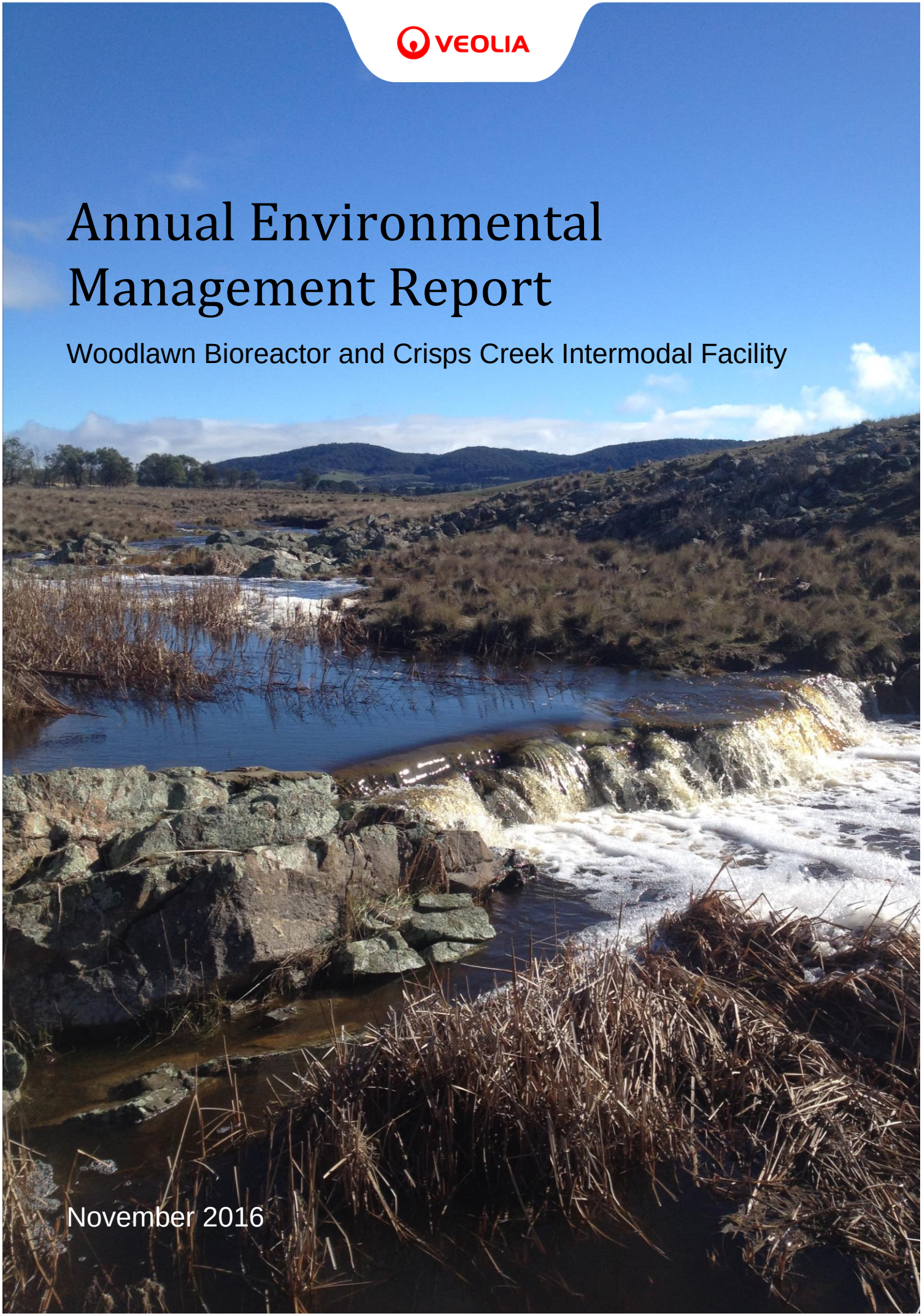
Annual Environmental Management Report

Woodlawn Bioreactor and Crisps Creek Intermodal Facility



November 2016

Cover: The Woodlawn Eco-Project, located on the Southern Tablelands of New South Wales, received substantial rainfall during the 3rd and 4th quarter of the reporting period. This photo depicts water cascading over the V-Notch (centre-right) at Monitoring Point 15 (Site 105) in Crisps Creek.
Photo: James Easterbrook.

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1. Introduction

1.1 Site Overview

The Woodlawn Eco Project Site (the Eco Project Site), owned and operated by Veolia Australia and New Zealand (Veolia), is located approximately 250 kilometres (km) south west of Sydney in the NSW Southern Tablelands. A site location plan is provided in **Appendix 1**. The Eco Project Site, which covers an area of 6000 hectares, comprises of the 'Pylara' and 'Woodlawn' agricultural properties. An integral part of the Woodlawn property is the Woodlawn Bioreactor (the Bioreactor), where waste landfilling and landfill gas extraction occurs in the void of a remnant open cut mine, approximately 33 million cubic metres (m^3) in capacity.

The Bioreactor has been operating since September 2004, with the collection of landfill gas from landfilled waste to extract methane for energy generation commencing in 2008. This occurs at the adjacent Woodlawn Bio Energy Power Station (the Power Station).

Waste to the Bioreactor from Sydney is transported in shipping containers via rail and unloaded onto road trucks at the Crisps Creek Intermodal Facility (IMF), also owned and operated by Veolia and located approximately 8 km away in the township of Tarago. Local waste from neighboring councils and businesses is transported via road.

In accordance with relevant legislative requirements and industry best practice, the environmental performance of the Bioreactor and the IMF is managed to stringent conditions, the reporting of which forms the basis of this Annual Environmental Monitoring Report (AEMR). The AEMR has been prepared in accordance with Environmental Protection Licence (EPL) 11436, as well as documenting performance against EPL 11455, issued and regulated by the NSW Environment Protection Authority (EPA) for the Bioreactor and the IMF respectively.

The AEMR is submitted to the EPA in conjunction with the Annual Returns which comprise statements of compliance and summaries of monitoring and compliance for both sites, as required under Condition R1 of the EPLs for the reporting period of 6 September 2015 to 5 September 2016.

1. Introduction

1.2 Legislative Requirements

The main legislative instrument governing the environmental performance and activities undertaken at the Bioreactor and the IMF pertaining to this AEMR is the Protection of the Environment Operations Act 1997 (POEO Act) regulated by the EPA, as well as its associated regulations.

The EPL for each site has been issued under s55 of the POEO Act. A supervisory licence (EPL 11437) is also maintained by Goulburn Mulwaree Council (the Council) to supervise the Bioreactor operations, under section 87 of the POEO Act, for a putrescible waste landfill site not operated by a public authority. The Council ensures compliance with the types and volumes of waste received at the Bioreactor, any design works and other matters that the Council deems necessary to facilitate the implementation of a waste strategy under the Waste Avoidance and Resource Recovery (WARR) Act 2001.

Conditions of the EPLs stipulate the environmental and operational parameters that need to be addressed by Veolia in the management strategies adopted for both the sites to maintain compliance where relevant. This AEMR is split into a section for each site and contains these management strategies.

Part 1 EPL 11436

Woodlawn Bioreactor

2. Bioreactor Operations

In accordance with EPL 11436, the Bioreactor is permitted to accept material classified as General Solid Waste (Putrescible) as described in the Waste Classification Guidelines (EPA, 2014) for the scheduled activity 'Waste disposal by application to land'. The other activity permitted on the EPL is 'Electricity generating works' for the generation of energy from the extraction of landfill gas.

In addition to the waste management and energy generation activities, the site EPL mandates the administrative, operative and reporting conditions for the Bioreactor, as described in **Table 2.1** below. A licenced boundary plan is provided in **Appendix 2**.

Table 2.1: Bioreactor Licence Conditions

Condition	Compliance with Condition
1. Administrative conditions	Noted
2. Discharges to air and water and application to land	Noted
3. Limit conditions	**L1. Pollution of Waters** The Bioreactor is deemed a zero discharge site, as all surface and storm water that comes into contact with waste or leachate is captured, stored and treated onsite. Non contaminated water is managed through diversion drains and bunds. No water was discharged during this reporting period.
	L3. Waste All waste received at the Bioreactor during this reporting period was in accordance with the waste types permitted in the EPL. Waste generated onsite was deposited in the Bioreactor.
	L4. Noise Limits No noise complaints were received during this reporting period indicating that noise at the Bioreactor was likely maintained within the 35 dB(A) LAeq (15 minute) criteria at the nearest residential receiver. Noise monitoring will be undertaken by Veolia on the receipt of any such complaints.
	L5. Hours of Operation All operational activities at the Bioreactor, including haulage of waste from the IMF were undertaken between 6:00 am and 10:00 pm, Monday to Saturday during this reporting period as permitted.
	L6. Potentially Offensive Odour 88 odour complaints were received at the premises during this reporting period. It should be noted that 2 complainants were responsible for 69% of the complaints. An annual independent odour audit is used to assess the effectiveness of odour control measures and to identify improvements to existing odour management practices at the site. The odour audit report indicated Veolia has implemented all recommendations from the previous odour audit and is further discussed in Section 6 of this AEMR.

2. Bioreactor Operations

Condition	Compliance with Condition
	Veolia also actively engages with the community through use of odour diaries and attendance at local community meetings, such as the Tarago and District Progress Association Inc. The odour diaries are collected and reviewed as part of the annual odour audit. Veolia will continue to implement recommended actions from the odour audit in combination with improving current odour control measures identified by Veolia. Veolia received a letter from the EPA on 21 March 2016 in regards to alleged odours from trains carrying waste to Crisps Creek Intermodal Facility. A container quality assurance program was submitted to the EPA and a continual improvement program has been implemented to improve container integrity.
4. Operating conditions	**O1. Activities Carried out in Competent Manner** All licenced activities undertaken at the Bioreactor in this reporting period were carried out in a competent manner and under a high standard of environmental management for which Veolia is certified under ISO 14001.
	O2. Maintenance of Plant and Equipment The maintenance and operation of all plant and equipment on the premises associated with the licenced activities was undertaken in a proper and efficient condition as required by qualified technicians. All major plant and equipment at the site is stored in a computerised maintenance management system in order to schedule and complete the required maintenance. All Veolia operators hold the appropriate qualifications and licenses to operate plant and equipment used as part of Bioreactor operations.
	O3. Dust All operations and activities were carried out at the Bioreactor in a manner to minimise dust at the boundary of the premises. These included all access roads from the IMF to the Bioreactor and the haul road used for ancillary operations being sealed, the use of water trucks for dust suppression as required and monthly sampling to monitor for the presence and quantity of depositional dust. Veolia was issued with a Show Cause Notice from the NSW Department of Planning and Environment for tracking material beyond the site boundary during a period of prolonged rainfall over the Winter months. Over 209mm of rainfall was recorded in June 2016 alone (68mm five year average). Improvements to the wheel wash system have been implemented and will continue to be monitored and improved in the 2016-17 reporting period (Section 5, Table 6.2). Total solids were elevated at depositional dust gauge EPA monitoring point identification numbers 11 (DG22) and 12 (DG24) located on the Eastern and Western sides of the Bioreactor void (Section 2.3.2). These results were reflective of increased earthwork activity on the haul roads for construction of the new Woodlawn Mechanical & Biological Treatment (WMBT) Facility. Increased dust suppression was undertaken by water carts throughout the period by both Veolia and the contracted WMBT construction company, Lipman Pty Ltd. The dry conditions experienced throughout the first half of the reporting period also contributed to these elevated results.

2. Bioreactor Operations

Condition	Compliance with Condition
	With construction activity almost completed, results have subsequently declined and site boundary receivers did not record comparable elevated results during this period (Monitoring Point 10 <DG28, Pylara> and EPL20476, Monitoring Point 7)
	O4. Emergency Response The Emergency Response Plan (ERP) for the Bioreactor is maintained on the premises and electronically on Veolia's National Integrated Management System, an online platform for storing Veolia policies procedures and plans. The ERP contains procedures for minimising the risk of and managing incidents such as fires, spills, explosions etc. at the Bioreactor, as well as incorporates the Pollution Incidence Response Management Plan (PIRMP) in accordance with the EPL. As per the PIRMP requirements, the ERP is tested annually. The PIRMP was not activated in this reporting period.
	O5. Processes and Management The processes and management of water quality is documented and implemented on site in accordance with the EPL and the Landfill Environmental Management Plan (LEMP) for the Bioreactor. The LEMP provides guidance on the management of surface and stormwater systems such as drainage and pumping networks to divert clean water from any water that has come in contact with waste or leachate. Clean surface and stormwater collected from within the void is pumped to Evaporation Dam 3 South (ED3S) for evaporation. Water contaminated by waste or leachate is collected and treated in the Leachate Treatment System before being transferred to Evaporation Dam 3 North (ED3N) for evaporation. Mechanical evaporators may be used to assist evaporation and are controlled by wind direction sensors to prevent the drifting of sprayed liquids from the premises. The wash bay, used for cleaning of containers and equipment associated with Bioreactor operations, collects sediment in a drainage sump. This sump is periodically drained and the resultant waste deposited in the Bioreactor where it is directed to the leachate collection and treatment systems. Veolia maintains site access for the supervisory holder for EPL 11437, which is Goulburn Mulwaree Council (the Council). Veolia grants the Council's representative access to the site and all requested documentation and records. All instructions provided by the Council's representative were complied with by Veolia in this reporting period. This supervisory process provides a secondary compliance check for the design, construction, extension and maintenance of all engineered features of the Bioreactor and ensures they are completed in compliance with the EPL for the site.

2. Bioreactor Operations

Condition	Compliance with Condition
	O6. Waste Management All licenced activities associated with this condition were carried out in accordance during this reporting period. A closure plan shall be submitted prior to the closure date of the Bioreactor. Monitoring undertaken within the Bioreactor void and around the licenced boundary during this reporting period validated that groundwater flows form an inward gradient towards the void ensuring no outward movement of leachate occurs. Veolia continues to address the challenges of water management to improve gas capture within the Bioreactor as outlined to EPA executives and the community in April 2016. The EPA have recently approved (14 October 2016) a revised licence with a pollution reduction program to reflect Veolia's commitment to the leachate strategy. Run Energy Pty Ltd has also been engaged to provide expert consultative and operational advice on system improvements to facilitate improved performance of the gas capture network throughout the 2015-16 reporting period. The leachate recirculation, collection and treatment system was continued to be maintained and operated to optimise the Bioreactor conditions for treatment of leachate, other waste waters and contaminated storm waters. Excess leachate was extracted and treated in the Leachate Treatment System and transferred for storage in ED3N lagoons 1, 2, 3 & 4 (ED3N-1, ED3N-2, ED3N-3 & ED3N-4). Design and implementation of a longer term treatment solution is currently being advanced by Veolia. Clay lined barriers were continued to be installed in the southern portion of the void wall as detailed in the previous reporting period. Leachate from the waste accepted at the Clyde Transfer Terminal was the only liquid imported into the void during this reporting period and was processed through the leachate treatment system as approved by the EPA. Virgin Excavated Natural Material (VENM) was sourced from onsite and offsite locations for use as cover material during the reporting period. All waste accepted within the Bioreactor in this reporting period was screened prior to final disposal in accordance with the requirements of the Veolia Control of Non-Conforming Waste Procedure and NSW Resource Recovery Screening & Recording of Waste Procedure to ensure only conforming waste is received. Veolia will undertake final capping of the Bioreactor when required and in accordance with the EPL.

2. Bioreactor Operations

Condition	Compliance with Condition
	Veolia operate the Bioreactor to maximise the production of landfill gas for generation of renewable energy at the Power Station, where 6 generators have been installed and commissioned, with 2 auxiliary flares as back up treatment of landfill gas emissions captured. The generators and flares satisfy the design, installation and operational requirements within the EPL. The landfill gas extraction and utilisation infrastructure in the Bioreactor has been designed to meet the conditions of the landfill including settlement. In this reporting period, Veolia continued to construct temporary access roads to minimise waste delivery vehicles coming in contact with and tracking waste to external surfaces. Dedicated site vehicles that only operate within the void and other operational areas were utilised. Any vehicles exiting the facility are required to use the wheel wash facility to prevent the tracking of materials. In addition to tracking of materials, a monthly site inspection checklist is used to ensure practical measures are in place at the site to prevent materials leaving the premises.
5. Monitoring and recording conditions	Noted, all compliance monitoring was carried out in this reporting period in accordance with EPL requirements. The results of which are detailed in Section 3. There were no non-conformances in this reporting period.
6. Reporting conditions	Noted and addressed in this AEMR and the annual return documents, where relevant. Notifications to the EPA were undertaken in a timely fashion.
7. General conditions	Noted.
8. Pollution Studies and Reduction Programs	**U1. Trial of Alternative Daily Cover** A request for a new trial period for the use of alternate daily cover materials was not approved by the EPA therefore this program was removed from licence modification dated 8-7-16.
	U2. ED3N-1 Leachate Management This program was removed from licence modification dated 8-7-16.
9. Special Conditions	Noted.

2.1 Complaints –

Veolia operates a 24 hour telephone complaints line that enables the receipt of complaints from members of the public, as required under the EPL. Other complaints that were received off site during this reporting period were logged by Goulburn-Mulwaree Council and the EPA. Veolia recorded a total of 88 complaints, relating only to odour, during this reporting period. Upon receipt of an odour complaint, Veolia recorded all details into the site complaints register as required under the EPL and Site Management followed up with the complainant to determine the nature (and scale) of the odour.

2. Bioreactor Operations

In order to proactively engage in effective odour management, Veolia participates in regular community liaisons to encourage and gather feedback from the local residents regarding the odour performance at the Bioreactor. These liaisons are facilitated either through the Community Liaison Committee (CLC) to voice their concerns with the Bioreactor site and also at the Tarago Progress Association Inc. (TADPAI) meetings. Veolia continues to implement activities to eliminate and minimise odour sources at the site based on annual odour audit recommendations.

3. Bioreactor Environmental Monitoring

3.1 Bioreactor Monitoring Points

Veolia is required to monitor environmental performance of the Bioreactor under EPL 11436. **Table 3.1** details the EPL ID, sampling location, frequency and the type of monitoring undertaken at each licensed point. A monitoring location plan is included in **Appendix 3**.

Table 3.1: Bioreactor Licensed Monitoring Points

EPA ID	Sampling Location	Frequency	Type of Monitoring
1	GMBH1	Quarterly	Subsurface Gas
2	GMBH2		
4	GMBH4		
5	Gas Extraction Booster	Annual	Landfill Gas Input
6	Landfill Surface	Quarterly	Surface Gas
7	Landfill Gas Flare	Annual / Continuous	Air Discharge
8	Landfill Gas Engine Exhaust Point – Gen 1	Annual	Air Discharge
9	Meteorological Station	Continuous	Meteorological
10	DG28 – Pylara	Monthly	Particulates – Deposited Matter
11	DG22		
12	DG24		
13	Site 115 – Allianoyonyige Creek	Quarterly	Surface Water
14	Spring 2 – Crisps Creek		
15	Site 105 – Crisps Creek		
16	WM200 – RWD		
17	WM201 – ERC		
18	WM202 – ED3S		
19	WM203 – ED3N		
21	Pond 2 (Decommissioned)		
22	Pond 3		
23	Leachate Pond	Annual	Leachate
24	Leachate Recirculation System		
25	MB1	Quarterly / Annual	Groundwater
26	MB2		
27	MB3		
28	MB4		
29	MB5		
30	MB6		
31	MB7		
32	MB8		
33	MB10		
34	MB11		
35	MB12		
36	MB13		

3. Bioreactor Environmental Monitoring

EPA ID	Sampling Location	Frequency	Type of Monitoring
37	MB14		
38	MB15	Quarterly / Annual	Groundwater
39	MB16		
40	MB17		
41	ED3B		
42	WM1		
43	WM3 (Decommissioned*)		
44	WM4		
45	WM5		
46	WM6		
47	WM7 (Decommissioned*)		
48	P38A & P38B	Quarterly	Standing Water Level
49	P44A & P44B		
50	P45A & P45B		
51	P58A & P58B		
52	P59A & P59B		
53	P100A & P100B		
54	ED3	Monthly	Storage Volume
55	MW8S	Quarterly / Annual	Groundwater
56	MW8D		
57	MW9S		
58	MW10S (Dry well)		

**Monitoring point removed from EPL during the 2015-16 reporting period.*

All monitoring data collected at the monitoring points identified in **Table 3.1** during this reporting period has been tabulated and provided in **Section 3.2** or in **Appendix 4**. Graphs of data collected have been developed to assist in the assessment of trends and depict any variability within the monitoring results are presented in **Section 3.2** or in **Appendix 5**.

3. Bioreactor Environmental Monitoring

3.2 Bioreactor Monitoring Results

3.2.1 Bioreactor Landfill Gas Monitoring Results

Table 3.2.1: Bioreactor Landfill Gas Monitoring Results

<table>
<tr><th>Parameter</th><th>Results/Discussion</th></tr>
<tr><td>Subsurface Gas</td><td>Monitoring of 3 subsurface gas monitoring bores (GMB) was undertaken on a quarterly basis as per EPL requirements and is summarised in Table 3.2.1.1 below:

Table 3.2.1.1: Subsurface Gas Monitoring Result
<table>
<tr><th rowspan="2">Gas Monitoring Bore ID</th><th colspan="4">Purged Methane Reading (%)</th></tr>
<tr><th>30/11/2015</th><th>24/02/2016</th><th>2/06/2016</th><th>17/08/2016</th></tr>
<tr><td>GMBH1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>GMBH2</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>GMBH4</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
</table>
The results show that the gas collection network is effectively capturing and controlling landfill gas within the landfill void. Engineered impermeable barriers and the natural subsurface of the void wall also minimises the potential movement of landfill gas from the Bioreactor, allowing for maximum extraction through the gas collection system.</td></tr>
<tr><td>Landfill Gas Extraction Booster</td><td>The data reported for the landfill gas extraction booster at the Power Station is consistent to the historical average since 2008 as summarised in Table 3.2.1.2 below:

Table 3.2.1.2: Landfill Gas Extraction Booster Monitoring Results Summary
<table>
<tr><th>Parameter</th><th>Historical Average</th><th>2015/2016 Result</th></tr>
<tr><td>Temperature (° C)</td><td>36.7</td><td>2.4</td></tr>
<tr><td>Volumetric Flow (m3/hr)</td><td>2761</td><td>1814</td></tr>
<tr><td>Methane (%)</td><td>52.1</td><td>57</td></tr>
</table>
The detailed data for each of the parameters required under the EPL for the gas extraction booster is provided in Table 1 (refer Appendix 4).</td></tr>
<tr><td>Surface Gas</td><td>Surface gas monitoring was completed on a quarterly basis as per EPL requirements, which are summarised in Table 3.2.1.3 below. The detailed tabulated data is available in Table 2 (refer Appendix 4).</td></tr>
</table>

3. Bioreactor Environmental Monitoring

<table>
<tr><th>Parameter</th><th>Results/Discussion</th></tr>
<tr><td></td><td>

Table 3.2.1.3: Surface Gas Monitoring Results Summary

Parameter	Minimum	Maximum	Average
Methane (%)	0.0004	0.0049	0.042

Methane was detected in varying amounts over the waste surface with an overall average of 0.042% during this reporting period which was lower than 0.05% average from the previous reporting period.

The emission threshold concentration for methane detected in surface gas emission testing is 500 parts per million (0.05%), as recommended in (Environmental Guidelines for Solid Waste Landfills, January 1996).

Surface gas monitoring enables site operational personnel to investigate and apply corrective actions where any high concentrations of methane has been detected to maintain the effectiveness of the landfill cap and prevent migration of landfill gas through preferential pathways to the surface.

This can include application of cover material in areas of the void demonstrating settlement cracking, commissioning and rebalancing of gas extraction wells and installing additional gas collection infrastructure. During this reporting period a new vegetation mulch bio-cover was implemented around wells which has assisted in mitigating odour and reducing surface gas emissions.

</td></tr>
<tr><td>**Landfill Gas Flare**</td><td>

The landfill gas flares are manufactured to a residence time of 0.3 seconds with a destruction efficiency of 98% for methane and non methanogenic organic compounds to meet the requirements of the EPL. Monitoring was continuously performed during this reporting period, an average of which is summarised in **Table 3.2.1.4** below.

Table 3.2.1.4: Landfill Gas Flare Monitoring Results

Parameter	Units	Result
Temperature	°C	1212
Residence Time	Seconds	< 0.3

</td></tr>
<tr><td>**Landfill Gas Engine Exhaust Point(s)**</td><td>

Monitoring of a landfill gas engine 1's exhaust point was completed during the reporting period. The results are consistent with the previous monitoring period and presented in **Tables 3.1** to **3.5** (refer **Appendix 4**).

Concentration limits for each of the following pollutants are stipulated in the EPL, all of which were below the threshold for each exhaust point test within this reporting period and consistent with previously reported levels, as demonstrated in **Figures 3.2.1.1** – **3.2.1.3**.

- Nitrogen Oxides;
- Hydrogen Sulphide;
- Sulphuric Acid Mist; and
- Sulphur Trioxide.

An upward trend in nitrogen oxides was noted from the previous monitoring period however was still within the concentration threshold.

