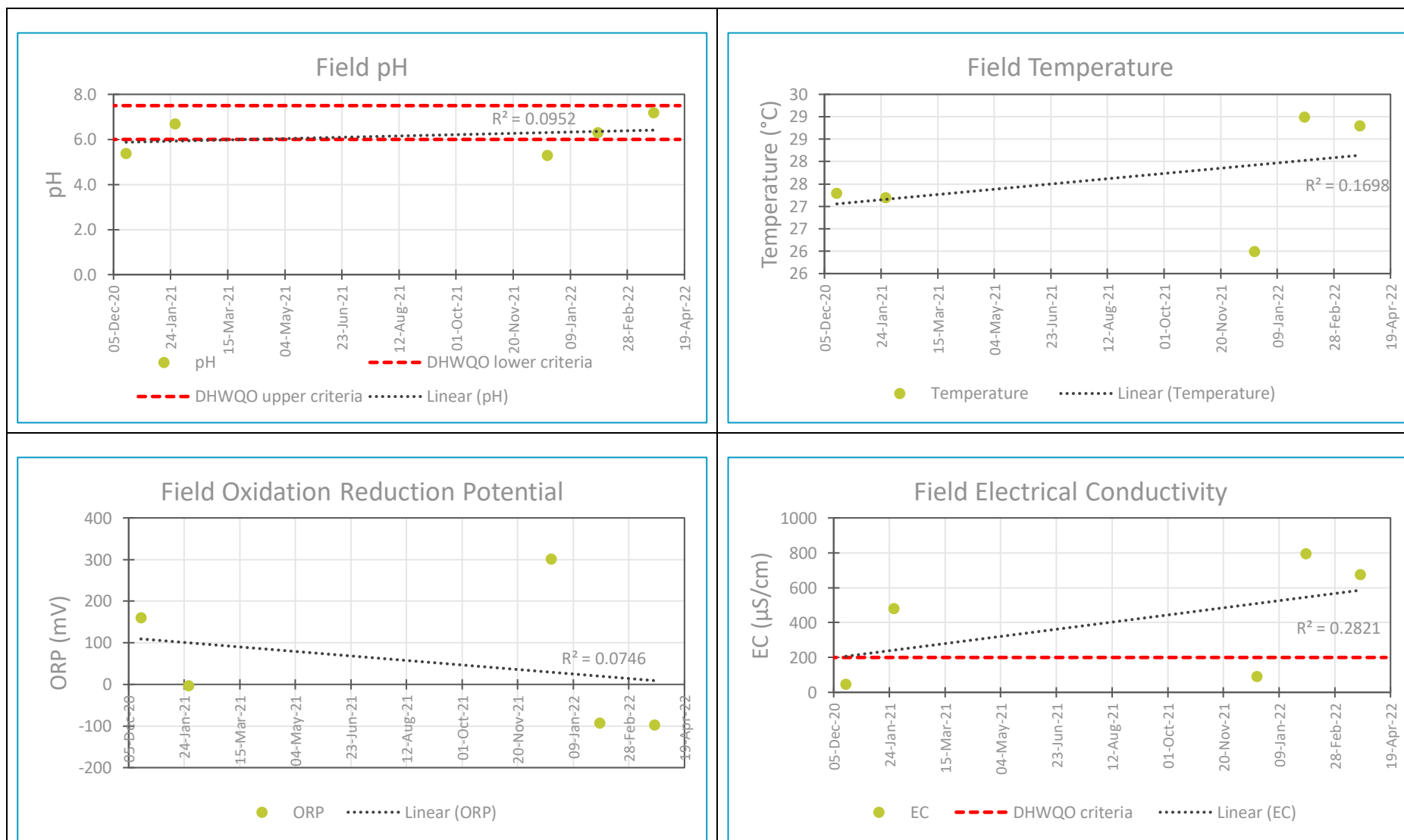


02 February 2022



23 March 2022

Figure 4 Howard Springs surface water wet season 2021/22 photo-monitoring



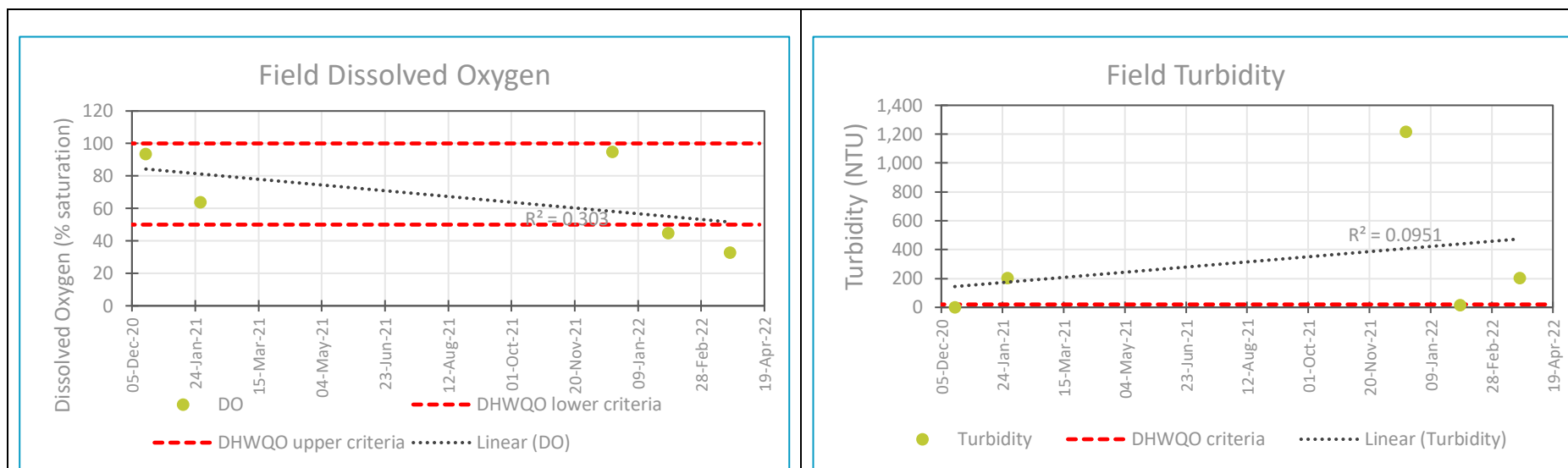


Figure 5 Field water quality measurements in Howard Springs WTS

4.2 Laboratory Results

Surface water samples were dispatched to the NATA accredited Laboratory ALS for analysis in Sydney. Historical and wet season 2021/22 exceedances against the WQOs are summarised in **Table 4**. Laboratory certificates for the wet season 2021/22 monitoring program are presented in **Appendix A**.

Key findings of the wet season 2021/22 surface water monitoring are:

Nutrients

The following nutrients exceeded the WQOs:

- Ammonia exceeded the ANZG (2018) WQO of 900 µg/L during the March event with 9,350 µg/L. Historically, an exceedance was recorded during the last monitoring round of the wet season 2020/21 with 4,740 µg/L.
- Levels of nitrite and nitrate (NO_x) were recorded above the DHWQO (2010) WQO of 8 µg/L in all the three sampling events, ranging from 50 µg/L to 1,520 µg/L. These exceedances are consistent with the previous monitoring season.
- Total phosphorus levels exceeded the DHWQO (2010) WQO of 10 µg/L in February and March 2022 with 90 µg/L and 770 µg/L respectively. These exceedances are consistent with the previous monitoring season.
- It is important to note that the assessment criteria are applied to natural waterways and not to drainage channels for stormwater, therefore, elevated concentrations are expected to reduce upon mixing in a waterway.
- Trend analysis indicate a fluctuation of the three above nutrient levels since the wet season 2020/21 (**Figure 6**).

Microbiology

Escherichia coli exceeded the DHWQO criteria of 200 MPN/100 mL at all sampling events with results ranging from ~20 CFU/100 mL to 17,329 CFU/100 mL. These levels are consistent with historical data. The trend analysis of both wet seasons indicates an increase of *Escherichia coli* concentrations. However, it is observed that concentrations *Escherichia coli* are elevated at the beginning of the wet seasons with a decrease during the seasons (**Figure 6**).

Heavy Metals

- Dissolved copper slightly exceeded the ANZG (2018) dissolved metal WQO 1.4 µg/L in December 2021 with 2 µg/L. Similar levels of dissolved copper were observed in the previous monitoring season. However, the trend analysis indicates a significant decrease of dissolved copper concentrations over time (**Figure 7**).
- Dissolved zinc levels were recorded above the WQO during the previous monitoring season 2020/21. Levels of dissolved zinc in 2021/22 were recorded below limit of reporting and the trend analysis of zinc concentrations indicates a significant decrease (**Figure 7**).

Hydrocarbons

All hydrocarbons were recorded below laboratory detection limits.

PFAS

PFAS analysis did not exceed the assessment criteria. However, traces of PFAS, PFHxS and PFOS were detected at Howard Springs WTS. These PFAS types are to be expected to occur in landfill facilities due to any manufactured products that have been historically disposed within.

Quality Control/Quality Assurance (QA/QC)

Laboratory quality assurance and quality control reported no outliers for the three samples collected.

Table 4 Howard Springs WTS laboratory results exceedances summary

Analytes	Ammonia	Nitrite + Nitrate (as NO _x)	Total Phosphorus	Copper Cu Total	Copper Cu Dissolved	Zinc Zn Total	Zinc Zn Dissolved	<i>Escherichia coli</i>
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	CFU/100mL
Water Quality Objectives 2010 - freshwater rivers and streams	-	8	10	-	-	-	-	200
ANZG 2018 freshwater - 95% species protection	900	-	-	-	1.4	-	8	-
16-Dec-20	120	1,180	920	56	4	535	74	~500
28-Jan-21	4,740	160	150	2	2	25	11	8,400
02-Nov-21	N/A - DRY							
20-Dec-21	230	1,520	<50	12	2	60	<5	17,329
02-Feb-22	140	180	90	7	<1	8	<5	2,900
23-Mar-22	9,350	50	770	13	<1	118	<5	~20

Notes:

- Shaded cells denote where parameters were reported outside of the guideline value or range.
- ANZG guideline applies to dissolved metals. However, total metal concentrations indicate formation of bioavailable metal complex. Results of dissolved heavy metals display lower concentration than total heavy metals.

