

18 December, 2013

Rajan Sinha
Yara Pilbara Nitrates Pty Ltd
5th Floor, 182 St Georges Terrace
PERTH WA 6000

Our Reference: 0220651

Attention: Rajan Sinha

Dear Rajan,



RE: GROUNDWATER MONITORING EVENT OCTOBER 2013

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) was engaged by Yara Pilbara Nitrates Pty Ltd (YPNPL) to conduct a Groundwater Monitoring Event (GME) at the proposed site for the YPNPL Technical Ammonium Nitrates Production Facility (TANPF) on 17 and 18 October 2013.

This report outlines the detection of analytes above trigger levels. The site location and layout are illustrated in *Figures 1 and 2*, provided in *Annex A*.

For the convenience of the reader, an acronyms and abbreviations table is provided below.

Table 1 *Acronyms and Abbreviations*

Acronym/Abbreviation	Expansion	Further Definition (if applicable)
ALS	ALS Environmental (laboratory)	
ANZECC	Australian and New Zealand Environment Conservation Council	
AS/NZS	Australian Standard/New Zealand Standard	
BIE	Burrup Industrial Estate	
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes	

Acronym/Abbreviation	Expansion	Further Definition (if applicable)
CaCO ₃	Calcium Carbonate	
CEO	Chief Executive Officer	
EQL	Estimated Quantitation Limit	The minimum concentration of an analyte that can be measured within specified limits of precision and accuracy.
ERM	Environmental Resources Management Ltd Pty	
GME	Groundwater Monitoring Event	
H&S	Health and Safety	
ha	Hectare	
mg	Milligram	
L	Litre	
MW	Monitoring Well	
N	Nitrogen	
NATA	National Association of Testing Authorities	The Australian government's endorsed provider of accreditation for laboratories and similar testing facilities.
NO ₂ -	Nitrite	
NO ₃ -	Nitrate	
OEPA	Office of the Environmental Protection Authority	
ORP	Oxidation Reduction Potential (Redox)	A measure of the electrochemical potential or electron availability within the water and soil.
P	Phosphorus	
QA/QC	Quality Assurance / Quality Control	
RPD	Relative Percentage Difference	The relative change or difference between two values, expressed as a percentage.
TANPF	Technical Ammonium Nitrates Production Facility	
TDS	Total dissolved solids	A measure of the organic and inorganic dissolved substances in water,

Acronym/Abbreviation	Expansion	Further Definition (if applicable)
TPH	Total Petroleum Hydrocarbons	
TSS	Total Suspended Solids	A measure of all particles suspended in water.
WARN	Work Activity Risk Assessment	
YPNPL	Yara Pilbara Nitrates Pty Ltd	
µg	Microgram	

2. PROJECT APPRECIATION

The site (including temporary laydown areas) occupies approximately 35 ha of land in the north-western section of Lot 3017. Lot 3017 totals approximately 49 ha and is located within the Burrup Industrial Estate (BIE). The existing ammonia fertiliser plant is situated adjacent to the western boundary of Lot 3017.

The civil works for the TANPF include the following activities:

- excavation and backfilling works;
- foundations of structures, permanent buildings equipment and modules;
- concrete structures (*in situ* and precast);
- pipe racks foundations;
- roads and pavements;
- underground piping and grounding;
- electrical trenches civil works; and
- civil completion.

3. REGULATORY REQUIREMENTS

Condition 8-4 of Ministerial Statement No. 870 requires YPNPL to sample/monitor all groundwater bores required by Condition 8-3 every six months. The condition sets a trigger value of 10% above the baseline contaminant concentrations which were characterised and established prior to the commencement of works at the site.

In accordance with Condition 8-5 of Ministerial Statement No. 870, YPNPL are required to:

- 1) Report findings to the Chief Executive Officer (CEO) of the Office of the Environmental Protection Authority (OEPA) within 7 days of the exceedence being identified;
- 2) Provide evidence which allows determination of the cause of the exceedence; and
- 3) If determined by the CEO to be project attributable, take actions to address the exceedence within 7 days of the determination being made.

YPNPL reported the exceedences identified in the October 2013 GME by 4 November 2013, within 7 days of the exceedences being identified.

4. OBJECTIVES

The primary objective of the October GME was to assess groundwater quality and determine if the site work has impacted the groundwater below the site. Given the variability recorded between the March and April GMEs, the October 2013 GME offered an opportunity to further explore the natural variability of groundwater conditions.

5. SCOPE OF WORKS

In order to achieve the project objectives, the following scope of work was completed by ERM:

- 1) Preparation of site works risk/hazard analysis documents (Work Activity Risk Assessment (WARN)) and the preparation of a health and safety plan to oversee safe work practices at the site.
- 2) Preparation of a travel communication plan to be implemented during field work to maintain contact between site personnel and the ERM project manager;
- 3) A single GME in October 2013, comprising the sampling of five established on-site wells (*Figure 2*).

It is noted that two of these wells (MW1 and MW4) had been redrilled, on Saturday 7th September 2013, to replace their damaged predecessors.

The new wells were redrilled using the airlift method (to remove introduced fluids) in accordance with:

- Water Quality Protection Note 30: Groundwater Monitoring Bores, Department of Water, Government of Western Australia; and
- Minimum Construction Requirements for Water Bores in Australia, February 2012, Third Edition.

The replacement wells were then constructed with 50 mm Class 18 PVC casing and a lockable protective casing extending approximately 700 mm above ground level.

The GME included:

- a) Gauging of groundwater depths;
 - b) Measurement of groundwater field parameters using a calibrated water quality meter and included temperature, pH, oxygen reduction potential (ORP), electrical conductivity and dissolved oxygen during well purging to determine the stabilisation of field parameters prior to groundwater sampling; and
 - c) Collection of groundwater samples to assess groundwater conditions.
- 4) Laboratory analysis of groundwater samples, including a Modified Acid Sulphate Soils Suite and an Extended Groundwater Quality suite. Five primary samples (one from each well), one duplicate sample and relevant quality assurance samples were taken. Analysis was undertaken by ALS Environmental (ALS), a NATA accredited laboratory, to ensure quality assurance.
 - 5) Screening of laboratory results against trigger levels.
 - 6) The preparation of this short factual report to detail the scope of works undertaken and the results of the investigation.

6. METHODOLOGY

6.1 HEALTH AND SAFETY

All works were completed in accordance with ERM health and safety (H&S) procedures. This included the preparation of site works risk/hazard analysis documents and the preparation of an H&S plan to ensure safe work practices at the site. A travel communication plan was also prepared.

6.2 GAUGING OF GROUNDWATER DEPTHS

Groundwater monitoring wells were gauged during the GME with an interface probe in accordance with ERM's standard operation procedures. Groundwater levels where recorded, are presented in Table 1 of *Annex B*.

6.3 GROUNDWATER SAMPLING

The five existing groundwater monitoring wells (MW1-MW5) were purged and sampled in accordance with ERM's standard groundwater sampling protocols using disposable plastic bailers. A minimum of three well volumes were purged from each groundwater monitoring well prior to sampling. Field parameters were measured after each well volume and the sample collected following the stabilisation of field parameters over three consecutive readings.

Field parameters were measured using a calibrated water quality meter and included temperature, pH, oxygen reduction potential, electrical conductivity and dissolved oxygen. The stabilised water quality parameters are detailed in Table 1 of *Annex B*.

All groundwater samples were collected, stored and transported to the laboratory under strict chain of custody procedures.

Field measured pH has been used in the interpretation of results in this report as, given the location of the TANPF site, it was not possible to deliver the samples to the laboratory within the 6 hour holding time for this parameter.

6.4 QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC samples were collected and analysed in accordance with *Australian Standard AS/NZS 5667.11:1998: Water Quality – Sampling – Guidance on Sampling of Groundwater*. This included the collection of field duplicates at a frequency of no less than 1 in 10 samples as well as a rinsate sample from the interface meter to demonstrate the sufficiency of the decontamination procedure.

A single duplicate sample was collected from MW1 and submitted for laboratory analysis. Of the Relative Percentage Difference (RPD) values able to be calculated, all were within the acceptable limit except Zinc. Given the high level of reproducibility for other analytes, this is not considered to represent an unacceptable level of uncertainty with respect to data quality.

A rinsate sample was collected from the equipment and submitted for laboratory analysis following the GME. The results showed all analytes below the laboratory limit of detection, albeit that limit of detection was raised due to the hyper salinity of the groundwater.

The trip blank sample stored in the esky during transit did not record any analytes above the limit of detection providing confidence that there has been no cross contamination from samples during transit and storage.

6.5 LABORATORY ANALYSIS

Groundwater samples were submitted to ALS. Samples were analysed for a suite of compounds including:

- Cations and anions including calcium, magnesium, sodium, potassium, phosphate, ammonia, carbonate, bicarbonate, chloride, sulphate, nitrate, nitrite and silica;
- Total dissolved solids (TDS), and total alkalinity; and
- Dissolved metals including; aluminium, arsenic, cadmium, chromium, iron, lead, manganese, mercury, selenium and zinc.