</td></tr>
</table>

3. Bioreactor Environmental Monitoring

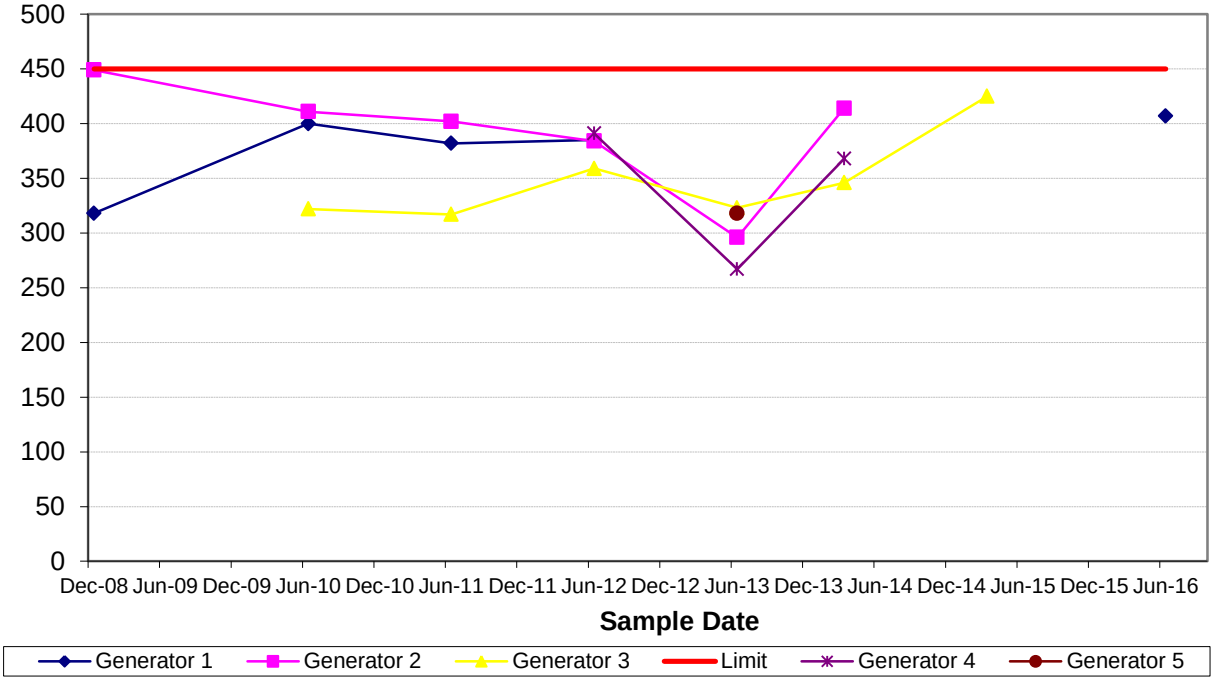

Figure 3.2.1.1 – Landfill Gas Engine Exhaust Point – Nitrogen Oxide Flow (mg/m^3)

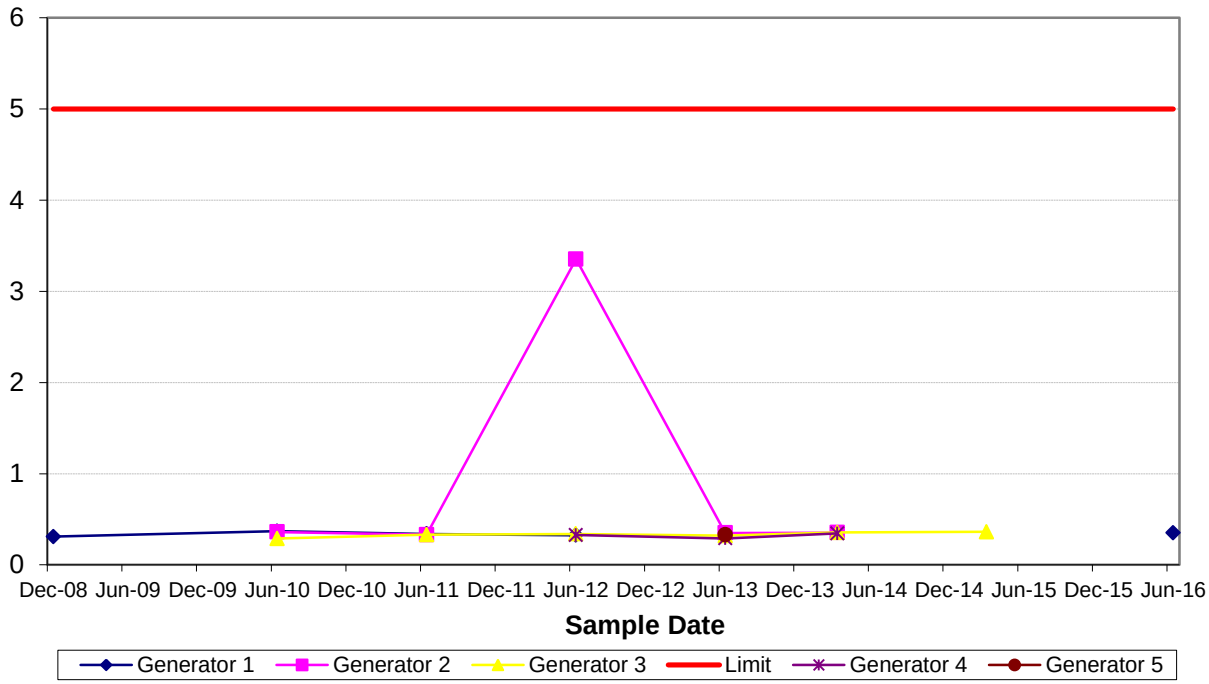

Figure 3.2.1.2 – Landfill Gas Engine Exhaust Point – Hydrogen Sulphide (mg/m^3)

3. Bioreactor Environmental Monitoring

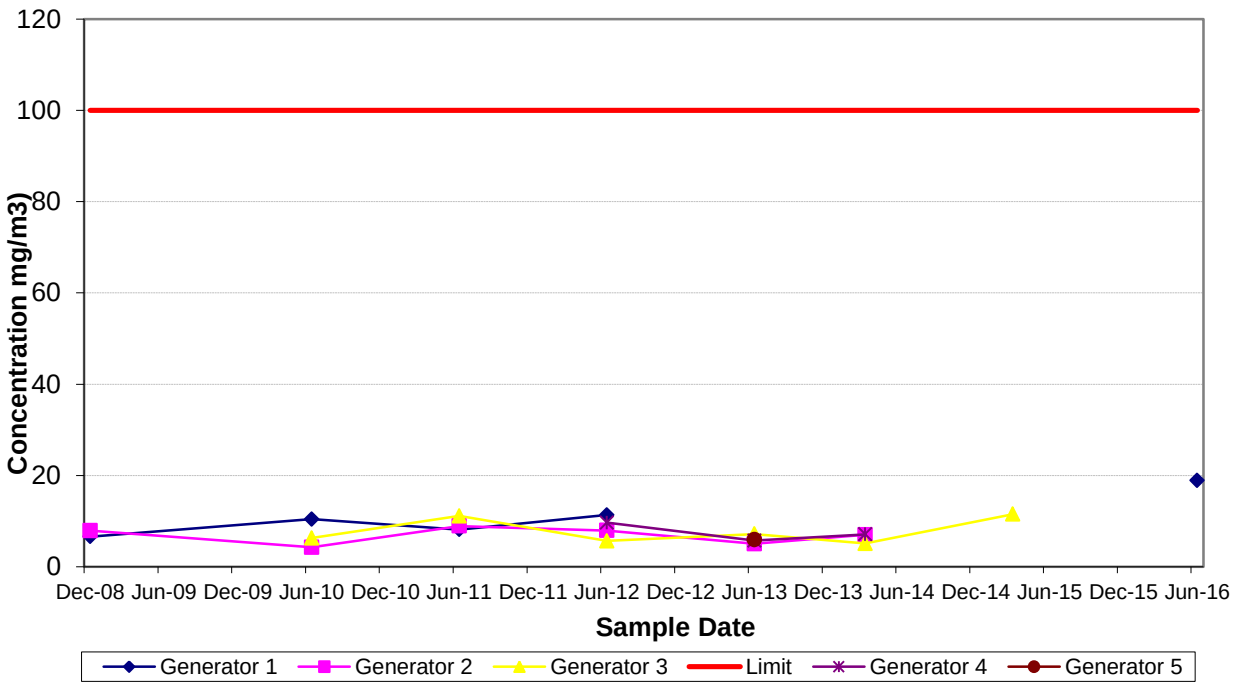

Figure 3.2.1.3 – Landfill Gas Engine Exhaust Point – Sulphuric Acid Mist and Sulphur Trioxide (mg/m^3)

3.2.2 Bioreactor Air Quality Monitoring Results

Table 3.2.2: Bioreactor Air Quality Monitoring Results

Parameter	Results/Discussion
Meteorological Station	Veolia operates an onsite meteorological station to continuously monitor climatic data listed in the EPL. Meteorological data recorded includes (but is not limited to): • Wind speed at 10m; • Wind direction at 10m; • Temperature at 2m; • Temperature at 10m; • Rainfall; • Solar radiation; and • Sigma theta at 10m Meteorological data is logged in 15 minute and 24 hour intervals and can be made available for the 2015/2016 reporting period upon request. Servicing and calibration of the meteorological station is carried out quarterly by Hydrometric Consulting Services (calibration reports can be provided upon request).

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion
Particulates/Dust Monitoring	Monitoring of 3 depositional dust gauges (DG) was completed on a monthly basis as required under the EPL, the results of which are generally consistent with previously reporting periods as depicted in **Figure 3.2.2.1**. The results of total solids found within the depositional dust samples are summarised for each of the monitoring locations in **Table 3.2.2.1** below, with the detailed results tabulated in **Tables 4.1** - **4.3** (refer **Appendix 4**). *Table 3.2.2.1: Dust Monitoring Results* **Dust Gauge** / **Summary Total Solids (g/m2/month)** **Minimum** / **Maximum** / **Average** **DG22** 0.9 9.1 2.47 **DG24** 0.3 25.9 11.49 **DG28** 0.4 23.6 3.83 The maximum dust level recorded in this reporting period was 25.9 g/m2/month at DG24 in April 2016 which is located on the Western side of the Void. As detailed in section 2 (section 4.03), increased earthworks in this vicinity related to construction activities for the new WMBT facility contributed to this elevated reading. Subsequent monitoring of this site since construction activities have declined has been more reflective of historical trends. Site boundary receivers did not record comparable elevated results during this period (Monitoring Point 10 <DG28, Pylara> and EPL20476, Monitoring Point 7). The reading of 23.6 g/m2/month at DG28, located at the Veolia owned property of 'Pylara', in July 2016 is abnormal. Given that for the corresponding month there were no similar levels recorded at the dust gauges located within the proximity of the landfill void, it can be inferred that this dust emission was not as a result of the Bioreactor activities and can be treated as an outlier. Veolia infer that this result is due to activities such as mowing and/or recreational camp fires in the immediate vicinity by visiting guests. Overall dust suppression is generally consistent with previous years and a measure of the dust control measures that the site has in place.

3. Bioreactor Environmental Monitoring

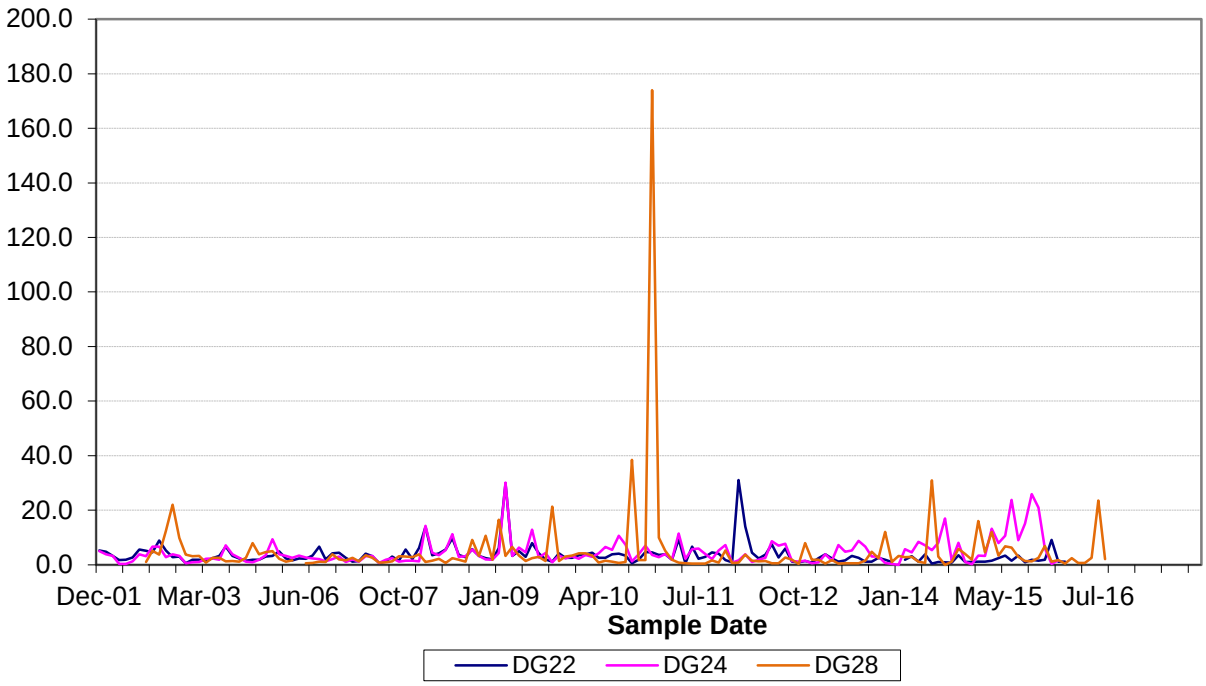

Figure 3.2.2.1 – Bioreactor Depositional Dust Levels (g/m^2/month)

3.2.3 Bioreactor Surface Water Monitoring Results

The findings from water quality monitoring of surface water locations required under the EPL is summarised in **Table 3.2.3** below with detailed data provided in **Tables 5.1 - 5.8** (refer **Appendix 4**). Key quality indicators selected to identify likely impacts from the Bioreactor include:

- pH,
- Electrical conductivity (EC),
- Ammonia (NH_3),
- Total organic carbon (TOC),
- Iron (Fe),
- Sulphate (SO_4), and
- Zinc (Zn).

These are depicted in the trend graphs (**Figures 3.2.3.1 – 3.2.3.8**) provided in **Appendix 5**.

3. Bioreactor Environmental Monitoring

Table 3.2.3: Bioreactor Surface Water Monitoring Results

Parameter	Results/Discussion
Site 115 – Allianoyonyige Creek	Site 115 is situated downstream of the evaporation dams. All quarterly monitoring events required under the EPL were undertaken in this reporting period and have been documented in the Annual Return. Based on the results provided in **Table 5.1** (refer **Appendix 4**), the pollutant concentration trends from previous monitoring periods are generally consistent. • Mean pH at 7.8 (overall range of 6.1 – 8.6) for this location indicates slightly alkaline water. • EC ranges overall between 285 – 3630 µS/cm, indicating fresh to brackish water. Variability can be resultant of dilution during rainfall events and evapo-concentration as is likely based on Woodlawn's local climatic conditions and historical trends (Earth2Water, 2010). • NH_3 at 0.1mg/L and TOC at mean of 14.75 mg/L concentrations recorded in this monitoring period remain consistent with historical monitoring results • Heavy metal concentrations are of low magnitude for this reporting period – less than 0.02 mg/L for Pb and less than 0.2mg/L for Zn, indicating no contaminated runoff is impacting surface water at this monitoring location.
Spring 2	Spring 2 is located upstream of the Bioreactor and adjacent to Crisps Creek. The site therefore provides background water quality information to site operations. The spring naturally overflows to Crisps Creek during rainfall events. 4 monitoring events were undertaken in this reporting period and have been documented in the Annual Return. Water quality trend in Spring 2, based on the results provided in **Table 5.2** (refer **Appendix 4**), is consistent with water quality from historical monitoring records. • pH is consistent with previous years (average 6.11) and reflective of the overall range of 3.5 – 8.5 for this location; • EC (average 390 µS/cm) for this reporting period is indicative of fresh water. • SO_4 (average 143 mg/L) shows an identical trend to conductivity, again indicating a direct effect on EC. • Pb (average 0.02 mg/L) and Zn (average 8.2 mg/L) concentrations continue to show slow decline from overall averages with some variability likely due to dilution following wet weather periods and concentration during drier periods. • NH_3 (average 0.43 mg/L) and TOC (average 13.8 mg/L) concentrations recorded in this monitoring period were consistent with historical monitoring results.

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion
Site 105 – Crisps Creek	Site 105 is located downstream of the Bioreactor and tailings dams. All quarterly monitoring events required under the EPL were undertaken in this monitoring period and have been documented in the Annual Return. Water quality trends in Site 105, based on the results provided in **Table 5.3** (refer **Appendix 4**) are consistent with previous monitoring results. • pH (average 7.6) is within the overall range of 5.4 – 8.6 for this location, indicating relatively neutral water; • EC (average 840 µS/cm) is consistent with historical results, reflecting brackish water. • TOC (average 16.25 mg/L) and NH_3 (average 0.1 mg/L) were consistent with historical trends. • Zn and Pb remain consistent and average less than 0.3 mg/L as per previous reporting periods.
WM200 Raw Water Dam	The Raw Water Dam is located to the west of the dolerite stockpile and collects uncontaminated water. Quarterly monitoring events were undertaken in accordance with EPL conditions. Based on the results provided in **Table 5.4** (refer **Appendix 4**), the results for WM200 remain generally consistent with the previous reporting periods. • pH (average 7.0 – 8.32) indicates slightly alkaline water; • EC (average 1509 µS/cm) is consistent with previous monitoring periods (average 1500 µS/cm) and is indicative of fresh/brackish water; • SO_4 level (average 253 mg/L) was slightly lower than the previous monitoring period (average 469 mg/L) • Zn and Fe levels appear to have stabilised at averages of 10.9 mg/L and 0.1 mg/L respectively, which are lower than the previous reporting period of 52mg/L and 0.78mg/L. Based on historical evidence, it appears the variability in the heavy metals may be quite cyclical; • TOC was an average of 8 mg/L in this reporting period which is consistent with historical results. This could be reflective of the presence of organic matter from riparian zone vegetation surrounding the dam. • NH_3 at an average of 0.2 mg/L is at quite low levels at this location.
WM201 – Entrance Road Culvert	The Entrance Road Culvert collects surface water runoff from the Woodlawn Bioreactor administration office and workshop areas. Four monitoring events were undertaken during this reporting period, the results of which are provided in **Table 5.5** (refer **Appendix 4**). • pH is consistent (average 7.0) with previous reporting periods and remains within the overall range of 4.5 – 8.2 for this location; • EC at 634 µS/cm is reflective of fresh water and is consistent with previous reporting periods. EC variability can be caused by dilution during rainfall events.

Parameter	Results/Discussion
	• Both Pb and Zn (average 0.4mg/L and Fe 4mg/L respectively) remainined reasonably stable throughout the reporting period with Zn declining slightly over the year (6.01 to 2.23mg/L). Veolia will continue to monitoring this location in the next reporting period for any likely contaminant run off impacts.
WM202 – Evaporation Dam 3 South	Evaporation Dam 3 South is a storage point to manage stormwater from the void by evaporation. Quarterly monitoring events were undertaken in accordance with EPL conditions. Water quality results indicated a similar trend to previously reported data as seen **in Table 5.6** (refer **Appendix 4**). • pH levels indicate an acidic, yet stable trending result with the average pH of 3.2 slightly higher than the previous reporting period most likely due to increased rainfall during this period; • Fe (average 53mg/L) is consistent with previous reporting period; • Zn at an average of 905 mg/L shows an increase from the average reporting in the previous period (845 mg/L) however is well within the maximum measured at this location of 1964 mg/L; • SO_4 shows an increase of an average of 8140 mg/L from an average of 7310 mg/L reported in the previous period • EC (average 9375 µS/cm) remains within the overall average. Both SO_4 and EC concentrations reflect the signature for Acid Mine Drainage (AMD) contaminated waters from remnant mining operations stored in Evaporation Dam 3 South. • NH_3 concentrations (average 100.9 mg/L) which is consistent with previous reporting periods.
WM203 – Evaporation Dam 3 North	Evaporation Dam 3 North (ED3N) is a storage point to manage treated leachate by evaporation. Quarterly monitoring events were undertaken in accordance with the EPL. Based on the water quality results provided in **Table 5.7** (refer **Appendix 4**), for WM203, the following can be confirmed: • pH (average 7.68) continues to demonstrate an upward trend from the previous reporting period. • EC average 28450 µS/cm is trending upward from the previously reported period (average 24925µS/cm); • SO_4 averages (7760 mg/L) appears to be generally consistent with previous reporting periods. • Fe levels (average 15.5 mg/L) are slightly higher than previous years whilst Zn levels (average 302.1) reflect a downward trend. • NH_3 concentrations (average 904 mg/L) remained stable over the course of the reporting period (877 – 972mg/L). • TOC is trending upward (average 1250 mg/L) from the previous

Parameter	Results/Discussion
	reporting period.
Pond 3	Pond 3 is situated on a bench within the landfill void at a relative level (RL) of 740 m above sea level. Pond 3 acts as a transfer point to capture stormwater from the walls of the landfill void to Evaporation Dam 3. Quarterly monitoring events were undertaken in accordance with the EPL, the results of which are tabulated in **Table 5.8** (refer **Appendix 4**). These water quality results consistent results with previous reporting periods. • pH average of 4.95 confirms acidic nature of water that comes in contact with the void walls and is generally consistent with previous results • EC (average 3053 µS/cm) remains similar with previous results, showing variability (1690 – 4590 µS/cm), likely due to weather influences; • SO_4 trends (average 1328 mg/L) mirror variability of EC (702 – 3310mg/L). The reading of 0.4 mg/L in quarter 1 is not consistent with other results and can therefore be classified as an outlier • Pb average of 0.64 mg/L is consistent with the previous reporting period. • Zn (average 219.6 mg/L) also shows a declining trend; • NH_3 (average 10.73 mg/L) and TOC (average 17.5 mg/L) both mirror a similar trend which appears quite variable over historical monitoring results. These results and trends are deemed representative of the stormwater quality captured from the walls of the void.

3.2.4 Bioreactor Leachate Monitoring Results

Leachate quality monitoring is undertaken annually at 2 monitoring locations in the Bioreactor as required by the EP. The findings from this reporting period are summarised in **Table 3.2.4** below with the detailed data provided in **Tables 6.1** and **6.2** (refer **Appendix 4**). The key quality indicators selected to characterize the leachate and identify any migration into groundwater or surface water monitoring locations include:

- pH,
- Electrical Conductivity (EC),
- Sulphate (SO_4),
- Lead (Pb),
- Zinc (Zn),
- Ammonia (NH_3), and
- Total Organic Carbon (TOC).

These are depicted in the subsequent trend graphs **Figures 3.2.4.1** and **3.2.4.2**.

3. Bioreactor Environmental Monitoring

Table 3.2.4: Bioreactor Leachate Monitoring Results

Parameter	Results/Discussion
Leachate Dam	The leachate dam is located at the northwest rim of the landfill void where leachate collected and extracted from the void is treated by aeration to oxidise organic compounds. An annual monitoring round was completed during this reporting period as per the requirements of the EPL. Based on the results provided in **Table 6.1** (refer **Appendix 4**), the characteristics of the leachate are: • pH (8.59) is indicative of an increasingly alkaline state from the previous reporting period result of 8.47 • EC (24,800 µS/cm) is consistent with the previous reporting period; • SO_4, one of the dominant anions, (555 mg/L) continues to indicate a downward trend from the previous reporting periods; • Pb (0.212 mg/L) shows an increase in trend from the previous reporting period, whereas Zn (6.36 mg/L) show an decrease in trend from the previous reporting period. • NH_3 (1700 mg/L) is consistent with previous reporting readings; • TOC (3220 mg/L) is slightly higher than the previous reporting period (2410 mg/L) but remains considerably lower than previous reporting periods. Leachate quality sampled at this point will be affected by the status of the Leachate Treatment System and how long the leachate has been subjected to the treatment process.
Leachate Recirculation System	The leachate recirculation system is located within the landfill void, comprised of a network of drainage sumps, pipes, pumps and wells that are used to collect and extract leachate from the waste mass. An annual round was completed during this reporting period in accordance with the EPL, the results of which are detailed in the **Table 6.2** (refer **Appendix 4**). Based on these results, the leachate collected directly from the recirculation system displays similar characteristics to the leachate pond, with some exceptions as summarised below: • pH (8.05) is generally consistent with previous reporting period and slightly less alkaline than the dam; • EC (34,900 µS/cm) is consistent with the previous reporting period (33,500 µS/cm) and is generally consistent with the overall annual average for this location; • SO_4 (204 mg/L) shows a significant decrease from the previous reporting period, however is still less than the overall annual average for this location; • Both Pb and Zinc show decreasing trends from previous reporting period, 0.06 mg/L and 1.04 Mg/L respectively, remaining significantly lower than historical averages. • TOC (5300 mg/L) shows a slight increase from the previous reporting period but is generally consistent with historical monitoring results.

3. Bioreactor Environmental Monitoring

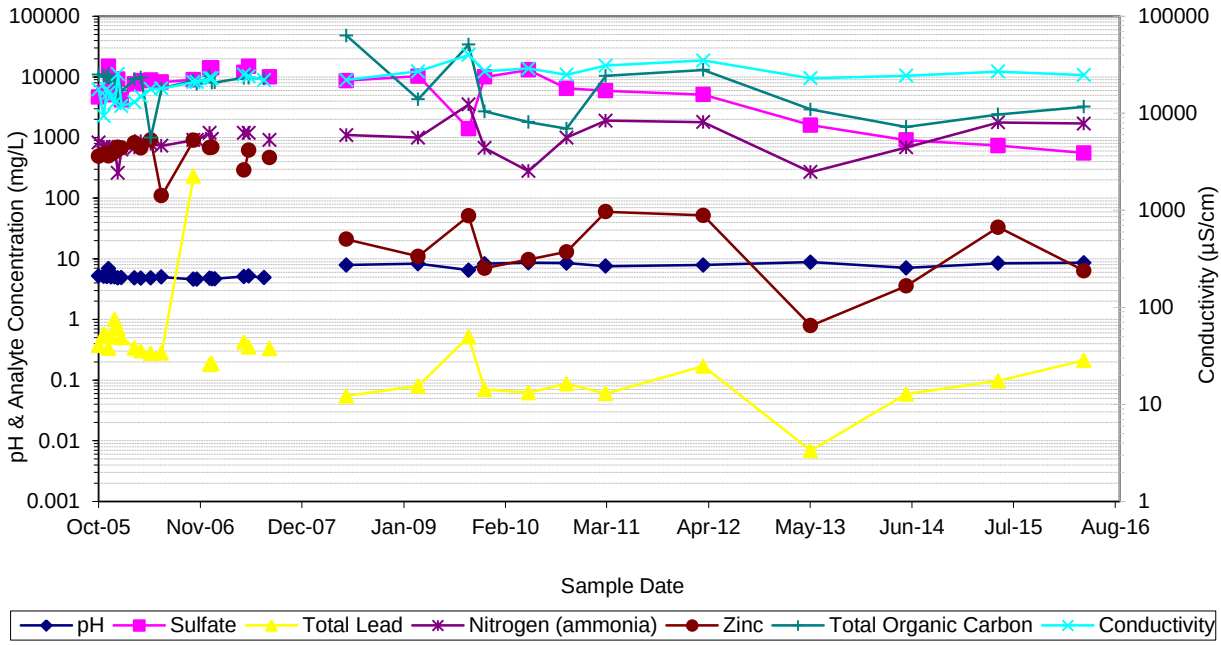

Figure 3.2.4.1 – Leachate Trends – Leachate Dam

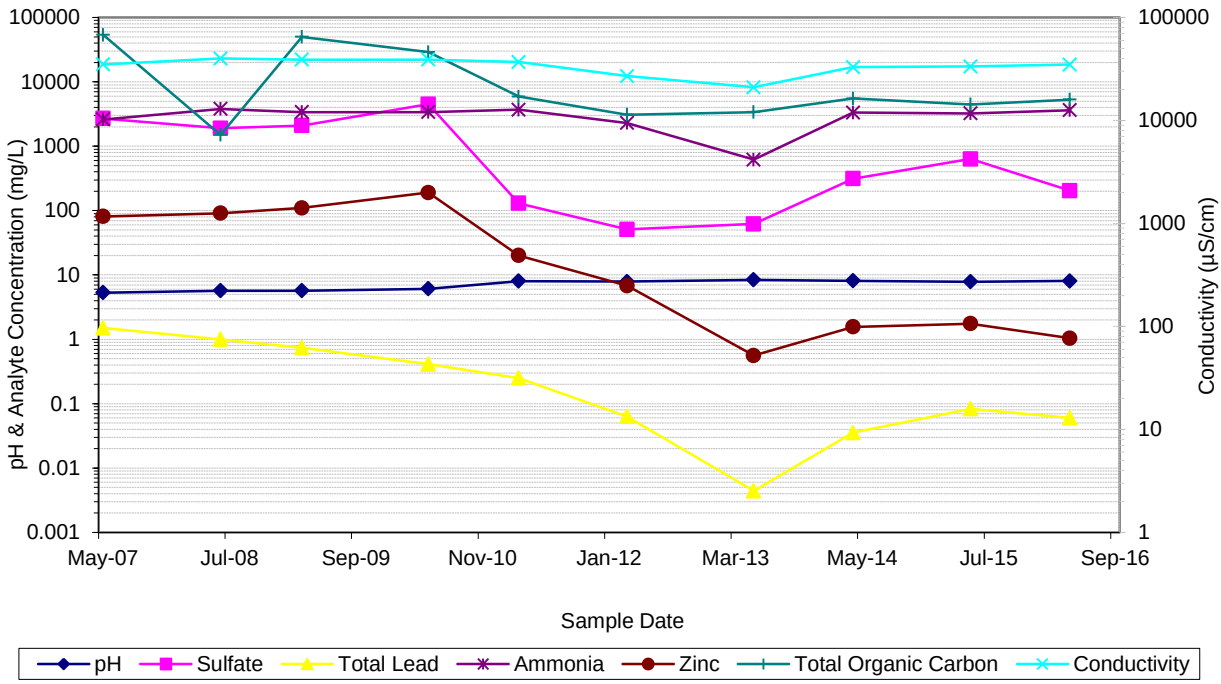

Figure 3.2.4.2 – Leachate Trends – Leachate Recirculation System

3. Bioreactor Environmental Monitoring

3.2.5 Bioreactor Groundwater Monitoring Results

Groundwater quality monitoring at 24 locations was undertaken in this reporting period as required by the EPL, comprising 1 annual and 3 quarterly rounds of monitoring, the results of which are summarised in **Table 3.2.5** below. Detailed data is provided in Tables **7.1** – **7.24** (refer **Appendix 4**).