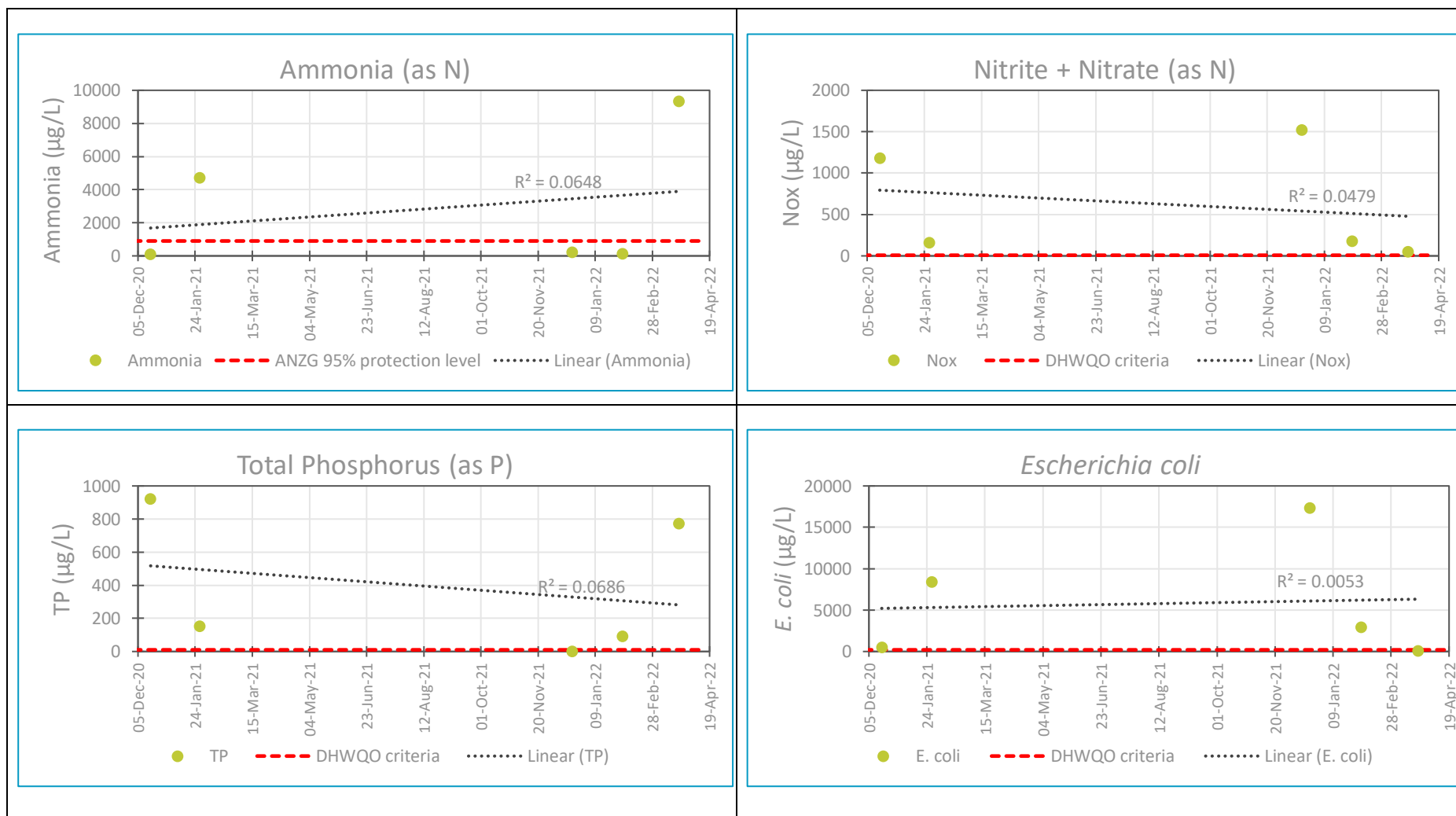


Figure 6 Nutrient and *Escherichia coli* concentrations in Howard Springs WTS

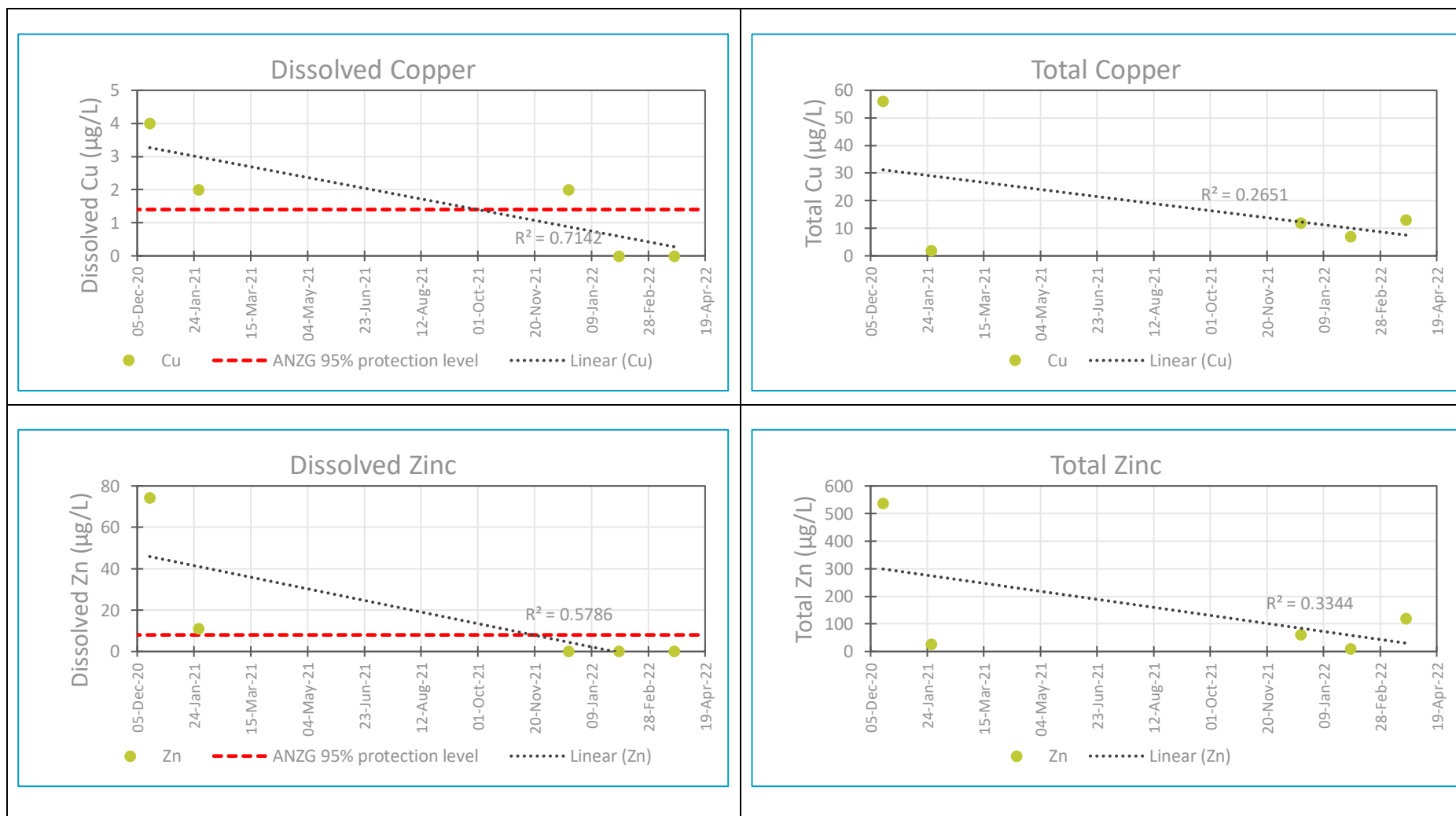


Figure 7 Copper and zinc concentrations in Howard Springs WTS

5 Conclusion

Wet season 2021/22 key findings

Key findings of the surface water wet season 2021/22 monitoring are:

- Collected water samples were observed to be generally turbid to highly turbid, yellow brown, running off from the site with a light flow and with no odour.
- Several parameters exceeded the WQOs during the wet season 2021/22 monitoring including *in-situ* and laboratory as listed below.
- Hydrocarbon levels were recorded below limit of reporting.
- Traces of PFAS, PFHxS and PFOS were detected but did not exceed the assessment criteria.

Exceedance of the WQOs

During the wet season 2021/22 surface water monitoring, exceedances against the selected WQO were recorded for:

- Field data:
 - pH
 - Oxidation potential reduction
 - Electrical conductivity
 - Dissolved oxygen
 - Turbidity
- Laboratory data:
 - Ammonia (as N)
 - Nitrates and Nitrites (as N)
 - Total phosphorus (as P)
 - Dissolved copper
 - *Escherichia coli*

Generally, high concentrations of analytes are expected at the start of the wet season due to the absence of the rainfall events for several months and a build-up of the chemicals on site. Once the wet season commences, heavy rains result in the mobilisation of organic matter, thus creating an increase of nutrients due to the breakdown of organic matter and runoff of metals.

Trend analysis

- The exceedances mentioned above are consistent with the historical data (previous wet season monitoring). However, it was noted that dissolved zinc concentrations recorded above the WQOs in 2020/21 were below limit of reporting in 2021/22 indicating a downward trend in concentrations leaving the site.
- OPR, DO and turbidity showed non-significant downward trends over the wet season 2021/22.
- EC concentration trends showed non-significant upward trends during the monitoring period.
- Dissolved copper concentrations were observed to decrease over the wet season with a significant downward trend with the R^2 value greater than 0.7.
- Trend analysis indicate a slight decrease of NOx and total phosphorus concentrations and a slight increase of ammonia concentrations.
- *Escherichia coli* overall trend analysis indicates an increase of levels. However, concentrations were recorded to be elevated at the beginning of the wet seasons and display a decreasing trend until the end of the wet seasons.

Conclusion and recommendations

Generally, an overall decrease in concentrations of analytes, from the beginning to the end of the wet season is recorded and the same pattern is observed over both wet seasons.

While some analytes display evident trends, it is difficult to establish a conclusion for all of them as strong fluctuations are observed in the graphs. These fluctuations depend on various factors occurring on site such as the sampling timing, the rainfall volume occurred or occurring on site and the volume and type of waste deposited on site prior sampling.

Moreover, the current dataset is limited with insufficient data to be confident in the analysis. A dataset with a minimum of seven data points would give a better understanding of the contaminant trends.

However, when a trend is evident, the decreased concentrations observed for dissolved copper or dissolved zinc indicate a low risk to the receiving environment.

Another wet season of monitoring is recommended to provide additional data points for more accurate trend analysis. The next monitoring program will also allow revision of the analytical program to potentially remove analytes where concentrations are consistently recorded below limit of reporting.

Overall, the surface water monitoring undertaken in the wet season 2021/22 at Howard Springs WTS meets the requirement of the EMP.

6 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcome all feedback via <https://www.slrconsulting.com/en/feedback>. We recognise the value of your time and we will make a \$10 donation to our 2022 Charity Partner – Lifeline, for every completed form.

7 References

Australian & New Zealand Guidelines for Fresh & Marine Water Quality, 2018.

Bureau of Meteorology: <http://www.bom.gov.au/climate/data/>

Natural Resources Maps (NR Maps): <https://nrmaps.nt.gov.au/nrmaps.html>

NHMRC, 2008. Guidelines for Managing Risks in Recreational Water.

NT EPA, 2019. Environment Protection Licence 278.

Water Quality Objectives for the Darwin Harbour Region - Background Document, 2010.

Tonkin, 2020. Environmental Management Plan – Howard Springs Waste Transfer Station.

APPENDIX A

Laboratory certificates

ABN 29 001 584 612

PROJECT OFFICE	☐ BRISBANE: Level 2, 15 Astor Terrace, Spring Hill, QLD 4000	☐ GOLD COAST: 194 Varsity Parade, Varsity Lakes, QLD 4227	☐ NEWCASTLE: 10 Kings Road, New Lambton, NSW 2305	☐ SYDNEY: 2 Lincoln Street, Lane Cove, Sydney, NSW 2066	☐ NELSON: 6/A Cambridge Street, Richmond Park Nelson, 7020 NZ
	☐ CANBERRA: GPO Box 410, Canberra, ACT 2600	☐ MACKAY: 21 Rwer Street, Mackay, QLD 4740	☐ PERTH: 503 Murray Street, Perth, WA 6000	☐ TOWNSVILLE: 514 Stuart Street, Townsville, QLD 4810	☐ NEW PLYMOUTH: Level 2, 10 Devon Street East, New Plymouth, 4310 NZ
(Tick one)	☒ DARWIN: 21 Parana Rd, Darwin, NT 08200	☐ MELBOURNE: 1/11 1, 1/6 Wellington Parade, East Melbourne, VIC 3002	☐ ROCKHAMPTON: rockhampton@siliconsling.com	☐ AUCKLAND: 68 Beech Road, Auckland 1010 NZ	☐

[illegible]

Sample Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Preserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Speciation bottle; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles; G = unpreserved glass soli jar;

I attest that the proper field sampling procedures were used during the collection of these samples.			
Relinquished By Sampler	Sign <u>[Signature]</u> JANE	Date / Time 30.12.21	Received by Sign <u>[Signature]</u> ASaadhu
Relinquished By	Sign	Date / Time	Received by Sign <u>[Signature]</u> Kim
Relinquished By	Sign	Date / Time	Received by Sign

Temperature Received: 17.7 °C

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2146722

Client : SLR CONSULTING AUSTRALIA PTY LTD Contact : EMMANUELLE ALIOTTI Address : UNIT 5/21 PARAP ROAD PARAP 0820 E-mail : ealiotti@slrconsulting.com Telephone : ---- Facsimile : ---- Project : 680.30105 LSC waste transfer facilities SW monitoring Order number : ---- C-O-C number : ---- Site : ---- Sampler : EMMANUELLE ALIOTTI, JAMES MURDOCH	Laboratory : Environmental Division Sydney Contact : Tyler Anderson Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 E-mail : Tyler.Anderson@ALSGlobal.com Telephone : +61 2 8784 8555 Facsimile : +61-2-8784 8500 Page : 1 of 3 Quote number : ES2021HEGAUS0004 (EN/032/21) QC Level : NEPM 2013 B3 & ALS QC Standard
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Dates