The water quality parameters analysed are detailed in Table 2 and table 3 of *Annex B*.

7. RESULTS AND DISCUSSION

Groundwater elevation ranged from 2.02 m (MW3) to 6.44 m (MW1) below top of casing. Compared to April 2013, water level has dropped in MW2 and MW5 and increased slightly in MW3. The observed pattern is likely as a result of a combination of reduced rainfall over the period and tidal variation. Results of samples collected from MW1 and MW4 during the October round of monitoring were not compared to the April results due to these being replacement wells drilled near the original locations but not necessarily directly comparable as elevations are likely slightly different .

Groundwater temperature ranged between 29.3 (MW3) and 31.2 °C (MW1); which is lower than previous monitoring in April 2013 and can most likely be attributed to seasonal changes in weather conditions.

The pH results ranged between 4.32 (MW4) and 6.21 (MW5). The lowest pH was recorded in MW4, but mildly acidic readings as low as 5.34 were recorded in MW1 and MW2.

ORP readings were consistent for the duration of the sampling period (approx. 81.4 – 158.6 mV).

Electrical conductivity was consistent across the monitoring wells compared to previous GME's. Electrical conductivity increases with increased salinity towards the tidal flats. MW1 and MW2 are brackish, MW3 is saline and groundwater from MW4 and MW5 is hypersaline.

Dissolved oxygen content was recorded as 0.30 - 1.99 mg/L during the GME. Results at MW2 are notably lower than readings taken in March 2013 and October 2012 possible as a result of low rainfall recharge to the groundwater.

The field and laboratory results of the GME are presented in *Annex B* and laboratory analytical reports and chain of custody documentation are presented in *Annex C*. A review of the data displayed a number of low exceedences of the trigger levels (set at 10% above the maximum baseline concentration). The following exceedences of trigger levels were observed.

Table 2 Exceedences of Trigger Levels (October 2013)

Well	Analyte	Exceedence	Trends (over past 7 GMEs)
MW1	Iron (Filtered)	0.437 mg/L compared to the maximum acceptable baseline value of 0.264 mg/L.	Historical results (between <0.005 - 0.437 mg/L) likely represent natural variation in groundwater chemistry.
	Manganese	0.425 mg/L compared to the maximum acceptable baseline value of 0.242 mg/L.	Historical results (between 0.038 - 0.425 mg/L) likely represent natural variation in groundwater chemistry.
MW2	No exceedences recorded		
MW3	Aluminium (Filtered)	0.021 mg/L compared to the maximum acceptable baseline value of 0.0209 mg/L.	Historical results (between 0.005 - 0.072 mg/L) likely represent natural variation in groundwater chemistry and the actual difference between the reported concentration and the baseline value is in fact very small.
	Selenium	0.0038 mg/L compared to the maximum acceptable baseline value of 0.0033 mg/L.	Historical results (between 0.0038 - <0.01 mg/L) likely represent natural variation in groundwater chemistry. Furthermore the actual difference between the reported concentration and the baseline value is very small.

Well	Analyte	Exceedence	Trends (over past 7 GMEs)
MW4	Ammonia as N	877 µg/L compared to the maximum acceptable baseline value of 814 µg/L. [April 2013 - Recorded concentration for Ammonia as N in MW5 was 1000 µg/].	It is noted that this bore replaces the previous one. Constructed deeper, results likely represent natural variation in groundwater chemistry over time and with depth (between <5 - 877 µg/L).
	Aluminium (Filtered)	Unable to verify results at MW4 as the detection limit of <0.025 mg/L is higher than the maximum acceptable baseline value of 0.0209 mg/L due to the hyper saline groundwater.	Although the elevation of the limits of reporting marginally higher than the baseline value, it is considered that any potential exceedence would be marginally above the baseline trigger value and likely to represent natural variation in groundwater chemistry (between <0.005 - 0.031 mg/L).
	Manganese	0.277 mg/L compared to the maximum acceptable baseline value of 0.242 mg/L.	It is noted that this bore replaces the previous one. Constructed deeper, results likely indicate a natural variation in groundwater chemistry over time and with depth (between 0.011 - 0.277 mg/L).
	Selenium	Unable to verify results at MW4 as the detection limit of <0.01 mg/L is higher than the maximum acceptable baseline value of 0.0033 mg/L. Due to the hyper saline groundwater.	Although the elevation of the limits of reporting are marginally higher than the baseline value, it is considered that any potential exceedence would be marginally above the baseline trigger value and likely to represent natural variation in groundwater chemistry.
MW5	Chromium (hexavalent) (Filtered)	0.012 mg/L compared to the maximum acceptable baseline value of 0.011 mg/L.	No trend identified as results from October 2013 only. Although the result is marginally above the baseline value, it is considered to still be representative of natural variation in groundwater chemistry.

Elsewhere concentrations of analytes were consistent with previously recorded conditions.

There could be natural variations in groundwater chemistry between the original and replacement wells because a different part of the aquifer is being sampled.

8. CONCLUSION

The results of the October 2013 GME display a number of exceedences in the set trigger levels, though exceedences were very small in most of the cases. With the exception of aluminium at MW3, none of the analytes which exceeded a trigger level during the April 2013 GME exceeded the trigger level during the October 2013 GME at the same well location. Sampling methodology has remained consistent.

It is noted that the salinity of the groundwater varies from brackish to hypersaline the closer the wells are to the natural surface water drainage systems. Groundwater in the vicinity of MW5 has likely been derived from multiple directions, while those monitoring wells located further away from the main drainage intercept groundwater from more discrete flow directions.

Until the wells are surveyed in, it is not possible to assess actual groundwater flow direction. However, what is likely is that depending on the groundwater flow paths intercepted by the monitoring wells, groundwater chemistry is likely to differ between wells. In addition, rainfall events and cyclonic activity causing localised flooding will result in seasonal changes to groundwater recharge and resultant groundwater chemistry.

The results continue to support the notion that variability in the groundwater chemistry observed both between monitoring wells and between monitoring events with no clear trends suggests the results depict natural variability in groundwater chemistry as opposed to increasing concentrations of analytes associated with site activities. None of the analytes observed exceeding the trigger levels are directly attributed to current on site activities.

It was previously commented that site levelling activities may have exposed areas of ground and soils not previously exposed to rainfall and leaching, and it is possible that leaching of these soils has released localised increased metals into the groundwater.

With the drilling and installation of replacement wells MW1 and MW4, the variation in bore depth and deeper screens may also lead to variation in groundwater chemistry where sampled, if compared with the previous MW1 and MW4 wells, because a different part of the aquifer is being sampled (for example, the deeper in the bedrock profile and closer to the tidal flats the higher the salinity). Should future sampling show consistent concentrations representative of natural background conditions in these replacement wells that are outside of the current trigger limits, there may be a need to review and propose revised trigger levels.

The current Groundwater well network (with the new MW1 and MW4) is in compliance with condition 8-4 and provide a representative survey of the groundwater characteristics within our site.

Exceedences recorded during October 2013 GME can be attributed to natural variation in groundwater chemistry and are not considered to be the result of activities at the construction site.

The variability in chemistry between monitoring wells and between monitoring events should continue to be assessed biannually in order to build a more comprehensive data set of range in concentration over time and determine whether there are any clear trends emerging and if so, are they related to any changed site activities. Based on this data, the current trigger level concentrations may need to be revaluated to account for natural variability.

Should you require any clarification please contact the undersigned.