The groundwater monitoring well network allows for an assessment of potential impacts from the waste operations at the Bioreactor, evaporation dams and tailing dams. The key quality indicators selected to detect any pollutants in groundwater samples are the same as those deemed characteristic for leachate and are as follows:

- pH
- Electrical Conductivity (EC),
- Sulphate (SO_4),
- Lead (Pb),
- Zinc (Zn),
- Ammonia (NH_3), and
- Total Organic Carbon (TOC).

These are depicted in the trend graphs **Figures 3.2.5.1** to **3.2.5.24** (refer **Appendix 5**). In addition to water quality monitoring, standing water levels (SWL) of the wells are also measured in metres relative to sea level (m RL) and are depicted in the subsequent graphs Figures **3.2.5A**, **3.2.5B** and **3.2.5C**.

Table3.2.5: Bioreactor Groundwater Monitoring Results

Parameter	Results/Discussion
MB1	MB1 is located down gradient of the landfill void. Based on the results provided in **Table 7.1** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 776.2 m RL) was slightly higher than the long term average since 2004 (769.98) due to significant rainfall events; • pH (average 7.3) neutral – to slightly alkaline consistent with previous reporting period; • EC (average 1550 µS/cm) is slightly higher than but generally consistent with previous readings representing fresh water; • SO_4 (average 270 mg/L) is generally consistent with previous periods; • Pb and Zn (average 0.001 mg/L and 0.214mg/L respectively) are generally consistent with previous periods. • NH_3 (average 0.1) is consistent with previous reporting periods. • TOC (5 mg/L) is consistent with the previous reporting period and historical trends. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved.

Parameter	Results/Discussion
	All trends at this location indicate fairly stable concentration and there is no indication of contamination from mining or Bioreactor activities. No significant variations or anomalies were recorded for any analyte tested during this monitoring period.
MB2	MB2 is located upstream of Evaporation Dam 2. Based on the results provided in **Table 7.2** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 778.7 m RL) was consistent with long term average since 2004; • pH (average 6.85) neutral, consistent with previous reporting period; • EC (average 6795 µS/cm) and SO_4 (average 4085 mg/L) is consistent with previous periods; • Pb (average 0.0002 mg/L) indicates a stable trend consistent with the previous reporting period. • Zn (average 0.057 mg/L) is generally consistent with previous reporting periods. • NH_3 (<0.1 mg/L) same as previous monitoring periods of non detection rates; • TOC (4 mg/L) is consistent with previous reporting periods. All trends indicate fairly stable concentration and there is no indication of contamination from mining or Bioreactor activities. No significant variations or anomalies were recorded for any analyte tested during this monitoring period.
MB3	MB3 is located upstream of the Bioreactor and mine site. Based on the results provided in **Table 7.3** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 790.62 m RL) was consistent with long term average since 2004; • pH (average 6.96) near neutral is consistent with previous reporting period; • EC (average 1985 µS/cm) is consistent with previous readings representing fresh water; • SO_4 (average 32.1 mg/L) is stable and consistent with previous periods; • Pb (average 0.0002 mg/L) and Zn (average 0.013 mg/L) is) are stable and consistent with previous periods. • NH_3 (< 0.1 mg/L) is consistent with previous monitoring periods of non detection rates; • TOC (3 mg/L) result is consistent with historical results. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentration and provide an indication of background groundwater concentrations.
MB4	MB4 is located downstream of the Bioreactor. Based on the results provided in **Table 7.4** (refer **Appendix 4**), the groundwater quality at this location can

Parameter	Results/Discussion
	be described as: • SWL (average 774.1 m RL) was consistent with long term average since 2004; • pH (average 5.42) slightly acidic, consistent with previous reporting period; • EC (average 1598 µS/cm) represents fresh water salinity and is consistent with previous period. This trend is reflected in SO_4 (average 204.75 mg/L) results for this period; • Pb (average 0.019 mg/L) remains stable while Zn (average 0.72 mg/L) is seen to fluctuate which appears consistent with historical cyclic trends; • NH_3 (< 0.1 mg/L) is consistent with previous monitoring periods of non detection rates; • TOC (2 mg/L) result is consistent with historical results. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentrations and there is no indication of contamination from mining or Bioreactor activities.
MB5	MB5 is located upstream of the Western Tailings Dam at the Waste Rock Dump area. Based on the results provided in **Table 7.5** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 827.71 m RL) was consistent with long term average since 2004; • pH (average 4.27) acidic, consistent with previous reporting period, reflecting the characteristic of tailings and waste rock. • EC (average 8133 µS/cm) is consistent historically with brackish water quality; • SO_4 (average 5618 mg/L) mirrors the trend of EC; • Pb (average 0.00098 mg/L) and Zn (average 244 mg/L) are consistent with the previous reporting period; • NH_3 (< 0.1 mg/L) is consistent with previous monitoring periods of non detection rates; • TOC (6 mg/L) appears consistent with historical results. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentration and there is no indication of contamination from Bioreactor activities. There is indication of impacts from mining activities at this monitoring location although this has been ongoing prior to Veolia obtaining the site. No significant variations or anomalies were recorded for any analyte tested during this monitoring period.
MB6	MB6 is located downstream of Evaporation Dam 3 and upstream of the Bioreactor. Based on the results provided in **Table 7.6** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 791.47 m RL) was consistent with historical results; • pH (average 5.71) slightly acidic consistent with previous reporting period;

Parameter	Results/Discussion
	• EC (average 5660 µS/cm) represents brackish water and the trend is mirrored by SO_4 (average 870.1 mg/L) consistent with previous periods; • Pb (average 0.00073 mg/L) shows a decreasing trend while Zn (average 10.83 mg/L) is consistent with previous periods; • NH_3 (< 0.1mg/L) is consistent with previous monitoring periods of non detection rates; • TOC (4 mg/L) appears consistent with historical results. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentration and there is no indication of contamination from Bioreactor activities. There is indication of impacts from mining activities at this monitoring location although this has been ongoing prior to Veolia obtaining the site. No significant variations or anomalies were recorded for any analyte tested during this monitoring period.
MB7	MB7 is located upstream of Evaporation Dam 3. Based on the results provided in **Table 7.7** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 785.48 m RL) was consistent with long term average since 2004; • pH (average 6.9) neutral is consistent with the previous reporting period; • EC (average 10053 µS/cm) and SO_4 (average 162 mg/L) follow a similar stable trend to previous reporting periods ; • Pb (average 0.0003 mg/L) is consistent throughout the reporting period whilst Zn (average 3.18 mg/L) shows a fluctuating trend consistent with historical cycles; • NH_3 (< 0.1 mg/L) is consistent with previous monitoring periods of non detection rates; • TOC (11 mg/L) appears consistent with the previous reporting period. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentration and there is no indication of contamination from mining or Bioreactor activities.
MB8	MB8 is located downstream of the Bioreactor on 'Pylara' farm, the agricultural enterprise surrounding the Woodlawn site. Based on the results provided in **Table 7.8** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 748.58 m RL) was consistent with previous periods; • pH (average 7.23) neutral to slightly alkaline is consistent with previous reporting period; • EC (average 3607 µS/cm) and SO_4 (average 98.2 mg/L) show a stable trend, overall consistent with previous periods; • Pb (average 0.0002 mg/L) and Zn (average 0.025 mg/L) show a fluctuating trend consistent with historical cycles; • NH_3 (< 0.1 mg/L) is consistent with previous monitoring periods of

Parameter	Results/Discussion
	non detection rates; • TOC (6 mg/L) is consistent with previous monitoring periods. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentrations and no indication of contamination from mining or Bioreactor activities is evident.
MB10	MB10 is located adjacent to Evaporation Dam 1. Based on the results provided in **Table 7.9** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 780.72 m RL) was higher than long term averages since 2004 due to increased rainfall during the period; • pH (average 7.0) neutral is consistent with previous reporting periods; • EC (average 7652 µS/cm) is of brackish quality consistent with previous readings; • SO_4 (average 3693 mg/L) mirrors EC and is generally consistent with previous periods; • Pb (average 0.00065 mg/L) is stable while Zn (average 0.01725 mg/L) and generally consistent with previous reporting periods; • NH_3 (< 0.1 mg/L) is consistent with previous monitoring periods of non detection rates; • TOC (5 mg/L) appears consistent with the previous reporting period. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentrations and there is no indication of contamination from mining or Bioreactor activities.
MB11	MB11 is located between Evaporation Dam 2 (ED2) and the Seepage Collection Trench (SCT), which is a dedicated capture area for seepage waters. Based on the results provided in **Table 7.10** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 782.35 m RL) was consistent with long term average since 2004; • pH (average 3.87) acidic and consistent with previous reporting period; • EC (average 35,375 µS/cm) consistent with previous readings for saline water; • SO_4 (average 45,300 mg/L) mirrors the trend of EC but is generally consistent with previous periods; • Pb (average 0.017 mg/L) shows a decreasing trend while Zn (average 5658 mg/L) is consistent with the previous reporting period. • NH_3 (average 0.275 mg/L) is consistent with previous monitoring periods which were close to non-detection limits; • TOC (14 mg/L) is slightly higher than previous reporting period but still indicative of natural conditions.

Parameter	Results/Discussion
	Any fluctuations in trends is influenced by seepage water from ED2, which has been ongoing since Veolia assumed responsibility for the site however there is no indication of increasing trends. Veolia is managing the water volume in ED2 by promoting evaporation and limiting inputs from rainfall to minimise the volume of seepage at this location. In addition to monitoring this well. Veolia monitor groundwater wells MB19 and MB20 located down gradient of the SCT. These wells are monitored to determine downgrade migration from the SCT. Results of these wells have been tabulated and provided in **Tables 11.1** and **11.2** (refer **Appendix 6**).
MB12	MB12 is also located at the ED2 SCT, adjacent to MB11. Based on the results provided in **Table 7.11** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 777.93 m RL) is consistent with previous historical results noting that results were heavily skewed by an inaccurate reading in 2013-14 Quarter 1 (747.15 m RL) which is not possible due to well depth (possible transcription error); • pH (average 3.65) acidic and consistent with previous reporting period; • EC (average 39,275 µS/cm) consistent with previous readings for saline water; • SO_4 (average 51,075 mg/L) mirrors EC and is again slightly lower than the previous reporting period but generally consistent with historical records; • Pb (average 0.90 mg/L) and Zn (average 6933 mg/L) are generally stable and consistent with previous reporting period. • NH_3 (average 0.58 mg/L) is consistent with previous monitoring periods of close to non-detection rates; • TOC (16 mg/L) is slightly lower than previous reporting period but still indicative of natural conditions. All trends indicate fairly stable concentrations.
MB13	MB13 is located downstream of Evaporation Dam 1 (ED1) and surface water monitoring point Site 115. Based on the results provided in **Table 7.12** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 746.4 m RL) was consistent with long term average since 2004; • pH (average 7.24) neutral to slightly alkaline consistent with previous reporting period; • EC (average 3365 µS/cm) is consistent with previous readings for brackish water; • SO_4 (average 71.23 mg/L) mirrors EC and is generally consistent with previous periods; • Pb (average 0.0002 mg/L) remains stable while Zn (average 0.027 mg/L) is variable but consistent with historical records. • NH_3 (< 0.1 mg/L) is at non detection rates; • TOC (9 mg/L) remains consistent with previous reporting period and indicative of organic matter being present in the groundwater at this location, which may be influenced by local microbial communities

Parameter	Results/Discussion
	rather than Bioreactor operations. All trends indicate fairly stable concentrations and no contamination from mining or Bioreactor activities.
MB14	MB14 is located upstream of Evaporation Dam 2. Based on the results provided in **Table 7.13** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 783.4 m RL) is consistent with long term average since 2004; • pH (average 7.35) neutral – to slightly alkaline consistent with previous reporting period; • EC (average 3425 µS/cm) consistent with previous reporting period for brackish water; • SO_4 (average 1845 mg/L) is higher than the previous reporting period but generally consistent with historical records; • Pb (average 0.00065 mg/L) remains stable while Zn (average 0.0047 mg/L) displays a fluctuating trend consistent with previous reporting periods. • NH_3 (< 0.1 mg/L) is at non detection rates; • TOC (4 mg/L) consistent with historical results is indicative of natural conditions. No significant variations or anomalies were recorded for any analyte tested at this location during this monitoring period.
MB15	MB15 is located downstream of the Waste Rock Dam (WRD). Based on the results provided in **Table 7.14** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 764.86 m RL) was consistent with long term average since 2004; • pH (average 6.9) near neutral and generally consistent with historical results; • EC (average 8135 µS/cm) representative of brackish water and SO_4 (average 5373 mg/L) follow a similar and stable trend consistent with previous periods; • Pb (average 0.0002 mg/L) and Zn (average 1.24 mg/L) are consistent with previous reporting period but display a fluctuating trend consistent with historical cycles; • NH_3 (average 0.1) is reflective of previous monitoring periods at close to non-detection rates; • TOC (9 mg/L) is higher than the previous reporting period but comparable with historical results and indicative of natural conditions, which may include some influence from microbial communities; All trends indicate fairly stable concentrations with the exception of fluctuating metal trends that are reflective of long term well characteristics. There is no indication of contamination from Bioreactor activities at this monitoring location.
MB16	MB16 is located downstream of the WRD. Based on the results provided in

Parameter	Results/Discussion
	Table 7.15 (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 769 mRL) was consistent with long term average since 2004; • pH (average 3.2) acidic consistent with previous reporting period; • EC (average 36,025 µS/cm) representative of brackish water and SO_4 (average 46,925 mg/L) follows similar trends consistent with previous periods when the Quarter 1 result of 11,000 mg/L is excluded. This result is not reflective of historical records and therefore can be treated as an outlier; • Pb (average 0.49 mg/L) remains stable while Zn (average 8407 mg/L) is consistent with a long term upward trend. • NH_3 (average 8.6 mg/L) is stable and consistent with previous monitoring periods; • TOC (33 mg/L) is consistent with previous monitoring period indicating the likely presence of organic matter present in groundwater at this location (which may also be attributed to microbial communities). There appears to be no indication of contamination from Bioreactor activities.
MB17	MB17 is located upstream of the WRD. Based on the results provided in **Table 7.16** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 767.8 mRL) was consistent with long term average since 2004; • pH (average 6.5) is slightly acidic consistent with previous reporting period; • EC (average 12800 µS/cm) indicating brackish water and SO_4 (average 10918 mg/L) follow similar trends consistent with previous periods; • Pb (average 0.0005 mg/L) shows a decreasing trend while Zn (average 12.4 mg/L) is seen to be rising over the long term trend. • NH_3 (average 0.1 mg/L) is close to, or within, non-detection rates; • TOC (12 mg/L) is consistent with long term averages and confirms the abnormality of 140 mg/L from the 2013-14 reporting period. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. Contamination from Bioreactor activities at this location is not evident.
ED3B	ED3B is located downstream of Evaporation Dam 3. Based on the results provided in **Table 7.17** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 783.47 mRL) was slightly higher than the long term average since 2004; • pH (average 7.16) is neutral – slightly alkaline and consistent with previous reporting period; • EC (average 8173 µS/cm) indicating brackish water and SO_4 (average 1165 mg/L) follow similar trends consistent with previous periods;

Parameter	Results/Discussion
	• Pb (average 0.0002 mg/L) remains stable while Zn (average 0.44 mg/L) is reflective of long term averages and providing evidence that the results of 9.38 mg/L in the 2014-15 (quarter 2) reporting year can be treated as an outlier. • NH_3 (< 0.1 mg/L) is at non detection rates; • TOC (10 mg/L) is slightly higher but reflective of historical results in previous reporting periods. All trends indicate fairly stable concentrations at this location with no evidence of contamination from mining or Bioreactor activities.
WM1	WM1 is located northeast of the landfill void. Based on the results provided in **Table 7.18** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 738.9 m RL) is higher than the previous reporting period and reflective of increased rainfall during this reporting period; • pH (average 7.3) neutral – to slightly alkaline consistent with previous reporting period; • EC (average 2155 µS/cm) represents slightly brackish water, and is consistent with previous historical records; • SO_4 (average 1080 mg/L) is similar in trend to EC and demonstrating a long term upward trend; • Both Pb (average 0.006 mg/L) and Zn (average 3.74 mg/L) remain consistent with previous reporting periods. • NH_3 (average 0.1 mg/L) is close to, or within, non-detection rates; • TOC (4 mg/L) is consistent with previous monitoring period reflective of natural conditions; All trends indicate fairly stable concentrations at this location with no evidence of contamination from mining or Bioreactor activities.
WM3	Decommissioned. Monitoring point removed from EPL during the 2015-16 reporting period (licence variation dated 8 July 2016).
WM4	WM4 is located on the northeast side of the void. Based on the results provided in **Table 7.19** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 720.33 mRL) continues to show a noticeable increase since previous reporting periods. This increase is likely due to the increased height of the waste within the void and that the water level has risen to capacity in the mine decline. • pH (average 7.3) neutral is consistent with long term historical trend; • EC (average 2013 µS/cm) is generally consistent with previous readings representing fresh water; • SO_4 (average 1034 mg/L) is similar to EC trend; • Pb (average 0.0003 mg/L) and Zn (average 0.44 mg/L) both fluctuate, which appears consistent with historical cyclic trends; • NH_3 (average 0.1 mg/L) is close to, or within, non-detection rates; • TOC (1 mg/L) is lower again than the previous reporting period and reflective of natural conditions.

Parameter	Results/Discussion
	No other significant variations or anomalies were recorded for any analytes tested during this monitoring period from the data available.
WM5	WM5 is located to the west of the void near Evaporation Dam 3 South. Based on the results provided in **Table 7.20** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 784.85 mRL) is consistent with long term averages; • pH (average 7.4) neutral is consistent with the previous period. • EC (average 8260 µS/cm) is representative of saline water and consistent with the previous reporting period; • SO_4 (average 205 mg/L) is similar to previous reporting period (158.5 mg/L). • Pb (average 0.0002 mg/L) and Zn (average 0.0455 mg/L) are both lower than the previous reporting period but can be seen to be fluctuating which appears consistent with historical cyclic trends; • NH_3 (average 0.1 mg/L) is close non-detection rates; • TOC (5 mg/L) is lower than previous monitoring periods reflecting natural conditions; No significant variations or anomalies were recorded for any analyte tested in this location during this monitoring period from the data available.
WM6	WM6 is located to the west of the void adjacent to Evaporation Dam 3 North. Based on the results provided in **Table 7.21** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 785.44 m RL) is consistent with the previous reporting period; • pH (average 6.05) is slightly acidic, but stable and consistent with previous reporting period; • EC (average 13,550 µS/cm) represents brackish to slightly saline water, consistent with previous reporting period; • SO_4 (average 335.5 mg/L) mirrors EC's stable trend; • Pb (average 0.007 mg/L) and Zn (average 0.237 mg/L) are both similar to the previous reporting period and generally consistent with historical fluctuations. • NH_3 (average 0.1 mg/L) is close to, or within, non-detection rates; • TOC (4 mg/L) is consistent with previous monitoring period reflecting natural conditions; All trends are relatively consistent and there is no indication of contamination from mining or Bioreactor activities.
WM7	Decommissioned. Monitoring point removed from EPL during the 2015-16 reporting period (licence variation dated 8 July 2016).
MW8S	MW8S is located northern side of ED3N. Based on the results provided in **Table 7.22** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 785.1 m RL) was consistent with long term average since 2004; • pH (average 7.01) is neutral and consistent with previous reporting period;

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion
	• EC (average 11550 µS/cm) remains stable with previous reporting period results; • SO_4 (average 1335 mg/L) continues to show a declining trend but is generally consistent with previous periods; • Pb (average 0.0004 mg/L) is stable whilst Zn (average 2.86 mg/L) continues to showa declining trend from historical records. • NH_3 (average 0.1 mg/L) is close to, or within, non-detection rates; • TOC (11 mg/L) is consistent with previous monitoring period reflecting natural conditions; The fluctuations noted could be attributed to the recharging of this well only following significant wet weather events which indicates that this well intercepts the shallow unconfined aquifer. There is no indication of contamination from mining or Bioreactor activities.
MW8D	MW8D is located adjacent to MW8S. Based on the results provided in **Table 7.23** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 785.57 m RL) was consistent with long term average since 2004; • pH (average 6.47) slightly acidic to neutral consistent with previous reporting period. • EC (average 10475 µS/cm) represents brackish water which is consistent with previous readings; • SO_4 (average 4483 mg/L) mirrors EC consistent with previous periods; • Pb (average 0.00025 mg/L) and Zn (average 18.3 mg/L) are both consistent with previous periods; • NH_3 (< 0.1 mg/L) is at non detection rates; • TOC (5 mg/L) is consistent with previous monitoring period reflecting natural conditions; All trends indicate fairly stable concentrations with no evidence of contamination from mining or Bioreactor activities.
MW9S	MW9S is located on the northwest side of ED3N. Based on the results provided in **Table 7.24** (refer **Appendix 4**), the groundwater quality at this location can be described as: • SWL (average 786.3) was consistent with previous reporting period; • pH (average 6.8) close to neutral consistent with previous reporting period; • EC (average 11,100 µS/cm) remains stable, consistent with previous reporting period for brackish water; • SO_4 (average 5020 mg/L) is consistent with previous periods; • Pb (average 0.0002 mg/L) and Zn (average 0.05 mg/L) were both generally consistent with historical results. • NH_3 (< 0.1 mg/L) is at non detection rates; • TOC (5 mg/L) reflecting natural conditions is consistent with historical results; No significant variations or anomalies were recorded for any analyte tested

Parameter	Results/Discussion
	at this location during this monitoring period.
MW10S	MW10S is located on the northeast side of ED3. No sampling of MW10S could be undertaken during the reporting period as this well was continually dry This has been a consistent observation since the well was commissioned in 2007. No data is available to produce tables or graphs for this monitoring point.

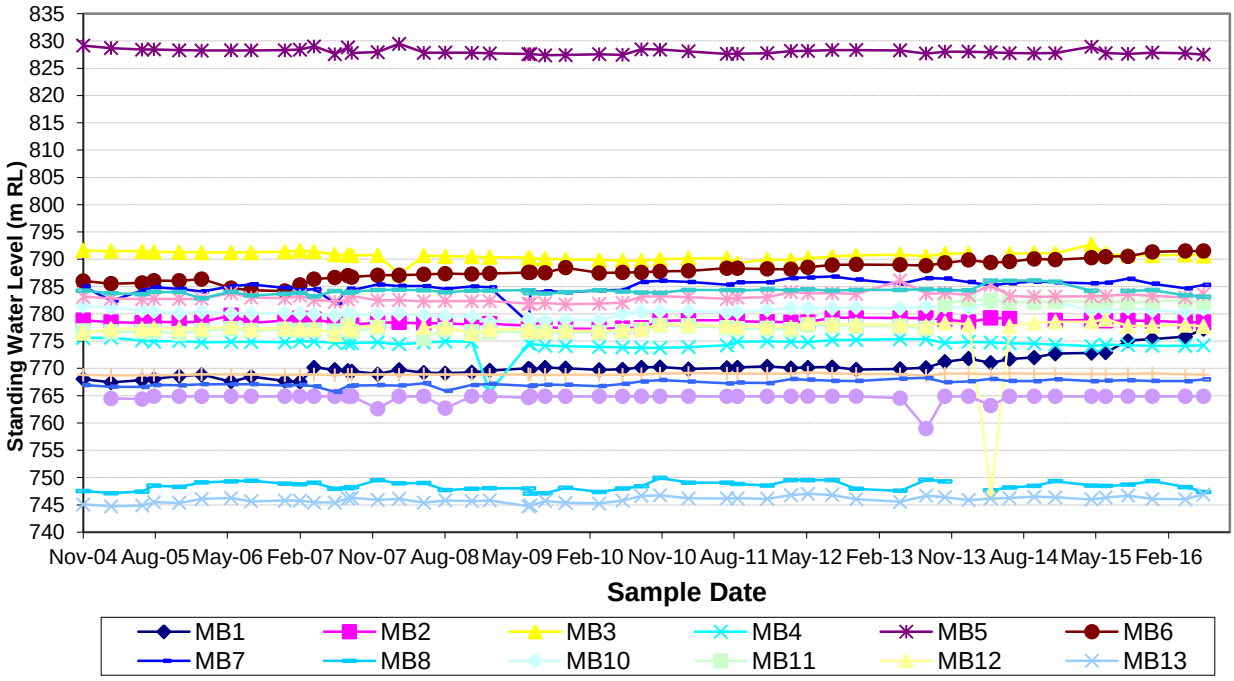

Figure 3.2.5A – Groundwater Levels – MB1 to MB17 and ED3B

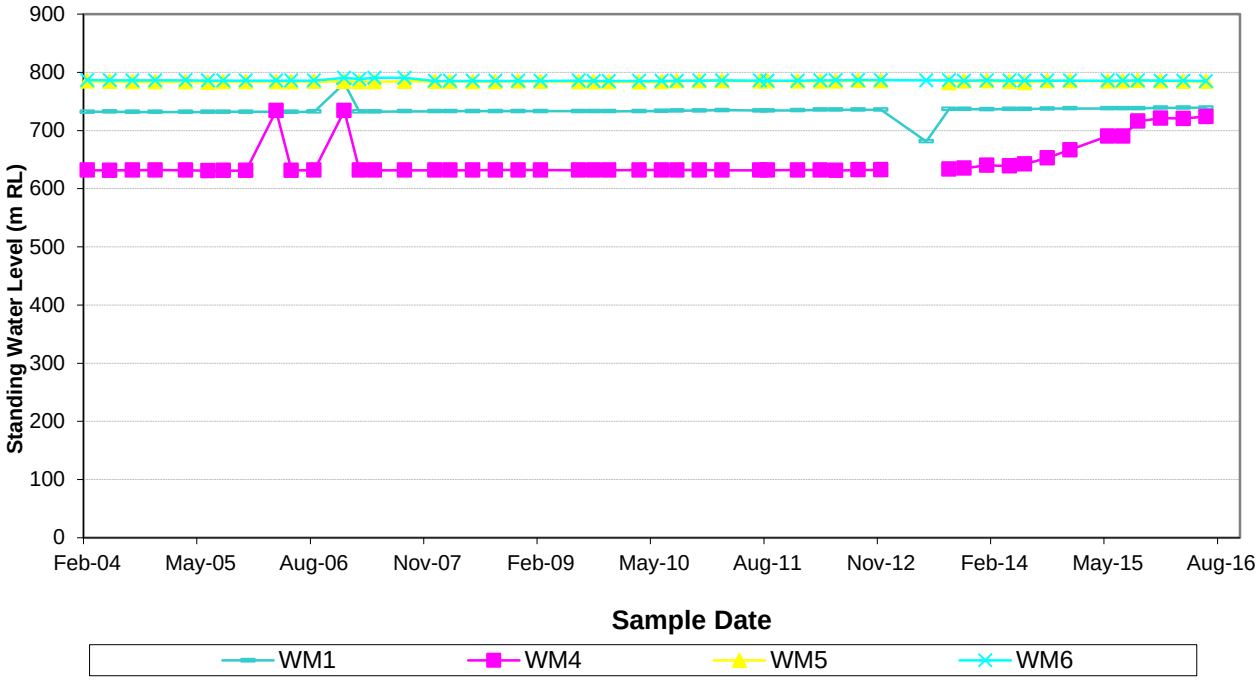

Figure 3.2.5B – Groundwater Levels – WM1 to WM6

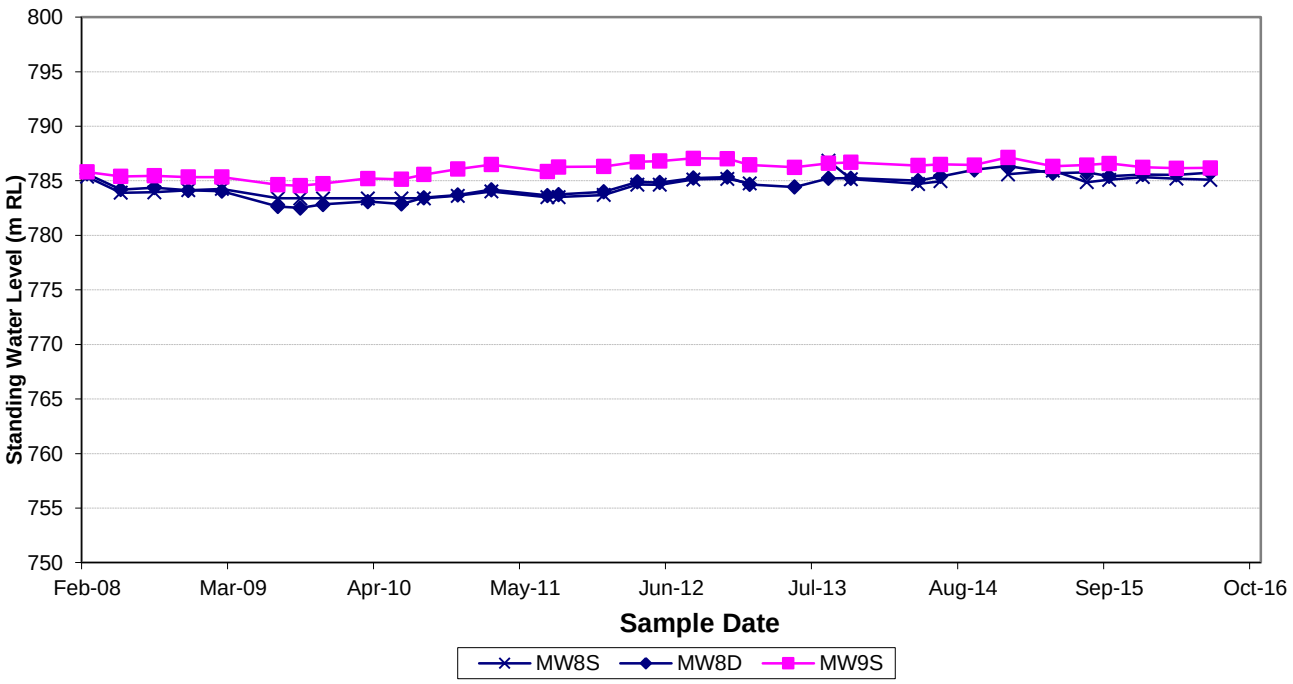

Figure 3.2.5C – Groundwater Levels – MW8S to MW9S

3.2.6 Bioreactor Piezometers Level Monitoring Results

Measurements for groundwater standing water levels (SWL) in the vicinity of the Bioreactor were undertaken at 6 out of 6 piezometers around the landfill void in accordance with the EPL and have been documented in the Annual Return. Each location consists of a shallow (reference A) and deep (reference B) piezometer.