Date Samples Received : 22-Dec-2021 14:20 Client Requested Due Date : 06-Jan-2022	Issue Date : 22-Dec-2021 Scheduled Reporting Date : 06-Jan-2022
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Delivery Details

Mode of Delivery : Client Drop Off No. of coolers/boxes : ---- Receipt Detail :	Security Seal : Not Available Temperature : 17.7° C No. of samples received / analysed : 1 / 1
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General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA045 Turbidity	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - IN-1 EC plus TDS Calculated	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity	WATER - NT-08 Total Nitrogen + NO2 + NO3 + NH3 + Total P	WATER - W-02T 8 metals (Total)	WATER - W-05 TRH/BTEXN/8 Metals
ES2146722-001	20-Dec-2021 00:00	HS	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (PCT)	WATER - EP005 Total Organic Carbon (TOC)	WATER - EP025 Dissolved Oxygen (DO)	WATER - EP030 BOD	WATER - EP231X PFAS - Full Suite (28 analytes)
ES2146722-001	20-Dec-2021 00:00	HS	✓	✓	✓	✓	✓

Proactive Holding Time Report

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

Matrix: **WATER**

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

Method	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)				Date	Evaluation	Date	Evaluation
EA005-P: pH by PC Titrator							
HS	Clear Plastic Bottle - Natural	----	20-Dec-2021	22-Dec-2021	✗	----	----
EP025: Oxygen - Dissolved							
HS	Clear Plastic Bottle - Natural	----	20-Dec-2021	22-Dec-2021	✗	----	----

[illegible]

CERTIFICATE OF ANALYSIS

Work Order : **ES2146722**
Client : **SLR CONSULTING AUSTRALIA PTY LTD**
Contact : EMMANUELLE ALIOTTI
Address : UNIT 5/21 PARAP ROAD
 PARAP 0820
Telephone : ----
Project : 680.30105 LSC waste transfer facilities SW monitoring
Order number : ----
C-O-C number : ----
Sampler : EMMANUELLE ALIOTTI, JAMES MURDOCH
Site : ----
Quote number : EN/032/21
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 8
Laboratory : Environmental Division Sydney
Contact : Tyler Anderson
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61 2 8784 8555
Date Samples Received : 22-Dec-2021 14:20
Date Analysis Commenced : 22-Dec-2021
Issue Date : 07-Jan-2022 08:17



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>
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS 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.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EK067G:LOR raised due to sample matrix.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	HS	----	----	----	----
Sampling date / time				20-Dec-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2146722-001	-----	-----	-----	-----
Result				----	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	5.94	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	77	----	----	----	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	50	----	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	1330	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	16	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	16	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	14	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	7	----	----	----	----
Magnesium	7439-95-4	1	mg/L	2	----	----	----	----
Sodium	7440-23-5	1	mg/L	2	----	----	----	----
Potassium	7440-09-7	1	mg/L	4	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	0.002	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.004	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	0.014	----	----	----	----
Copper	7440-50-8	0.001	mg/L	0.012	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	----	----	----	----
Sampling date / time					20-Dec-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2146722-001	-----	-----	-----	-----
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS - Continued									
Nickel	7440-02-0	0.001	mg/L		0.005	----	----	----	----
Lead	7439-92-1	0.001	mg/L		0.012	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		0.060	----	----	----	----
Iron	7439-89-6	0.05	mg/L		11.1	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.23	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		1.52	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		1.52	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		2.2	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		3.7	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.05	----	----	----	----
EN055: Ionic Balance									
∅ Total Anions	----	0.01	meq/L		0.72	----	----	----	----
∅ Total Cations	----	0.01	meq/L		0.70	----	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		8	----	----	----	----
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen	----	0.1	mg/L		8.0	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		3	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	----	----	----	----
Sampling date / time					20-Dec-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2146722-001	-----	-----	-----	-----
					Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	----	----	----	----
Sampling date / time				20-Dec-2021 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2146722-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	----	----	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	----	----	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	----	----	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	----	----	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	----	----	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	----	----	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	----	----	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	----	----	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	----	----	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	----	----	----	----	
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	----	----	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	----	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	----	----	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	----	----	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	----	----	----	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	----	----	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	----	----	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	----	----	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	----	----	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	----	----	----	----
Sampling date / time					20-Dec-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2146722-001	-----	-----	-----	-----
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		85.6	----	----	----	----
Toluene-D8	2037-26-5	2	%		101	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		78.2	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		98.7	----	----	----	----
13C8-PFOA	----	0.02	%		116	----	----	----	----



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
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

QUALITY CONTROL REPORT

Work Order	: ES2146722	Page	: 1 of 10
Client	: SLR CONSULTING AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: EMMANUELLE ALIOTTI	Contact	: Tyler Anderson
Address	: UNIT 5/21 PARAP ROAD PARAP 0820	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 680.30105 LSC waste transfer facilities SW monitoring	Date Samples Received	: 22-Dec-2021
Order number	: ----	Date Analysis Commenced	: 22-Dec-2021
C-O-C number	: ----	Issue Date	: 07-Jan-2022
Sampler	: EMMANUELLE ALIOTTI, JAMES MURDOCH		
Site	: ----		
Quote number	: EN/032/21		
No. of samples received	: 1		
No. of samples analysed	: 1		



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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS 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.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 4095514)									
ES2146658-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.70	6.24	7.1	0% - 20%
ES2146669-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.22	7.20	0.3	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4095507)									
ES2146658-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	100	102	2.3	0% - 20%
ES2146589-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2420	2390	1.3	0% - 20%
ES2146669-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	191	188	1.1	0% - 20%
ES2146774-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1120	1120	0.0	0% - 20%
ES2146774-009	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1430	1430	0.1	0% - 20%
ES2146462-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	9670	9640	0.3	0% - 20%
EA045: Turbidity (QC Lot: 4094759)									
ES2146722-001	HS	EA045: Turbidity	----	0.1	NTU	1330	1340	0.4	0% - 20%
ES2146976-001	Anonymous	EA045: Turbidity	----	0.1	NTU	<0.1	<0.1	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 4095515)									
ES2146774-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	9	5	59.6	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	9	5	59.6	No Limit
ES2146774-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	56	56	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	56	56	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4094688)									
EW2105500-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	10	9	0.0	No Limit

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 Work Order : ES2146722
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : 680.30105 LSC waste transfer facilities SW monitoring



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4094688) - continued									
EW2105500-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4094689)									
EW2105500-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	36	36	0.0	0% - 20%
EW2105500-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4104372)									
ES2147107-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	662	661	0.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	484	485	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2040	2040	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	60	59	0.0	0% - 20%
ES2146551-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	956	883	8.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	7230	6640	8.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	10400	9670	7.2	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4104373)									
ES2147107-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.016	0.015	8.6	No Limit
ES2146551-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0010	<0.0010	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.856	0.806	6.0	0% - 20%
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.380	0.394	3.9	0% - 20%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.058	0.052	10.7	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.050	<0.050	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4105886)									
ES2146722-001	HS	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.014	0.015	0.0	0% - 50%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.012	0.012	0.0	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.012	0.012	0.0	0% - 50%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.060	0.060	0.0	0% - 50%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	11.1	12.0	7.9	0% - 20%
ES2146869-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit

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 Work Order : ES2146722
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : 680.30105 LSC waste transfer facilities SW monitoring



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 4105886) - continued									
ES2146869-001	Anonymous	EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 4104375)									
ES2146555-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2146555-007	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4104355)									
ES2146551-004	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2146867-004	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4104180)									
ES2146722-001	HS	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.23	0.20	11.9	0% - 20%
ES2146902-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	84.1	87.5	4.0	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4094687)									
EW2105500-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EW2105500-010	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4104181)									
ES2146722-001	HS	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.52	1.70	11.3	0% - 20%
ES2146902-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	100	99.7	0.5	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4104184)									
ES2146722-001	HS	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.2	2.3	0.0	No Limit
ES2146933-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	38.6	38.7	0.4	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4104183)									
ES2146722-001	HS	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.05	<0.05	0.0	No Limit
ES2146933-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	1.95	1.87	3.9	No Limit
EP005: Total Organic Carbon (TOC) (QC Lot: 4097794)									
ES2146550-001	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	16	19	18.8	0% - 50%
ES2146946-002	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	9	6	33.2	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 4094693)									
ES2146722-001	HS	EP030: Biochemical Oxygen Demand	----	2	mg/L	3	8	90.9	No Limit
ES2146896-004	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	4	2	66.7	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4100929)									
ES2146576-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2146718-004	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4100929)									
ES2146576-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit

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 Work Order : ES2146722
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : 680.30105 LSC waste transfer facilities SW monitoring



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4100929) - continued									
ES2146718-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 4100929)									
ES2146576-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
ES2146718-004	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



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

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4095514)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	99.8	99.2	101
EA010P: Conductivity by PC Titrator (QCLot: 4095507)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	98.8	91.1	107
				<1	2100 µS/cm	97.4	93.2	108
				<1	58301 µS/cm	103	93.3	106
EA045: Turbidity (QCLot: 4094759)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	96.5	91.0	105
ED037P: Alkalinity by PC Titrator (QCLot: 4095515)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	104	81.0	111
				----	50 mg/L	114	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4094688)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	106	82.0	122
				<1	500 mg/L	100	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 4094689)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	97.5	80.9	127
				<1	1000 mg/L	101	80.9	127
ED093F: Dissolved Major Cations (QCLot: 4104372)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	94.1	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.1	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.4	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.0	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 4104373)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	85.0	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	87.0	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	87.9	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	82.9	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	86.1	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	82.8	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	83.9	81.0	117
EG020T: Total Metals by ICP-MS (QCLot: 4105886)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	90.3	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	92.0	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	90.4	86.0	116



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG020T: Total Metals by ICP-MS (QCLot: 4105886) - continued								
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	88.8	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.8	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	88.7	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	88.8	79.0	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	94.2	85.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 4104375)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	101	83.0	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4104355)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	98.8	77.0	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4104180)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	105	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4094687)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	94.9	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4104181)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	98.0	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4104184)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	87.2	69.0	101
				<0.1	1 mg/L	102	70.0	118
				<0.1	5 mg/L	91.5	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4104183)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	95.3	71.0	101
				<0.01	0.442 mg/L	104	72.0	108
				<0.01	1 mg/L	101	70.0	130
EP005: Total Organic Carbon (TOC) (QCLot: 4097794)								
EP005: Total Organic Carbon	----	1	mg/L	<1	10 mg/L	97.8	72.0	120
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 4094693)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	200 mg/L	92.5	74.0	112
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4095503)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	77.1	55.8	112
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	95.1	71.6	113
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	98.0	56.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4100929)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	87.7	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4095503)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	79.4	57.9	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	99.6	62.5	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	93.2	61.5	121



Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
CAS Number	LOR	Unit						
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4100929)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	91.8	75.0	127
EP080: BTEXN (QCLot: 4100929)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	102	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	92.5	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	95.2	70.0	120
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	94.9	69.0	121
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	97.4	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	88.2	70.0	120
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4104053)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	126	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	126	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	118	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	127	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	115	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	114	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4104053)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	101	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	122	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	122	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	118	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	126	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	121	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	124	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	134
EP231X: Perfluorotridecanoic acid (PFTriDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	127	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	115	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4104053)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	111	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	91.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	92.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	110	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	126	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	118	65.0	136



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4104053) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	118	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4104053)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	124	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	128	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	116	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	101	71.4	144

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4094688)							
EW2105500-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	50 mg/L	114	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4094689)							
EW2105500-001	Anonymous	ED045G: Chloride	16887-00-6	50 mg/L	114	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 4104373)							
ES2146555-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	92.6	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	85.6	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	81.5	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	92.5	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	85.6	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	93.6	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	93.2	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4105886)							
ES2146867-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	91.1	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	90.8	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	89.5	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	90.8	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	88.4	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	88.0	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	89.6	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 4104375)							
ES2146555-003	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	91.2	70.0	130