Yours sincerely,
for Environmental Resources Management Australia Pty Ltd



Sean Scaife
Project Manager



Paul Myers-Allen
Partner

Attachments:

Annex A – Site Location & Well Locations

Annex B – Results Tables

Annex C – Laboratory Analytical Reports

Annex A

SITE LOCATION & WELL LOCATIONS



Legend

- Area of Disturbance 'The Site'
- Lot 3017
- Site D Boundary



Client:	Yarra Pilbara Nitrates Pty Ltd
Drawing No:	0086269p_GME_OCT_2013_G001_R0.mxd
Date:	05/11/2013
Drawn By:	DN
Drawing Size:	A4
Reviewed By:	SLS

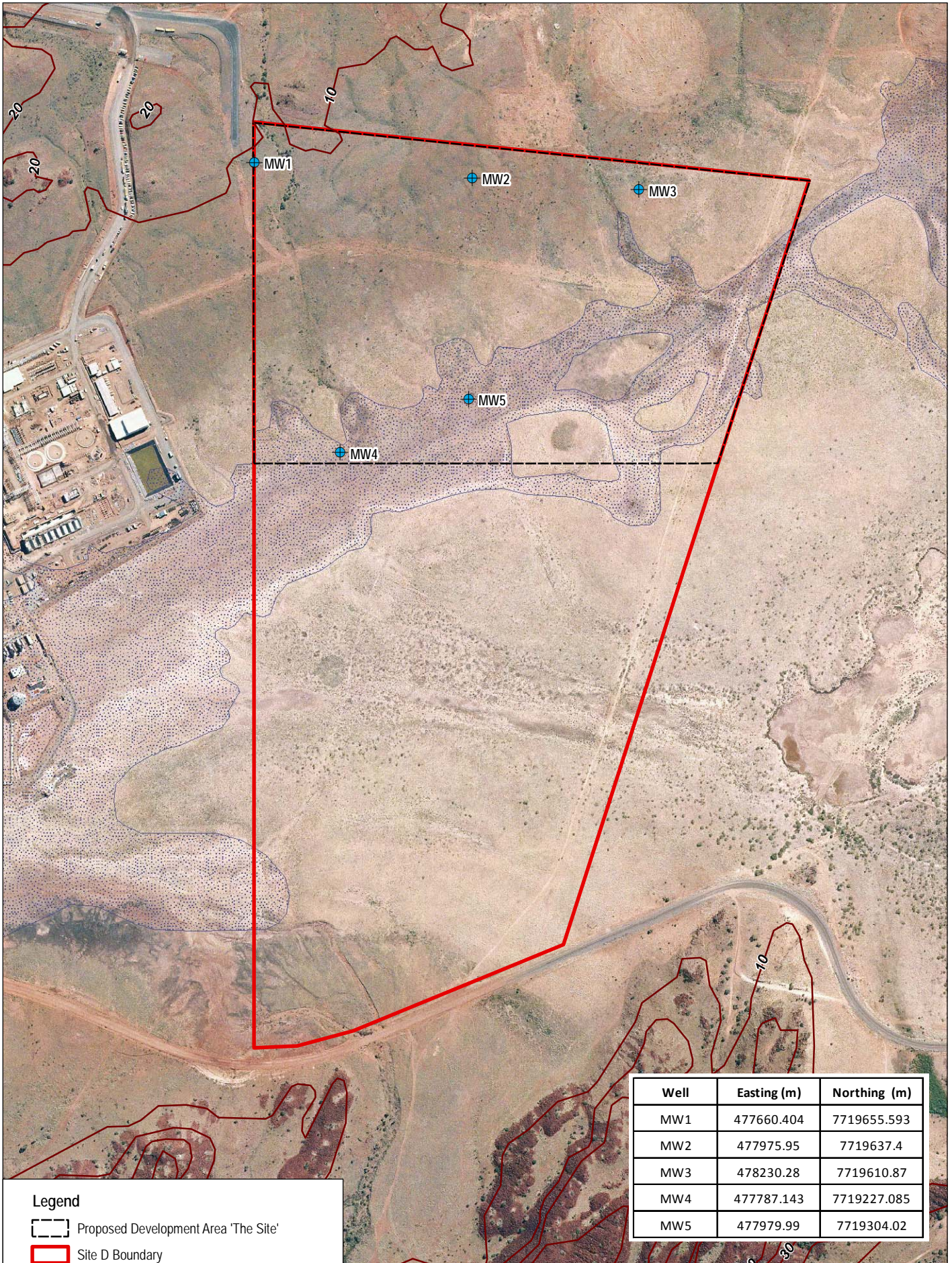
Figure 1 - Site Location

GME Report October 2013

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

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Well	Easting (m)	Northing (m)
MW1	477660.404	7719655.593
MW2	477975.95	7719637.4
MW3	478230.28	7719610.87
MW4	477787.143	7719227.085
MW5	477979.99	7719304.02

Legend

- Proposed Development Area 'The Site'
- Site D Boundary
- + Monitoring Well
- Contour Elevation (10m interval)
- Saline Coastal Flat



Client: Yarra Pilbara Nitrates Pty Ltd
 Drawing No: 0086269p_GME_OCT_2013_G002_R0.mxd
 Date: 16/12/2013 Drawing Size: A4
 Drawn By: DN Reviewed By: SLS

Figure 2 - Well Locations

GME Report October 2013

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

Environmental Resources Management ANZ
 Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney



Annex B

RESULTS TABLES



Table 1. Groundwater Summary - Gauging and Field Parameter Results

YPNPL - Burrup TANFP - 0220651

Well ID	Sample Date	Sample Time	Groundwater Gauging Results (October 2013)				Field Parameters (October 2013)					Gauging Results April 2013		Gauging Results September 2013	
			Easting	Northing	Bore Depth	Depth to Water	Dissolved Oxygen	Conductivity	Redox	pH (Field)	Temp	Bore Depth	Depth to Water	Bore Depth	Depth to Water
			mToC	mToC	mg/L	ms/cm	mV	pH_Units	oC	mToC	mToC	mToC	mToC		
MW1 (old)												8.74	4.90		
MW1 (new)	17/10/2013	15:04	477660.404	7719655.593	17.4	6.44	0.30	1.74	81.40	5.60	31.20			16.50	10.00
MW2	17/10/2013	16:10	477975.95	7719637.4	8.19	5.80	1.17	3.51	158.60	5.34	29.90	8.21	4.60		
MW3	17/10/2013	16:51	478230.28	7719610.87	8.17	2.02	1.75	14.70	145.90	6.17	29.30	8.19	3.01		
MW4 (old)												7.35	4.07		
MW4 (new)	17/10/2013	14:15	477787.143	7719227.085	14.4	3.82	1.99	124.40	135.00	4.32	31.00			13.50	8.25
MW5	17/10/2013	12:25	477979.99	7719304.02	8.95	4.53	0.51	104.00	125.60	6.21	30.30	5.97	2.02		

Notes

- Field Parameters represent the last of three consecutive readings taken prior to sampling
- MW1 and MW4 Drilling September 2013 results included in final columns to compare with the previous GME, as provides a more accurate representation.

**MW1 and MW4 replaced in September 2013

Table 3 - QA/QC Samples
Relative Percent Differences (RPDs)

Field Duplicates (WATER)
Filter: SDG in ('EP1307966')
October 2013 GME



SDG	EP1307966	EP1307966	
Field_ID	MW1	DUP01	RPD *
Sampled_Date-Time	17/10/2013 15:00	17/10/2013 15:00	

Chem_Group	ChemName	Units	EQL			
	Silicon as SiO2 (Filtered)	mg/l	0.1	31.8	32.0	1
BTEX	Benzene	µg/L	1	<1.0	<1.0	0
	Ethylbenzene	µg/L	2	<2.0	<2.0	0
	Toluene	µg/L	2	<2.0	<2.0	0
	Total BTEX	mg/l	0.001	<0.001	<0.001	0
	Xylene (m & p)	µg/L	2	<2.0	<2.0	0
	Xylene (o)	µg/L	2	<2.0	<2.0	0
	Xylene Total	µg/L	2	<2.0	<2.0	0
	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02	0
Inorganics	Alkalinity (Hydroxide) as CaCO3	µg/l	1000	<1000.0	<1000.0	0
	Alkalinity (total) as CaCO3	mg/l	1	367.0	371.0	1
	Ammonia as N	µg/l	5	32.0	27.0	17
	Anions Total	meq/L	0.01	17.2	17.1	1
	Alkalinity (Bicarbonate as CaCO3)	mg/l	1	367.0	371.0	1
	Alkalinity (Carbonate as CaCO3)	mg/l	1	<1.0	<1.0	0
	Cations Total	meq/L	0.01	17.5	17.4	1
	Chloride	mg/l	1	300.0	296.0	1
	Fluoride	mg/l	0.1	0.8	0.8	0
	Hydrogen sulfide	mg/l	0.1	<0.1	<0.1	0
	Ionic Balance	%	0.01	0.87	0.88	1
	Kjeldahl Nitrogen Total	mg/l	0.05	0.15	0.26	54
	Nitrate (as N)	mg/l	0.002	0.086	0.078	10
	Nitrite (as N)	mg/l	0.002	<0.002	<0.002	0
	Nitrogen (Total Oxidised)	mg/l	0.002	0.086	0.078	10
	Nitrogen (Total)	µg/l	50	240.0	340.0	34
	Reactive Phosphorus as P	mg/l	0.001	0.007	0.005	33
	Sodium (Filtered)	mg/l	1	265.0	257.0	3
	Sulphate (Filtered)	mg/l	1	69.0	66.0	4
	Sulphide	mg/l	0.1	<0.1	<0.1	0
	TDS	mg/l	10	940.0	964.0	3
	Hardness as CaCO3 (Filtered)	mg/l	1	284.0	298.0	5
	TSS	mg/l	5	25.0	22.0	13
Lead	Lead (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
Metals	Aluminium (Filtered)	mg/l	0.005	0.006	0.005	18
	Aluminium	mg/l	0.01	0.38	0.43	12
	Arsenic (Filtered)	mg/l	0.0002	0.0008	0.0008	0
	Cadmium (Filtered)	mg/l	0.00005	<0.0001	<0.0001	0
	Calcium (Filtered)	mg/l	1	66.0	70.0	6
	Chromium (hexavalent) (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Chromium (III+VI) (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Chromium (III+VI) (Filtered)	mg/l	0.0002	<0.0002	<0.0002	0
	Chromium (Trivalent) (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Copper (Filtered)	mg/l	0.0005	<0.0005	<0.0005	0
	Iron (Filtered)	mg/l	0.002	0.437	0.432	1
	Iron	mg/l	0.05	1.47	1.51	3
	Magnesium (Filtered)	mg/l	1	29.0	30.0	3
	Manganese (Filtered)	mg/l	0.0005	0.425	0.43	1
	Mercury	mg/l	0.0001	<0.0001	<0.0001	0
	Nickel (Filtered)	mg/l	0.0005	0.001	0.0011	10
	Phosphorus	mg/l	0.005	0.015	0.03	67
	Potassium (Filtered)	mg/l	1	13.0	12.0	8
	Selenium (Filtered)	mg/l	0.0002	0.0005	0.0005	0
	Silicon (Filtered)	µg/l	50	14800.0	14900.0	1
	Zinc (Filtered)	mg/l	0.001	0.005	0.001	133**
PAH/Phenols	Naphthalene	µg/L	5	<5.0	<5.0	0
TPH	F2-NAPHTHALENE	mg/l	0.1	<0.1	<0.1	0
	C6 - C9	µg/L	20	<20.0	<20.0	0
	C10 - C14	µg/L	50	<50.0	<50.0	0
	C15 - C28	µg/L	100	<100.0	<100.0	0
	C29-C36	µg/L	50	<50.0	<50.0	0
	+C10 - C36 (Sum of total)	µg/L	50	<50.0	<50.0	0
	C10 - C40 (Sum of total)	µg/L	100	<100.0	<100.0	0
	C10-C16	mg/l	0.1	<0.1	<0.1	0
	C16-C34	mg/l	0.1	<0.1	<0.1	0
	C34-C40	mg/l	0.1	<0.1	<0.1	0
	C6-C10	mg/l	0.02	<0.02	<0.02	0