The findings of the monitoring are summarised in Table 3.2.6 below and detailed quarterly levels are provided in Tables 8.1 – 8.5 (refer **Appendix 4**)

Table 3.2.6: Bioreactor Piezometers Level Monitoring Results

Parameter	Results/Discussion
P38A & P38B	P38 is located east of the void. Standing water levels are presented in **Table 8.1** (refer **Appendix 4**). This monitoring location was deemed unsafe to access due to a rock slip on the Southern side of the Bioreactor void wall in 2010. An application to remove this monitoring point from the licence was submitted to the EPA and rejected during this reporting period. Following this decision, Veolia engaged a geotechnical consultant and earthmoving company to provide safe access. Monitoring re-commenced immediately. SWL in P38A (shallow aquifer)) indicated a stable standing water level ranging from 776.47 metres Relative Level (m RL) to 776.58 RL during this reporting period. SWL in P38B (deep) ranged from 772.32m RL to 772.62 m RL in this reporting period, consistent with previous reporting periods.
P44A & P44B	P44 is located east of the void. Standing water levels are presented in **Table 8.2** (refer **Appendix 4**). SWL in P44A (shallow aquifer)) indicated a variable standing water level from 722.5 m RL to 725.48m RL during this reporting period, similar to previous trends, indicative of rainfall and infiltration influence. SWL in P44B (deep) has increased approximately 5 m from the previous reporting period and is trending upward. This increase is likely due to the compaction of landfill waste at higher levels within the void preventing water ingress.
P45A & P45B	P45 is located east of the mine void, and to the south of P44. Standing water levels are presented in **Table 8.3** (refer **Appendix 4**). P45A/B were damaged by earthmoving equipment during construction of an adjacent stormwater trench in quarter 3. Monitoring re-commenced immediately after repair. SWL in P45A (shallow) showed a range of 724.13m RL to 729.68m RL, stable and is approximately 2 m higher than previous reporting periods. SWL in P45B (deep) fluctuated between 722.16 m RL and 729.81 m RL and is approximately 2m higher than previous reporting periods.

Parameter	Results/Discussion
	This increase is likely due to the compaction of landfill waste at higher levels within the void preventing water ingress.
P58A & P58B	P58 is located west of the void. Standing water levels are presented in **Table 8.4** (refer **Appendix 4**). SWL in P58A (shallow) showed a range of 764.25m RL to 767.33m RL and is stable. SWL in P58B (deep) is similar to previous reporting period fluctuating between 755.87 m RL and 760.97 m RL.
P59A & P59B	P59 is located west of the void and to the south of P58. Standing water levels are presented in **Table 8.5** (refer **Appendix 4**). SWL in P59A (shallow) ranged from 786.37m RL to 788.05 m RL in this reporting period, consistent with previous reporting period. SWL in P59B (deep) ranged between 786.41m RL and 787.78m RL, which is almost identical to the level within the shallow piezometer as per previous reporting periods.
P100A & P100B	P100 is located northeast of the void. Standing water levels are presented in **Table 8.5** (refer **Appendix 4**). SWL in P100A (shallow) is consistent with the previous reporting period averaging between 740.42 m RL to 740.78 m RL. P100B (deep) averaged between 726.41 m RL and 730.65m RL which indicates water above the base level of 698.29 m RL which has been recorded in previous periods. This increase is likely due to the compaction of landfill waste at higher levels within the void preventing water ingress.

3. Bioreactor Environmental Monitoring

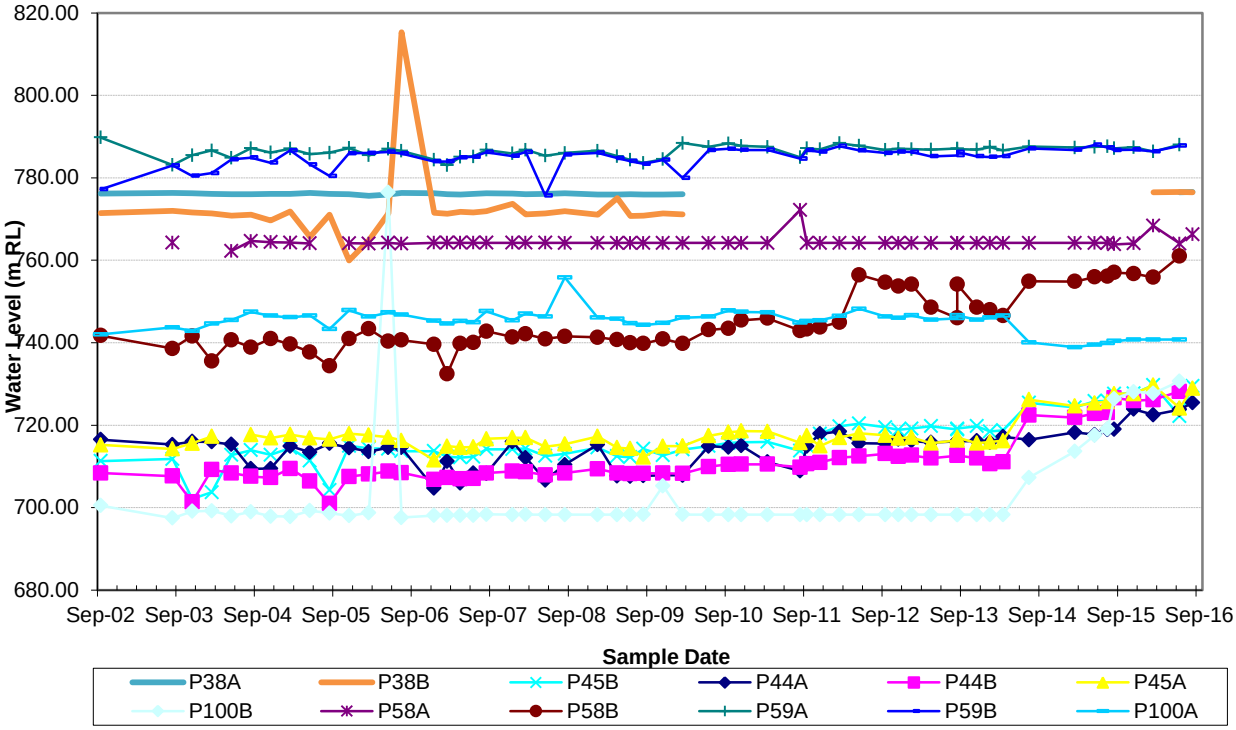

Figure 3.2.6.1 – Piezometer Standing Water Levels – P38 to P100

3.2.7 Bioreactor Evaporation Dam Volume Monitoring Results

The Evaporation Dam 3 (ED3) system comprises extracted (and treated) leachate from the landfill void and captured stormwater. The water volume has to be maintained in Evaporation Dam 3 to below 323 Megalitres as specified in the EPL.

Water levels are taken monthly as detailed in **Table 3.2.7**, which shows that the dam levels have been kept at an average of 250.32 Megalitres in this reporting period. The subsequent graph, **Figure 3.2.7.1** shows the overall trend over time.

3. Bioreactor Environmental Monitoring

Table 3.2.7: ED3 Water Volume Monitoring Results

Date	ED3S	ED3N Lagoon 1	ED3N Lagoon 2	ED3N Lagoon 3	ED3N Lagoon 4	ED3 System Total Volume
Sep-15	109.78	23.02	18.94	17.26	76.04	245.04
Oct-15	112.5	22.25	16.54	16.67	76.34	244.30
Nov-15	112.5	21.23	16.01	16.21	75.23	241.18
Dec-15	108.43	20.23	14.97	15.18	72.33	231.14
Jan-16	95.06	18.75	13.78	14.17	72.70	214.46
Feb-16	101.43	18.00	15.99	11.41	76.04	222.87
Apr-16	98.77	17.71	13.00	13.31	79.42	222.21
Apr-16	97.34	16.52	12.42	12.47	82.44	221.19
May-16	97.7	16.36	12.42	12.47	88.95	227.90
Jun-16	140.18	17.94	23.19	13.80	100.65	295.76
Jul-16	147.26	24.77	18.87	20.49	105.00	316.39
Aug-16	150.13	24.07	22.43	11.39	113.40	321.42
Minimum	**95.06**	**16.36**	**12.42**	**11.39**	**72.33**	**214.46**
Mean	**114.26**	**20.07**	**16.55**	**14.57**	**84.88**	**250.32**
Maximum	**150.13**	**24.77**	**23.19**	**20.49**	**113.4**	**321.42**

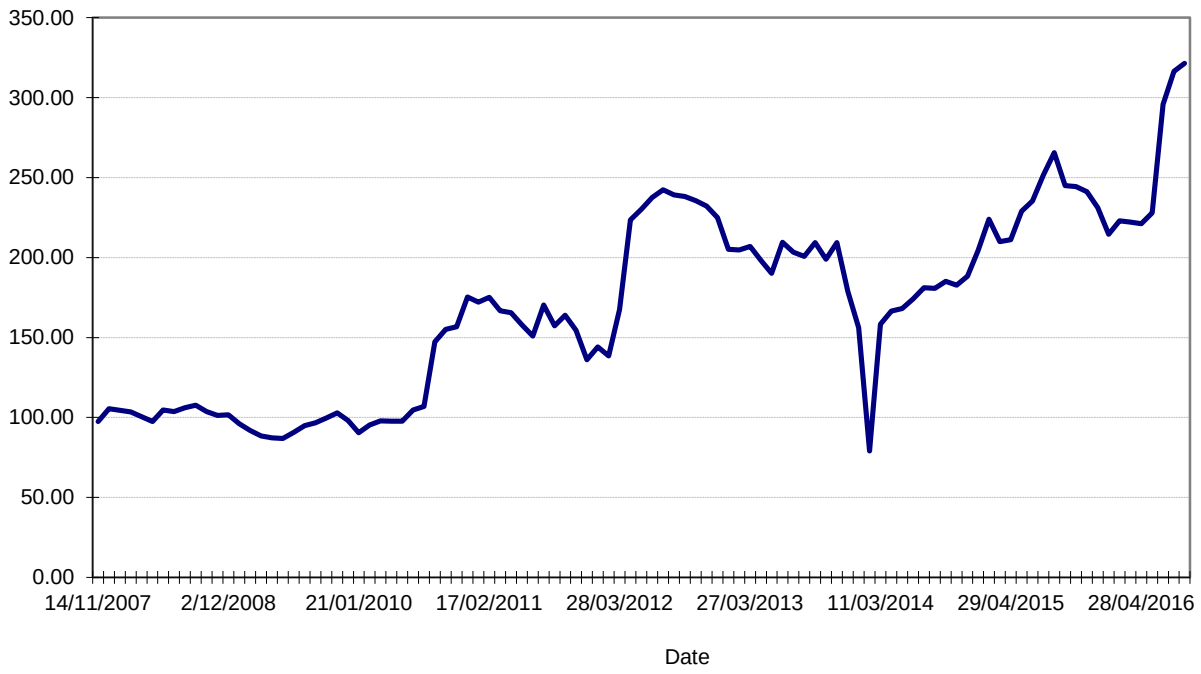

Figure 3.2.7.1 – Evaporation Dam 3 Water Volume (Megalitres)

Part 2 EPL 11455

Crisps Creek Intermodal Facility

4. IMF Operations

Veolia operates the Crisps Creek Intermodal Facility (IMF) which is comprised of a hardstand located adjacent to the regional rail network (approximately 1 km south of Tarago train station and 8 km from the Bioreactor) to enable transfer of containeried waste received by rail from Sydney onto road trucks and subsequent to the Bioreactor for disposal.

4.1 IMF Licence Conditions

The IMF is operated under EPL 11455 which details the operating conditions and environmental monitoring requirements as noted in **Table 4.1**.

Table 4.1: IMF Licence Conditions

Condition	Compliance with Condition
1. Administrative conditions	Noted
2. Discharges to air and water and application to land	Noted
3. Limit conditions	**L1. Pollution of Waters** All clean surface and storm water collected at the IMF was diverted to the onsite retention system for storage, as part of the first flush stormwater management system, in this reporting period. Following rainfall events, surface water monitoring was undertaken to assess the water quality prior to discharge.
	L5. Waste All waste received at the IMF during this reporting period was in accordance with the waste types permitted in the EPL, received via rail from the Clyde Transfer Terminal in Sydney. All waste was maintained in sealed containers and transported to the Bioreactor on the same day.
	L6. Noise Limits No noise complaints were received during this reporting period indicating that noise from operational activities at the IMF was likely maintained within the 35 dB(A) LAeq (15 minute) criteria at the nearest residential receiver. Similarly it can be inferred that noise from freight trains did not exceed 45 dB(A) LAeq (15 minute and 50 dB(A) LAeq (15 minute before and after 7:00 am respectively. Noise monitoring will be undertaken by Veolia on the receipt of any such complaints.
	L7. Hours of Operation All operational activities at the IMF including haulage of waste to the Bioreactor were undertaken between 6:00 am and 10:00 pm, Monday to Saturday during this reporting period as permitted under the DA.

Condition	Compliance with Condition
	L8. Potentially Offensive Odour No odour complaints were received for the IMF during this reporting period.
4. Operating conditions	**O1. Activities Carried out in Competent Manner** All licenced activities undertaken at the IMF in this reporting period were carried out in a competent manner and under a high standard of environmental management for which Veolia is certified under ISO 14001.
	O2. Maintenance of Plant and Equipment The maintenance and operation of all plant and equipment on the premises associated with the licenced activities was undertaken in a proper and efficient condition as required by qualified technicians. All major plant and equipment at the site is stored in a computerised maintenance management system in order to schedule and complete the required maintenance. All Veolia operators hold the appropriate qualifications and licenses to operate plant and equipment used as part of IMF operations.
	O3. Dust Control All operations and activities were carried out at the IMF in a manner to minimise dust at the boundary of the premises. These included operating on a hardstand site with fully paved access roads to the site. All haulage of waste to the Bioreactor occurred within enclosed containers. Monitoring for the presence and quantity of depositional dust is undertaken monthly to verify the performance.
	O4. Stormwater and Wastewater Management – Operating Phase The first flush stormwater management system was operated effectively in this reporting period in accordance with the EPL requirements to capture all the clean storm and surface water from the paved and sealed areas of the IMF. No sewage was removed from the IMF in this reporting period. Uncontaminated stormwater is permitted under the EPL to be utilised in vegetated areas of the IMF, as requirement.
	O5.Tracking of Mud and Waste As all waste container unloading and movements occurred within enclosed containers on a hardstand site, tracking of waste from the IMF did not occur during this reporting period. However, substantial improvements to the wheel wash system have been implemented since Veolia was issued with a Show Cause notice from the Department of Planning & Environment for tracking material beyond the site boundary during a period of prolonged rainfall as detailed in Section 2.3. No opening of containers was required to be undertaken at the IMF during this reporting period.
	O6. Waste Transportation All containers utilised in the transportation of waste in this reporting period were maintained in accordance with the EPL requirements to minimise potential odour emissions. All containers had rubber seals to prevent the leakage of leachate during transport and handling activities. Veolia reviewed and improved its container quality assurance program during the reporting period to improve container integrity as detailed in Section 2.3.
	O7. Fire Extinguishment There were no fires at the IMF during this reporting period.
	O8. Fire Fighting Capability All Veolia operators are trained in handling emergency situations, which

4. IMF Operations

Condition	Compliance with Condition
	include fire fighting in accordance with site specific Emergency Response Plans. Fire extinguishers and a 20,000 litre water tank were maintained onsite during this reporting period to enable effective fire fighting capabilities. In addition, Crisps Creek and Mulwaree River are located adjacent to the IMF as approved and readily available water source for fire fighting. The Tarago Fire Brigade is also located approximately 1 km from the site which enables fast mobilisation at the site.
5. Monitoring and recording conditions	Noted, all compliance monitoring was carried out in this reporting period in according to EPL requirements, the results of which are detailed, along with any non conformances in Section 5.
6. Reporting conditions	Noted and addressed in this AEMR and the annual return documents, where relevant. Notifications to the EPA were undertaken in a timely fashion.
General conditions	Noted.
Pollution studies and reduction programs	N/A
Special Conditions	N/A

5. IMF Environmental Monitoring

5.1 IMF Monitoring Points

Veolia is required to monitor environmental performance of the IMF under the site EPL. **Table 5.1** details the EPA ID, Veolia monitoring point identification, frequency and the type of monitoring undertaken at each licensed point. A monitoring location plan is included in **Appendix 3**.

Table 5.1: IMF Licensed Monitoring Points

EPA ID	Veolia ID	Frequency	Type of Monitoring
1	Site 110 - Upstream	6 x Annually	Surface Water
2	Site 150 - Downstream		
3	IMF First Flush		
4	DG18 IMF	Monthly	Dust / Particulates

Veolia also undertakes additional surface water quality monitoring at Site 130 (located upstream of Crisps Creek Intermodal in Mulwaree River) to provide additional background quality information.

5.2 IMF Monitoring Results

5.2.1 IMF Surface Water Monitoring Results

Surface water quality monitoring at 3 monitoring locations was undertaken as required by the EPL, the findings of which are summarised in **Table 5.2.1**. Detailed quality results are provided in **Tables 9.1** to **9.4** (refer **Appendix 4**). The key quality indicators selected to identify any contamination in the receiving surface waters from site operations include:

- pH,
- Electrical Conductivity (EC),
- Sulphate (SO_4),
- Iron (Fe),
- Zinc (Zn),
- Ammonia (NH_3), and
- Total Organic Carbon (TOC).

These are depicted in trend graphs **Figures 5.2.1.1** to **5.2.1.4** (refer **Appendix 5**).

5. IMF Environmental Monitoring

Table 5.2.1: IMF Surface Water Monitoring Results

Parameter	Results/Discussion
Site 110 - Upstream	Site 110 is located upstream of the IMF in Crisps Creek. It is approximately 8 km downstream of the Bioreactor. Results provided in **Table 9.1** (refer **Appendix 4**) indicate the following trends: • pH is close to neutral (average7.66), slightly lower than the previous reporting period; • EC (average 898 µS/cm) is slightly lower but generally consistent with the previous period and representative of fresh water salinity; • SO_4 (average 96.77 mg/L) is slightly lower but generally consistent with previous reporting periods; • Fe (average 0.28 mg/L) is consistent with previous reporting periods, whilst Zinc indicates a fluctuating trend (average 0.3 mg/L), consistent with historical cyclic results; • NH_3 (average 0.1 mg/L) is consistent with previous reporting periods and continues to be at non-detection levels. • TOC (average 13.86 mg/L) is slightly higher than the previous reporting period and is generally reflective of natural organic matter in streams. While the indicator trends for this location indicate some variability over time, this is not uncommon when sampling intermittent streams.
Site 130 - Upstream	Site 130 is located upstream of the IMF in the Mulwaree River. Results provided in **Table 9.2** (refer **Appendix 4**) indicate the following trends: • pH is close to neutral (average 7.49), slightly higher than the previous reporting period; • EC (average 316 µS/cm) is lower than the previous reporting period and representative of fresh water salinity; • SO_4 (average 19.3 mg/L) is also lower but generally consistent with previous reporting period; • Fe and Zn, average 0.71 mg/L and 0.01 mg/L respectively indicate consistency with fluctuating cycles in previous reporting periods; • NH_3 (<0.1 mg/L) continued to be un-detectable during this reporting period. • TOC (average 13.6 mg/L) is consistent with previous reporting periods.
Site 150 – Mulwaree River	Site 150 is located 2 km downstream of the IMF on the Mulwaree River, which is also downstream of a railway bridge and Braidwood Road. Results provided in **Table 9.3** (refer **Appendix 4**) indicate the following trends: • pH (average 7.62) is slightly alkaline, consistent with the previous reporting period; • EC (average 514.83 µS/cm) shows a fluctuating trend and is

Parameter	Results/Discussion
	generally consistent with previous periods and fresh water salinity; • SO_4 (average 43.8 mg/L) is also lower, reflecting EC trend, but generally consistent with previous reporting period; • Fe and Zn, average 0.55 mg/L and 0.1 mg/L are higher than the previous reporting period but reflective of fluctuating cycles. • NH_3 (< 0.1mg/L) continued to be not detected during this reporting period. • TOC (average 14.33 mg/L), is slightly higher but generally consistent with previous reporting periods; These results are consistent with the trends for Site 110.
First Flush Stormwater Outlet	The IMF First Flush is located at the surface water outlet point of the site, prior to runoff into Crisps Creek. Results provided in **Table 9.4** (refer **Appendix 4**) indicate the following trends: • pH (average 7.62) is close to neutral, consistent with the previous reporting period; • EC (average 178.5 µS/cm) shows a slight downward trend but is generally consistent with the previous period and fresh water salinity; • SO_4 (average 9.26 mg/L) is also slightly lower, reflecting EC trend, but generally consistent with previous reporting period; • Fe and Zn, average 0.81 mg/L and 0.04 mg/L are lower than the previous reporting period but reflective of fluctuating cycles. • NH_3 (< 0.1mg/L) continued to be not detected during this reporting period. • TOC (average 9.0 mg/L) which is lower than previous reporting periods;

5.2.2 IMF Air Quality Monitoring Results

Dust monitoring is undertaken monthly at 1 location at the IMF in accordance with the EPL. A summary of this reporting period is provided in **Table 5.2.2.1** and detailed in **Table 10** (refer **Appendix 4**).

The results at DG18 indicate an average level of total solid matter is 2.78 g/m^2/month, which is generally consistent with overall historical trends as seen in the subsequent graph, **Figure 5.2.2.1**. The handling of waste and associated operational activities at the IMF are undertaken in a manner to ensure minimal emissions of dust. This includes no opening of containerised waste on unloading and operating on hardstand site.

Table 5.2.2: Dust Monitoring Results

Dust Gauge	Summary Total Solids (g/m2/month)		
	Minimum	Maximum	Average
DG18	0.9	14.4	2.78

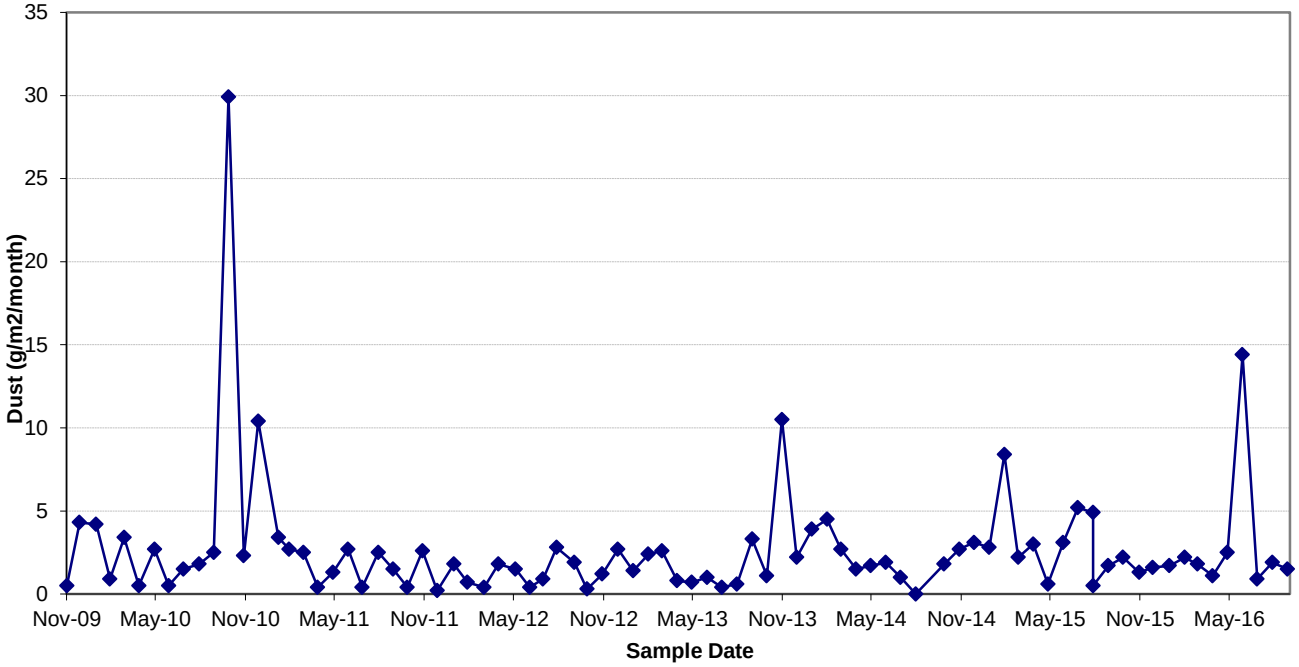

Figure 5.2.2.1 – IMF Depositional Dust Levels – DG18

6. Bioreactor and IMF Environmental Performance

- Based on the results of monitoring undertaken at both the Bioreactor and IMF sites in accordance with the respective EPLs, the overall environmental performance of the Woodlawn Eco Project in this reporting period can be demonstrated to be well managed.