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 Work Order : ES2146722
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : 680.30105 LSC waste transfer facilities SW monitoring



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4104355)							
ES2146726-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	93.7	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4104180)							
ES2146722-001	HS	EK055G: Ammonia as N	7664-41-7	1 mg/L	90.8	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4094687)							
EW2105500-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	128	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4104181)							
ES2146722-001	HS	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	85.0	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4104184)							
ES2146724-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	87.2	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4104183)							
ES2146724-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	99.5	70.0	130
EP005: Total Organic Carbon (TOC) (QCLot: 4097794)							
ES2146709-001	Anonymous	EP005: Total Organic Carbon	----	100 mg/L	113	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4100929)							
ES2146576-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	83.5	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4100929)							
ES2146576-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	82.7	70.0	130
EP080: BTEXN (QCLot: 4100929)							
ES2146576-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	82.3	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	77.3	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	95.2	70.0	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	93.5	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	98.5	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	97.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2146722	Page	: 1 of 10
Client	: SLR CONSULTING AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: EMMANUELLE ALIOTTI	Telephone	: +61 2 8784 8555
Project	: 680.30105 LSC waste transfer facilities SW monitoring	Date Samples Received	: 22-Dec-2021
Site	: ----	Issue Date	: 07-Jan-2022
Sampler	: EMMANUELLE ALIOTTI, JAMES MURDOCH	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural HS	----	----	----	23-Dec-2021	20-Dec-2021	3
EP025: Oxygen - Dissolved (DO)						
Clear Plastic Bottle - Natural HS	----	----	----	22-Dec-2021	20-Dec-2021	2

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	20	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	17	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	20	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	17	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) HS	20-Dec-2021	----	----	----	23-Dec-2021	20-Dec-2021	✖
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) HS	20-Dec-2021	----	----	----	23-Dec-2021	17-Jan-2022	✔
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045) HS	20-Dec-2021	----	----	----	22-Dec-2021	22-Dec-2021	✔



Matrix: **WATER**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) HS	20-Dec-2021	----	----	----	23-Dec-2021	03-Jan-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) HS	20-Dec-2021	----	----	----	22-Dec-2021	17-Jan-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) HS	20-Dec-2021	----	----	----	22-Dec-2021	17-Jan-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) HS	20-Dec-2021	----	----	----	31-Dec-2021	17-Jan-2022	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) HS	20-Dec-2021	----	----	----	31-Dec-2021	18-Jun-2022	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) HS	20-Dec-2021	04-Jan-2022	18-Jun-2022	✓	04-Jan-2022	18-Jun-2022	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) HS	20-Dec-2021	----	----	----	31-Dec-2021	17-Jan-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T) HS	20-Dec-2021	----	----	----	04-Jan-2022	17-Jan-2022	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) HS	20-Dec-2021	----	----	----	31-Dec-2021	17-Jan-2022	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) HS	20-Dec-2021	----	----	----	22-Dec-2021	22-Dec-2021	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) HS	20-Dec-2021	----	----	----	31-Dec-2021	17-Jan-2022	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) HS	20-Dec-2021	31-Dec-2021	17-Jan-2022	✓	31-Dec-2021	17-Jan-2022	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) HS	20-Dec-2021	31-Dec-2021	17-Jan-2022	✓	31-Dec-2021	17-Jan-2022	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP005: Total Organic Carbon (TOC)							
Amber TOC Vial - Sulfuric Acid (EP005) HS	20-Dec-2021	----	----	----	24-Dec-2021	17-Jan-2022	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025) HS	20-Dec-2021	----	----	----	22-Dec-2021	20-Dec-2021	✖
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030) HS	20-Dec-2021	----	----	----	22-Dec-2021	22-Dec-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) HS	20-Dec-2021	23-Dec-2021	27-Dec-2021	✓	31-Dec-2021	01-Feb-2022	✓
Amber VOC Vial - Sulfuric Acid (EP080) HS	20-Dec-2021	31-Dec-2021	03-Jan-2022	✓	31-Dec-2021	03-Jan-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) HS	20-Dec-2021	23-Dec-2021	27-Dec-2021	✓	31-Dec-2021	01-Feb-2022	✓
Amber VOC Vial - Sulfuric Acid (EP080) HS	20-Dec-2021	31-Dec-2021	03-Jan-2022	✓	31-Dec-2021	03-Jan-2022	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) HS	20-Dec-2021	31-Dec-2021	03-Jan-2022	✓	31-Dec-2021	03-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) HS	20-Dec-2021	31-Dec-2021	18-Jun-2022	✓	05-Jan-2022	18-Jun-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) HS	20-Dec-2021	31-Dec-2021	18-Jun-2022	✓	05-Jan-2022	18-Jun-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) HS	20-Dec-2021	31-Dec-2021	18-Jun-2022	✓	05-Jan-2022	18-Jun-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) HS	20-Dec-2021	31-Dec-2021	18-Jun-2022	✓	05-Jan-2022	18-Jun-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) HS	20-Dec-2021	31-Dec-2021	18-Jun-2022	✓	05-Jan-2022	18-Jun-2022	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	6	59	10.17	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	20	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	17	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	5	59	8.47	8.33	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS) - Continued							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	20	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	59	1.69	1.67	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	20	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Page : 7 of 10
 Work Order : ES2146722
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : 680.30105 LSC waste transfer facilities SW monitoring



Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Matrix Spikes (MS) - Continued							
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	17	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Calculated TDS (from Electrical Conductivity)	EA016	WATER	In house: Calculation from Electrical Conductivity (APHA 2510 B) using a conversion factor specified in the analytical report. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).



Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH ₃ G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO ₄ DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Total Organic Carbon	EP005	WATER	In house: Referenced to APHA 5310 B, The automated TOC analyzer determines Total and Inorganic Carbon by IR cell. TOC is calculated as the difference. This method is compliant with NEPM Schedule B(3)
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

Certificate of Analysis

Project No: **D213282** Final Report

Report Number: **82972** Date Issued: **24/12/2021**

Water Microbiology Darwin
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NATA Accredited Laboratory

Accreditation Number 15606

Accredited for compliance with ISO/IEC17025 - Testing

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Customer SLR Consulting	Project Title: Howard Springs	Date Received: 20/12/2021	Number of Samples Received: 1
Address: 21 Parap Rd Parap N.T 0820	Purchase Order: DML181 Paid Attention: Manue Aliotti	Date Completed: 23/12/2021	Number of Samples Tested: 1

The sample(s) referred to in this report were analysed by the following method(s):

Analyte	Method Reference	Accreditation Status	Analyte	Method Reference	Accreditation Status
E. coli (MPN)	AS 4276.21	NATA Accredited			

Lab Number	Sampling Point*	Customer Reference*	Free Cl (mg/L)*	Total Cl (mg/L)*	Sample Collection Temp (°C)*	Temp on Arrival (°C) #	Type of Sample
D213282-01	HS	-	Not supplied	Not supplied	Not supplied	23	Water

*Based on information supplied by customer ; # Reported arrival temperature reflects the approximate temperature of the group of samples when received by the laboratory. This measurement does not fall within the scope of the Laboratory's NATA Accreditation.

Holding Time

Max Holding Time is the maximum time permitted between sample collection and commencement of analysis. Reference: AS 2031.

^ indicates the sample has exceeded the maximum holding time permitted for the analysis. Affected results must be considered indicative only.

**Sample collection dates and times are reported as supplied by the customer and reported holding times are calculated from this information. While all due care is taken during transcription, the accuracy of this information is not guaranteed by the laboratory.

		E. coli	
		Max Holding Time: 24 hrs	
Lab Number	Sample Collected**	Date of Analysis	Analysed within**
D213282-01	20/12/2021 2:30pm	20/12/2021 4:10pm	1h 40m

Results of Analysis

	E. coli MPN/100mL
D213282-01 HS	17329

The results in this report were authorised by:

Stephen Poole - Laboratory Manager



CHAIN OF CUSTODY DOCUMENTATION

SLR Consulting Australia Pty Ltd

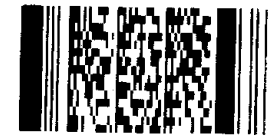
ABN 29 001 584 612

PROJECT OFFICE	☐ BRISBANE: Level 2, 25 Astor Terrace, Spring Hill, QLD 4000	☐ GOLD COAST: 194 Varsity Parade, Varsity Lakes, QLD 4227	☐ NEWCASTLE: 10 Kings Road, New Lambton, NSW 2305	☐ SYDNEY: 2 Lincoln Street, Lane Cove, Sydney, NSW 2086	☐ NELSON: 6/A Cambridge Street, Richmond, Port Nelson, 7070 NZ
	☐ CANBERRA: GPO Box 410, Canberra, ACT 2600	☐ MACKAY: 21 River Street, Mackay, QLD 4740	☐ PERTH: 303 Murray Street, Perth, WA 6000	☐ TOWNSVILLE: 514 Sturt Street, Townsville, QLD 4830	☐ NEW PLYMOUTH: Level 2, 10 Devon Street East, New Plymouth, 4310 NZ
(Tick one)	☒ DARWIN: 21 Parua Rd, Darwin, NT 0870	☐ MELBOURNE: Tel 11, 175 Wellington Parade, East Melbourne, VIC 3002	☐ ROCKHAMPTON: rockhampton@siliconsolutions.com	☐ AUCKLAND: 68 Beach Road, Auckland 1010 NZ	

CLIENT: Litchfield Council	LABORATORY: ALS Environmental	Turnaround Time (TAT) ☐ Standard TAT ☐ Non Standard or Urgent TAT Required TAT: Standard	COC Number of
PROJECT: LSC waste transfer facilities SW monitoring	LABORATORY ADDRESS: Charlton Crt, Winnellie NT		
PROJECT NUMBER: 680.30105	SAMPLER: E. Aliotti, J. Murdoch		
PROJECT MANAGER: Emmanuelle Aliotti	SAMPLER CONTACT No: E. Aliotti: 0455 656 856		
PM CONTACT No: 0455 656 856	Email Reports and Invoices to: ealiotti@slrconsulting.com; pturyn@slrconsulting.com		

[illegible]

Environmental Division
Sydney
Work Order Reference
ES2203458



Telephone : + 61-2-8784 8555

Sample Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; U = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles; G = unpreserved glass soil jar.

I attest that the proper field sampling procedures were used during the collection of these samples.					Temperature Received:		
Relinquished By Sampler		Date / Time	2/02/2022	Received by		Sign	Date / Time
Relinquished By	Sign	Date / Time		Received by		Sign	Date / Time
Relinquished By	Sign	Date / Time		Received by		Sign	Date / Time

Received by Aklina
3/2/22, 9am

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2203458

Client	: SLR CONSULTING AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: EMMANUELLE ALIOTTI	Contact	: Tyler Anderson
Address	: UNIT 5/21 PARAP ROAD PARAP 0820	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: ealiotti@slrconsulting.com	E-mail	: Tyler.Anderson@ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 680.30105 LSC waste transfer facilities SW monitoring	Page	: 1 of 3
Order number	: 680.30105	Quote number	: ES2021HEGAUS0004 (EN/032/21 Primary Work Only)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: EMMANUELLE ALIOTTI, JAMES MURDOCH		

Dates

Date Samples Received	: 03-Feb-2022 07:30	Issue Date	: 03-Feb-2022
Client Requested Due Date	: 10-Feb-2022	Scheduled Reporting Date	: 10-Feb-2022

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 21.2 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EP025 DO and Saturation% DO and DO Saturation%	WATER - IN-1 EC plus TDS Calculated	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO ₄ , Alkalinity	WATER - NT-08 Total Nitrogen + NO ₂ + NO ₃ + NH ₃ + Total P	WATER - W-02T 8 metals (Total)	WATER - W-05 TRH/BTEXN/8 Metals
ES2203458-001	02-Feb-2022 00:00	HS	✓	✓	✓	✓	✓	✓	✓
ES2203458-002	02-Feb-2022 00:00	HD	✓	✓	✓	✓	✓	✓	✓
ES2203458-003	02-Feb-2022 00:00	BS	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (PCT)	WATER - EA045 Turbidity	WATER - EP005 Total Organic Carbon (TOC)	WATER - EP030 BOD	WATER - EP231X PFAS - Full Suite (28 analytes)
ES2203458-001	02-Feb-2022 00:00	HS	✓	✓	✓	✓	✓
ES2203458-002	02-Feb-2022 00:00	HD	✓	✓	✓	✓	✓
ES2203458-003	02-Feb-2022 00:00	BS	✓	✓	✓	✓	✓