* Relative Percent Differences (RPDs) have only been considered where a concentration is greater than 1 times the Estimated Quantitation limit (EQL).

** ERM consider the acceptable RPD for each EQL multiplier range as: 100 (1-5 x EQL); 40 (5-10 x EQL); 40 (> 10 x EQL).

Annex C

LABORATORY ANALYTICAL REPORTS

CERTIFICATE OF ANALYSIS

Work Order	: EP1307966	Page	: 1 of 11
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Perth
Contact	: SEAN SCAIFE	Contact	: Shuk Hui Li
Address	: LEVEL 6, GRAIN POOL BLDG 172 ST GEORGE TCE WA, AUSTRALIA 6000	Address	: 10 Hod Way Malaga WA Australia 6090
E-mail	: sean.scaife@erm.com	E-mail	: ShukHui.Li@alsglobal.com
Telephone	: +61 08 9321 5200	Telephone	: 08 9209 7655
Facsimile	: +61 08 9321 5262	Facsimile	: 08 9209 7600
Project	: 0220615 YPNPL-TANPF GME	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 18-OCT-2013
C-O-C number	: A07449	Issue Date	: 29-OCT-2013
Sampler	: JG LM	No. of samples received	: 8
Site	: BURRUP	No. of samples analysed	: 8
Quote number	: EP/901/13		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



General Comments

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

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

- **EG020: Metals LOR for particular sample(s) raised due to high TDS content**
- **EG050G LL-F: LOR raised due to possible sample matrix interference.**
- **EG093: Some samples required dilution (X5) and(X2) prior to analysis, due to matrix interference and LOR's have been raised accordingly.**
- **It has been noted that NH3 is greater than TKN in sample ID MW4, however this difference is within the limits of experimental variation.**
- **It has been noted that NOx is greater than TN in sample ID MW3, however this difference is within the limits of experimental variation.**



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Agnes Szilagyi	Senior Organic Chemist	Perth Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Benjamin Nicholson	Metals Chemist	Perth Inorganics
Canhuang Ke	Metals Instrument Chemist	Perth Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Chas Tucker	Senior Inorganic Chemist	Perth Inorganics
Efua Wilson	Metals Chemist	Perth Inorganics



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MW1	MW2	MW3	MW4	MW5
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EP1307966-001	EP1307966-002	EP1307966-003	EP1307966-004	EP1307966-005
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	10	mg/L	940	2040	7280	136000	75400
EA025: Suspended Solids								
Suspended Solids (SS)	----	5	mg/L	25	10	54	74	63
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	284	593	1180	18500	9860
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	367	281	479	109	207
Total Alkalinity as CaCO3	----	1	mg/L	367	281	479	109	207
ED040F: Dissolved Major Anions								
Silicon as SiO2	14464-46-1	0.1	mg/L	31.8	22.8	37.2	15.8	13.0
Silicon	7440-21-3	0.05	mg/L	14.8	10.6	17.4	7.38	6.06
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	69	156	606	5590	3080
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	300	811	3140	69800	40500
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	66	112	91	972	599
Magnesium	7439-95-4	1	mg/L	29	76	232	3900	2030
Sodium	7440-23-5	1	mg/L	265	507	2180	45400	25700
Potassium	7440-09-7	1	mg/L	13	18	97	1640	988
EG020F: Dissolved Metals by ICP-MS								
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.020	<0.010
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.38	0.04	<0.01	1.33	0.74
Iron	7439-89-6	0.05	mg/L	1.47	0.06	<0.05	1.63	0.80
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG049G LL-F: Dissolved Trivalent Chromium - Low Level								
Trivalent Chromium	16065-83-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.020	<0.010
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level								
Hexavalent Chromium	18540-29-9	0.001	mg/L	<0.001	<0.001	<0.001	<0.010	<0.010



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MW1	MW2	MW3	MW4	MW5
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EP1307966-001	EP1307966-002	EP1307966-003	EP1307966-004	EP1307966-005
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	----	----	----	<25	<10
Selenium	7782-49-2	2	µg/L	----	----	----	<10	<4
Iron	7439-89-6	5	µg/L	----	----	----	<25	<10
Arsenic	7440-38-2	0.5	µg/L	----	----	----	<2.5	1.3
Cadmium	7440-43-9	0.2	µg/L	----	----	----	<1.0	<0.4
Chromium	7440-47-3	0.5	µg/L	----	----	----	<2.5	12.0
Copper	7440-50-8	1	µg/L	----	----	----	5	<2
Lead	7439-92-1	0.2	µg/L	----	----	----	<1.0	<0.4
Manganese	7439-96-5	0.5	µg/L	----	----	----	277	1.3
Nickel	7440-02-0	0.5	µg/L	----	----	----	47.9	7.3
Zinc	7440-66-6	5	µg/L	----	----	----	<25	<10
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	6	<5	21	----	----
Iron	7439-89-6	2	µg/L	437	<2	10	----	----
Selenium	7782-49-2	0.2	µg/L	0.5	3.1	3.8	----	----
Arsenic	7440-38-2	0.2	µg/L	0.8	<0.2	0.8	----	----
Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	<0.05	----	----
Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	<0.2	----	----
Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.5	----	----
Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Manganese	7439-96-5	0.5	µg/L	425	<0.5	3.8	----	----
Nickel	7440-02-0	0.5	µg/L	1.0	<0.5	0.6	----	----
Zinc	7440-66-6	1	µg/L	5	<1	<1	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.8	0.6	1.6	0.3	0.6
EK084: Un-ionized Hydrogen Sulfide								
Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EK085M: Sulfide as S2-								
Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	17.2	31.7	111	2090	1210
Total Cations	----	0.01	meq/L	17.5	34.4	121	2390	1340
Ionic Balance	----	0.01	%	0.87	3.95	4.37	6.66	5.06



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MW1	MW2	MW3	MW4	MW5
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EP1307966-001	EP1307966-002	EP1307966-003	EP1307966-004	EP1307966-005
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
Ultra-Trace Nutrients								
Ammonia as N	7664-41-7	0.005	mg/L	0.032	<0.005	<0.005	0.877	<0.005
Nitrite as N	----	0.002	mg/L	<0.002	<0.002	0.002	<0.002	<0.002
Nitrate as N	14797-55-8	0.002	mg/L	0.086	2.28	0.611	2.89	3.29
Nitrite + Nitrate as N	----	0.002	mg/L	0.086	2.28	0.613	2.89	3.29
Total Kjeldahl Nitrogen as N	----	0.05	mg/L	0.15	0.42	<0.05	0.71	0.17
Total Nitrogen as N	----	0.05	mg/L	0.24	2.70	0.53	3.60	3.46
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.007	0.003	<0.001	<0.001	0.005
Total Phosphorus as P	----	0.005	mg/L	0.015	0.008	<0.005	0.014	0.011