- No Non-conformances were recorded during the 2015-16 reporting period as detailed in the Annual Return.

- In this reporting period, Veolia have also implemented the recommendations for environmental and operational improvements identified in the 2014/2015 AEMR as discussed in **Table 6.1**.

- Additional improvements proposed for the 2016/2017 reporting period at the Bioreactor and the IMF are as follows in **Table 6.2**:

Table 6.1: 2014/2015 Reporting Period Recommendations

Item No.	Recommendation	2015-16 Action
1.	Implementing actions recommended from the most recent annual odour audit undertaken at the Bioreactor.	All mandatory recommendations completed.
2.	Consistent leachate treatment and operational monitoring is to be maintained to ensure leachate quality is kept at a level that does not produce offensive odour. The treated leachate is to continue to be maintained at alkaline conditions in the lagoons for Evaporation Dam 3 North (ED3N-1, ED3N-2, ED3N-3 and ED3N-4) to prevent reproduction of odour in stagnant condition.	Operational monitoring is conducted monthly and ED3-N dams have been maintained in an alkaline state ensuring odour is controlled from these storage ponds.

6. Bioreactor and IMF Environmental Performance

Table 6.2: 2016/2017 Reporting Period Recommendations

Item No.	Recommendation
1.	**Tracking of materials** Veolia will continue to monitor and implement improvements to the wheel wash system to ensure tracking of materials beyond the site boundary is negated.
2.	**Container Integrity** Improvements identified in the mid-year container quality assurance program review will continue to be implemented to ensure container integrity between the Clyde Transfer Terminal, Crisps Creek Intermodal Facility and Woodlawn Bioreactor.
3.	**Odour management** As detailed in section 2, Veolia engaged Run Energy Pty Ltd during the reporting period to assess, modify and improve the gas capture network in the Bioreactor. Implementation of recommended waste profiling and infrastructure improvements will continue to be implemented to reduce odour emissions and increase gas capture. Furthermore, a long term leachate treatment strategy will be progress in the coming year. Proposal of potential alternative cover materials will also be prepared for approval by the EPA.
4.	**Evaporation Dam 1 and 2 Lining assessment** Suitably qualified consultants will be engaged to assess the integrity of Evaporation Dams 1 & 2 to determine their suitability for proposed stormwater and treated leachate storage proposed under Department of Planning & Environment consent modifications.
5.	**Community consultation** Veolia will actively be involved in the regional community by continuing to participate in the Community Liaison Committee process and TADPAI meetings. The distribution of odour diaries will also be undertaken to develop an understanding of odour profiles within the regional landscape.

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References

- **Earth2Water (2010)** EPL - Annual Assessment of Woodlawn Bioreactor and Intermodal Facility Monitoring Data, 30 November 2010;

- **EPA (2016)** Environmental Guidelines: Solid Waste Landfills Second Edition, April 2016;

- **Veolia (2015)** Annual Environmental Monitoring Report – Woodlawn Bioreactor and Crisps Creek Intermodal Facility, November 2014;

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Appendices

Note: All documents appended to this Report are provided electronically.

Appendices

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Appendices

Appendix 1 Site Location Plan

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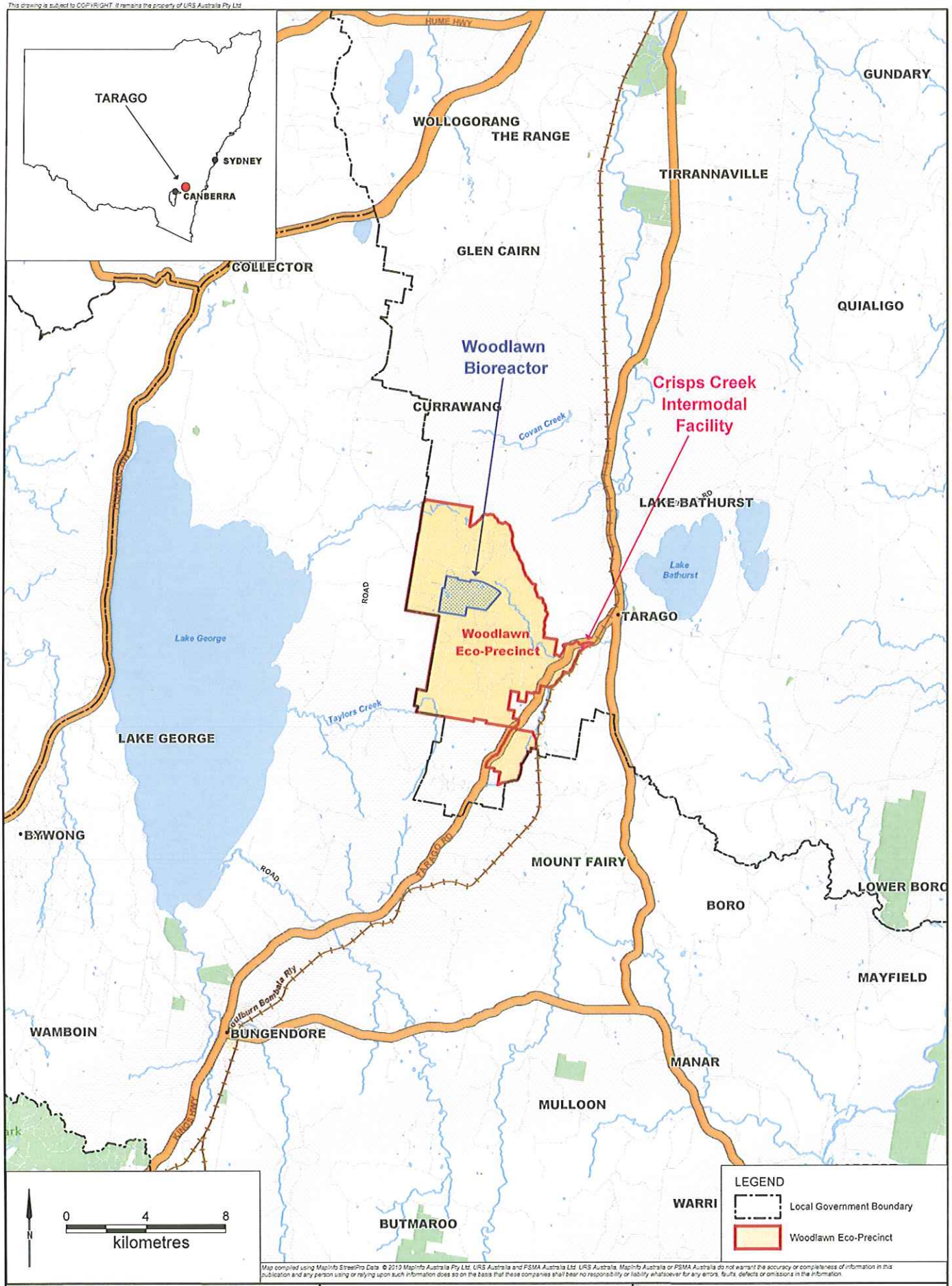

Map compiled using MapInfo StreetPro Data © 2010 MapInfo Australia Pty Ltd, URS Australia and PSMA Australia Ltd. URS Australia, MapInfo Australia or PSMA Australia do not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that these companies shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

Client	Project	Title
VEOLIA ENVIRONMENTAL SERVICES PTY LTD	WOODLAWN EXPANSION PROJECT	WOODLAWN ECO-PRECINCT LOCATION
URS	Drawn: SB / Approved: LO / Date: 06/08/2010	Figure: 1.1
	Job No: 43177703 / File No: 43177703.018.wor	

Appendices

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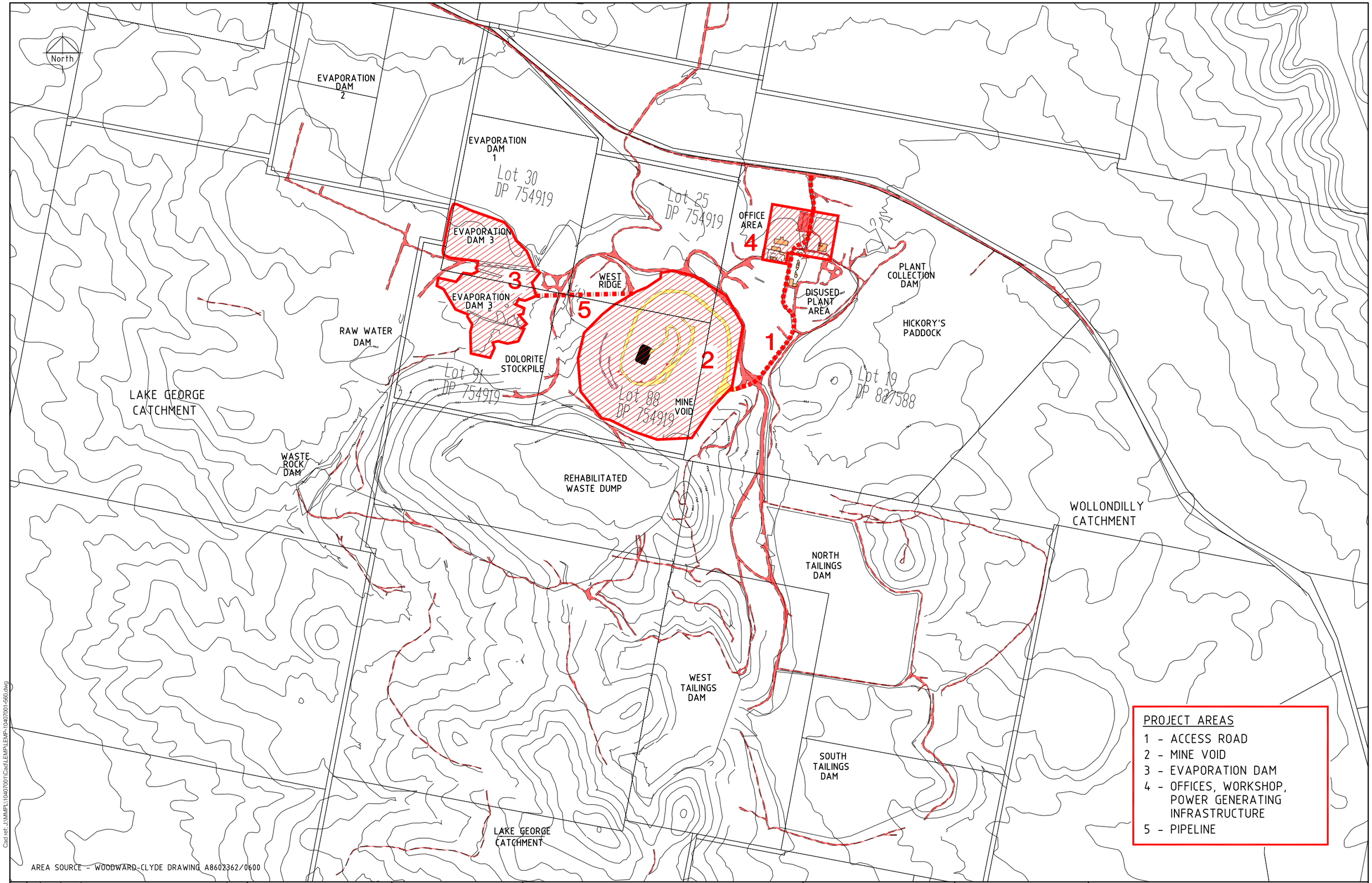
Appendices

Appendix 2 EPL Boundary



Cad ref: J:\MMPL\10407001\Cad\LEMP\LEMP-10407001-560.dwg

Last modified: 23 Jun 04 - 15:00

REVISIONS				
A	SGG	23.6.04		
No.	BY	DATE	DESCRIPTION	APPD

Before commencing work, all controlling dimensions on the drawings must be verified on the site, particularly those relative to property allignments, other structures, and services.

Figured dimensions take preference over scaled. If in doubt, ask.

SCALES

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1 : 1500 at A3

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	PREPARED	CHECKED	PASSED
DESIGN			DATE
DRAFTING	PM		

maunsell

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An AECOM company

WOODLAWN BIOREACTOR

WOODLAWN MINE SITE

LICENCED PREMISES

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Appendices

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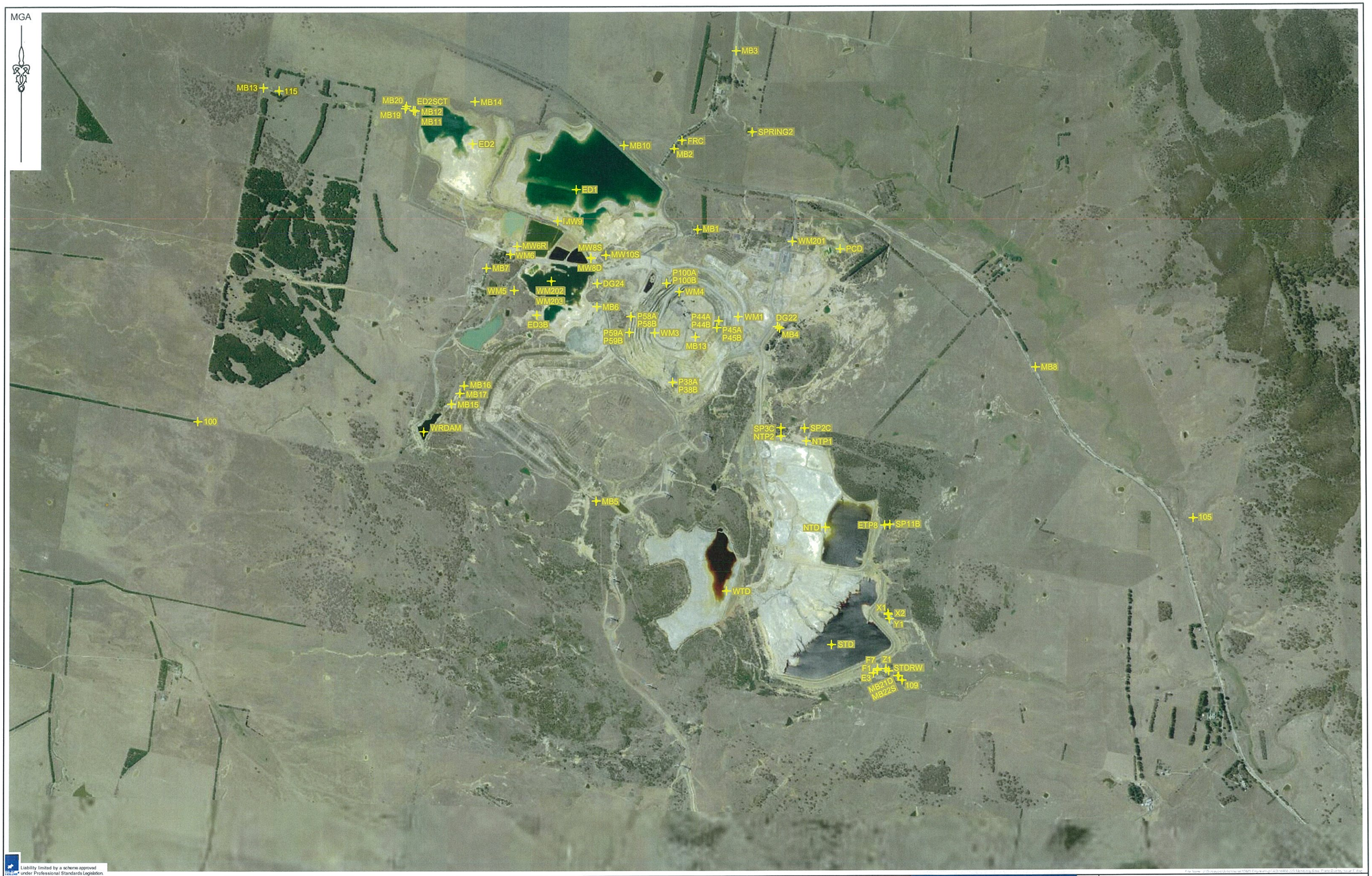
Appendices

Appendix 3 Monitoring Locations Plan



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VEOLIA ENVIRONMENTAL SERVICES

SCALE 1:10,000

0 200 400 600 800 1000
Metres

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ISSUE	AMENDMENT	DRAWN	DATE
A	INITIAL ISSUE	BR	12/10/2007
B	ADDITIONAL SITES ADDED	SH	01/06/2015
C	WELL POSITIONS AMENDED	MK	18/09/2015
D	REDUNDANT WELLS REMOVED & PLAN RESCALED	MK	06/10/2015
E	WELL LABELLING ENHANCED	MK	19/10/2015

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Integrated Management System

LandTeam

A1 SHEET

VEOLIA ENVIRONMENTAL SERVICES

WOODLAWN BIOREACTOR
COLLECTOR ROAD, TARAGO

WOODLAWN BIOREACTOR
SITE MONITORING
LOCATIONS

DESIGNED: N/A
DRAWN: MK
CHECKED: JK
ISSUE E
DRAWING No. 16800-220

DATUM N/A | CONTOUR INTERVAL N/A | DATE 19/10/2015

Appendices

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Appendices

Appendix 4 Tabulated Monitoring Results

Table 1 - Landfill Gas Extraction Booster Results

EPL 11436	Date	Carbon Dioxide	Dry Gas Density	Moisture Content	Molecular weight of stack gases	Oxygen	Temperature	Volatile Organic Compounds	Volumetric Flow rate	Volumetric Flow rate	Methane
		%	%	%	mg/m3	%	Deg C	mg/m3	m3/hour	m3/sec	%
	1/06/2011	37.04			N/A	1.09	22.2		771.83	0.21	
	14/10/2011	34.8	11617	8.5	30.17	1.6	44.7	0.09	5380	1.49	48.6
	6/05/2013	36.1			N/A	0.53	32.2		2124	0.59	61.4
	29/05/2014	44.7	105	7.8	N/A	1.68	47.8		2520	0.7	48
	5/08/2015	46.9	104.2	7.6	N/A	0.3	39.1		3010	0.84	50.4
	2/06/2016	39	1,250,000	0.50	N/A	1.2	2.4	Attached Document	1814	0.50	57

OVERALL											
	Minimum	34.8	104.2	0.5	30.17	0.3	2.4	0.09	771.83	0.21	48
	Maximum	46.9	1250000	8.5	30.17	1.68	47.8	0.09	5380	1.49	61.4
	Average	39.76	315456.55	6.10	30.17	1.07	36.7	0.09	2603.31	0.72	53.08
	StdDev	4.93	N/A	N/A	N/A	0.56	16.92	N/A	1554.95	0.43	5.87
	Count	6	4	4	1	6	6	1	6	6	5

Table 2 - Surface Gas Monitoring Results

Quarter 1 - Surface Gas Results

17/11/2015

Transect	Time	No of measurements	Min Methane (%)	Max Methane (%)	Average Methane (%)
1	14:30:00 PM	11	0.0005	0.0064	0.0021
2		11	0.0006	0.0148	0.0073
3		11	0.0012	0.0176	0.0061
4		12	0.0017	0.0162	0.0082
5		13	0.0015	0.0172	0.0060
6		14	0.0012	0.0121	0.0061
7		12	0.0013	0.0121	0.0066
8		12	0.0005	0.0102	0.0046
9		12	0.0013	0.0178	0.0071
10		13	0.0013	0.0110	0.0044
11		13	0.0005	0.0056	0.0025
12		17	0.0011	0.0041	0.0022
13	16:15:00 PM	13	0.0004	0.0021	0.0013
Total Measurements		**164**	**0.000**	**0.018**	**0.005**

Quarter 2 - Surface Gas Results

24/02/2016

Transect	Time	No of measurements	Min Methane (%)	Max Methane (%)	Average Methane (%)
1	8:45:00 AM	12	0.0006	0.0102	0.0033
2		12	0.0009	0.0087	0.0043
3		12	0.0011	0.0213	0.0058
4		12	0.0007	0.0087	0.0048
5		13	0.0021	0.0262	0.0098
6		12	0.0035	0.0420	0.0111
7		12	0.0025	0.0241	0.0086
8		12	0.0056	0.0128	0.0092
9		12	0.0016	0.0078	0.0044
10		12	0.0038	0.0109	0.0063
11		12	0.0021	0.0122	0.0051
12		16	0.0012	0.0136	0.0086
13	10:10:00 AM	12	0.0026	0.0140	0.0061
Total Measurements		**161**	**0.001**	**0.042**	**0.007**

Quarter 3 Surface Gas Results

19/05/2016

Transect	Time	No of measurements	Min Methane (%)	Max Methane (%)	Average Methane (%)
1	8:40:00 AM	12	0.0007	0.0062	0.0026
2		14	0.0012	0.0122	0.0041
3		12	0.0011	0.0109	0.0044
4		12	0.0013	0.0056	0.0034
5		14	0.0011	0.0078	0.0038
6		12	0.0011	0.0121	0.0042
7		13	0.0021	0.0106	0.0046
8		13	0.0018	0.0092	0.0055
9		13	0.0010	0.0112	0.0037
10		12	0.0011	0.0087	0.0037
11		12	0.0008	0.0071	0.0031
12		17	0.0015	0.0085	0.0039
13	10:25:00 AM	13	0.0015	0.0067	0.0033
Total Measurements		**169**	**0.001**	**0.012**	**0.004**

Quarter 4 - Surface Gas Results

17/08/2016

Transect	Time	No of measurements	Min Methane (%)	Max Methane (%)	Average Methane (%)
1	9:45:00 AM	12	0.0016	0.0089	0.0033
2		12	0.0014	0.0095	0.0038
3		12	0.0015	0.0102	0.0052
4		12	0.0025	0.0149	0.0078
5		15	0.0009	0.0071	0.0041
6		15	0.0026	0.0091	0.0053
7		13	0.0013	0.0210	0.0049
8		13	0.0017	0.0116	0.0048
9		13	0.0013	0.0081	0.0038
10		12	0.0009	0.0061	0.0027
11		12	0.0009	0.0112	0.0036
12		16	0.0008	0.0055	0.0024
13	11:10:00 AM	13	0.0011	0.0062	0.0029
Total Measurements		**170**	**0.001**	**0.021**	**0.004**

2015/2016 Surface Gas Results Summary			
	Minimum	**Maximum**	**Average**
Methane (%)	0.000	0.042	0.005

Table 3.1 - Landfill Gas Engine Results - Generator 1

EPL 11436

	Date	Carbon Dioxide	Carbon Monoxide	Dry Gas Density	Moisture Content	Molcular Weight Of Stack Gases	Nitrogen Oxides	Oxygen	Sulfuric Acid Mist & Sulfur Trioxides S03	Sulphur Dioxide	Temperature	Velocity	Volatile Organic Compounds	Volumetric Flowrate	Hydrogen Sulphide
							EPL Limit		EPL Limit						EPL Limit
							450		100						5
		%	mg/m3	kg/m3	%	gr/gr mole	mg/m3	%	mg/m3	mg/m3	Deg C	m/sec	mg/m3	m3/sec	mg/m3
	3/04/2009	11.6	962	1.35	5.6	30.2	318	8.2	6.58	21	455	50.5	3.62	1.71	0.31
	10/02/2010	13.3	1073	1.36	5.3	30.472	400	8.2	10.4	3	475	46.4	1.74	1.59	0.37
	30/06/2011	10.4	1011	1.34	3.3	30.032	382	9.2	8.13	56	418	42.9	4.14	1.6	0.34
	20/06/2012	11.6	997	1.35	8.3	30.172	385	8.2	11.3	214	447	45	0.09	1.49	0.326
	11/06/2013	Generator 1 was not available													
	25/03/2015	Generator 1 was not available													
	2/06/2016	9.3	898	1.33	4.7	29.9	407	9.5	18.9	72	463	47.8	3.9	1.64	0.35
OVERALL	Minimum	9.3	898	1.33	3.3	29.9	318	8.2	6.58	3	418	42.9	0.09	1.49	0.31
	Maximum	13.3	1073	1.36	8.3	30.472	407	9.5	18.9	214	475	50.5	4.14	1.71	0.37
	Average	11.24	988.20	1.35	5.44	30.16	378.40	8.66	11.06	73.20	451.60	46.52	2.70	1.61	0.34
	StdDev	1.50	64.44	0.01	1.83	0.21	35.32	0.64	4.76	83.33	21.44	2.87	1.74	0.08	0.02
	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Note: A TAN coloured cell indicates that the indicated value is LESS THAN (<) indicated

Table 3.2 - Landfill Gas Engine Results - Generator 2

EPL 11436

	Date	Carbon Dioxide	Carbon Monoxide	Dry Gas Density	Moisture Content	Molcular Weight Of Stack Gases	Nitrogen Oxides	Oxygen	Sulfuric Acid Mist & Sulfur Trioxides S03	Sulphur Dioxide	Temperature	Velocity	Volatile Organic Compounds	Volumetric Flowrate	Hydrogen Sulphide
							EPL Limit		EPL Limit						EPL Limit
							450		100						5
		%	mg/m3	kg/m3	%	gr/gr mole	mg/m3	%	mg/m3	mg/m3	Deg C	m/sec	mg/m3	m3/sec	mg/m3
	8/12/2008	9.3	674	1.31	6.2	29.4	449	10	7.88	10	437	44.7	4.17	1.55	
	23/06/2010	13.4	799	1.36	5.4	30.48	411	8.4	4.23	3	368	41.7	0.086	1.61	0.36
	30/06/2011	11.4	750	1.35	4.8	30.152	402	8.2	8.89	109	415	43.6	4.1	1.59	0.33
	20/06/2012	9.8	1011	1.34	8.1	29.944	384	9	7.9	255	432	44.7	0.18	1.52	3.354
	11/06/2013	10.1	981	1.34	5	29.976	296	9	5	136	464	45	3.71	1.51	0.35
	25/03/2014	9.7	766	1.33	5.9	29.9	414	8.6	6.95	410	471	46.2	4.178	1.53	0.354
	25/03/2015	Generator 2 was not available													
	2/06/2016	Generator 2 was not available													
OVERALL	Minimum	9.30	674.00	1.31	4.80	29.40	296.00	8.20	4.23	3.00	368.00	41.70	0.09	1.51	0.33
	Maximum	13.40	1011.00	1.36	8.10	30.48	449.00	10.00	8.89	410.00	471.00	46.20	4.18	1.61	3.35
	Average	10.62	830.17	1.34	5.90	29.98	392.67	8.87	6.81	153.83	431.17	44.32	2.74	1.55	0.35
	StdDev	1.54	135.17	0.02	1.20	0.35	51.91	0.64	1.82	155.96	37.28	1.53	2.02	0.04	1.34
	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	5

Table 3.3 - Landfill Gas Engine Results - Generator 3

EPL 11436

Date	Carbon Dioxide	Carbon Monoxide	Dry Gas Density	Moisture Content	Molcular Weight Of Stack Gases	Nitrogen Oxides	Oxygen	Sulfuric Acid Mist & Sulfur Trioxides S03	Sulphur Dioxide	Temperature	Velocity	Volatile Organic Compounds	Volumetric Flowrate	Hydrogen Sulphide
						EPL Limit		EPL Limit						EPL Limit
						450		100						5
	%	mg/m3	kg/m3	%	gr/gr mole	mg/m3	%	mg/m3	mg/m3	Deg C	m/sec	mg/m3	m3/sec	mg/m3
8/04/2010	7.5	304	1.35	6	30.138	322	14.7	6.25	3	345	46.2	0.09	1.89	0.288
30/06/2011	10.5	869	1.34	3.8	30.04	317	9	11.1	120	438	48.7	25	1.75	0.33
20/06/2012	10.6	926	1.34	3.8	30.032	359	8.3	5.65	266	421	45.8	3.87	1.65	0.34
11/06/2013	9.6	622	1.34	7.1	29.992	323	10.8	7.15	83	476	51.3	3.12	1.66	0.32
25/03/2014	11.6	819	1.35	7.3	30.19	346	8.3	5.07	395	474	52.5	4.122	1.69	0.355
23/03/2015	11.5	870	1.35	6.3	30.17	425	8.2	11.5	161	451	44	0.16	1.5	0.362
2/06/2016	Generator 3 was not available													