Proactive Holding Time Report

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

Matrix: **WATER**

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

Method	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)				Date	Evaluation	Date	Evaluation
EA005-P: pH by PC Titrator							
BS	Clear Plastic Bottle - Natural	----	02-Feb-2022	03-Feb-2022	✗	----	----
HD	Clear Plastic Bottle - Natural	----	02-Feb-2022	03-Feb-2022	✗	----	----
HS	Clear Plastic Bottle - Natural	----	02-Feb-2022	03-Feb-2022	✗	----	----
EP025: Oxygen - Dissolved							
BS	Clear Plastic Bottle - Natural	----	02-Feb-2022	03-Feb-2022	✗	----	----
HD	Clear Plastic Bottle - Natural	----	02-Feb-2022	03-Feb-2022	✗	----	----
HS	Clear Plastic Bottle - Natural	----	02-Feb-2022	03-Feb-2022	✗	----	----

CERTIFICATE OF ANALYSIS

Work Order : **ES2203458**
Client : **SLR CONSULTING AUSTRALIA PTY LTD**
Contact : EMMANUELLE ALIOTTI
Address : UNIT 5/21 PARAP ROAD
 PARAP 0820
Telephone : ----
Project : 680.30105 LSC waste transfer facilities SW monitoring
Order number : 680.30105
C-O-C number : ----
Sampler : EMMANUELLE ALIOTTI, JAMES MURDOCH
Site : ----
Quote number : EN/032/21 Primary Work Only
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 8
Laboratory : Environmental Division Sydney
Contact : Tyler Anderson
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61 2 8784 8555
Date Samples Received : 03-Feb-2022 07:30
Date Analysis Commenced : 03-Feb-2022
Issue Date : 10-Feb-2022 16:24



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	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Somlok Chai	Microbiologist	Sydney Microbiology, 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.

- MF = membrane filtration
- CFU = colony forming unit
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- Membrane filtration results for MW006 are reported as an estimate (~) due to the presence of many non-target organism colonies that may have inhibited the growth of the target organisms on the filter membrane. It may be informative to record this fact.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	HD	BS	----	----
Sampling date / time					02-Feb-2022 00:00	02-Feb-2022 00:00	02-Feb-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2203458-001	ES2203458-002	ES2203458-003	-----	-----
					Result	Result	Result	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.57	6.16	5.92	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		803	25	40	----	----
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	1	mg/L		522	16	26	----	----
EA045: Turbidity									
Turbidity	----	0.1	NTU		181	37.6	124	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		339	18	24	----	----
Total Alkalinity as CaCO3	----	1	mg/L		339	18	24	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		36	<1	<1	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		37	2	4	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		105	3	3	----	----
Magnesium	7439-95-4	1	mg/L		18	<1	1	----	----
Sodium	7440-23-5	1	mg/L		12	2	1	----	----
Potassium	7440-09-7	1	mg/L		21	1	4	----	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.002	<0.001	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	0.008	<0.005	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.002	<0.001	0.002	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	0.004	----	----
Copper	7440-50-8	0.001	mg/L		0.007	<0.001	0.017	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	HD	BS	----	----
Sampling date / time					02-Feb-2022 00:00	02-Feb-2022 00:00	02-Feb-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2203458-001	ES2203458-002	ES2203458-003	-----	-----
					Result	Result	Result	----	----
EG020T: Total Metals by ICP-MS - Continued									
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	0.001	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	0.001	0.004	----	----
Zinc	7440-66-6	0.005	mg/L		0.008	0.019	0.025	----	----
Iron	7439-89-6	0.05	mg/L		12.1	0.41	1.76	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.14	0.06	0.13	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		0.18	0.03	0.06	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.18	0.03	0.06	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.5	0.2	0.7	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		0.7	0.2	0.8	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.09	0.02	0.12	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		8.57	0.42	0.59	----	----
ø Total Cations	----	0.01	meq/L		7.78	0.26	0.38	----	----
ø Ionic Balance	----	0.01	%		4.81	----	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		4	3	6	----	----
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen	----	0.1	mg/L		10.3	10.8	11.0	----	----
Dissolved Oxygen - % Saturation	----	0.1	% saturation		87.6	91.5	87.5	----	----
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		<2	<2	<2	----	----



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				HS	HD	BS	----	----
Sampling date / time				02-Feb-2022 00:00	02-Feb-2022 00:00	02-Feb-2022 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2203458-001	ES2203458-002	ES2203458-003	-----	-----
				Result	Result	Result	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L	<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	----	----
^ Total Xylenes	----	2	µg/L	<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.03	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.22	<0.01	<0.01	----	----

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	HD	BS	----	----
Sampling date / time				02-Feb-2022 00:00	02-Feb-2022 00:00	02-Feb-2022 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES2203458-001	ES2203458-002	ES2203458-003	-----	-----	
				Result	Result	Result	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.02	<0.02	<0.02	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.02	<0.02	<0.02	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.11	<0.01	<0.01	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.02	<0.02	<0.02	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	0.05	<0.02	<0.02	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	HD	BS	----	----
Sampling date / time					02-Feb-2022 00:00	02-Feb-2022 00:00	02-Feb-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2203458-001	ES2203458-002	ES2203458-003	-----	-----
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		0.47	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		0.25	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		0.40	<0.01	<0.01	----	----
MW006: Faecal Coliforms & E.coli by MF									
<i>Escherichia coli</i>	----	1	CFU/100mL		2900	22000	~1700	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		110	106	109	----	----
Toluene-D8	2037-26-5	2	%		107	104	105	----	----
4-Bromofluorobenzene	460-00-4	2	%		102	96.7	99.9	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		97.4	96.2	101	----	----
13C8-PFOA	----	0.02	%		100	99.5	101	----	----



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
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

QUALITY CONTROL REPORT

Work Order	: ES2203458	Page	: 1 of 10
Client	: SLR CONSULTING AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: EMMANUELLE ALIOTTI	Contact	: Tyler Anderson
Address	: UNIT 5/21 PARAP ROAD PARAP 0820	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 680.30105 LSC waste transfer facilities SW monitoring	Date Samples Received	: 03-Feb-2022
Order number	: 680.30105	Date Analysis Commenced	: 03-Feb-2022
C-O-C number	: ----	Issue Date	: 10-Feb-2022
Sampler	: EMMANUELLE ALIOTTI, JAMES MURDOCH		
Site	: ----		
Quote number	: EN/032/21 Primary Work Only		
No. of samples received	: 3		
No. of samples analysed	: 3		



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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Somlok Chai	Microbiologist	Sydney Microbiology, 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.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 4152689)									
ES2203517-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	5.48	5.00	9.2	0% - 20%
ES2203517-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	5.47	5.41	1.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4152688)									
EW2200409-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	9630	9560	0.8	0% - 20%
ES2203519-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	108	110	1.6	0% - 20%
ES2203517-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	100	100	0.0	0% - 20%
ES2203517-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	100	100	0.0	0% - 20%
ES2203518-007	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	120	118	1.8	0% - 20%
ES2203571-005	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	<1	0.0	No Limit
EA045: Turbidity (QC Lot: 4155353)									
ES2203458-001	HS	EA045: Turbidity	----	0.1	NTU	181	183	1.1	0% - 20%
ES2203518-001	Anonymous	EA045: Turbidity	----	0.1	NTU	<0.1	<0.1	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 4152687)									
ES2203517-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	12	8	34.0	0% - 50%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	12	8	34.0	0% - 50%
ES2203517-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	14	12	14.9	0% - 50%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	14	12	14.9	0% - 50%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4155395)									
ES2203458-001	HS	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	36	36	0.0	0% - 20%

Page : 3 of 10
 Work Order : ES2203458
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : 680.30105 LSC waste transfer facilities SW monitoring



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4155395) - continued									
ES2203581-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1	1	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4155396)									
ES2203458-001	HS	ED045G: Chloride	16887-00-6	1	mg/L	37	38	0.0	0% - 20%
ES2203581-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	7	7	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4159108)									
ES2203205-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	1	1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ES2203822-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	17	16	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	15	14	8.1	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	198	197	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	35	34	0.0	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4159107)									
ES2203205-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.003	0.005	31.5	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES2203535-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0005	0.0006	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.041	0.044	6.4	0% - 20%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.026	0.026	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.028	0.029	3.8	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.417	0.419	0.3	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 4159029)									
ES2204106-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.031	0.032	0.0	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.008	0.009	13.2	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2203535-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0009	0.0008	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	<0.001	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 4159029) - continued									
ES2203535-001	Anonymous	EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.126	0.125	1.0	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.040	0.040	0.0	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.032	0.033	0.0	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	1.11	1.10	0.8	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.16	0.19	14.7	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 4159109)									
ES2203205-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2203260-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.1 µg/L	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4156480)									
ES2202944-019	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2203506-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4157197)									
ES2203205-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.09	0.12	31.5	0% - 50%
ES2203458-002	HD	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.06	0.05	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4155394)									
ES2203458-001	HS	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2203581-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4157198)									
ES2203205-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.0	No Limit
ES2203458-002	HD	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.03	0.05	32.8	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4157194)									
ES2203205-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.4	0.4	0.0	No Limit
ES2203458-003	BS	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.7	0.7	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4157193)									
ES2203205-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.02	<0.01	0.0	No Limit
ES2203458-003	BS	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.12	0.12	0.0	0% - 50%
EP005: Total Organic Carbon (TOC) (QC Lot: 4154333)									
ES2203458-001	HS	EP005: Total Organic Carbon	----	1	mg/L	4	4	0.0	No Limit
ES2203671-001	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	24	27	12.8	0% - 20%
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 4152632)									
ES2203426-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	4	66.7	No Limit
ES2203488-001	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	15	13	14.3	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4158312)									
ES2203458-001	HS	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2203696-006	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4158312)									
ES2203458-001	HS	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit

Page : 5 of 10
 Work Order : ES2203458
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : 680.30105 LSC waste transfer facilities SW monitoring



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4158312) - continued									
ES2203696-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 4158312)									
ES2203458-001	HS	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
ES2203696-006	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



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

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA005P: pH by PC Titrator (QCLot: 4152689)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.2	101
EA010P: Conductivity by PC Titrator (QCLot: 4152688)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	96.1	91.1	107
				<1	2100 µS/cm	98.4	93.2	108
				<1	58301 µS/cm	97.7	93.3	106
EA045: Turbidity (QCLot: 4155353)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	96.2	91.0	105
ED037P: Alkalinity by PC Titrator (QCLot: 4152687)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	105	81.0	111
				----	50 mg/L	102	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4155395)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	82.0	122
				<1	500 mg/L	97.8	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 4155396)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	104	80.9	127
				<1	1000 mg/L	95.4	80.9	127
ED093F: Dissolved Major Cations (QCLot: 4159108)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.8	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.7	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.3	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 4159107)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.1	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	92.6	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.1	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.0	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.2	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	90.2	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.3	81.0	117
EG020T: Total Metals by ICP-MS (QCLot: 4159029)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.4	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.5	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.2	86.0	116



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG020T: Total Metals by ICP-MS (QCLot: 4159029) - continued								
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	111	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.7	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.0	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	110	79.0	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.9	85.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 4159109)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	94.2	83.0	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4156480)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	96.2	77.0	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4157197)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	104	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4155394)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	102	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4157198)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	103	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4157194)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	91.9	69.0	101
				<0.1	1 mg/L	88.8	70.0	118
				<0.1	5 mg/L	99.5	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4157193)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	97.6	71.0	101
				<0.01	0.442 mg/L	104	72.0	108
				<0.01	1 mg/L	115	70.0	130
EP005: Total Organic Carbon (TOC) (QCLot: 4154333)								
EP005: Total Organic Carbon	----	1	mg/L	<1	10 mg/L	96.1	72.0	120
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 4152632)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	200 mg/L	99.0	74.0	112
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4152606)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	77.8	55.8	112
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	87.2	71.6	113
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	87.4	56.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4158312)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	87.0	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4152606)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	68.2	57.9	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	98.3	62.5	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	93.1	61.5	121



Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
CAS Number	LOR	Unit	Result					
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4158312)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	91.0	75.0	127
EP080: BTEXN (QCLot: 4158312)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	90.8	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	94.7	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	98.3	70.0	120
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	97.5	69.0	121
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	95.9	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	95.4	70.0	120
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4157187)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	98.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	94.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	86.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	87.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	94.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	101	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4157187)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.9	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	116	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	108	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	124	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	121	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134
EP231X: Perfluorotridecanoic acid (PFTriDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	73.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	125	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4157187)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	98.9	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	126	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	98.9	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	123	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	136



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4157187) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4157187)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	104	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	115	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	117	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	86.0	71.4	144

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4155395)							
ES2203458-001	HS	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	75.0	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4155396)							
ES2203458-001	HS	ED045G: Chloride	16887-00-6	50 mg/L	123	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 4159107)							
ES2203205-004	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	87.7	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	94.4	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	100.0	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	95.6	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	97.5	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	94.9	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	95.6	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4159029)							
ES2203458-002	HD	EG020A-T: Arsenic	7440-38-2	1 mg/L	99.8	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	101	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	102	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	104	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	105	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	100	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	99.7	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 4159109)							
ES2203205-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	94.6	70.0	130

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 Work Order : ES2203458
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : 680.30105 LSC waste transfer facilities SW monitoring



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4156480)							
ES2202944-019	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	77.8	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4157197)							
ES2203205-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	95.9	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4155394)							
ES2203458-001	HS	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	113	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4157198)							
ES2203205-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	95.5	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4157194)							
ES2203205-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	96.4	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4157193)							
ES2203205-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	115	70.0	130
EP005: Total Organic Carbon (TOC) (QCLot: 4154333)							
ES2203458-002	HD	EP005: Total Organic Carbon	----	100 mg/L	89.3	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4158312)							
ES2203458-001	HS	EP080: C6 - C9 Fraction	----	325 µg/L	90.4	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4158312)							
ES2203458-001	HS	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	92.1	70.0	130
EP080: BTEXN (QCLot: 4158312)							
ES2203458-001	HS	EP080: Benzene	71-43-2	25 µg/L	84.4	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	92.4	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	101	70.0	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	99.0	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	102	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	99.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2203458	Page	: 1 of 11
Client	: SLR CONSULTING AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: EMMANUELLE ALIOTTI	Telephone	: +61 2 8784 8555
Project	: 680.30105 LSC waste transfer facilities SW monitoring	Date Samples Received	: 03-Feb-2022
Site	: ----	Issue Date	: 10-Feb-2022
Sampler	: EMMANUELLE ALIOTTI, JAMES MURDOCH	No. of samples received	: 3
Order number	: 680.30105	No. of samples analysed	: 3

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural HS, HD, BS	----	----	----	03-Feb-2022	02-Feb-2022	1
EP025: Oxygen - Dissolved (DO)						
Clear Plastic Bottle - Natural HS, HD, BS	----	----	----	03-Feb-2022	02-Feb-2022	1

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	19	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	19	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P)	HD, HS, BS	02-Feb-2022	----	----	----	03-Feb-2022	02-Feb-2022	✘
EA010P: Conductivity by PC Titrator								
Clear Plastic Bottle - Natural (EA010-P)	HD, HS, BS	02-Feb-2022	----	----	----	03-Feb-2022	02-Mar-2022	✔



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA045: Turbidity								
Clear Plastic Bottle - Natural (EA045) HS, BS	HD,	02-Feb-2022	----	----	----	04-Feb-2022	04-Feb-2022	✓
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P) HS, BS	HD,	02-Feb-2022	----	----	----	03-Feb-2022	16-Feb-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G) HS, BS	HD,	02-Feb-2022	----	----	----	04-Feb-2022	02-Mar-2022	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G) HS, BS	HD,	02-Feb-2022	----	----	----	04-Feb-2022	02-Mar-2022	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) HS, BS	HD,	02-Feb-2022	----	----	----	08-Feb-2022	02-Mar-2022	✓
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) HS, BS	HD,	02-Feb-2022	----	----	----	08-Feb-2022	01-Aug-2022	✓
EG020T: Total Metals by ICP-MS								
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) HS, BS	HD,	02-Feb-2022	08-Feb-2022	01-Aug-2022	✓	08-Feb-2022	01-Aug-2022	✓
EG035F: Dissolved Mercury by FIMS								
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) HS, BS	HD,	02-Feb-2022	----	----	----	09-Feb-2022	02-Mar-2022	✓
EG035T: Total Recoverable Mercury by FIMS								
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T) HS, BS	HD,	02-Feb-2022	----	----	----	07-Feb-2022	02-Mar-2022	✓
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK055G) HS, BS	HD,	02-Feb-2022	----	----	----	07-Feb-2022	02-Mar-2022	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) HS, HD, BS	02-Feb-2022	----	----	----	04-Feb-2022	04-Feb-2022	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) HS, HD, BS	02-Feb-2022	----	----	----	07-Feb-2022	02-Mar-2022	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) HS, HD, BS	02-Feb-2022	07-Feb-2022	02-Mar-2022	✓	07-Feb-2022	02-Mar-2022	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) HS, HD, BS	02-Feb-2022	07-Feb-2022	02-Mar-2022	✓	07-Feb-2022	02-Mar-2022	✓
EP005: Total Organic Carbon (TOC)							
Amber TOC Vial - Sulfuric Acid (EP005) HS, HD, BS	02-Feb-2022	----	----	----	04-Feb-2022	02-Mar-2022	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025) HS, HD, BS	02-Feb-2022	----	----	----	03-Feb-2022	02-Feb-2022	✗
EP030: Biochemical Oxygen Demand (BOD)							
Clear Plastic Bottle - Natural (EP030) HS, HD, BS	02-Feb-2022	----	----	----	03-Feb-2022	04-Feb-2022	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) HS, HD, BS	02-Feb-2022	07-Feb-2022	09-Feb-2022	✓	08-Feb-2022	19-Mar-2022	✓
Amber VOC Vial - Sulfuric Acid (EP080) HS, HD, BS	02-Feb-2022	09-Feb-2022	16-Feb-2022	✓	09-Feb-2022	16-Feb-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) HS, HD, BS	02-Feb-2022	07-Feb-2022	09-Feb-2022	✓	08-Feb-2022	19-Mar-2022	✓
Amber VOC Vial - Sulfuric Acid (EP080) HS, HD, BS	02-Feb-2022	09-Feb-2022	16-Feb-2022	✓	09-Feb-2022	16-Feb-2022	✓



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080) HS, BS	HD,	02-Feb-2022	09-Feb-2022	16-Feb-2022	✓	09-Feb-2022	16-Feb-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X) HS, BS	HD,	02-Feb-2022	08-Feb-2022	01-Aug-2022	✓	08-Feb-2022	01-Aug-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) HS, BS	HD,	02-Feb-2022	08-Feb-2022	01-Aug-2022	✓	08-Feb-2022	01-Aug-2022	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) HS, BS	HD,	02-Feb-2022	08-Feb-2022	01-Aug-2022	✓	08-Feb-2022	01-Aug-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) HS, BS	HD,	02-Feb-2022	08-Feb-2022	01-Aug-2022	✓	08-Feb-2022	01-Aug-2022	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X) HS, BS	HD,	02-Feb-2022	08-Feb-2022	01-Aug-2022	✓	08-Feb-2022	01-Aug-2022	✓
MW006: Faecal Coliforms & E.coli by MF								
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) HS, BS	HD,	02-Feb-2022	----	----	----	03-Feb-2022	03-Feb-2022	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	6	60	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	12	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	19	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	12	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	10	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	17	11.76	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	5	60	8.33	8.33	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	15.00	15.00	✔	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS) - Continued							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	20	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	60	1.67	1.67	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	19	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Page : 8 of 11
 Work Order : ES2203458
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : 680.30105 LSC waste transfer facilities SW monitoring



Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Matrix Spikes (MS) - Continued							
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	10	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Calculated TDS (from Electrical Conductivity)	EA016	WATER	In house: Calculation from Electrical Conductivity (APHA 2510 B) using a conversion factor specified in the analytical report. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).



Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH ₃ G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO ₄ DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Total Organic Carbon	EP005	WATER	In house: Referenced to APHA 5310 B, The automated TOC analyzer determines Total and Inorganic Carbon by IR cell. TOC is calculated as the difference. This method is compliant with NEPM Schedule B(3)
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY DOCUMENTATION

SLR Consulting Australia Pty Ltd

ABN 29 001 584 612

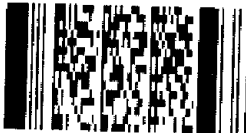
PROJECT OFFICE	☐ BRISBANE Level 2, 35 Astor Terrace Spring Hill, QLD 4000	☐ GOLD COAST 199 Varsity Parade Varsity Lakes, QLD 4227	☐ NEWCASTLE 10 Kings Road, New Lambton, NSW 2305	☐ SYDNEY 2 Lindson Street, Lane Cove, Sydney, NSW 2066	☐ NELSON 61A Cambridge Street, Richmond, Port Nelson, 7070 NZ
	☐ CANNBERRA GPO Box 430, Canberra ACT 2600	☐ MACKAY 21 River Street Mackay, QLD 4740	☐ PERTH 509 Murray Street, Perth, WA 6000	☐ TOWNSVILLE 514 Sturt Street, Townsville, QLD 4810	☐ NEW PLYMOUTH Level 2, 10 Devon Street East, New Plymouth, 4310 NZ
(Tick one)	☒ DARWIN 21 Parap Rd, Darwin, NT 0810	☐ MELBOURNE Int 31, 270 Wellington Parade, East Melbourne VIC 3002	☐ ROCKHAMPTON rockhampton@slrconsulting.com	☐ AUCKLAND 68 Beach Road, Auckland 1010 NZ	☐

CLIENT: Litchfield Council	LABORATORY: ALS Environmental	Turnaround Time (TAT)	COC Number
PROJECT: LSC waste transfer facilities SW monitoring	LABORATORY ADDRESS: Charlton Crt, Winnellie NT	☒ Standard TAT	1 of 1
PROJECT NUMBER: 680.30105	SAMPLER: E. Aliotti, J. Murdoch	☐ Non Standard or Urgent TAT	
PROJECT MANAGER: Emmanuelle Aliotti	SAMPLER CONTACT No: Flynn Mackley: 0428 012 854	Required TAT: Standard	
PM CONTACT No: 0455 656 856	Email Reports and Invoices to: ealiotti@slrconsulting.com; pturyn@slrconsulting.com		

COMMENTS OR ADDITIONAL DIRECTIONS					REQUESTED ANALYSIS														Additional Information (Comment on any gross contamination or specific requirements)	
No.	Sample ID	Date & Time	Matrix (Soil, water, AOM, etc)	Containers and Preservatives	EA005 - pH	IN-1 - EC, TDS	EP025 - DO	EA045 - Turbidity	NT-1&NT-2 - Major ions {Ca, Mg, Na, K, SO4, Cl, CO3 & HCO3}	EP005 - TOC	EP030 - BOD	NT-8 Total Nitrogen (as N), Nitrate, Nitrite, TRN, Total Phosphorus	W-5 - TRH (CG-C40) / BTEXN / 8 Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	W-2T - 8 Metals: As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	EG020T - Iron (Fe)	EP231X - PFAS - Full Suite (28 analytes)	MW006 - E. Coli			
1	HS	23/3/22	Water		X	X	X	X	X	X	X	X	X	X	X	X	X			
2	HD	23/3/22	Water		X	X	X	X	X	X	X	X	X	X	X	X	X			
	BS		Water		X	X	X	X	X	X	X	X	X	X	X	X	X			

Environmental Division
Sydney

Work Order Reference
ES2207094



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Environmental Division
Sydney
Work Order Reference
ES2207094



Telephone - 61-2-8784 8555

Sample Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; U = Lugols Iodine Preserved Bottle; STT = Sterile Sodium Thiosulfate Preserved Bottle; G = unpreserved glass soil jar;