EP080S: TPH(V)/BTEX Surrogates



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

MW1	MW2	MW3	MW4	MW5
17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00

Client sampling date / time

Compound	CAS Number	LOR	Unit	EP1307966-001	EP1307966-002	EP1307966-003	EP1307966-004	EP1307966-005
EP080S: TPH(V)/BTEX Surrogates - Continued								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	114	126	119	110	95.5
Toluene-D8	2037-26-5	0.1	%	91.6	91.6	91.6	97.3	102
4-Bromofluorobenzene	460-00-4	0.1	%	96.9	96.6	98.5	99.1	88.6



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				DUP01	RIN01	TRIP BLANK	----	----
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	EP1307966-006	EP1307966-007	EP1307966-008	----	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	10	mg/L	964	----	----	----	----
EA025: Suspended Solids								
Suspended Solids (SS)	----	5	mg/L	22	----	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	298	----	----	----	----
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	371	<1	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	371	<1	----	----	----
ED040F: Dissolved Major Anions								
Silicon as SiO2	14464-46-1	0.1	mg/L	32.0	----	----	----	----
Silicon	7440-21-3	0.05	mg/L	14.9	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	66	<1	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	296	<1	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	70	<1	----	----	----
Magnesium	7439-95-4	1	mg/L	30	<1	----	----	----
Sodium	7440-23-5	1	mg/L	257	<1	----	----	----
Potassium	7440-09-7	1	mg/L	12	<1	----	----	----
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	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	----	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	----	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L	----	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	----	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L	----	<0.005	----	----	----
Iron	7439-89-6	0.05	mg/L	----	<0.05	----	----	----
EG020T: Total Metals by ICP-MS								



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				DUP01	RIN01	TRIP BLANK	---	---
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	---	---
Compound	CAS Number	LOR	Unit	EP1307966-006	EP1307966-007	EP1307966-008	---	---
EG020T: Total Metals by ICP-MS - Continued								
Aluminium	7429-90-5	0.01	mg/L	0.43	---	---	---	---
Iron	7439-89-6	0.05	mg/L	1.51	---	---	---	---
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	---	---	---	---
EG049G LL-F: Dissolved Trivalent Chromium - Low Level								
Trivalent Chromium	16065-83-1	0.001	mg/L	<0.001	---	---	---	---
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level								
Hexavalent Chromium	18540-29-9	0.001	mg/L	<0.001	---	---	---	---
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	5	---	---	---	---
Iron	7439-89-6	2	µg/L	432	---	---	---	---
Selenium	7782-49-2	0.2	µg/L	0.5	---	---	---	---
Arsenic	7440-38-2	0.2	µg/L	0.8	---	---	---	---
Cadmium	7440-43-9	0.05	µg/L	<0.05	---	---	---	---
Chromium	7440-47-3	0.2	µg/L	<0.2	---	---	---	---
Copper	7440-50-8	0.5	µg/L	<0.5	---	---	---	---
Lead	7439-92-1	0.1	µg/L	<0.1	---	---	---	---
Manganese	7439-96-5	0.5	µg/L	430	---	---	---	---
Nickel	7440-02-0	0.5	µg/L	1.1	---	---	---	---
Zinc	7440-66-6	1	µg/L	1	---	---	---	---
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.8	---	---	---	---
EK084: Un-ionized Hydrogen Sulfide								
Unionized Hydrogen Sulfide	---	0.1	mg/L	<0.1	---	---	---	---
EK085M: Sulfide as S2-								
Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	---	---	---	---
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	17.1	<0.01	---	---	---
Total Cations	---	0.01	meq/L	17.4	<0.01	---	---	---
Ionic Balance	---	0.01	%	0.88	---	---	---	---
EP080/071: Total Petroleum Hydrocarbons								



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				DUP01	RIN01	TRIP BLANK	---	---
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	---	---
Compound	CAS Number	LOR	Unit	EP1307966-006	EP1307966-007	EP1307966-008	---	---
EP080/071: Total Petroleum Hydrocarbons - Continued								
C6 - C9 Fraction	----	20	µg/L	<20	----	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013								
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	>C10_C16	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	1330-20-7	2	µg/L	<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
Ultra-Trace Nutrients								
Ammonia as N	7664-41-7	0.005	mg/L	0.027	----	----	----	----
Nitrite as N	----	0.002	mg/L	<0.002	----	----	----	----
Nitrate as N	14797-55-8	0.002	mg/L	0.078	----	----	----	----
Nitrite + Nitrate as N	----	0.002	mg/L	0.078	----	----	----	----
Total Kjeldahl Nitrogen as N	----	0.05	mg/L	0.26	----	----	----	----
Total Nitrogen as N	----	0.05	mg/L	0.34	----	----	----	----
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.005	----	----	----	----
Total Phosphorus as P	----	0.005	mg/L	0.030	----	----	----	----

EP080S: TPH(V)/BTEX Surrogates



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sample ID	DUP01	RIN01	TRIP BLANK		
17-OCT-2013 15:00				----	----
17-OCT-2013 15:00				----	----
EP1307966-006	EP1307966-007	EP1307966-008		----	----

Client sampling date / time

Compound	CAS Number	LOR	Unit	EP1307966-006	EP1307966-007	EP1307966-008		
EP080S: TPH(V)/BTEX Surrogates - Continued								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	118	----	100	----	----
Toluene-D8	2037-26-5	0.1	%	94.7	----	101	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	97.4	----	94.5	----	----



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	60.5	141.2
Toluene-D8	2037-26-5	73.4	126
4-Bromofluorobenzene	460-00-4	59.6	125.3

QUALITY CONTROL REPORT

Work Order	: EP1307966	Page	: 1 of 13
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Perth
Contact	: SEAN SCAIFE	Contact	: Shuk Hui Li
Address	: LEVEL 6, GRAIN POOL BLDG 172 ST GEORGE TCE WA, AUSTRALIA 6000	Address	: 10 Hod Way Malaga WA Australia 6090
E-mail	: sean.scaife@erm.com	E-mail	: ShukHui.Li@alsglobal.com
Telephone	: +61 08 9321 5200	Telephone	: 08 9209 7655
Facsimile	: +61 08 9321 5262	Facsimile	: 08 9209 7600
Project	: 0220615 YPNPL-TANPF GME	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: BURRUP	Date Samples Received	: 18-OCT-2013
C-O-C number	: A07449	Issue Date	: 29-OCT-2013
Sampler	: JG LM	No. of samples received	: 8
Order number	: ----	No. of samples analysed	: 8
Quote number	: EP/901/13		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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