OVERALL	Minimum	7.50	304.00	1.34	3.80	29.99	317.00	8.20	5.07	3.00	345.00	44.00	0.09	1.50	0.29
	Maximum	11.60	926.00	1.35	7.30	30.19	425.00	14.70	11.50	395.00	476.00	52.50	25.00	1.89	0.36
	Average	10.22	735.00	1.35	5.72	30.09	348.67	9.88	7.79	171.33	434.17	48.08	6.06	1.69	0.33
	StdDev	1.52	235.90	0.01	1.56	0.08	40.78	2.56	2.81	139.91	48.50	3.34	9.45	0.13	0.03
	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Table 3.4 - Landfill Gas Engine Results - Generator 4

EPL 11436	Date	Carbon Dioxide	Carbon Monoxide	Dry Gas Density	Moisture Content	Molcular Weight Of Stack Gases	Nitrogen Oxides	Oxygen	Sulfuric Acid Mist & Sulfur Trioxides S03	Sulphur Dioxide	Temperature	Velocity	Volatile Organic Compounds	Volumetric Flowrate	Hydrogen Sulphide
							EPL Limit		EPL Limit						EPL Limit
							450		100						5
		%	mg/m3	kg/m3	%	gr/gr mole	mg/m3	%	mg/m3	mg/m3	Deg C	m/sec	mg/m3	m3/sec	mg/m3
	20/06/2012	10.3	686	1.34	5.7	29.964	391	8.3	9.64	278	425	45.3	3.77	1.6	0.327
	11/06/2013	9.4	784	1.33	4.6	29.884	267	9.5	5.72	121	436	52.9	3.87	1.87	0.29
	25/03/2014	9.7	878	1.34	5.8	29.9	368	8.8	7.08	411	458	51.7	0.099	1.73	0.345
	25/03/2015	Generator 4 was not available													
	2/06/2016	Generator 4 was not available													
OVERALL Minimum		9.40	686.00	1.33	4.60	29.88	267.00	8.30	5.72	121.00	425.00	45.30	0.10	1.60	0.29
Maximum		10.30	878.00	1.34	5.80	29.96	391.00	9.50	9.64	411.00	458.00	52.90	3.87	1.87	0.35
Average		9.80	782.67	1.34	5.37	29.92	342.00	8.87	7.48	270.00	439.67	49.97	2.58	1.73	0.32
StdDev		0.46	96.01	0.01	0.67	0.04	65.96	0.60	1.99	145.17	16.80	4.09	2.15	0.14	0.03
Count		3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 3..5 - Landfill Gas Engine Results - Generator 5

EPL 11436	Date	Carbon Dioxide	Carbon Monoxide	Dry Gas Density	Moisture Content	Molcular Weight Of Stack Gases	Nitrogen Oxides	Oxygen	Sulfuric Acid Mist & Sulfur Trioxides S03	Sulphur Dioxide	Temperature	Velocity	Volatile Organic Compounds	Volumetric Flowrate	Hydrogen Sulphide
							EPL Limit		EPL Limit						EPL Limit
							450		100						5
		%	mg/m3	kg/m3	%	gr/gr mole	mg/m3	%	mg/m3	mg/m3	Deg C	m/sec	mg/m3	m3/sec	mg/m3
	25/03/2014	Generator 5 was not available													
	25/03/2015	Generator 5 was not available													
	2/06/2016	Generator 5 was not available													
OVERALL Minimum		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
StdDev		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Count		0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 4.1 - Dust Deposition Results - DG22 East Void

Site Name	ALS Batch Code	Date	Ash Residue	Combustibles	Calculated Rainfall	Soluble Matter	Insoluble Solids	Total Solids
			g/m2/mth	g/m2/mth	mm	g/m2/mth	g/m2/mth	g/m2/mth
DG22	CA150408	Sep-15	1.21	0.29	15	0.2	1.5	1.5
DG22	CA150500	Oct-15	1.3	0.4	39	0.7	1.7	2.4
DG22	CA150564	Nov-15	1.62	0.48	42	1.3	2.1	3.4
DG22	CA160002	Dec-15	0.74	0.2	10	0.6	0.9	1.5
DG22	CA160064	Jan-16	3.05	0.35	96	0.2	3.4	3.4
DG22	CA160142	Feb-16	0.73	0.2	10	0.2	0.9	0.9
DG22	CA160203	Mar-16	1.34	0.46	48	0.2	1.8	1.8
DG22	CA160271	Apr-16	1.26	0.24	16	0.2	1.5	1.5
DG22	CA160324	May-16	1.56	0.24	12	0.2	1.8	1.8
DG22	CA160377	Jun-16	5.84	1.76	113	1.5	7.6	9.1
DG22	CA160434	Jul-16	0.78	0.42	21	0.2	1.2	1.2
DG22	CA160490	Aug-16	0.87	0.23	28	0.2	1.1	1.1
		Min	0.73	0.2	10	0.2	0.9	0.9
		Avg	1.69	0.44	37.50	0.48	2.13	2.47
		Max	5.84	1.76	113	1.5	7.6	9.1
		stDev	1.45	0.43	34.04	0.47	1.85	2.24

Table 4.2 - Dust Deposition Results - DG24 West Void

Site Name	ALS Batch Code	Date	Ash Residue	Combustibles	Calculated Rainfall	Soluble Matter	Insoluble Solids	Total Solids
			g/m2/mth	g/m2/mth	mm	g/m2/mth	g/m2/mth	g/m2/mth
DG24	CA150408	Sep-15	1.1	0.9	19	1.3	2	3.3
DG24	CA1505009	Oct-15	3.72	1.68	39	7.8	5.4	13.2
DG24	CA150564	Nov-15	2.99	2.51	56	2.5	5.5	8
DG24	CA160002	Dec-15	4.54	1.26	20	4.9	5.8	10.7
DG24	CA160064	Jan-16	6.95	3.05	114	13.8	10	23.8
DG24	CA160142	Feb-16	2.6	1.9	12	4.5	4.5	9
DG24	CA160203	Mar-16	8.81	2.19	72	4.1	11	15.1
DG24	CA160271	Apr-16	4.1	4.4	30	17.4	8.5	25.9
DG24	CA160324	May-16	4.4	1.8	21	14.8	6.2	21
DG24	CA160377	Jun-16	0.64	0.56	113	4.8	1.2	6
DG24	CA160434	Jul-16	0.17	0.2	56	0.2	0.3	0.3
DG24	CA160490	Aug-16	0.39	0.21	53	1	0.6	1.6
		Min	0.17	0.2	12	0.2	0.3	0.3
		Avg	3.37	1.72	50.42	6.43	5.08	11.49
		Max	8.81	4.4	114	17.4	11	25.9
		stDev	2.66	1.23	34.77	5.81	3.58	8.55

Table 4.3 - Dust Deposition Results - DG28 Pylara

Site Name	ALS Batch Code	Date	Ash Residue	Combustibles	Calculated Rainfall	Soluble Matter	Insoluble Solids	Total Solids
			g/m2/mth	g/m2/mth	mm	g/m2/mth	g/m2/mth	g/m2/mth
DG28	CA150408	Sep-15	0.69	0.61	20	0.2	1.3	1.3
DG28	CA150500	Oct-15	0.91	0.89	43	0.7	1.8	2.5
DG28	CA150564	Nov-15	2.8	2.9	44	1.2	5.7	6.9
DG28	CA160002	Dec-15	0.4	0.2	13	0.5	0.6	1.1
DG28	CA160064	Jan-16	0.76	0.54	114	0.4	1.3	1.7
DG28	CA160142	Feb-16	0.17	0.23	10	0.2	0.4	0.4
DG28	CA160203	Mar-16	1.8	0.6	34	0.2	2.4	2.4
DG28	CA160271	Apr-16	0.44	0.26	21	0.2	0.7	0.7
DG28	CA160324	May-16	0.39	0.31	30	0.2	0.7	0.7
DG28	CA160377	Jun-16	1.7	0.8	104	0.2	2.5	2.5
DG28	CA160434	Jul-16	17.3	5.7	63	0.6	23	23.6
DG28	CA160490	Aug-16	1.46	0.44	43	0.2	1.9	2.1
		Min	0.17	0.2	10	0.2	0.4	0.4
		Avg	2.40	1.12	44.92	0.40	3.53	3.83
		Max	17.3	5.7	114	1.2	23	23.6
		stDev	4.75	1.61	33.54	0.31	6.30	6.46

	Summary Total Solids (g/m2/month)		
Dust Gauge	Minimum	Maximum	Average
DG22	0.9	9.1	2.5
DG24	0.3	25.9	11.5
DG28	0.4	23.6	3.8

'<' removed from <LOR values

Table 5.1 - Surface Water Results - Site 115

EPL 11436	Statistics	Field Information									Analytical Information								
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissovled Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Total Dissolved Solids	Total Organic Carbon	Total Potassium
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L
		4/12/2015	Site 115		JE						No rainfall events generating flow in Q1								
		1/02/2016	Site 115	11:30	JE	7.52	2373	17.29	6.79	178.3	Low flow	CA1600637-001	0.1	2	2910	7.96	2470	19	5
		10/05/2016	Site 115	11:30	JE & J.Ev	6.73	3375	14.2	7.25	240	Clear, low flow	CA1602712-002	0.1	2	3630	7.93	2850	19	3.4
		6/06/2016	Site 115	12:30	JE & J.Ev	6.65	418	10.51	9.15	298	Turbid, fast flow	CA1603234-005	0.1	2	553	7.67	440	9	3
		20/06/2016	Site 115	11:30	JE & J.Ev	6.79	227	11.01	9.35	248	Turbid, fast flow	CA1603475-005	0.1	2	285	7.62	388	12	2.9
2015/16	Minimum					6.65	227.00	10.51	6.79	178.30			0.10	2.00	285.00	7.62	388.00	9.00	2.90
	Maximum					7.52	3375.00	17.29	9.35	298.00			0.10	2.00	3630.00	7.96	2850.00	19.00	5.00
	Average					6.92	1598.25	13.25	8.14	241.08			0.10	2.00	1844.50	7.80	1537.00	14.75	3.58
	StdDev					0.40	1530.84	3.15	1.30	49.09			0.00	0.00	1675.64	0.17	1306.15	5.06	0.97
	Count					4.00	4.00	4.00	4.00	4.00			4.00	4.00	4.00	4.00	4.00	4.00	4.00

Table 5.2 - Surface Water Results - Spring 2

EPL 11436	Statistics	Field Information									Analytical Information								
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissovled Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Total Dissolved Solids	Total Organic Carbon	Total Potassium
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L
		4/12/2015	Spring 2		JE						No rainfall events generating flow in Q1								
		1/02/2016	Spring 2	10:55	JE	6.25	591.6	17.65	6.3	212.1	Slightly turbid	CA1600637-002	0.8	2	725	5.16	626	19	16.6
		10/05/2016	Spring 2	11:05	JE & J.Ev	6.44	441.2	13.04	8.75	265	Clear	CA1602712-001	0.6	2	489	6.77	379	9	16.2
		6/06/2016	Spring 2	12:15	JE & J.Ev	5.94	139	9.42	8.67	194	Clear, full	CA1603234-004	0.2	2	200	5.93	125	12	2.5
		20/06/2016	Spring 2	11:05	JE & J.Ev	6.61	113	10.04	8.37	201	Clear, overflowing	CA1603475-004	0.1	3	147	6.57	136	15	1.6
2015/16	Minimum					5.94	113.00	9.42	6.30	194.00			0.10	2.00	147.00	5.16	125.00	9.00	1.60
	Maximum					6.61	591.60	17.65	8.75	265.00			0.80	3.00	725.00	6.77	626.00	19.00	16.60
	Average					6.31	321.20	12.54	8.02	218.03			0.43	2.25	390.25	6.11	316.50	13.75	9.23
	StdDev					0.29	233.85	3.76	1.16	32.19			0.33	0.50	269.06	0.73	237.31	4.27	8.29
	Count					4.00	4.00	4.00	4.00	4.00			4.00	4.00	4.00	4.00	4.00	4.00	4.00

Table 5.3 - Surface Water Results - Site 105

EPL 11436	Statistics	Field Information									Analytical Information								
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissovled Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Total Dissolved Solids	Total Organic Carbon	Total Potassium
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L
		4/12/2015	Site 105		JE						No rainfall events generating flow in Q1								
		1/02/2016	Site 105	10:30	JE	7.86	794.8	16.56	4.63	181.8	Low/medium flow	CA1600637-003	0.1	3	989	7.47	758	15	4
		10/05/2016	Site 105	10:40	JE & J.Ev						No flow								
		6/06/2016	Site 105	11:45	JE & J.Ev	6.61	176	9.47	8.77	188	Turbid, fast flow	CA1603234-003	0.1	3	469	7.39	382	14	2.6
		20/06/2016	Site 105	10:30	JE & J.Ev	6.69	421	10.28	8.65	237	Clear, very fast flow	CA1603475-003	0.1	2	542	7.7	340	16	2.1
		25/06/2016	Site 105	10:30	JE & J.Ev	7.18	825	6.02	11.14	231	Fast, clear	CA1604162-001	0.1	2	1360	7.9	889	20	2.1
2015/16	Minimum					6.61	176.00	6.02	4.63	181.80			0.10	2.00	469.00	7.39	340.00	14.00	2.10
	Maximum					7.86	825.00	16.56	11.14	237.00			0.10	3.00	1360.00	7.90	889.00	20.00	4.00
	Average					7.09	554.20	10.58	8.30	209.45			0.10	2.50	840.00	7.62	592.25	16.25	2.70
	StdDev					0.57	311.98	4.39	2.70	28.57			0.00	0.58	415.95	0.23	272.87	2.63	0.90
	Count					4.00	4.00	4.00	4.00	4.00			4.00	4.00	4.00	4.00	4.00	4.00	4.00

Table 5.4 - Surface Water Results - Raw Water Dam (WM200)

SML20 EPL 11436	Statistics	Field Information											Analytical Information						
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissovled Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Total Dissolved Solids	Total Organic Carbon	Total Potassium
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L
		23/09/2015	WM200	14:00	JE	6.85	1136	15.39	9.15		Clear, dam has green tinge	CA1503873-002	0.1	2	1520	7.65	1040	11	3.4
		17/12/2015	WM200	12:10	JE & JEv	7.92	1615	23.7	7.91	267.3	Clear	CA1505760-002	0.1	2	1760	8.32	1240	9	3.6
		24/03/2016	WM200	9:25am	JE & JEv	6.9	1834	17.3	8.19	259.8	Clear	CA1601838-002	0.1	2	1780	8.32	1280	8	3.4
		29/06/2016	WM200	14:00	JE & JEv	6.06	759	9.1	9.9	404	Clear	CA1603672-002	0.4	2	977	7.03	788	4	2.4
2015/16	Minimum					6.06	759.00	9.10	7.91	259.80			0.10	2.00	977.00	7.03	788.00	4.00	2.40
	Maximum					7.92	1834.00	23.70	9.90	404.00			0.40	2.00	1780.00	8.32	1280.00	11.00	3.60
	Average					6.93	1336.00	16.37	8.79	310.37			0.18	2.00	1509.25	7.83	1087.00	8.00	3.20
	StdDev					0.76	482.62	6.01	0.91	81.18			0.15	0.00	373.98	0.62	225.29	2.94	0.54
	Count					4.00	4.00	4.00	4.00	3.00			4.00	4.00	4.00	4.00	4.00	4.00	4.00

Table 5.5 - Surface Water Results - Entrance Road Culvert (WM201)

EPL 11436	Statistics	Field Information									Analytical Information								
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissovled Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Total Dissolved Solids	Total Organic Carbon	Total Potassium
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L
		4/12/2015	WM201		JE						No rainfall events generating flow in Q1								
		1/02/2016	WM201	13:25	JE						No flow								
		10/05/2016	WM201	11:45	JE & J.Ev						No flow								
		6/06/2016	WM201	10:20	JE & J.Ev	5.67	786	10.59	5.08	255	No flow	CA1603234-002	0.1	2	1040	6.61	740	10	6.8
		20/06/2016	WM201	10:45	JE & J.Ev	6.19	763	11.24	5.6	178	Turbid, low flow	CA1603475-002	0.1	2	951	7.13	628	14	5.8
		6/07/2016	WM201	9:00	JE & J.Ev	6.19	112	7.75	8.88	278	Turbid, medium flow	CA1603819-001	0.1	2	164	7.08	150	6	3.4
		20/07/2016	WM201	12:30	JE & J.Ev	7.26	344	12.1	5.62	278	Low flow, turbid	CA1604087-001	0.2	3	382	7.16	304	7	3.8
2015/16	Minimum					5.67	112.00	7.75	5.08	178.00			0.10	2.00	164.00	6.61	150.00	6.00	3.40
	Maximum					7.26	786.00	12.10	8.88	278.00			0.20	3.00	1040.00	7.16	740.00	14.00	6.80
	Average					6.33	501.25	10.42	6.30	247.25			0.13	2.25	634.25	7.00	455.50	9.25	4.95
	StdDev					0.67	329.56	1.88	1.74	47.42			0.05	0.50	428.07	0.26	275.06	3.59	1.62
	Count					4.00	4.00	4.00	4.00	4.00			4.00	4.00	4.00	4.00	4.00	4.00	4.00

Table 5.6 - Surface Water Results - Evaporation Dam 3 South (WM202)

EPL 11436	Statistics	Field Information									Analytical Information								
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissovled Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Total Dissolved Solids	Total Organic Carbon	Total Potassium
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L
		23/09/2015	WM202	13:10	JE	3.04	5728	14.9	9.05		Clear, green tinge	CA1503873-001	63	2	7640	3.09	9740	5	14.7
		17/12/2015	WM202	11:30	JE & JEv	3.33	9042.4	21.68	7.23	473.2	Clear	CA1505760-001	85.7	2	10300	3.02	14000	5	19.6
		24/03/2016	WM202	9:05am	JE & JEv	3.35	11222	17.01	6.8	419.3	Clear, slight blue tinge	CA1601838-001	146	2	10800	3.2	14800	14	52.4
		29/06/2016	WM202	13:50	JE & JEv	3.35	8760	9.7	4.41	383	Slightly turbid	CA1603672-001	109	15	8760	3.41	11100	18	30.2
2015/16	Minimum					3.04	5728.00	9.70	4.41	383.00			63.00	2.00	7640.00	3.02	9740.00	5.00	14.70
	Maximum					3.35	11222.00	21.68	9.05	473.20			146.00	15.00	10800.00	3.41	14800.00	18.00	52.40
	Average					3.27	8688.10	15.82	6.87	425.17			100.93	5.25	9375.00	3.18	12410.00	10.50	29.23
	StdDev					0.15	2259.32	4.97	1.91	45.39			35.44	6.50	1446.22	0.17	2386.43	6.56	16.75
	Count					4.00	4.00	4.00	4.00	3.00			4.00	4.00	4.00	4.00	4.00	4.00	4.00

Table 5.7 - Surface Water Results - Evaporation Dam 3 North (WM203)

EPL 11436	Statistics	Field Information									Analytical Information								
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissovled Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Total Dissolved Solids	Total Organic Carbon	Total Potassium
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L
		23/09/2015	WM203	14:20	JE	7.77	19026	12.29	4.98		leachate	CA1503873-002	890	22	26200	7.63	19400	980	1580
		17/12/2015	WM203	12:30	JE+JEv	7.85	26886	23.66	3.4	332	leachate	CA1505760-003	972	13	29000	7.18	20600	1110	1720
		20/04/2016	WM203	13:50	JE+JEv	7.52	37858	24.74	2.84	298	leachate	CA1602345-001	877	20	30900	7.9	24300	1450	1850
		30/06/2016	WM203	11:30	JE+JEv	8.05	20148	7.03	4.61	277	leachate	CA1603711-001	877	34	27700	8.01	18800	1460	180
2015/16	Minimum					7.52	19026.00	7.03	2.84	277.00			877.00	13.00	26200.00	7.18	18800.00	980.00	180.00
	Maximum					8.05	37858.00	24.74	4.98	332.00			972.00	34.00	30900.00	8.01	24300.00	1460.00	1850.00
	Average					7.80	25979.50	16.93	3.96	302.33			904.00	22.25	28450.00	7.68	20775.00	1250.00	1332.50
	StdDev					0.22	8646.35	8.68	1.01	27.75			45.75	8.73	1994.16	0.37	2466.27	242.62	776.20
	Count					4.00	4.00	4.00	4.00	3.00			4.00	4.00	4.00	4.00	4.00	4.00	4.00

Table 5.8 - Surface Water Results - Pond 3

EPL 11436	Statistics	Field Information									Analytical Information								
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissovled Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Total Dissolved Solids	Total Organic Carbon	Total Potassium
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	water, siltry brown, stinks		mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L
		4/12/2015	Pond 3	12:00	JE						No rainfall events generating flow in Q1								
		1/02/2016	Pond 3	13:20	JE	3.7	2461	18.07	7.42	455.4	ks for Heron drilling platform being underta	CA1600637-005	8.5	5	2970	3.02	4140	5	2.8
		10/05/2016	Pond 3	12:10	JE & J.Ev	5.94	2792	14.81	8.5	241	Turbid	CA1602712-003	7.1	7	2960	6.84	2250	14	11.6
		6/06/2016	Pond 3	10:10	JE & J.Ev	3.28	3186	9.61	9.74	440	Slightly turbid	CA1603234-001	7.7	3	4590	3.13	5380	4	4.7
		20/06/2016	Pond 3	9:00	JE & J.Ev	6.27	1357	10.8	9.2	116	Turbid	CA1603475-001	19.6	15	1690	6.82	1130	47	17.5
2015/16	Minimum					3.28	1357.00	9.61	7.42	116.00			7.10	3.00	1690.00	3.02	1130.00	4.00	2.80
	Maximum					6.27	3186.00	18.07	9.74	455.40			19.60	15.00	4590.00	6.84	5380.00	47.00	17.50
	Average					4.80	2449.00	13.32	8.72	313.10			10.73	7.50	3052.50	4.95	3225.00	17.50	9.15
	StdDev					1.53	786.01	3.87	1.00	163.71			5.94	5.26	1188.23	2.17	1899.20	20.17	6.73
	Count					4.00	4.00	4.00	4.00	4.00			4.00	4.00	4.00	4.00	4.00	4.00	4.00

'<' removed from <LOR values

Table 6.1 - Leachate Results - Leachate Dam

Statistics	Field Information									Analytical Information																																									
EPL 11436	Date	Site Code	Time	Sampler	pH	Cond.	Temp	ORP	DO	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Chromium (Hex)	Conductivity	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	pH	Sulphate	Total Suspended Solids	Total Dissolved Solids	Total Organic Carbon	Total Phosphorous	Total Aluminium	Total Arsenic	Total Barium	Total Cadmium	Total Calcium	Total Chromium	Total Cobalt	Total Copper	Total Lead	Total Magnesium	Total Manganese	Total Mercury	Total Phenols	Total Potassium	Total Sodium	Total Zinc
			AM/PM	Initials	pH	µS/cm	°C	mV	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	17/03/2011	LD	10.28	TH	7.94	30700	17.5	-25.6	0.23	829336	6390	0.1	6390	1900	3500	0.024	31000	2	1.6	0.01	0.0001	2	0.001	1100	37000	29000	3900	40	48	40	100	7.6	5900	2000	26000	10400	5	12	0.18	0.045	0.16	730	0.35	0.36	0.38	0.06	1100	0.82	0.0003	2.4	2100	3100	60
	30/03/2012	LD	10.37	TH	7.8	34300	16.8	0	0.19	882567	9710	0.1	9710	1800	5400	0.1	35000	0.26	6.9	0.23	2.5	2.5	10	190	348000	21200	50	1	5	2	2	7.9	5100	3400	31000	13000	7.5	17	0.188	0.067	0.055	660	0.41	0.15	0.32	0.17	1400	0.91	0.0012	1.57	2900	4400	52
	22/05/2013	LD	2:30pm	CC	8.8	23000	N/A	N/A	N/A	940239	5170	2230	7400	270	4700	0.1	23000	9	5	1												8.8	1600	2400	18000	2900	26	0.1	0.011	0.016	0.0004	36	0.62	0.1	0.19	0.0069	800	0.25	0.0011	<0.05	2000	3000	0.79
	29/05/2013	LD	9:05:00 AM	CC	N/A	N/A	N/A	N/A	N/A	941057											2	2	0.5	20	1360	4420	630	1	2	2	2																					
	29/05/2014	LD	12:00pm	CC	7.5	27100	16		3	CA1401648-001	653	0.1	653	690	3550	0.1	24400	7.8	70	1660	2	2	1	100	3390	6370	810	5	5	5	5	7.09	910	848	13400	1500	29.3	2.3	0.268	0.149	0.0107	266	0.55	0.102	0.267	0.0591	0.332	0.96	0.001	0.51	1610	2910	3.56
	22/05/2015	LD	12:00pm	JE	9.39	19897	12.5		6.3	CA1501937-001	5510	834	6340	1780	3450	2	26900	5.1	58.9	887	2	2	1	40	1100	2930	130	1	2	2	2	8.47	738	491	12300	2410	11.6	3.54	0.212	0.182	0.183	79.1	0.526	0.16	1.37	0.0969	161	3.18	0.0009	0.3	1310	2490	33.1
	20/04/2016	LD	1:35:00 PM	JE	8.52	26643	20.98	186.2	2.97	CA1602339-001	7940	1810	9750	1700	3610	0.732	24800	7.4	5	1	2	2	0.5	20	1010	2650	450	1	2	2	2	8.59	555	649	13400	3220	9.64	3.6	0.325	1.32	0.0157	75.6	0.732	0.147	0.289	0.212	172	0.832	0.002	0.05	1520	2850	6.36

Table 6.2 - Leachate Results - Leachate Recirculation System

Statistics	Field Information																																																			
EPL 11436	Date	Site Code	Time	Sampler	pH	Cond.	Temp	ORP	DO	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chemical Oxygen Demand	Chloride	Chromium (Hex)	Conductivity	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	pH	Sulphate	Total Suspended Solids	Total Dissolved Solids	Nitrate + Nitrite (oxidised nitrogen)	Total Organic Carbon	Total Phosphorous	Total Aluminium	Total Arsenic	Total Barium	Total Cadmium	Total Calcium	Total Chromium	Total Cobalt	Total Copper	Total Iron	Total Lead	Total Magnesium	Total Manganese	Total Mercury	Total Phenols	Total Sodium
			AM/PM	Initials	pH	µS/cm	°C	mV	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	17/03/2011	LR	9.54	TH	7.69	39800	28.4	-36.2	0.25	829337	16900	0.1	16900	3700	11100	3400	0.05	37000	1.5	0.89	0.07	0.0001	0.001	2	550	13000	42000	4100	40	49	40	80	8	130	720	16000		5900	23	35	0.29	0.41	0.016	370	2.9	0.4	0.46	140	0.25	930	3.7	0.0092	0.88	11400
	30/03/2012	LR	10.51	TH	7.77	28500	28.8	0	0.22	882680	12600	0.1	12600	2300	5500	2500	0.1	27000	1.1	0.01	0.17	2	2	5	780	27100	37300	610	2	73	22	77	7.9	51	160	12000	0.1	3100	2.34	3.5	0.217	0.16	0.016	110	0.41	0.061	0.25	31	0.063	360	1	0.001	2.34	2300
	3/05/2013	LR	11:30am	CC	N/A	21000	N/A	N/A	N/A	937588	6550	500	7570	620	N/A	3800	0.1	21000	0.1	5	1	5	5	1	20	8130	8980	1100	1	2	2	2	8.4	62	140	15000	5	3400	4.3	1.4	0.17	0.092	0.0028	41	0.1	0.043	0.033	N/A	0.0044	490	0.075	0.0005	2.71	2300
	16/04/2014	LR	8:30am	CC	8.3	18500	23.2		0.07	CA1401181-001	15400	0.1	15400	3330	N/A	18100	0.1	33000	2.3	0.5	0.31	2	2	3.2	1380	8790	13300	1170	3	65	22	81	8.1	313	259	21400	0.5	5510	23.6	1.33	0.267	0.224	0.00246	87.1	0.604	0.0826	0.099	N/A	0.0354	172	0.461	0.0024	1.44	2720
	22/05/2015	LR	13:30	JE	8.4	37260	28.1		2.65	CA1501937-002	14400	0.1	14400	3240	N/A	3500	0.1	33500	12.3	5	1.12	2	2	4.8	340	5370	9320	940	2	43	11	16	7.85	632	123	12700	5	4460	15.6	1.65	0.245	0.257	0.00329	57.5	0.477	0.0566	0.171		0.0833	145	0.604	0.0008	0.08	2050
	20/04/2016	LR	13:35	JE	7.68	54941	36.21	-277	0.08	CA1602339-002	16300	104	16400	3640		3650	0.78	34900	0.1	5	1	2	2	0.5	960	4240	13300	150	3	67	20	51	8.05	204	64	14800	5	5300	26.4	1.77	0.418	1.15	0.00229	79	0.78	0.104	0.119		0.06	149	0.333	0.0018	0.5	2990