I attest that the proper field sampling procedures were used during the collection of these samples.			
Relinquished By Sampler	FM	Date / Time	23 03 2022
Received by	Signature	Date / Time	10:25 am 23/03/22
Relinquished By	Signature	Date / Time	23/3/22
Received by	Signature	Date / Time	
Relinquished By	Signature	Date / Time	
Received by	Signature	Date / Time	

Temperature Received:

23.3 °C

0/25

LAB OF ORIGIN:
DARWIN

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2207094

Client : SLR CONSULTING AUSTRALIA PTY LTD Contact : EMMANUELLE ALIOTTI Address : UNIT 5/21 PARAP ROAD PARAP 0820 E-mail : ealiotti@slrconsulting.com Telephone : ---- Facsimile : ---- Project : 680.30105 LSC waste transfer facilities SW monitoring Order number : ---- C-O-C number : ---- Site : ---- Sampler : EMMANUELLE ALIOTTI, JAMES MURDOCH	Laboratory : Environmental Division Sydney Contact : Tyler Anderson Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 E-mail : Tyler.Anderson@ALSGlobal.com Telephone : +61 2 8784 8555 Facsimile : +61-2-8784 8500 Page : 1 of 3 Quote number : ES2021HEGAUS0004 (EN/032/21 Primary Work Only) QC Level : NEPM 2013 B3 & ALS QC Standard
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Dates

Date Samples Received : 24-Mar-2022 08:30 Client Requested Due Date : 31-Mar-2022	Issue Date : 24-Mar-2022 Scheduled Reporting Date : 31-Mar-2022
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Delivery Details

Mode of Delivery : Carrier No. of coolers/boxes : 1	Security Seal : Intact. Temperature : NT 23.3°C Syd 10.2°C - Ice present
Receipt Detail :	No. of samples received / analysed : 2 / 2

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **One VOC vial for sample 1, HS, was received broken.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Volatile organic compound analysis may be compromised as sample containers contained headspace for sample 1, HS. Please contact ALS for further information.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (PCT)	WATER - EA045 Turbidity	WATER - EP005 Total Organic Carbon (TOC)	WATER - EP025 Dissolved Oxygen (DO)	WATER - IN-1 EC plus TDS Calculated	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO ₄ , Alkalinity	WATER - W-05 TRH/BTEXN/8 Metals
ES2207094-001	23-Mar-2022 00:00	HS	✓	✓	✓	✓	✓	✓	✓
ES2207094-002	23-Mar-2022 00:00	HD	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EP030 BOD	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - MW006 (Ec) E.coli by Membrane Filtration	WATER - NT-08 Total Nitrogen + NO ₂ + NO ₃ + NH ₃ + Total P	WATER - W-02T 8 metals (Total)
ES2207094-001	23-Mar-2022 00:00	HS	✓	✓	✓	✓	✓	✓
ES2207094-002	23-Mar-2022 00:00	HD	✓	✓	✓	✓	✓	✓

Proactive Holding Time Report

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

Matrix: **WATER**

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

Method	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)				Date	Evaluation	Date	Evaluation
EA005-P: pH by PC Titrator							
HD	Clear Plastic Bottle - Natural	----	23-Mar-2022	24-Mar-2022	✗	----	----
HS	Clear Plastic Bottle - Natural	----	23-Mar-2022	24-Mar-2022	✗	----	----
EP025: Oxygen - Dissolved							
HD	Clear Plastic Bottle - Natural	----	23-Mar-2022	24-Mar-2022	✗	----	----
HS	Clear Plastic Bottle - Natural	----	23-Mar-2022	24-Mar-2022	✗	----	----

CERTIFICATE OF ANALYSIS

Work Order : **ES2207094**
Client : **SLR CONSULTING AUSTRALIA PTY LTD**
Contact : EMMANUELLE ALIOTTI
Address : UNIT 5/21 PARAP ROAD
 PARAP 0820
Telephone : ----
Project : 680.30105 LSC waste transfer facilities SW monitoring
Order number : ----
C-O-C number : ----
Sampler : EMMANUELLE ALIOTTI, JAMES MURDOCH
Site : ----
Quote number : EN/032/21 NSW/NT Only (Primary Work Only)
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 8
Laboratory : Environmental Division Sydney
Contact : Tyler Anderson
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61 2 8784 8555
Date Samples Received : 24-Mar-2022 08:30
Date Analysis Commenced : 24-Mar-2022
Issue Date : 31-Mar-2022 12:10



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 Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Sarah Griffiths	Microbiologist	Sydney Microbiology, 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.

- MF = membrane filtration
- CFU = colony forming unit
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	HD	----	----	----
Sampling date / time					23-Mar-2022 00:00	23-Mar-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2207094-001	ES2207094-002	-----	-----	-----
					Result	Result	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.52	7.45	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		586	121	----	----	----
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	1	mg/L		381	79	----	----	----
EA045: Turbidity									
Turbidity	----	0.1	NTU		1230	62.0	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		254	37	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		254	37	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		26	28	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		28	2	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		79	22	----	----	----
Magnesium	7439-95-4	1	mg/L		14	1	----	----	----
Sodium	7440-23-5	1	mg/L		13	2	----	----	----
Potassium	7440-09-7	1	mg/L		21	2	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.002	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L		0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.028	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		0.0002	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L		0.008	0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		0.013	0.006	----	----	----

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	HD	----	----	----
Sampling date / time				23-Mar-2022 00:00	23-Mar-2022 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES2207094-001	ES2207094-002	-----	-----	-----	
				Result	Result	----	----	----	
EG020T: Total Metals by ICP-MS - Continued									
Nickel	7440-02-0	0.001	mg/L	0.008	<0.001	----	----	----	
Lead	7439-92-1	0.001	mg/L	0.020	0.001	----	----	----	
Zinc	7440-66-6	0.005	mg/L	0.118	0.021	----	----	----	
Iron	7439-89-6	0.05	mg/L	134	0.65	----	----	----	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	9.35	<0.01	----	----	----	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	0.05	0.02	----	----	----	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.09	----	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	0.05	0.11	----	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	12.3	0.4	----	----	----	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	12.4	0.5	----	----	----	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.77	0.05	----	----	----	
EN055: Ionic Balance									
∅ Total Anions	----	0.01	meq/L	6.41	1.38	----	----	----	
∅ Total Cations	----	0.01	meq/L	6.20	1.32	----	----	----	
∅ Ionic Balance	----	0.01	%	1.66	----	----	----	----	
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L	11	6	----	----	----	
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen	----	0.1	mg/L	8.6	9.7	----	----	----	
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L	2	<2	----	----	----	
EP080/071: Total Petroleum Hydrocarbons									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	HD	----	----	----
Sampling date / time					23-Mar-2022 00:00	23-Mar-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2207094-001	ES2207094-002	-----	-----	-----
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.04	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.02	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.18	<0.01	----	----	----

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	HD	----	----	----
Sampling date / time				23-Mar-2022 00:00	23-Mar-2022 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES2207094-001	ES2207094-002	-----	-----	-----	
				Result	Result	----	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	----	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	----	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	----	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.02	<0.02	----	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.02	<0.02	----	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.11	<0.01	----	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.03	<0.02	----	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	----	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	----	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	----	----	----	
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	----	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	----	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	----	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	----	----	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	----	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	----	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	----	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	0.04	<0.02	----	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HS	HD	----	----	----
Sampling date / time					23-Mar-2022 00:00	23-Mar-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2207094-001	ES2207094-002	-----	-----	-----
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		0.46	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		0.20	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		0.39	<0.01	----	----	----
MW006: Faecal Coliforms & E.coli by MF									
<i>Escherichia coli</i>	----	1	CFU/100mL		~20	~2000	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		94.9	89.4	----	----	----
Toluene-D8	2037-26-5	2	%		122	109	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		107	102	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		103	95.1	----	----	----
13C8-PFOA	----	0.02	%		93.5	97.0	----	----	----



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
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

QUALITY CONTROL REPORT

Work Order	: ES2207094	Page	: 1 of 13
Client	: SLR CONSULTING AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: EMMANUELLE ALIOTTI	Contact	: Tyler Anderson
Address	: UNIT 5/21 PARAP ROAD PARAP 0820	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 680.30105 LSC waste transfer facilities SW monitoring	Date Samples Received	: 24-Mar-2022
Order number	: ----	Date Analysis Commenced	: 24-Mar-2022
C-O-C number	: ----	Issue Date	: 31-Mar-2022
Sampler	: EMMANUELLE ALIOTTI, JAMES MURDOCH		
Site	: ----		
Quote number	: EN/032/21 NSW/NT Only (Primary Work Only)		
No. of samples received	: 2		
No. of samples analysed	: 2		



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

This Quality Control Report contains the following information:

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

Signatories

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

<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
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Sarah Griffiths	Microbiologist	Sydney Microbiology, 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.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA010P: Conductivity by PC Titrator (QC Lot: 4250301)									
ES2210255-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	10200	10400	2.2	0% - 20%
ES2210255-014	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2860	2860	0.2	0% - 20%
ES2210292-011	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	3330	3410	2.2	0% - 20%
ES2210305-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	17600	18500	5.1	0% - 20%
ES2209885-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1750	1790	2.3	0% - 20%
EA045: Turbidity (QC Lot: 4250102)									
ES2207094-001	HS	EA045: Turbidity	----	0.1	NTU	1230	1240	1.1	0% - 20%
ES2210265-002	Anonymous	EA045: Turbidity	----	0.1	NTU	106	108	1.9	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4250303)									
ES2209885-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	641	644	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	641	644	0.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4248926)									
ES2210405-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2050	2040	0.3	0% - 20%
ES2207094-001	HS	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	27	4.6	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4248927)									
ES2210405-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	7	8	0.0	No Limit
ES2207094-001	HS	ED045G: Chloride	16887-00-6	1	mg/L	28	29	4.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4254037)									
ES2207094-001	HS	ED093F: Calcium	7440-70-2	1	mg/L	79	79	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	13	13	0.0	0% - 50%



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED093F: Dissolved Major Cations (QC Lot: 4254037) - continued									
ES2207094-001	HS	ED093F: Potassium	7440-09-7	1	mg/L	21	20	0.0	0% - 20%
ES2210452-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	182	183	0.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	230	235	2.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1270	1290	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	45	46	0.0	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4254036)									
ES2207094-001	HS	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES2210452-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.006	0.006	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.015	0.017	9.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4248759)									
EN2202341-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.016	0.015	0.0	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.06	<0.05	23.7	No Limit
EN2202371-005	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.228	0.218	4.6	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.012	0.005	71.9	No Limit
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit		
EG035F: Dissolved Mercury by FIMS (QC Lot: 4254038)									
ES2209755-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2210414-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4250320)									
ES2210132-004	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2210304-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4253879)									
ES2207094-001	HS	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	9.35	9.46	1.2	0% - 20%
ES2210684-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.09	0.08	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4248925)									
ES2210434-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	1.72	1.72	0.0	0% - 20%
ES2207094-001	HS	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.05	0.06	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4253880)									
ES2210132-008	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2207094-001	HS	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.05	0.04	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4253876)									
ES2207094-001	HS	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	12.3	12.1	1.4	0% - 20%
ES2210132-009	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.7	0.7	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4253875)									
ES2207094-001	HS	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.77	0.78	0.0	0% - 20%
ES2210132-009	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP005: Total Organic Carbon (TOC) (QC Lot: 4249306)									
ES2207094-001	HS	EP005: Total Organic Carbon	----	1	mg/L	11	11	0.0	0% - 50%
ES2210418-009	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	1	1	0.0	No Limit
EP030: Biochemical Oxygen Demand (BOD) (QC Lot: 4247815)									
ES2207094-001	HS	EP030: Biochemical Oxygen Demand	----	2	mg/L	2	6	100	No Limit
ES2210060-004	Anonymous	EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4247301)									
ES2210130-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<0.10 mg/L	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<0.05 mg/L	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<0.05 mg/L	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4248224)									
CA2201842-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
CA2202060-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4247301)									
ES2210130-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<0.10 mg/L	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<0.10 mg/L	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<0.10 mg/L	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4248224)									
CA2201842-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
CA2202060-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 4248224)									