General Comments

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



NATA Accredited
Laboratory 825

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ACCREDITATION

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
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Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA015: Total Dissolved Solids (QC Lot: 3118875)									
EP1307966-001	MW1	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	940	947	0.7	0% - 20%
EP1307972-003	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1460	1440	1.7	0% - 20%
EA025: Suspended Solids (QC Lot: 3118876)									
EP1307966-001	MW1	EA025H: Suspended Solids (SS)	----	5	mg/L	25	28	11.2	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 3119131)									
EP1307966-001	MW1	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	367	363	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	367	363	1.0	0% - 20%
EP1307976-003	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	69	68	1.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	69	68	1.7	0% - 20%
ED040F: Dissolved Major Anions (QC Lot: 3124320)									
EP1307966-001	MW1	ED040F: Silicon	7440-21-3	0.05	mg/L	14.8	14.9	0.5	0% - 20%
		ED040F: Silicon as SiO2	14464-46-1	0.1	mg/L	31.8	32.0	0.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3124323)									
EP1307966-001	MW1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	69	68	1.6	0% - 20%
EP1308088-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	104	104	0.0	0% - 20%
ED045G: Chloride Discrete analyser (QC Lot: 3124322)									
EP1307966-001	MW1	ED045G: Chloride	16887-00-6	1	mg/L	300	297	1.2	0% - 20%
EP1308088-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	220	222	1.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 3124321)									
EP1307966-001	MW1	ED093F: Calcium	7440-70-2	1	mg/L	66	66	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	29	30	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	265	267	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3119188)									
EP1307966-001	MW1	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.407	0.412	1.1	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3119188) - continued									
EP1307966-001	MW1	EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.007	0.007	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.34	0.36	6.3	No Limit
EP1307976-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	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
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 3119164)									
EP1307966-001	MW1	EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.38	0.36	7.6	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.47	1.42	3.5	0% - 20%
EP1307984-002	Anonymous	EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.01	0.01	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.06	0.06	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 3119189)									
EP1307966-007	RIN01	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP1307976-010	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: 3119166)									
EP1308009-013	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level (QC Lot: 3117803)									
EP1307966-001	MW1	EG050G: Hexavalent Chromium	18540-29-9	0.001	mg/L	<0.001	<0.001	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 3128735)									
ES1323013-001	Anonymous	EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	2.1	2.2	0.0	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Copper	7440-50-8	0.5	µg/L	<0.5	0.7	37.4	No Limit
		EG093A-F: Manganese	7439-96-5	0.5	µg/L	188	188	0.3	0% - 20%
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	1.1	1.3	19.8	No Limit
		EG093A-F: Aluminium	7429-90-5	5	µg/L	16	16	0.0	No Limit
		EG093A-F: Zinc	7440-66-6	5.0	µg/L	<5.0	<5.0	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 3128736)									
ES1323013-001	Anonymous	EG093B-F: Selenium	7782-49-2	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EG093B-F: Iron	7439-89-6	5	µg/L	<5	<5	0.0	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3128936)									
EP1307966-001	MW1	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3128936) - continued										
EP1307966-001	MW1	EG094A-F: Arsenic	7440-38-2	0.2	µg/L	0.8	0.8	0.0	No Limit	
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit	
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit	
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	425	428	0.6	0% - 20%	
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	1.0	1.1	0.0	No Limit	
		EG094A-F: Zinc	7440-66-6	1	µg/L	5	5	0.0	No Limit	
		EG094A-F: Aluminium	7429-90-5	5	µg/L	6	5	0.0	No Limit	
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3128937)										
EP1307966-001	MW1	EG094B-F: Selenium	7782-49-2	0.2	µg/L	0.5	0.5	0.0	No Limit	
		EG094B-F: Iron	7439-89-6	2	µg/L	437	435	0.4	0% - 20%	
EK040P: Fluoride by PC Titrator (QC Lot: 3119132)										
EP1307966-001	MW1	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.8	0.8	0.0	No Limit	
EK084: Un-ionized Hydrogen Sulfide (QC Lot: 3120425)										
EP1307966-001	MW1	EK084: Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	0.0	No Limit	
EK085M: Sulfide as S2- (QC Lot: 3120502)										
EP1307966-001	MW1	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3119275)										
EP1307966-001	MW1	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
EP1308008-003	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3119704)										
EP1307966-003	MW3	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3119275)										
EP1307966-001	MW1	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
EP1308008-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3119704)										
EP1307966-003	MW3	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit	
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
EP080: BTEXN (QC Lot: 3119275)										
EP1307966-001	MW1	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	
EP1308008-003	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	

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 Work Order : EP1307966
 Client : ENVIRO RESOURCES MANAGEMENT
 Project : 0220615 YPNPL-TANPF GME



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EP080: BTEXN (QC Lot: 3119275) - continued										
EP1308008-003	Anonymous	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	
Ultra-Trace Nutrients (QC Lot: 3119647)										
EP1307966-001	MW1	EK262PA-SW: Total Nitrogen as N	----	0.05	mg/L	0.24	0.23	0.0	No Limit	
Ultra-Trace Nutrients (QC Lot: 3119648)										
EP1307966-001	MW1	EK267PA-SW: Total Phosphorus as P	----	0.005	mg/L	0.015	0.016	9.7	No Limit	
Ultra-Trace Nutrients (QC Lot: 3119661)										
EP1307966-001	MW1	EK257A-SW: Nitrite as N	----	0.002	mg/L	<0.002	<0.002	0.0	No Limit	
Ultra-Trace Nutrients (QC Lot: 3119662)										
EP1307966-001	MW1	EK255A-SW: Ammonia as N	7664-41-7	0.005	mg/L	0.032	0.036	10.6	No Limit	
Ultra-Trace Nutrients (QC Lot: 3119663)										
EP1307966-001	MW1	EK259A-SW: Nitrite + Nitrate as N	----	0.002	mg/L	0.086	0.089	3.0	0% - 20%	
Ultra-Trace Nutrients (QC Lot: 3119664)										
EP1307966-001	MW1	EK271A-SW: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.007	0.009	17.7	No Limit	



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

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

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EA015: Total Dissolved Solids (QCLot: 3118875)									
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	99.6	83	130	
EA025: Suspended Solids (QCLot: 3118876)									
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	98.0	70	130	
ED037P: Alkalinity by PC Titrator (QCLot: 3119131)									
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-00 1	1	mg/L	<1	----	----	----	----	
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----	
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----	
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	200 mg/L	98.3	87	121	
ED040F: Dissolved Major Anions (QCLot: 3124320)									
ED040F: Silicon as SiO2	14464-46-1	0.1	mg/L	<0.1	----	----	----	----	
ED040F: Silicon	7440-21-3	0.05	mg/L	<0.05	----	----	----	----	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3124323)									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.3	88	121	
ED045G: Chloride Discrete analyser (QCLot: 3124322)									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	96.0	84	120	
ED093F: Dissolved Major Cations (QCLot: 3124321)									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	91	109	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	90	108	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	107	87	111	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	109	90	110	
EG020F: Dissolved Metals by ICP-MS (QCLot: 3119188)									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.100 mg/L	102	89	109	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1000 mg/L	99.2	89	109	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.100 mg/L	96.6	88	106	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.100 mg/L	99.2	85	111	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.100 mg/L	97.4	87	105	
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.100 mg/L	96.1	87	107	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.100 mg/L	99.0	87	109	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.100 mg/L	104	89	115	
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.50 mg/L	94.3	83	109	
EG020T: Total Metals by ICP-MS (QCLot: 3119164)									
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	109	86	116	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
EG020T: Total Metals by ICP-MS (QCLot: 3119164) - continued									
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	106	83	113	
EG035F: Dissolved Mercury by FIMS (QCLot: 3119189)									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.0100 mg/L	96.4	92	116	
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3119166)									
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.0100 mg/L	99.0	87	115	
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level (QCLot: 3117803)									
EG050G: Hexavalent Chromium	18540-29-9	0.001	mg/L	<0.001	0.05 mg/L	109	70	130	
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 3128735)									
EG093A-F: Aluminium	7429-90-5	5	µg/L	<5	500 µg/L	111	75	131	
EG093A-F: Arsenic	7440-38-2	0.5	µg/L	<0.5	100 µg/L	99.9	76	134	
EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	100 µg/L	105	71	125	
EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	100 µg/L	118	74	126	
EG093A-F: Copper	7440-50-8	1	µg/L	<1	100 µg/L	114	71	129	
EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	100 µg/L	109	74	126	
EG093A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	100 µg/L	119	75	127	
EG093A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	100 µg/L	111	75	133	
EG093A-F: Zinc	7440-66-6	5	µg/L	<5	100 µg/L	111	75	129	
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 3128736)									
EG093B-F: Selenium	7782-49-2	2	µg/L	<2	100 µg/L	76.2	74	130	
EG093B-F: Iron	7439-89-6	5	µg/L	<5	500 µg/L	118	74	132	
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3128936)									
EG094A-F: Aluminium	7429-90-5	5	µg/L	<5	50 µg/L	96.0	80	128	
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	91.7	75	129	
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	99.4	78	112	
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	100	71	123	
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	93.4	77	125	
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	90.0	74	118	
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	102	79	119	
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	87.9	72	128	
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	94.9	76	134	
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3128937)									
EG094B-F: Iron	7439-89-6	2	µg/L	<2	50 µg/L	95.1	71	125	
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	90.7	75	125	
EK040P: Fluoride by PC Titrator (QCLot: 3119132)									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	102	89	115	
EK084: Un-ionized Hydrogen Sulfide (QCLot: 3120425)									
EK084: Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	0.5 mg/L	91.2	70	130	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EK085M: Sulfide as S2- (QCLot: 3120502)									
EK085: Sulfide as S2-	18496-25-8	0.10	mg/L	<0.1	0.50 mg/L	98.4	82	116	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3119275)									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	103	74.2	142	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3119704)									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	77.0	30.7	123	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	89.6	34	142	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	83.8	32	124	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3119275)									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	370 µg/L	104	74.2	142	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3119704)									
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	400 µg/L	81.2	32	126	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	600 µg/L	88.6	32	136	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	200 µg/L	75.6	28.3	142	
EP080: BTEXN (QCLot: 3119275)									
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	93.8	72.6	122	
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	97.9	71.1	123	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	102	71.9	121	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	40 µg/L	103	72.3	122	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	100	72.3	121	
EP080: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	99.6	78.8	121	
Ultra-Trace Nutrients (QCLot: 3119647)									
EK262PA-SW: Total Nitrogen as N	----	0.05	mg/L	<0.05	1.0 mg/L	96.7	65	117	
Ultra-Trace Nutrients (QCLot: 3119648)									
EK267PA-SW: Total Phosphorus as P	----	0.005	mg/L	<0.005	0.44 mg/L	90.1	72	136	
Ultra-Trace Nutrients (QCLot: 3119661)									
EK257A-SW: Nitrite as N	----	0.002	mg/L	<0.002	0.1 mg/L	100	91	127	
Ultra-Trace Nutrients (QCLot: 3119662)									
EK255A-SW: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.1 mg/L	99.2	63	121	
Ultra-Trace Nutrients (QCLot: 3119663)									
EK259A-SW: Nitrite + Nitrate as N	----	0.002	mg/L	<0.002	0.1 mg/L	101	87	121	
Ultra-Trace Nutrients (QCLot: 3119664)									
EK271A-SW: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.1 mg/L	95.6	79	113	