		Total Zinc	mg/L	20	6.8	0.56	1.56	1.75	1.04

Table 7.1 - Groundwater Results - MB 1

	Statistics	Field Information											Analytical Information																																											
EPL 11436		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminium	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
		16/09/2015	MB1	10:05	JE/Rhe	7.01	1185.2	15.41	3.39		21.71	775.80	CA150736-001	365	0.1	365	0.1	155	1540	153	61.1	6.2	46.2	7.42	274	1260			0.001	0.0025			0.004	0.0009			0.21																			
		17/12/2015	MB1	11:10	JE/JEv	7.45	1226.8	16.45	3.99	342.4	20.31	777.20	CA150-726-001	359	0.1	359	0.1	157	1580	156	78.4	6.5	52.2	7.2	278	1180			0.002	0.0032			0.007	0.0024			0.252																			
		20/04/2016	MB1	10:00	JE/JEv	6.88	1504	15.71	3.46	362	22.09	775.42	CA1602344-003	362	0.1	362	0.1	155	1520	154	76.6	6.8	49.8	7.14	268	1670	0.01	0.04	0.002	0.00154	0.0009	0.008	0.0006	0.057	0.0001	0.214	0.2	0.05	0.01	0.002	0.002	0.5	20	50	100	50	1	2	2	2	0.05	5	0.0908	0.001
		28/06/2016	MB1	10:00	JE/JEv	6.96	1345	13.1	4.24	317	21.11	776.42	CA1606845-011	360	0.1	360	0.1	145	1560	153	76.6	6.2	43.2	7.02	276	1130	1	1	0.004	0.00172	0.0009	0.008	0.0031	0.005	0.0002	0.23																			
2015/16	Minimum					6.88	1185.2	13.1	3.39	317	20.31	775.42		359	0.1	359	0.1	145	1520	153	76.6	6.2	43.2	7.14	260	1070	0.01	0.04	0.001	0.00154	0.0009	0.004	0.0006	0.057	0.0001	0.144	0.2	0.05	0.01	0.002	0.002	0.5	20	50	100	50	1	2	2	2	0.05	5	0.0908	0.001
	Maximum					7.45	1504	16.45	4.24	362	22.09	777.2		365	0.1	365	0.1	157	1580	156	81.1	6.6	52.2	7.42	278	1260	0.01	0.04	0.002	0.00362	0.0009	0.008	0.0024	0.057	0.0001	0.252	0.2	0.05	0.01	0.002	0.002	0.5	20	50	100	50	1	2	2	2	0.05	5	0.0908	0.001
	Average					7.075	1315.25	15.2175	3.77	347.13333333	21.309	776.205		361.5	0.1	361.5	0.1	157	1550	154	78.175	6.375	47.85	7.32	270	1160	0.01	0.04	0.00175	0.002345	0.0009	0.00625	0.00125	0.057	0.0001	0.214	0.2	0.05	0.01	0.002	0.002	0.5	20	50	100	50	1	2	2	2	0.05	5	0.0908	0.001
	StdDev					0.25969657	142.884604	1.50725744	0.41222709	32.75749278	0.778380491	0.778380491		2.64575	0	2.64575311	0	5.41602560 3	25.8198689	1.41421356 2	2.13661703	0.206315528	3.96190046 4	0.127541	7.83516	80.4155872	0	0	0.00175	0.000947	0.0009	0.000625	0.00125	0.057	0.0001	0.214	0.2	0.05	0.01	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.05	5	#DIV/0!	#DIV/0!
	Count					4	4	4	4	3	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	4	1	1	4	4	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7.2 - Groundwater Results - MB 2

	Statistics	Field Information											Analytical Information																																											
SML20		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminium	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
EPL 11436				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
		16/09/2015	MB2	10:30	JE/Rhe	6.47	5220.4	15.35	2.45		2.84	779.02	CA150736-002	200	0.1	200	0.1	594	6700	533	815	1.8	253	6.86	4050	7250			0.003	0.0302			0.003	0.0002			0.055																			
		14/12/2015	MB2	13:35	JE/JEv	6.91	5303	15.98	1.68	335	3.32	778.54	CA150645-004	200	0.1	200	0.1	611	6880	514	771	1.8	263	6.76	4010	7250			0.003	0.0513			0.005	0.0002			0.085																			
		22/03/2016	MB2	9:50	JE/JEv	6.54	6664	15.1	4.05	214	3.51	778.35	CA1601752-002	203	0.1	203	0.1	796	6850	546	797	1.9	275	6.86	4320	7370	0.01	0.009	0.003	0.00502	0.0005	0.004	0.0002	0.0376	0.0003	0.046	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0211	0.008
		27/06/2016	MB2	9:10	JE/JEv	6.57	6120	14.8	4.05	124	2.86	779.00	CA1603627-001	200	0.1	200	0.1	574	6750	534	759	1.8	266	6.93	3960	7170			0.004	0.0254			0.003	0.0002			0.043																			
2015/16	Minimum					6.47	5220.4	14.8	1.68	124	2.84	778.35		200	0.1	200	0.1	574	6700	514	759	1.8	253	6.76	3960	7170	0.01	0.009	0.003	0.00502	0.0005	0.003	0.0002	0.0376	0.0003	0.043	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0211	0.008
	Maximum					6.91	6664	15.98	4.05	335	3.51	779.02		203	0.1	203	0.1	796	6880	546	815	1.9	275	6.93	4320	7370	0.01	0.009	0.004	0.0513	0.0005	0.005	0.0002	0.0376	0.0003	0.085	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0211	0.008
	Average					6.6225	5826.85	15.3075	3.0575	224.3333333	3.1325	778.7275		200.75	0.1	200.75	0.1	643.75	6795	531.75	785.5	1.825	264.25	6.8625	4085	7290	0.01	0.009	0.00325	0.02798	0.0005	0.00375	0.0002	0.0376	0.0003	0.05725	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0211	0.008
	StdDev					0.196192932	690.158791	0.50155591	1.18837073	105.8788616	0.335397774	0.335397774		1.5	0	1.5	0	102.6202547	84.261498	13.22560648	25.2652594	0.05	9.069178574	0.06994	160.9348	82.4621125	#DIV/0!	#DIV/0!	0.0005	0.018996	#DIV/0!	0.0009574	0	#DIV/0!	#DIV/0!	0.0191898	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Count					4	4	4	4	3	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	4	1	1	4	4	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7.3 - Groundwater Results - MB 3

	Statistics	Field Information											Analytical Information																																											
SML20		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminium	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
EPL 11436				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
		16/09/2015	MB3	10:50	JE/Rhe	6.55	1533.2	15.51	2.92		2.37	790.83	CA150736-003	253	0.1	253	0.1	502	1980	138	107	1.6	65	6.96	29.4	1460			0.002	0.00015			0.001	0.0002			0.014																			
		14/12/2015	MB3	14:00	JE/JEv	7.03	1538	15.72	3.84	269	2.56	790.64	CA150645-005	249	0.1	249	0.1	504	2020	134	99.6	1.5	69.8	6.88	36.9	1620			0.002	0.00013			0.001	0.0002			0.016																			
		22/03/2016	MB3	10:20	JE/JEv	6.62	1938	15.4	4.68	294	2.74	790.46	CA1601752-003	254	0.1	254	0.1	575	2000	137	100	1.6	73.1	6.91	31.4	1520	0.01	0.009	0.002	0.00014	0.0003	0.001	0.0002	0.0005	0.0002	0.014	0.1	0.48	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	3	0.0332	0.013
		27/06/2016	MB3	9:35	JE/JEv	6.67	1767	15.13	4.8	200	2.64	790.56	CA1603627-002	251	0.1	251	0.1	462	1940	141	96.3	1.5	69.7	7.08	30.6	1340			0.002	0.00016			0.001	0.0002			0.011																			
2015/16	Minimum			6.55	1533.2	15.13	2.92	200	2.37	200	2.64	790.46		249	0.1	249	0.1	462	1940	134	96.3	1.5	65	6.88	29.4	1340	0.01	0.009	0.002	0.00013	0.0003	0.001	0.0002	0.0005	0.0002	0.011	0.1	0.48	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	3	0.0332	0.013
	Maximum			7.03	1938	15.72	4.8	294	2.74	790.83		790.64		254	0.1	254	0.1	575	2020	141	107	1.6	73.1	7.08	36.9	1620	0.01	0.009	0.002	0.00016	0.0003	0.001	0.0002	0.0005	0.0002	0.016	0.1	0.48	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	3	0.0332	0.013
	Average			6.7175	1694.05	15.44	4.06	254.3333333	2.5775	790.6225		790.5275		251.75	0.1	251.75	0.1	510.75	1985	137.5	100.725	1.55	69.4	6.9575	32.075	1485	0.01	0.009	0.002	0.000145	0.0003	0.001	0.0002	0.0005	0.0002	0.013	0.1	0.48	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	3	0.0332	0.013
	StdDev			0.214067746	195.838054	0.24562845	0.87179789	48.68606919	0.156710087	0.156710087		0.156710087		2.21736	0	2.215755783	0	46.99911347	34.1565033	2.88675134	4.49090741	0.05773503	3.33166625	0.088081	3.820015	117.046999	#DIV/0!	#DIV/0!	0	1.29E-05	#DIV/0!	0	0	#DIV/0!	#DIV/0!	0.0024495	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Count			4	4	4	4	3	4	4		4		4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	4	1	1	4	4	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7.4 - Groundwater Results - MB 4

	Statistics	Field Information											Analytical Information																																											
EPL 11436		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminium	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
		17/09/2015	MB4	11:15:00 AM	JE/Rhe	5.06	1298.2	15.84	2.64		12.36	774.43	CA150739-014	18	0.1	18	0.1	415	1710	77.1	1.5	152	5.43	202	1050			0.001	0.00242			0.054	0.0057			0.538	0.1	0.21	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	2	0.0229	0.007
		14/12/2015	MB4	2:45:00 PM	JE/JEv	5.49	1299	16.22	2.43	360.3	12.26	774.24	CA150645-007	15.6	0.1	16	0.1	407	1670	7.09	76.6	1.5	154	5.31	211	1100			0.003	0.00155			0.051	0.0066			0.716																			
		22/03/2016	MB4	1:00:00 PM	JE/JEv	5.1	1340	15.93	2.45	573	12.35	774.13	CA1601752-007	16	0.1	15	0.1	371	1680	7.8	72.9	1.6	151	5.47	185	945	0.01	0.122	0.003	0.00144	0.019	0.004	0.0006	0.0177	0.0002	0.636	0.1	0.21	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	2	0.0229	0.007
		28/06/2016	MB4	14:00:00 PM	JE/JEv	5.19	1377	15.12	4.75	390	12.5	774.00	CA1606845-012	16.1	0.1	16	0.1	364	1430	6.53	66.7	1.4	130	5.62	195	878			0.005	0.00144			0.055	0.0065			0.71																			
2015/16	Minimum			5.06	1298.2	15.84	2.43	360.3	12.26	573	12.26	774		14.9	0.1	15	0.1	364	1430	6.53	66.7	1.4	130	5.31	185	878	0.01	0.122	0.001	0.00144	0.019	0.004	0.0006	0.0177	0.0002	0.538	0.1	0.21	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	2	0.0229	0.007
	Maximum			5.49	1540	16.22	4.75	573	12.5	774.24		774.43		16.1	0.1	16	0.1	415	1710	7.14	77.1	1.6	154	5.62	211	1100	0.01	0.122	0.005	0.00232	0.019	0.058	0.059	0.0177	0.0002	0.824	0.1	0.21	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	2	0.0229	0.007
	Average			5.21	1378.05	15.775	3.0425	461.1	12.3875	774.1325		774.3275		15.65	0.1	15.75	0.1	389.25	1597.5	6.95	73.325	1.5	145.75	5.4175	197.5	993.25	0.01	0.122	0.003	0.001688	0.019	0.052	0.0575	0.0177	0.0002	0.7015	0.1	0.21	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	2	0.0229	0.007
	StdDev			0.194422221	114.3002	0.4673596	1.144835546	115.189735	0.099121138	0.099121138		0.099121138		0.54467	0	0.5	0	25.48692475	124.19742	0.282965539	4.79748198	0.08164966	11.23610253	0.146373	10.99621	100.377205	#DIV/0!	#DIV/0!	0.001632993	0.000425	#DIV/0!	0.006055	0.0263697	#DIV/0!	#DIV/0!	0.0774145	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Count			4	4	4	4	3	4	4		4		4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	4	1	1	4	4	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7.5 - Groundwater Results - MB 5

	Statistics	Field Information											Analytical Information																																											
SML20		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminium	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
EPL 11436				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
		17/09/2015	MB5	11:15:00 AM	JE/Rhe	4.14	6185.7	15.33	0.9	184.8	6.1	827.52	CA150798-013	0.1	0.1	1	0.2	516	8120	194	993	6.3	456	4.26	5060	9660			0.023	0.169			0.0061	0.0016			247																			
		15/12/2015	MB5	1:25:00 PM	JE/JEv	4.53	6234.3	15.7	0.82	246.1	6.22	827.76	CA150661-005	0.1	0.1	1	0.2	551	8220	173	854	6.9	438	4.17	5830	9540			0.03	0.17			0.012	0.0007			249																			
		20/04/2016	MB5	8:50:00 AM	JE/JEv	4.23	7968	15.39	0.59	184.8	6.46	827.52	CA1602344-001	0.1	0.1	1	0.2	509	8190	167	845	7	433	4.29	6020	9470	0.01	28.7	0.034	0.186	1.49	0.028	0.0006	29.1	0.0003	230	4.8	0.05	0.01	0.002	0.002	0.5	20	50	100	50	1	2	2	2	0.05	6	0.0021	0.002
		27/06/2016	MB5	12:20:00 PM	JE/JEv	4.23	7197	14.8	4.16	207	6.33	827.47	CA1603627-005	0.1	0.1	1	0.3	456	8000	176	852	6.8	444	4.34	5560	9450			0.033	0.187			0.013	0.0008			248																			
2015/16	Minimum			4.14	6185.7	14.8	6.9	184.8	6.1	184.8	6.1	827.52		0.1	0.1	1	0.2	456	8000	167	845	6.3	433	4.17	5060	9400	0.01	28.7	0.023	0.169	1.49	0.0001	0.0006	29.1	0.0003	230	4.8	0.05	0.01	0.002	0.002	0.5	20	50	100	50	1	2	2	2	0.05	6	0.0021	0.002
	Maximum			4.53	7968	15.7	15.7	4.16	246.1	246.1	6.46	827.76		0.1	0.1	1	0.3	551	8220	194	993	7	456	4.34	6020	9660	0.01	28.7	0.034	0.187	1.49	0.028	0.0006	29.1	0.0003	249	4.8	0.05	0.01	0.002	0.002	0.5	20	50	100	50	1	2	2	2	0.05	6	0.0021	0.002
	Average			4.2625	6888.75	15.305	1.5675	212.6333333	6.2725	827.7075		827.5075		0.1	0.1	1	0.225	508	8132.5	177.5	861	6.75	442.75	4.265	5617.5	9517.5	0.01	28.7	0.02975	0.178	1.49	0.013275	0.000975	29.1	0.0003	243.5	4.8	0.05	0.01	0.002	0.002	0.5	20	50	100	50	1	2	2	2	0.05	6	0.0021	0.002
	StdDev			0.170287725	849.468016	0.37067544	1.733952526	31.03583595	0.153789909	0.153789909		0.153789909		0	0	0	0.05	39.23433387	97.766729	11.61904904	21.67948434	0.319391264	9.914511801

Table 7.9 - Groundwater Results - MB 10

	Statistics	Field Information											Analytical Information																																									
SML20		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminum	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
EPL 11436				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
		16/09/2015	MB10	11:30:00 AM	JE/Rbe	6.63	5879.2	15.44	1.18	270	2.79	781.01	CLI503736-005	248	0.1	248	0.1	997	7530	541	750	1.2	483	7.1	3980	7110	0.01	0.009	0.004	0.00005	0.0017	0.005	0.0002	0.0644	0.0003	0.0025	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0057	0.011
		14/12/2015	MB10	12:15:00 PM	JE/Dv	7.02	5981	15.65	2.43	270.6	3.17	780.63	CLI505645-002	246	0.1	246	0.1	1140	7790	523	722	1.2	494	6.89	3870	7420			0.004	0.00005		0.008	0.0002			0.005																			
		22/03/2016	MB10	10:56:00 AM	JE/Rbe	6.59	7607	15.4	1.9	260	3.45	780.35	CLI601752-004	247	0.1	247	0.1	845	7790	528	704	1.2	497	6.96	3450	7580	0.01	0.009	0.004	0.00008	0.0017	0.007	0.002	0.0644	0.0003	0.0005	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0057	0.011
		27/06/2016	MB10	11:40:00 AM	JE/Dv	6.71	6850	14.8	2.02	200	2.88	780.92	CLI603627-004	248	0.1	248	0.1	923	7500	539	700	1.2	492	7.05	3470	7230			0.004	0.00015		0.005	0.0002			0.017																			
2015/16	Minimum					6.59	5879.2	14.8	1.18	200	2.79	780.35		246	0.1	246	0.1	845	7500	523	700	1.2	483	6.89	3450	7110	0.01	0.009	0.003	0.00005	0.0017	0.005	0.0002	0.0644	0.0003	0.0025	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0057	0.011
	Maximum					7.02	7607	15.65	2.43	270.6	3.45	781.01		248	0.1	248	0.1	1140	7790	541	750	1.2	497	7.1	3980	7580	0.01	0.009	0.004	0.00025	0.0017	0.008	0.002	0.0644	0.0003	0.042	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0057	0.011
	Average					6.7375	6579.3	15.3225	1.8825	243.5833333	3.0725	780.725		247.25	0.1	247.25	0.1	976.5	7652.5	532.75	719	1.2	491.5	7	3920	7335	0.01	0.009	0.0037	0.00013	0.0017	0.0065	0.0005	0.0644	0.0003	0.01725	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0057	0.011
	StdDev					0.194828985	811.90079	0.3651826	0.52040493	38.0716677	0.299374348	0.299374348		0.95743	0	0.957427108	0	125.2264615	159.243	8.655441448	22.7742545	0	6.027713773	0.093452	272.3203	207.284024	#DIV/0!	0	0.0005	8.88E-05	#DIV/0!	0.001291	0.0009	#DIV/0!	#DIV/0!	0.0174428	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Count					4	4	4	4	3	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	4	1	1	4	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7.10 - Groundwater Results - MB 11

	Statistics	Field Information											Analytical Information																																									
SML20		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminum	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
EPL 11436				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
		17/09/2015	MB11	10:35	JE/Rbe	4.23	21258.9	13.5	5.15		1.34	782.46	CLI503798-011	0.1	0.1	1	0.1	1780	29700	519	580	4.8	1580	3.78	33000	54900	0.01	617	0.035	21	19.9	135	0.0162	0.04	0.0001	4270	120	0.05	0.01	0.002	0.002	0.001	20	50	100	50	1	2	2	2	0.18	15	0.021	0.016
		15/12/2015	MB11	10:30	JE/Dv	4.36	28800	16.82	3.63	389.3	1.74	782.06	CLI505661-013	0.1	0.1	1	0.3	2050	37400	461	7140	8	2020	4.09	54800	77400			0.294	34.3		135	0.0172				6270																		
		23/03/2016	MB11	9:45	JE/Dv	3.89	37358	16.5	3.46	330	1.7	782.1	CLI601787-002	0.1	0.1	1	0.3	1550	36700	494	6500	6.8	1940	3.78	43400	77500	0.01	617	0.082	31.8	19.9	175	0.0185	648	0.0001	6030	120	0.05	0.01	0.002	0.002	0.001	20	50	100	50	1	2	2	2	0.18	15	0.021	0.016
		28/06/2016	MB11	9:45	JE/Dv	3.92	32803	13.3	4.5	357	1.01	782.79	CLI603645-015	0.1	0.1	1	0.4	1950	37700	428	6470	4.9	1800	3.81	54800	78300			0.474	35		212	0.0174				6060																		
2015/16	Minimum					3.89	21258.9	13.3	3.46	330	1.01	782.06		0.1	0.1	1	0.1	1550	29700	428	5670	4.8	1580	3.78	33000	54900	0.01	617	0.035	21	19.9	135	0.0162	0.04	0.0001	4270	120	0.05	0.01	0.002	0.002	0.001	20	50	100	50	1	2	2	2	0.18	15	0.021	0.016
	Maximum					4.36	37358	16.82	5.15	389.3	1.74	782.79		0.1	0.1	1	0.4	2050	37700	519	7140	8	2020	4.09	54800	78300	0.01	617	0.474	35	19.9	212	0.0185	648	0.0001	6270	120	0.05	0.01	0.002	0.002	0.001	20	50	100	50	1	2	2	2	0.18	15	0.021	0.016
	Average					4.1	30054.975	15.03	4.185	358.7666667	1.4475	782.3525		0.1	0.1	1	0.275	1832.5	35375	475.5	6445	6.125	1839	3.84	45300	72025	0.01	617	0.22125	30.525	19.9	165.5	0.017325	648	0.0001	5657.5	120	0.05	0.01	0.002	0.002	0.001	20	50	100	50	1	2	2	2	0.18	15	0.021	0.016
	StdDev					0.231606671	6827.1935	1.88845616	0.788268144	29.68944818	0.342673314	0.342673314		0	0	0	0.12583057	218.8416475	3806.4638	39.58535083	602.024363	1.55214905	192.7865832	0.147196	9438.22	11423.7691	#DIV/0!	#DIV/0!	0.202694146	6.496858	#DIV/0!	35.744463	0.000943	#DIV/0!	#DIV/0!	931.14177	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Count					4	4	4	4	3	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	4	1	1	4	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7.11 - Groundwater Results - MB 12

	Statistics	Field Information											Analytical Information																																									
SML20		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminum	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
EPL 11436				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
		17/09/2015	MB12	10:30	JE/Rbe	3.65	29297	14.76	4.43		1.97	777.98	CLI503798-010	0.1	0.1	1	0.5	1930	40000	547	8270	9.1	2280	3.6	46800	89200			0.051	31.2		293	0.983				7270																		
		15/12/2015	MB12	10:16	JE/Dv	4.06	32448	19.44	2.33	369.2	2.22	777.73	CLI505661-012	0.1	0.1	1	0.6	1980	39300	467	7150	13.7	3080	3.62	53200	84700			0.304	37		175	1				7060																		
		23/03/2016	MB12	9:40	JE/Dv	3.63	3481	14.3	3.97	331	2.27	777.68	CLI601787-001	0.1	0.1	1	0.6	1790	38900	498	6680	11.6	2230	3.66	50000	86700	0.01	931	0.096	36.8	23.3	293	0.904	654	0.0001	6870	140	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.92	16	0.021	0.022
		28/06/2016	MB12	9:40	JE/Dv	3.74	31522	11.2	5.8	350	1.62	778.33	CLI603645-014	0.1	0.1	1	0.6	1830	38900	398	6340	12.8	1980	3.72	54300	82400			0.448	37.8		252	0.723				6530																		
2015/16	Minimum					3.63	29297	11.2	2.33	331	1.62	777.68		0.1	0.1	1	0.5	1790	38900	398	6340	9.1	1980	3.6	46800	82400	0.01	931	0.051	31.2	23.3	175	0.723	654	0.0001	6530	140	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.92	16	0.021	0.022
	Maximum					4.06	37481	19.44	5.8	369.2	2.27	778.33		0.1	0.1	1	0.6	1980	40000	547	8270	13.7	3080	3.72	54300	89200	0.01	931	0.448	37.8	23.3	293	1	654	0.0001	7270	140	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.92	16	0.021	0.022
	Average					3.77	32087	14.325	4.1325	350.0666667	2.02	777.93		0.1	0.1	1	0.575	1882.5	39275	437.5	6510	11.8	2302.5	3.65	50750	85750	0.01	931	0.2247	35	23.3	239.75	0.8625	654	0.0001	6932.5	140	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.92	16	0.021	0.022
	StdDev					0.199164923	3458.75132	3.39993627	1.431138824	19.10008726	0.297209242	0.297209242		0	0	0	0.05	87.70214745	518.81275	62.39925213	841.625412	1.99499373	476.751158	0.052915	3383.662	2894.24717	#DIV/0!	#DIV/0!	0.185190668	3.030951	#DIV/0!	49.91744	0.1267662	#DIV/0!	#DIV/0!	314.1523	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Count					4	4	4	4	3	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	4	1	1	4	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7.12 - Groundwater Results - MB 13

	Statistics	Field Information											Analytical Information																																									
SML20		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminum	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
EPL 11436				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
		17/09/2015	MB13	10:10	JE/RBE	6.93	2635.1	15.8	1.41		1.97	746.69	CLI503798-009	623	0.1	623	0.1	746	3420	137	167	2.9	276	7.3	54.7	2040			0.003	0.00031		0.003	0.0002				0.046																		
		14/12/2015	MB13	11:35	JE/Dv	7.26	2664	16.2	0.5	280	2.59	746.07	CLI505645-001	617	0.1	617	0.1	803	3440	139	170	3	284	7.2	73.5	2250			0.005	0.00006		0.001	0.0002				0.006																		
		22/03/2016	MB13	9:10	JE/Dv	6.93	3280	15.4	2.23	277	2.64	746.02	CLI601752-003	608	0.1	608	0.1	790	3350	136	151	3	284	7.23	81.9	2150	0.01	0.009	0.002	0.00027	0.0005	0.0005	0.001	0.0003	0.0071	0.0004	0.0388	0.4	0.63	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	9	0.0266	0.031
		28/06/2016	MB13	14:00	JE/Dv	6.93	3049	15.49	2.83	364	1.78	746.9	CLI603645-013	595	0.1	595	0.1	761	3250	140	160	2.9	265	7.31	74.8	1870			0.003	0.00008		0.002	0.0001				0.016																		
2015/16	Minimum					6.93	2635.1	15.4	0.5	277	1.78	746.02		595	0.1	595	0.1	746	3250	136	160	2.9	265	7.2	54.7	1870	0.01	0.009	0.003	0.00006	0.0005	0.0005	0.001	0.0002	0.0071	0.0004	0.006	0.4	0.63	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	9	0.0266	0.031
	Maximum					7.26	3280	16.2	3.23	364	2.64	746.9		623	0.1	623	0.1	803	3440	140	170	3	284	7.31	81.9	2250	0.01	0.009	0.005	0.00027	0.0005	0.0005	0.003	0.0002	0.0071	0.0004	0.046	0.4	0.63	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	9	0.0266	0.031
	Average					7.0125	2907.025	15.7225	1.9925	321.25	2.2075	746.42		610.75	0.1	610.75	0.1	776.25	3335	138.25	164.5	2.95	277.5	7.24	77.5	2075	0.01	0.009	0.0037	0.00013	0.0005	0.0005	0.0025	0.0002	0.0071	0.0004	0.0388	0.4	0.63	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	9	0.0266	0.031
	StdDev					0.165	312.127969	0.36151302	1.264866241	49.3862329	0.441889881	0.441889881		12.1758	0	12.175795566	0	27.08473355	85.829288	1.825741858	4.795831512	0.05775303	8.995369179	0.08756	11.61877	162.762608	#DIV/0!	#DIV/0!	0.002217356	0.000126	#DIV/0!	0.0009574	0	#DIV/0!	#DIV/0!	0.0188548	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Count					4	4	4	4	3	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	4	1	1	4	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7.13 - Groundwater Results - MB 14