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 4248224) - continued									
CA2201842-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
CA2202060-002	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4250464)									
EP2203499-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.85	0.87	2.4	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.68	0.71	4.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.04	0.05	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2203498-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	42.8	42.4	1.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	204	225	9.7	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.36	0.38	4.3	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	1.89	1.98	4.9	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	10.0	10.1	0.5	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4250464)									
EP2203499-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.10	0.10	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.13	0.12	11.3	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.44	0.43	0.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.10	0.10	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2203498-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	8.54	8.72	2.0	0% - 20%



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4250464) - continued									
EP2203498-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	3.54	3.62	2.4	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	24.4	24.2	1.2	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	2.78	3.11	11.2	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.38	0.40	5.4	0% - 20%
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.4	1.4	0.0	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4250464)									
EP2203499-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2203498-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	0.67	0.70	4.3	0% - 20%
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4250464)									
EP2203499-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

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 Work Order : ES2207094
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : 680.30105 LSC waste transfer facilities SW monitoring



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4250464) - continued									
EP2203499-002	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.18	0.16	16.7	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2203498-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	10.8	10.8	0.1	0% - 20%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	0.10	0.12	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4250464)									
EP2203499-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	2.62	2.64	0.8	0% - 20%
EP2203498-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	312	333	6.6	0% - 20%



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

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA005P: pH by PC Titrator (QCLot: 4250302)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.2	101
EA010P: Conductivity by PC Titrator (QCLot: 4250301)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	94.7	89.9	110
				<1	2100 µS/cm	96.6	90.2	111
				<1	58301 µS/cm	100	93.3	106
EA045: Turbidity (QCLot: 4250102)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	93.8	91.0	105
ED037P: Alkalinity by PC Titrator (QCLot: 4250303)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	98.3	81.0	111
				----	50 mg/L	106	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4248926)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	109	82.0	122
				<1	500 mg/L	104	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 4248927)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	96.0	80.9	127
				<1	1000 mg/L	96.7	80.9	127
ED093F: Dissolved Major Cations (QCLot: 4254037)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	97.3	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	108	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	112	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 4254036)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	91.2	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	94.4	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	88.1	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.0	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	87.8	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	89.8	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	88.6	81.0	117
EG020T: Total Metals by ICP-MS (QCLot: 4248759)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.7	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.7	86.0	116



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG020T: Total Metals by ICP-MS (QCLot: 4248759) - continued								
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	100	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.1	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	79.0	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	100	85.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 4254038)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	93.9	83.0	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4250320)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	92.0	77.0	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4253879)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	102	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4248925)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	102	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4253880)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4253876)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	91.9	69.0	101
				<0.1	1 mg/L	101	70.0	118
				<0.1	5 mg/L	102	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4253875)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	99.3	71.3	126
				<0.01	0.442 mg/L	103	71.3	126
				<0.01	1 mg/L	108	71.3	126
EP005: Total Organic Carbon (TOC) (QCLot: 4249306)								
EP005: Total Organic Carbon	----	1	mg/L	<1	10 mg/L	111	72.0	120
EP030: Biochemical Oxygen Demand (BOD) (QCLot: 4247815)								
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	200 mg/L	92.5	74.0	112
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4247301)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	65.1	55.8	112
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	86.2	71.6	113
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	98.1	56.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4248224)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	98.1	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4247301)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	74.0	57.9	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	90.0	62.5	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	76.2	61.5	121



Sub-Matrix: **WATER**

Method Blank (MB) Report				Laboratory Control Spike (LCS) Report				
				Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)		
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4248224)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	100	75.0	127
EP080: BTEXN (QCLot: 4248224)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	101	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	105	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	104	70.0	120
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	103	69.0	121
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	105	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	106	70.0	120
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4250464)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	130	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	90.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	104	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	106	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	131	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4250464)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	100	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	128	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	122	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	114	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	100	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	134
EP231X: Perfluorotridecanoic acid (PFTriDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	118	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4250464)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	123	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.4	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	121	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	114	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	129	65.0	136



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4250464) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4250464)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	119	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	136	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	90.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	96.4	71.4	144

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4248926)							
ES2207094-001	HS	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	115	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4248927)							
ES2207094-001	HS	ED045G: Chloride	16887-00-6	50 mg/L	122	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 4254036)							
ES2209755-005	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	108	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	114	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	107	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	112	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	109	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	110	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	111	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4248759)							
EN2202341-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	110	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	111	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	111	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	114	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	123	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	112	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	110	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 4254038)							
ES2207094-002	HD	EG035F: Mercury	7439-97-6	0.01 mg/L	86.4	70.0	130

Matrix Spike (MS) Report

<i>Spike</i>	<i>SpikeRecovery(%)</i>	<i>Acceptable Limits (%)</i>	
<i>Concentration</i>	<i>MS</i>	<i>Low</i>	<i>High</i>



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4250464) - continued							
EP2203499-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	129	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	126	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	111	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	116	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	103	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	122	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4250464)							
EP2203499-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.7	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	111	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	110	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	117	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	125	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	113	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	115	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	111	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	114	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.25 µg/L	132	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	110	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4250464)							
EP2203499-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	106	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	102	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	121	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	108	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	128	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	94.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4250464)							
EP2203499-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	101	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	105	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	100	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2207094	Page	: 1 of 11
Client	: SLR CONSULTING AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: EMMANUELLE ALIOTTI	Telephone	: +61 2 8784 8555
Project	: 680.30105 LSC waste transfer facilities SW monitoring	Date Samples Received	: 24-Mar-2022
Site	: ----	Issue Date	: 31-Mar-2022
Sampler	: EMMANUELLE ALIOTTI, JAMES MURDOCH	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.

Page : 2 of 11
 Work Order : ES2207094
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : 680.30105 LSC waste transfer facilities SW monitoring



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK055G: Ammonia as N by Discrete Analyser	ES2207094--001	HS	Ammonia as N	7664-41-7	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural HS, HD		----	----	----	25-Mar-2022	23-Mar-2022	2
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural HS, HD		----	----	----	25-Mar-2022	23-Mar-2022	2

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Alkalinity by PC Titrator	1	20	5.00	10.00	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	5	57	8.77	10.00	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	0	2	0.00	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P) HS, HD		23-Mar-2022	----	----	----	25-Mar-2022	23-Mar-2022	✖



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010P: Conductivity by PC Titrator								
Clear Plastic Bottle - Natural (EA010-P) HS,	HD	23-Mar-2022	----	----	----	25-Mar-2022	20-Apr-2022	✓
EA045: Turbidity								
Clear Plastic Bottle - Natural (EA045) HS,	HD	23-Mar-2022	----	----	----	25-Mar-2022	25-Mar-2022	✓
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P) HS,	HD	23-Mar-2022	----	----	----	25-Mar-2022	06-Apr-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G) HS,	HD	23-Mar-2022	----	----	----	25-Mar-2022	20-Apr-2022	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G) HS,	HD	23-Mar-2022	----	----	----	25-Mar-2022	20-Apr-2022	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) HS,	HD	23-Mar-2022	----	----	----	29-Mar-2022	20-Apr-2022	✓
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) HS,	HD	23-Mar-2022	----	----	----	29-Mar-2022	19-Sep-2022	✓
EG020T: Total Metals by ICP-MS								
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) HS,	HD	23-Mar-2022	25-Mar-2022	19-Sep-2022	✓	25-Mar-2022	19-Sep-2022	✓
EG035F: Dissolved Mercury by FIMS								
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) HS,	HD	23-Mar-2022	----	----	----	30-Mar-2022	20-Apr-2022	✓
EG035T: Total Recoverable Mercury by FIMS								
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T) HS,	HD	23-Mar-2022	----	----	----	25-Mar-2022	20-Apr-2022	✓
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK055G) HS,	HD	23-Mar-2022	----	----	----	29-Mar-2022	20-Apr-2022	✓
EK057G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural (EK057G) HS,	HD	23-Mar-2022	----	----	----	25-Mar-2022	25-Mar-2022	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK059G) HS,	HD	23-Mar-2022	----	----	----	29-Mar-2022	20-Apr-2022	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK061G) HS,	HD	23-Mar-2022	29-Mar-2022	20-Apr-2022	✓	29-Mar-2022	20-Apr-2022	✓
EK067G: Total Phosphorus as P by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK067G) HS,	HD	23-Mar-2022	29-Mar-2022	20-Apr-2022	✓	29-Mar-2022	20-Apr-2022	✓
EP005: Total Organic Carbon (TOC)								
Amber TOC Vial - Sulfuric Acid (EP005) HS,	HD	23-Mar-2022	----	----	----	25-Mar-2022	20-Apr-2022	✓
EP025: Oxygen - Dissolved (DO)								
Clear Plastic Bottle - Natural (EP025) HS,	HD	23-Mar-2022	----	----	----	25-Mar-2022	23-Mar-2022	✗
EP030: Biochemical Oxygen Demand (BOD)								
Clear Plastic Bottle - Natural (EP030) HS,	HD	23-Mar-2022	----	----	----	24-Mar-2022	25-Mar-2022	✓
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071) HS,	HD	23-Mar-2022	25-Mar-2022	30-Mar-2022	✓	28-Mar-2022	04-May-2022	✓
Amber VOC Vial - Sulfuric Acid (EP080) HS,	HD	23-Mar-2022	29-Mar-2022	06-Apr-2022	✓	29-Mar-2022	06-Apr-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071) HS,	HD	23-Mar-2022	25-Mar-2022	30-Mar-2022	✓	28-Mar-2022	04-May-2022	✓
Amber VOC Vial - Sulfuric Acid (EP080) HS,	HD	23-Mar-2022	29-Mar-2022	06-Apr-2022	✓	29-Mar-2022	06-Apr-2022	✓
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080) HS,	HD	23-Mar-2022	29-Mar-2022	06-Apr-2022	✓	29-Mar-2022	06-Apr-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X) HS,	HD	23-Mar-2022	28-Mar-2022	19-Sep-2022	✓	28-Mar-2022	19-Sep-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) HS,	HD	23-Mar-2022	28-Mar-2022	19-Sep-2022	✓	28-Mar-2022	19-Sep-2022	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) HS,	HD	23-Mar-2022	28-Mar-2022	19-Sep-2022	✓	28-Mar-2022	19-Sep-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) HS,	HD	23-Mar-2022	28-Mar-2022	19-Sep-2022	✓	28-Mar-2022	19-Sep-2022	✓

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)	HD	23-Mar-2022	28-Mar-2022	19-Sep-2022	✓	28-Mar-2022	19-Sep-2022	✓
MW006: Faecal Coliforms & E.coli by MF								
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)	HD	23-Mar-2022	----	----	----	24-Mar-2022	24-Mar-2022	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	1	20	5.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	11	18.18	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	5	57	8.77	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	19	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	17	11.76	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	0	2	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	16	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	5	57	8.77	8.33	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	2	100.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	15.00	15.00	✔	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS) - Continued							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	20	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Biochemical Oxygen Demand (BOD)	EP030	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	57	1.75	1.67	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Page : 8 of 11
 Work Order : ES2207094
 Client : SLR CONSULTING AUSTRALIA PTY LTD
 Project : 680.30105 LSC waste transfer facilities SW monitoring



Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Matrix Spikes (MS) - Continued							
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Calculated TDS (from Electrical Conductivity)	EA016	WATER	In house: Calculation from Electrical Conductivity (APHA 2510 B) using a conversion factor specified in the analytical report. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).



Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH ₃ G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO ₄ DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Total Organic Carbon	EP005	WATER	In house: Referenced to APHA 5310 B, The automated TOC analyzer determines Total and Inorganic Carbon by IR cell. TOC is calculated as the difference. This method is compliant with NEPM Schedule B(3)
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)
Biochemical Oxygen Demand (BOD)	EP030	WATER	In house: Referenced to APHA 5210 B. The 5-Day BOD test provides an empirical measure of the oxygen consumption capacity of a given water. A portion of the sample is diluted into oxygenated, nutrient rich water, and a seed added to begin biological decay. The initial dissolved oxygen content is measured, then the bottle is sealed and incubated for five days. The remaining dissolved oxygen is measured, and from the difference, the demand for oxygen, by biological decay, is determined. This method is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

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