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**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3124323)							
EP1307966-001	MW1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	95.9	70	130
ED045G: Chloride Discrete analyser (QCLot: 3124322)							
EP1307966-001	MW1	ED045G: Chloride	16887-00-6	1000 mg/L	94.7	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 3119188)							
EP1307966-002	MW2	EG020A-F: Arsenic	7440-38-2	0.200 mg/L	126	70	130
		EG020A-F: Cadmium	7440-43-9	0.0500 mg/L	120	70	130
		EG020A-F: Chromium	7440-47-3	0.200 mg/L	106	70	130
		EG020A-F: Copper	7440-50-8	0.200 mg/L	107	70	130
		EG020A-F: Lead	7439-92-1	0.200 mg/L	104	70	130
		EG020A-F: Manganese	7439-96-5	0.200 mg/L	107	70	130
		EG020A-F: Nickel	7440-02-0	0.200 mg/L	107	70	130
EG020A-F: Zinc	7440-66-6	0.200 mg/L	111	70	130		
EG035F: Dissolved Mercury by FIMS (QCLot: 3119189)							
EP1307976-001	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	106	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3119166)							
EP1308009-014	Anonymous	EG035T: Mercury	7439-97-6	0.0100 mg/L	110	70	130
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level (QCLot: 3117803)							
EP1307966-001	MW1	EG050G: Hexavalent Chromium	18540-29-9	0.05 mg/L	103	70	130
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 3128735)							
ES1323013-002	Anonymous	EG093A-F: Arsenic	7440-38-2	50 µg/L	75.1	70	130
		EG093A-F: Cadmium	7440-43-9	12.5 µg/L	86.8	70	130
		EG093A-F: Chromium	7440-47-3	50 µg/L	82.7	70	130
		EG093A-F: Copper	7440-50-8	50 µg/L	75.0	70	130
		EG093A-F: Lead	7439-92-1	50 µg/L	79.2	70	130
		EG093A-F: Manganese	7439-96-5	50 µg/L	85.7	70	130
		EG093A-F: Nickel	7440-02-0	50 µg/L	74.3	70	130
EG093A-F: Zinc	7440-66-6	50 µg/L	72.4	70	130		
EK040P: Fluoride by PC Titrator (QCLot: 3119132)							
EP1307966-002	MW2	EK040P: Fluoride	16984-48-8	4.9 mg/L	109	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3119275)							
EP1307966-002	MW2	EP080: C6 - C9 Fraction	----	240 µg/L	92.9	77.0	137
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3119704)							
EP1307966-003	MW3	EP071: C10 - C14 Fraction	----	400 µg/L	85.8	44.5	122
		EP071: C15 - C28 Fraction	----	400 µg/L	101	55.1	143
		EP071: C29 - C36 Fraction	----	400 µg/L	88.2	53.6	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3119275)							



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3119275) - continued							
EP1307966-002	MW2	EP080: C6 - C10 Fraction	C6_C10	290 µg/L	97.3	77.0	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3119704)							
EP1307966-003	MW3	EP071: >C10 - C16 Fraction	>C10_C16	400 µg/L	90.0	44.5	122
		EP071: >C16 - C34 Fraction	----	600 µg/L	97.8	55.1	143
		EP071: >C34 - C40 Fraction	----	200 µg/L	73.3	53.6	128
EP080: BTEXN (QCLot: 3119275)							
EP1307966-002	MW2	EP080: Benzene	71-43-2	20 µg/L	99.7	77.0	122
		EP080: Toluene	108-88-3	20 µg/L	97.1	73.5	126
Ultra-Trace Nutrients (QCLot: 3119647)							
EP1307966-001	MW1	EK262PA-SW: Total Nitrogen as N	----	0.5 mg/L	93.3	70	130
Ultra-Trace Nutrients (QCLot: 3119648)							
EP1307966-001	MW1	EK267PA-SW: Total Phosphorus as P	----	0.5 mg/L	75.7	70	130
Ultra-Trace Nutrients (QCLot: 3119661)							
EP1307966-001	MW1	EK257A-SW: Nitrite as N	----	0.5 mg/L	71.3	70	130
Ultra-Trace Nutrients (QCLot: 3119662)							
EP1307966-001	MW1	EK255A-SW: Ammonia as N	7664-41-7	0.5 mg/L	95.4	70.	130
Ultra-Trace Nutrients (QCLot: 3119663)							
EP1307966-001	MW1	EK259A-SW: Nitrite + Nitrate as N	----	0.1 mg/L	73.5	70	130
Ultra-Trace Nutrients (QCLot: 3119664)							
EP1307966-001	MW1	EK271A-SW: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	71.0	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are 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**

						Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
						Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit		
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level (QCLot: 3117803)												
EP1307966-001	MW1	EG050G: Hexavalent Chromium	18540-29-9	0.05 mg/L	103	----	70	130	----	----		
EK040P: Fluoride by PC Titrator (QCLot: 3119132)												
EP1307966-002	MW2	EK040P: Fluoride	16984-48-8	4.9 mg/L	109	----	70	130	----	----		
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3119166)												
EP1308009-014	Anonymous	EG035T: Mercury	7439-97-6	0.0100 mg/L	110	----	70	130	----	----		
EG020F: Dissolved Metals by ICP-MS (QCLot: 3119188)												



Sub-Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
EG020F: Dissolved Metals by ICP-MS (QCLot: 3119188) - continued										
EP1307966-002	MW2	EG020A-F: Arsenic	7440-38-2	0.200 mg/L	126	----	70	130	----	----
		EG020A-F: Cadmium	7440-43-9	0.0500 mg/L	120	----	70	130	----	----
		EG020A-F: Chromium	7440-47-3	0.200 mg/L	106	----	70	130	----	----
		EG020A-F: Copper	7440-50-8	0.200 mg/L	107	----	70	130	----	----
		EG020A-F: Lead	7439-92-1	0.200 mg/L	104	----	70	130	----	----
		EG020A-F: Manganese	7439-96-5	0.200 mg/L	107	----	70	130	----	----
		EG020A-F: Nickel	7440-02-0	0.200 mg/L	107	----	70	130	----	----
		EG020A-F: Zinc	7440-66-6	0.200 mg/L	111	----	70	130	----	----
EG035F: Dissolved Mercury by FIMS (QCLot: 3119189)										
EP1307976-001	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	106	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3119275)										
EP1307966-002	MW2	EP080: C6 - C9 Fraction	----	240 µg/L	92.9	----	77.0	137	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3119275)										
EP1307966-002	MW2	EP080: C6 - C10 Fraction	C6_C10	290 µg/L	97.3	----	77.0	137	----	----
EP080: BTEXN (QCLot: 3119275)										
EP1307966-002	MW2	EP080: Benzene	71-43-2	20 µg/L	99.7	----	77.0	122	----	----
		EP080: Toluene	108-88-3	20 µg/L	97.1	----	73.5	126	----	----
Ultra-Trace Nutrients (QCLot: 3119647)										
EP1307966-001	MW1	EK262PA-SW: Total Nitrogen as N	----	0.5 mg/L	93.3	----	70	130	----	----
Ultra-Trace Nutrients (QCLot: 3119648)										
EP1307966-001	MW1	EK267PA-SW: Total Phosphorus as P	----	0.5 mg/L	75.7	----	70	130	----	----
Ultra-Trace Nutrients (QCLot: 3119661)										
EP1307966-001	MW1	EK257A-SW: Nitrite as N	----	0.5 mg/L	71.3	----	70	130	----	----
Ultra-Trace Nutrients (QCLot: 3119662)										
EP1307966-001	MW1	EK255A-SW: Ammonia as N	7664-41-7	0.5 mg/L	95.4	----	70	130	----	----
Ultra-Trace Nutrients (QCLot: 3119663)										
EP1307966-001	MW1	EK259A-SW: Nitrite + Nitrate as N	----	0.1 mg/L	73.5	----	70	130	----	----
Ultra-Trace Nutrients (QCLot: 3119664)										
EP1307966-001	MW1	EK271A-SW: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	71.0	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3119704)										
EP1307966-003	MW3	EP071: C10 - C14 Fraction	----	400 µg/L	85.8	----	44.5	122	----	----
		EP071: C15 - C28 Fraction	----	400 µg/L	101	----	55.1	143	----	----
		EP071: C29 - C36 Fraction	----	400 µg/L	88.2	----	53.6	128	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3119704)										
EP1307966-003	MW3	EP071: >C10 - C16 Fraction	>C10_C16	400 µg/L	90.0	----	44.5	122	----	----
		EP071: >C16 - C34 Fraction	----	600 µg/L	97.8	----	55.1	143	----	----
		EP071: >C34 - C40 Fraction	----	200 µg/L	73.3	----	53.6	128	----	----



Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
				Concentration	MS	MSD	Low	High	Value	Control Limit
ED045G: Chloride Discrete analyser (QCLot: 3124322)										
EP1307966-001	MW1	ED045G: Chloride	16887-00-6	1000 mg/L	94.7	----	70	130	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3124323)										
EP1307966-001	MW1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	95.9	----	70	130	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 3128735)										
ES1323013-002	Anonymous	EG093A-F: Arsenic	7440-38-2	50 µg/L	75.1	----	70	130	----	----
		EG093A-F: Cadmium	7440-43-9	12.5 µg/L	86.8	----	70	130	----	----
		EG093A-F: Chromium	7440-47-3	50 µg/L	82.7	----	70	130	----	----
		EG093A-F: Copper	7440-50-8	50 µg/L	75.0	----	70	130	----	----
		EG093A-F: Lead	7439-92-1	50 µg/L	79.2	----	70	130	----	----
		EG093A-F: Manganese	7439-96-5	50 µg/L	85.7	----	70	130	----	----
		EG093A-F: Nickel	7440-02-0	50 µg/L	74.3	----	70	130	----	----
		EG093A-F: Zinc	7440-66-6	50 µg/L	72.4	----	70	130	----	----

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : EP1307966

<p>Client : ENVIRO RESOURCES MANAGEMENT</p> <p>Contact : SEAN SCAIFE</p> <p>Address : LEVEL 6, GRAIN POOL BLDG 172 ST GEORGE TCE WA, AUSTRALIA 6000</p> <p>E-mail : sean.scaife@erm.com</p> <p>Telephone : +61 08 9321 5200</p> <p>Facsimile : +61 08 9321 5262</p> <p>Project : 0220615 YPNPL-TANPF GME</p> <p>Order number : ----</p> <p>C-O-C number : A07449</p> <p>Site : BURRUP</p> <p>Sampler : JG LM</p>	<p>Laboratory : Environmental Division Perth</p> <p>Contact : Shuk Hui Li</p> <p>Address : 10 Hod Way Malaga WA Australia 6090</p> <p>E-mail : ShukHui.Li@alsglobal.com</p> <p>Telephone : 08 9209 7655</p> <p>Facsimile : 08 9209 7600</p> <p>Page : 1 of 3</p> <p>Quote number : EP2013ENVRES0371 (EP/901/13)</p> <p>QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement</p>
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Dates

<p>Date Samples Received : 18-OCT-2013</p> <p>Client Requested Due Date : 28-OCT-2013</p>	<p>Issue Date : 21-OCT-2013 19:01</p> <p>Scheduled Reporting Date : 28-OCT-2013</p>
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Delivery Details

<p>Mode of Delivery : Client Drop off</p> <p>No. of coolers/boxes : 2 Medium Hard Eskies</p> <p>Security Seal : Intact.</p>	<p>Temperature : 3.5 - Ice present</p> <p>No. of samples received : 8</p> <p>No. of samples analysed : 8</p>
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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
- Sample containers do not comply to pretreatment / preservation standards (AS, APHA, USEPA). Please refer to the Sample Container(s)/Preservation Non-Compliance Log at the end of this report for details.
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- **Sample containers do not comply to pretreatment / preservation standards (AS, APHA, USEPA). Please refer to the Sample Container(s)/Preservation Non-Compliance Log at the end of this report for details.**
- **UT metals + UT nutrients will be conducted by ALS Environmental, Sydney, NATA accreditation No. 825, Site No. 10911**
- **pH analysis should be conducted within 6 hours of sampling.**
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (SamplesPerth@alsenviro.com)
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of Work Order.



Sample Container(s)/Preservation Non-Compliances

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

Method Client sample ID	Sample Container Received	Preferred Sample Container for Analysis
EK262PA-SW : Total Nitrogen/Persulfate Digestion/Ultra-Trace/Saline		
MW1	- Clear Plastic - Filtered & Frozen (AS) - UT Nut.	- Clear Plastic Bottle - Natural (AS)
MW2	- Clear Plastic - Filtered & Frozen (AS) - UT Nut.	- Clear Plastic Bottle - Natural (AS)
MW3	- Clear Plastic - Filtered & Frozen (AS) - UT Nut.	- Clear Plastic Bottle - Natural (AS)
MW4	- Clear Plastic - Filtered & Frozen (AS) - UT Nut.	- Clear Plastic Bottle - Natural (AS)
MW5	- Clear Plastic - Filtered & Frozen (AS) - UT Nut.	- Clear Plastic Bottle - Natural (AS)
DUP01	- Clear Plastic - Filtered & Frozen (AS) - UT Nut.	- Clear Plastic Bottle - Natural (AS)
EK267PA-SW : Total Phosphorus/Persulfate Digestion/ Ultra Trace /Saline		
MW1	- Clear Plastic - Filtered & Frozen (AS) - UT Nut.	- Clear Plastic Bottle - Natural (AS)
MW2	- Clear Plastic - Filtered & Frozen (AS) - UT Nut.	- Clear Plastic Bottle - Natural (AS)
MW3	- Clear Plastic - Filtered & Frozen (AS) - UT Nut.	- Clear Plastic Bottle - Natural (AS)
MW4	- Clear Plastic - Filtered & Frozen (AS) - UT Nut.	- Clear Plastic Bottle - Natural (AS)
MW5	- Clear Plastic - Filtered & Frozen (AS) - UT Nut.	- Clear Plastic Bottle - Natural (AS)
DUP01	- Clear Plastic - Filtered & Frozen (AS) - UT Nut.	- Clear Plastic Bottle - Natural (AS)

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 to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - Balance Suite Balance Suite with DA Chloride	WATER - EA015H Total Dissolved Solids - High Level	WATER - EA025H Suspended Solids (High Level)	WATER - ED040F Dissolved Major Anions	WATER - EG020F Dissolved Metals by ICPMS	WATER - EG020T Total Recoverable Metals by ICPMS (including)	WATER - EG035F Dissolved Mercury by FIMS	WATER - EG035T Total Mercury by FIMS
EP1307966-001	17-OCT-2013 15:00	MW1		✓	✓	✓	✓	✓		✓
EP1307966-002	17-OCT-2013 15:00	MW2		✓	✓	✓	✓	✓		✓
EP1307966-003	17-OCT-2013 15:00	MW3		✓	✓	✓	✓	✓		✓
EP1307966-004	17-OCT-2013 15:00	MW4		✓	✓	✓	✓	✓		✓
EP1307966-005	17-OCT-2013 15:00	MW5		✓	✓	✓	✓	✓		✓
EP1307966-006	17-OCT-2013 15:00	DUP01		✓	✓	✓	✓	✓		✓
EP1307966-007	17-OCT-2013 15:00	RIN01	✓				✓		✓	



- Sydney
- Melbourne
- Brisbane
- Perth
- Hunter Valley
- North Coast
- Other

Grnd Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8584 8800
 Level 3, Yarra Tower, WTC, 18-38 Siddeley Street, Docklands, VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022
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 Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5262
 53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: **0220615**
 Project Name: **YPNPL - TANPF GME**
 Project Location: **BURRUP**
 Project Manager: **SEAN SCAIFE**
 Sampler: **JG & LM**

COC Number
A 07449
 Laboratory
ALS

General Analysis Requirements Yes (tick)

1. Turn Around Time (please tick: 1 Day 2 Days 3 Days Normal TAT)

2. Do you wish any sediment layers in water to be excluded from extractions?

3. Additional QA/QC reported where sample batches are < 10 samples?

4. % of extraneous material removed from samples to be reported as per NEPM 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix			Preservation				Containers (number/type)	BTEX	TPH (C6-C9 P & T) + TPH (C10-C28)	Speciated TPH	VOC Scan (USEPA 8280 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals (dissolved total)	WATER SAMPLES	MAJOR ANIONS	MAJOR CATIONS	Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)
					Soil	Water	Other	Ice	Acid	Filter	Other															
1	MW1		17/10/13		X	X																				
2	MW2																									
3	MW3																									
4	MW4																									
5	MW5																									
6	DUP01																									
7	RIN01																				X	X				
8	TRPBLANK												X													

Environmental Division
 Perth
 Work Order
EP1307966

 Telephone : +61-8-9209 7655

Comments: **AS PER QUOTE EP/901/13. Standard analysis for Rinseate.**

Relinquished by: **JAMES GAVSTON** Signed: Date/Time: **18.10.13**

Relinquished by: _____ Signed: _____ Date/Time: _____

Received by: **2 H...** Date/Time: **12.45 18/10**

Received by: _____ Date/Time: _____

*Metals (circle)
 As Cd Cr Cu Hg Ni Pb Zn **Fe Mn**