	Statistics	Field Information											Analytical Information																																									
SML20		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminum	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
EPL 11436				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
		16/09/2015	MB14	11:50	JE/Rbe	6.98	2698.2	15.15	1.66		8.81	783.56	CLI503736-005	263	0.1	263	0.1	93.6	3840	278	317	2.1	172	7.39	1990	3300			0.001	0.00006		0.002	0.0002				0.006																		
		14/12/2015	MB14	12:30	JE/Dv	7.4	2521	15.35	2.27	306	9.1	783.27	CLI505645-003	278	0.1	278	0.1	102	3350	243	268	1.9	169	7.26	1370	3060	0.01	0.009	0.001	0.00009	0.0005	0.003	0.002				0.0105																		
		22/03/2016	MB14	11:25am	JE/Dv	7	3188	15.2	2.4	454	9.37	783	CLI601752-005	280	0.1	280	0.1	81.8	3200	242	263	2	177	7.28	1810	3120	0.01	0.009	0.001	0.00014	0.0008	0.002	0.0002	0.0029	0.0002	0.0008	0.6	8.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0039	0.011
		27/06/2016	MB14	10:05	JE/Dv	7.13	3002	14.57	4.52	298	8.74	783.63	CLI603627-003	282	0.1	282	0.1	94.9	3240	266	281	2	174	7.45	1940	3120			0.002	0.00013		0.002	0.0002				0.007																		
2015/16	Minimum					6.98	2521	14.57	1.66	286	8.74	783		262	0.1	262	0.1	81.8	3240	242	263	1.9	169	7.26	1370	3060	0.01	0.009	0.001	0.00006	0.0008	0.002	0.0002	0.0029	0.0002	0.0008	0.6	8.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0039	0.011
	Maximum					7.4	3188	15.35	4.52	454	9.37	783.63		280	0.1	280	0.1	102	3840	278	317	2.1	177	7.45	1960	3300	0.01	0.009	0.003	0.00014	0.0008	0.003	0.0002	0.0029	0.0002	0.007	0.6	8.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0039	0.011
	Average					7.1275	2852.3	15.0675	2.7125	348.6666667	9.05	783.365		270.75	0.1	270.75	0.1	93.075	3425	257.25	282.25	2	173	7.345	1845	3150	0.01	0.009	0.00125	0.000105	0.0008	0.00225	0.00065	0.0029	0.0002	0.0047	0.6	8.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0039	0.011
	StdDev					0.193455421	299.227383	0.34238137	1.247434033	91.7678297	0.288963666	0.288963666		9.56992	0	9.569918147	0	8.374315892	276.7472	17.7270979	24.3772435	0.08164966	3.366501646	0.09037	81.85353	103.923048	#DIV/0!	#DIV/0!	0.0005	3.71E-05	#DIV/0!	0.0005	0.0009	#DIV/0!	#DIV/0!	0.0027252	#DIV/0!	#DIV/0

Table 7.17 - Groundwater Results - ED3B

	Statistics	Field Information										Analytical Information																																						
EPL 11436		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminum	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
				AM/PM	Initials	pH	µS/cm	°C	mV	mg/L	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L
		17/09/2015	ED3B	12:00:00 PM	JE/RBe	6.77	6633.6	12.77	7.43		2.45	784.35	CA1503798-004	428	0.1	428	0.1	2420	9300	84.4	462	0.6	1250	7.08	1230	6160			0.008	0.0117			0.007	0.0002			1.09																	
		15/12/2015	ED3B	12:00:00 PM	JE/JEv	7.17	6332.8	17.51	4.22	496	3.38	783.42	CA1505661-007	507	0.1	507	0.1	2130	7850	74.9	338	0.7	1040	6.99	1130	5380			0.014	0.00535			0.012	0.0002			0.296																	
		23/03/2016	ED3B	12:30pm	JE/JEv	6.7	8444	19.1	3.51	491	3.65	783.15	CA1601787-008	538	0.1	538	0.1	2090	7900	82.8	334	0.9	1030	7.09	1170	5190	0.01	0.04	0.018	0.00527	0.0024	0.0014	0.0002	0.438	0.0004	0.193	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	10	0.0442	0.001
		28/06/2016	ED3B	10:15:00 AM	JE/JEv	6.98	6793	13.1	5.47	278	3.84	782.96	CA1603645-005	511	0.1	511	0.1	1810	7640	83.5	350	0.7	975	6.99	1120	5190	0.01	0.04	0.008	0.00355	0.0024	0.0014	0.0002	0.438	0.0004	0.166	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	10	0.0442	0.001
2015/16	Minimum					6.7	6332.8	12.77	3.51	278	2.45	782.96		428	0.1	428	0.1	1810	7640	74.9	334	0.6	975	6.99	1120	5190	0.01	0.04	0.008	0.00355	0.0024	0.0014	0.0002	0.438	0.0004	0.166	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	10	0.0442	0.001
	Maximum					7.17	8444	19.1	7.43	496	3.84	784.35		538	0.1	538	0.1	2420	9300	84.4	462	0.9	1250	7.09	1230	6160	0.01	0.04	0.018	0.0117	0.0024	0.0014	0.0002	0.438	0.0004	1.09	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	10	0.0442	0.001
	Average					6.905	7050.85	15.62	5.1575	421.6666667	3.33	783.47		496	0.1	496	0.1	2112.5	8172.5	81.425	371	0.725	1073.75	7.1625	1165	5482.5	0.01	0.04	0.01475	0.006468	0.0024	0.00735	0.0002	0.438	0.0004	0.43625	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	10	0.0442	0.001
	StdDev					0.212994523	948.164351	3.17045738	1.71804796	124.4449372	0.615279158	0.483278158		47.3779	0	47.3779132 8	0	249.5829855	760.0603	4.39184105	61.0464304	0.12583057	120.9252524	0.229164	47.95832	460.027173	0	0	0.00429166	0.003586	0	0	0	0	0	0.044673	0	0	0	0	0	0	0.4184181	0	0	0	0	0	0	0	0	0	0	0	0
	Count					4	4	4	4	3	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	1	4	4	4	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7.18 - Groundwater Results - WM1

	Statistics	Field Information										Analytical Information																																									
EPL 11436		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminum	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
				AM/PM	Initials	pH	µS/cm	mV	mg/L	°C	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L
		17/09/2015	WM1	13:40	JE/RBe	6.49	904.9	291	5.18	16.27	43.06	738.21	CA1503798-002	61.2	0.1	61	0.1	46.6	1180	152	38.7	3.8	27.6	7.19	478	885			0.0001	0.0365		0.014	0.0042	0.186	0.0001	4.37	0.4	0	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.021	0.0001
		17/12/2015	WM1	13:20	JE/JEv	7.23	1710	440	5.18	20.3	42.15	739.12	CA1505755-002	112	0.1	112	0.1	122	2110	272	93.1	8.7	66.5	7.26	1090	1740			0.007	0.0684		0.023	0.0088				4.36																	
		23/03/2016	WM1	10:25am	JE/JEv	6.63	2711	499	6.95	17.28	42.39	738.88	CA1601344-004	171	0.1	171	0.1	133	2570	329	162	7.1	86.8	7.05	1350	2350	0.01	0.05	0.002	0.0687	0.0025	0.025	0.0069	0.186	0.0001	4.37	0.4	0	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.021	0.0001
		30/06/2016	WM1	10:25am	JE/JEv	6.44	2760	291	5.6	13.9	41.88	739.39	CA1602344-004	180	0.1	180	0.1	136	2760	340	172	7.5	85.4	7.59	1400	2410			0.003	0.066		0.019	0.0042				4.3																	
2015/16	Minimum					6.44	904.9	291	5.18	13.9	41.88	738.21		61.2	0.1	61	0.1	46.6	1180	152	38.7	3.8	27.6	7.05	478	885			0.0001	0.0365	0.0025	0.014	0.0042	0.186	0.0001	4.37	0.4	0	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.021	0.0001
	Maximum					7.23	2760	499	6.95	20.3	43.06	739.39		180	0.1	180	0.1	136	2760	340	172	8.7	86.8	7.59	1400	2410			0.007	0.0687	0.0025	0.025	0.0088	0.186	0.0001	4.37	0.4	0	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.021	0.0001
	Average					6.6975	2021.475	410	5.92	16.9375	42.37	738.9		131.05	0.1	131	0.1	109.4	2155	273.25	116.45	6.775	66.575	7.2725	1079.5	1846.25	0.01	0.05	0.00175	0.0599	0.0025	0.02025	0.00625	0.186	0.0001	3.7425	0.4	0	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.021	0.0001
	StdDev					0.363994048	887.810997	107.196082	0.753380699	2.651771421	0.504975247	0.504975247		55.4798	0	55.56377717	0	42.29704481	704.95863	86.1524811	62.585648	2.09662427	27.58311192	0.228965	423.4001	708.723912	0	0	0.001212092	0.015647	0	0	0.0048563	0.0020565	0	0	0	0	0	0	0	1.2020642	0	0	0	0	0	0	0	0	0	0	0	0	0
	Count					4	4	4	4	4	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	4	4	1	1	4	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7.19 - Groundwater Results - WM4

	Statistics	Field Information										Analytical Information																																									
EPL 11436		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminum	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
				AM/PM	Initials	pH	µS/cm	mV	mg/L	°C	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L
		17/09/2015	WM4	1:55:00 PM	JE/RBe	6.69	1132		3.23	16.83	18.08	715.84	CA1503798-003	46.2	0.1	46	0.1	43	2030	197	30.6	2	211	6.99	1060	1580			0.001	0.00323			0.004	0.0002			0.452																	
		17/12/2015	WM4	1:30:00 PM	JE/JEv	7.25	1444	114	3.55	20.13	12.84	721.08	CA1505755-003	55.6	0.1	56	0.1	50.4	2040	200	32.1	2.4	224	7.38	1070	1570			0.001	0.00397		0.005	0.00025	0.01	0.00	0.00	0.78	0.50	0.05	0.01	0.00	0.00	0.50	20.00	50.00	100.00	50.00	1.00	2.00	2.00	2.00	0.05	1.00	0.02	0.00
		20/04/2016	WM4	11:00:00 AM	JE/JEv	6.7	2095	468	3.23	18.6	13.46	720.46	CA1602344-005	60.3	0.1	60	0.1	45.9	2000	203	31.2	2.6	224	7.84	1010	1610	0.01	0.04	0.001	0.00294	0.0037	0.007	0.0004	0.93	0.0001	0.328	0.5	0.05	0.01	0.002	0.002	0.5	20	50	100	50	1	2	2	2	0.05	1	0.0176	0.001
		28/06/2016	WM4	10:35:00 AM	JE/JEv	6.87	1827	233	4.3	14.7	10	723.92	CA1603712-002	62.3	0.1	62	0.1	44.1	1980	203	31.4	2.4	205	7.42	996	1560			0.003	0.00141		0.003	0.0002				0.195																	
2015/16	Minimum					6.69	1132.00	114.00	3.23	14.70	10.00	715.84		46.20	0.10	46.00	0.10	43.00	1980.00	197.00	30.60	2.00	205.00	6.98	996.00	1560.00	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.50	0.05	0.01	0.00	0.00	0.50	20.00	50.00	100.00	50.00	1.00	2.00	2.00	2.00	0.05	1.00	0.02	0.00
	Maximum					7.25	2095.00	468.00	4.30	20.13	18.08	723.92		62.30	0.10	62.00	0.10	50.40	2040.00	203.00	32.10	2.60	224.00	7.84	1070.00	1610.00	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.78	0.50	0.05	0.01	0.00	0.00	0.50	20.00	50.00	100.00	50.00	1.00	2.00	2.00	2.00	0.05	1.00	0.02	0.00
	Average					6.69	1132.00	#DIV/0!	3.23	16.83	18.08	715.84		46.20	0.10	46.00	0.10	43.00	2030.00	197.00	30.60	2.00	211.00	6.99	1060.00	1580.00	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00	#DIV/0!	0.45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.50	20.00	50.00	100.00	50.00	1.00	2.00	2.00	2.00	0.05	1.00	0.02	0.00
	StdDev					0.26	406.33	180.14	0.50	2.34	3.35	3.35		7.17	0.00	7.12	0.00	1.35	27.54	2.55	0.62	0.25	9.56	0.41	36.48	21.60	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00	#DIV/0!	0.23	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Count					4.00	4.00	3.00	4.00	4.00	4.00	4.00		4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	1.00	1.00	4.00	4.00	1.00	1.00	4.00	1.00	1.00	4.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 7.20 - Groundwater Results - WM5

	Statistics	Field Information										Analytical Information																																									
EPL 11436		Date	Site Code	Time	Sampler	pH	Conductivity	Oxidation-Reduction Potential	Dissolved Oxygen	Temperature	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminum	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
				AM/PM	Initials	pH	µS/cm	mV	mg/L	°C	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L
		17/09/2015	WM5	11:55	JE/RBe	7.13	4610.4		2.85	12.18	0.73	786.00	CA1503798-001	806	0.1	806	0.1	825	6410	80.9	254	2	850	7.47	48.3	3900	0.01	0.06	0.006	0.00018	0.0025	0.002	0.0002	1.43	0.0001	0.075	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	5	0.406	0.001
		15/12/2015	WM5	11:50	JE/JEv	7.44	6149	126	1.58	15.38	1.71	785.02	CA1505661-008	864	0.1	864	0.1	2500	8140	122	362	2.8	962	7.23	216	5350			0.017	0.00022			0.003	0.0002			0.028																	
		23/03/2016	WM5	12:11pm	JE/JEv	6.9	8919	174	1.18	17	2.42	784.31	CA1601787-007	893	0.1	893	0.1	2900	8800	131	372	3.1	994	7.44	267	5650	0.01	0.06	0.023	0.00056	0.0025	0.007	0.0002	1.43	0.0001	0.075	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	5	0.406	0.001
		28/06/2016	WM5	10:05	JE/JEv	7.06	8732	79	3.06	14.2	2.65	784.08	CA1603645-004	921	0.1	921	0.1	2830	9690	170	476	3.1	1060	7.5	290	6380			0.03	0.00019			0.005	0.0002			0.061																	
2015/16	Minimum					6.9	4610.4	79	1.18	12.18	0.73	784.08		806	0.1	806	0.1	825	6410	80.9	254	2	850	7.23	48.3	3900	0.01	0.06	0.006	0.00018	0.0025	0.002	0.0002	1.43	0.0001	0.028	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	5	0.406	0.001
	Maximum					7.44	8919	174	3.06	17	2.65	786		921	0.1	921	0.1	2960	9690	170	476	3.1	1060	7.5	290	6380	0.01	0.06	0.03	0.00056	0.0025	0.007	0.0002	1.43	0.0001	0.075	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	5	0.406	0.001
	Average					7.1325	7102.6	126.33333	2.1675	14.9925	1.8775	784.8525		871	0.1	871	0.1	2675	8260	125.975	417	2.75	966.5	7.41	205.325	5317.5	0.01	0.06	0.019	0.000383	0.0025	0.00425	0.0002	1.43	0.0001	0.0475	0.1	0.05	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	5	0.406	0.001
	StdDev					0.226476636	2087.63559	47.5008772	0.927842479	2.025032922	0.863302767	0.863302767		49.1867	0	49.18671907	0	988.3182264	1387.2515	36.56504478	90.7303698	0.51961524	87.7325812	0.122474	109.155	978.583159	#DIV/0!	#DIV/0!	0.0101653	0.000187	#DIV/0!	0.0022174	0	#DIV/0!	#DIV/0!	0.0269134	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Count					4	4	3	4	4	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	4	4	1	1	4	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7.21 - Groundwater Results - WM6

	Statistics	Field Information										Analytical Information																																									
EPL 11436		Date	Site Code	Time	Sampler	pH	Conductivity	Oxidation-Reduction Potential	Dissolved Oxygen	Temperature	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids	Chromium (Hex)	Dissolved Aluminum	Dissolved Arsenic	Dissolved Cadmium	Dissolved Cobalt	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organo-chlorine pesticides	Organo-phosphate pesticides	Polycyclic Aromatic Hydrocarbons	TPH C6-C9	TPH C10-C14	TPH C15-C28	TPH C29-C36	Benzene	Toluene	Ethyl Benzene	Xylene	Total Phenols	Total Organic Carbon	Total Barium	Total Chromium
				AM/PM	Initials	pH	µS/cm	mV	mg/L	°C	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L
		17/09/2015	WM6	12:40:00 PM	JE/RB	5.9	10837.4		6.95	16.4	4.31	786.03	CA1503798-005	36.1	0.1	36	0.1	4850	13800	105	423	2.1	2100	5.98	324	8080			0.016	0.00316			0.01	0.0066			0.338																	
		15/12/2015	WM6	1:50:00 PM	JE/JEv	5.93	10807	494.2	7.31	17.13	4.88	785.46	CA1505661-004	36.9	0.1	37	0.1	4490	13700	99.4	403	2.2	2100	5.88	350	9210			0.034	0.00277			0.013	0.008			0.21																	
		23/03/2016	WM6	12:45:00 PM	JE/JEv	5.7	13701	494	7.32	17.3	4.95	785.39	CA1601787-011	41.1	0.1	41	0.1	4320	13450	98.3	401	2.5	1770	6.37	326	9470	0.01	0.05	0.048	0.00198	0.0501	0.023	0.0007	0.125	0.0001	0.156	0.1	16.5	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0501	0.001
		28/06/2016	WM6	10:30:00 AM	JE/JEv	5.94	12286	323	7.3	14.8	5.48	784.86	CA1603645-006	38.4	0.1	38	0.1	4860	13300	122	453	2.5	2010	6.2	342	8940			0.048	0.00186			0.016	0.0081			0.242																	
2015/16	Minimum					5.7	10807	323	6.95	14.8	4.31	784.86		36.1	0.1	36	0.1	4320	13300	98.3	401	2	1770	5.88	324	8080	0.01	0.05	0.016	0.00316	0.0501	0.01	0.006	0.125	0.0001	0.156	0.1	16.5	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0501	0.001
	Maximum					5.94	13701	494.2	7.32	17.3	5.48	786.46		41.1	0.1	41	0.1	4860	13800	122	453	2.5	2100	6.2	350	9470	0.01	0.05	0.048	0.00316	0.0501	0.023	0.0081	0.125	0.0001	0.338	0.1	16.5	0.01	0.002	0.002	1	20	50	100	50	1	2	2	2	0.05	4	0.0501	0.001
	Average					5.8675	11907.85	437.0666667	7.22	16.4075	4.905	785.435		38.125	0.1	38	0.1	4630	13550	106.175	420	2.2	1995	6.045

Table 8.1 - Piezometer Water Level Results - P38A & P38B

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		22/08/2016	P38A	38.78	776.53	JE
		26/08/2016	P38A	38.73	776.58	JE
		30/08/2016	P38A	38.84	776.47	JE
		2/09/2016	P38A	38.82	776.49	JE
2015/16	Minimum			38.73	776.47	
	Maximum			38.84	776.58	
	Average			38.79	776.52	
	StdDev			0.048563	0.048563	
	Count			4	4	

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		22/08/2016	P38B	42.93	772.38	JE
		26/08/2016	P38B	42.69	772.62	JE
		30/08/2016	P38B	42.94	772.37	JE
		2/09/2016	P38B	42.99	772.32	JE
2015/16	Minimum			42.69	772.32	
	Maximum			42.99	772.62	
	Average			42.89	772.42	
	StdDev			0.134257	0.134257	
	Count			4	4	

Table 8.1 - Piezometer Water Level Results - P44A & P44B

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		25/11/2015	P44A	7.16	723.89	JE
		24/02/2016	P44A	8.55	722.50	JE
		1/06/2016	P44A	7.24	723.81	JE
		30/08/2016	P44A	5.57	725.48	JE
2015/16	Minimum			5.57	722.50	
	Maximum			8.55	725.48	
	Average			7.13	723.92	
	StdDev			1.219699	1.219699	
	Count			4	4	

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		25/11/2015	P44B	4.43	726.62	JE
		24/02/2016	P44B	5.12	725.93	JE
		2/06/2016	P44B	4.90	726.15	JE
		30/08/2016	P44B	2.88	728.17	JE
2015/16	Minimum			2.88	725.93	
	Maximum			5.12	728.17	
	Average			4.33	726.72	
	StdDev			1.010194	1.010194	
	Count			4	4	

Table 8.2 - Piezometer Water Level Results - P45A & P45B

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		25/11/2015	P45A	3.52	727.64	JE
		24/02/2016	P45A	3.52	727.64	JE
		2/06/2016	P45A	1.48	729.68	JE
		30/08/2016	P45A	7.03	724.13	JE
		2/09/2016	P45A	2.20	728.96	JE
		5/09/2016	P45A	1.51	729.65	JE
2015/16	Minimum			1.48	724.13	
	Maximum			7.03	729.68	
	Average			3.21	727.95	
	StdDev			2.082671	2.082671	
	Count			6	6	

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		25/11/2015	P45B	3.47	727.64	JE
		24/02/2016	P45B	3.43	727.68	JE
		2/06/2016	P45B	1.39	729.72	JE
		30/08/2016	P45B	8.95	722.16	JE
		2/09/2016	P45B	1.61	729.50	JE
		5/09/2016	P45B	1.30	729.81	JE
2015/16	Minimum			1.30	722.16	
	Maximum			8.95	729.81	
	Average			3.36	727.75	
	StdDev			2.913832	2.913832	
	Count			6	6	

Table 8.3 - Piezometer Water Level Results - P58A & P58B

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler	Comments
		25/11/2015	P58A	39.98	766.27	JE	
		24/02/2016	P58A	42	764.25	JE	Dry
		2/06/2016	P58A	42	764.25	JE	Dry
		30/08/2016	P58A	38.92	767.33	JE	
2015/16	Minimum			38.92	764.25		
	Maximum			42	767.33		
	Average			40.725	765.525		
	StdDev			1.534525	1.534525		
	Count			4	4		

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		25/11/2015	P58B	49.22	757.03	JE
		24/02/2016	P58B	49.49	756.76	JE
		2/06/2016	P58B	50.38	755.87	JE
		30/08/2016	P58B	45.28	760.97	JE
2015/16	Minimum			45.28	755.87	
	Maximum			50.38	760.97	
	Average			48.59	757.66	
	StdDev			2.26	2.26	
	Count			4	4	

Table 8.4 - Piezometer Water Level Results - P59A & P59B

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		25/11/2015	P59A	17.54	787.16	JE
		24/02/2016	P59A	17.29	787.41	JE
		2/06/2016	P59A	18.33	786.37	JE
		30/08/2016	P59A	16.65	788.05	JE
2015/16	Minimum			16.65	786.37	
	Maximum			18.33	788.05	
	Average			17.4525	787.2475	
	StdDev			0.69476	0.69476	
	Count			4	4	

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		25/11/2015	P59B	17.99	786.71	JE
		24/02/2016	P59B	17.87	786.83	JE
		2/06/2016	P59B	18.29	786.41	JE
		30/08/2016	P59B	16.92	787.78	JE
2015/16	Minimum			16.92	786.41	
	Maximum			18.29	787.78	
	Average			17.7675	786.9325	
	StdDev			0.591967	0.591967	
	Count			4	4	

Table 8.5 - Piezometer Water Level Results - P100A & P100B

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		25/11/2015	P100A	36.01	740.42	JE
		24/02/2016	P100A	35.68	740.75	JE
		2/06/2016	P100A	35.65	740.78	JE
		30/08/2016	P100A	35.65	740.78	JE
2015/16	Minimum			35.65	740.42	
	Maximum			36.01	740.78	
	Average			35.7475	740.6825	
	StdDev			0.17557	0.17557	
	Count			4	4	

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		25/11/2015	P100B	50.02	726.41	JE
		24/02/2016	P100B	48.34	728.09	JE
		2/06/2016	P100B	48.71	727.72	JE
		30/08/2016	P100B	45.78	730.65	JE
2015/16	Minimum			45.78	726.41	
	Maximum			50.02	730.65	
	Average			48.21	728.22	
	StdDev			1.77	1.77	
	Count			4	4	

Table 9.1 - IMF Surface Water Results - Site 110

EPL 11455	Statistics	Field Information										Analytical Information															
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Sulphate	Total Suspended Solids	Total Dissolved Solids	Total Kjeldahl Nitrogen	Total Organic Carbon	Oil & Grease	Phosphorous	Total Copper	Total Iron	Total Lead	Total Zinc
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		17/11/2015	Site 110	9:30	JE						No flow																
		23/01/2016	Site 110	13:43	JE						No flow																
		1/02/2016	Site 110	10:00	JE	7.69	622	16.32	4.98	171.1	Low flow, clear, bugs evident	CA1600635-001	0.1	2	793	7.49	117	3	541	0.85	14	1	0.04	0.008	0.2	0.0008	0.15
		10/05/2016	Site 110	9:45	JE & J.Ev						No flow																
		6/06/2016	Site 110	11:30	JE & J.Ev	6.21	194.9	10.1	9.01	229	Clear, fast flowing	CA1603233-004	0.1	3	269	7.19	36.4	14	148	0.91	13	1	0.14	0.014	0.64	0.0085	0.231
		20/06/2016	Site 110	10:10	JE & J.Ev	6.57	532	9.43	9.43	220	Clear, fast flowing	CA1603478-004	0.1	2	680	7.7	71.4	15	402	1.1	16	1	0.09	0.019	0.46	0.0033	0.403
		6/07/2016	Site 110	12:30	JE & J.Ev	7.13	761	7.4	9.83	210	Clear, medium flow	CA1603810-004	0.1	2	964	7.77	105	4	640	0.62	10	1	0.02	0.006	0.12	0.001	0.303
		20/07/2016	Site 110	12:30	JE & J.Ev	7.52	1347	11.4	8.64	0	Low flow	CA1604088-004	0.1	2	1490	7.8	147	2	1030	0.68	11	1	0.01	0.007	0.1	0.0004	0.361
		25/07/2016	Site 110	11:00	JE	6.6	641	6.3	10.64	218	Fast flow	CA1604161-004	0.1	2	1060	7.82	99.6	3	662	1.05	17	1	0.03	0.012	0.22	0.0006	0.349
		27/07/2016	Site 110	11:45	JE	6.96	709	7.24	10.35	255	Medium flow	CA1604218-004	0.1	2	1030	7.88	101	4	698	0.98	16	1	0.02	0.012	0.2	0.0008	0.332
2015/16	Minimum					6.21	194.9	6.3	4.98	0			0.1	2	269	7.19	36.4	2	148	0.62	10	1	0.01	0.006	0.1	0.0004	0.15
	Maximum					7.69	1347	16.32	10.64	255			0.1	3	1490	7.88	147	15	1030	1.1	17	1	0.14	0.019	0.64	0.0085	0.403
	Average					6.95429	686.7	9.74142857	8.98286	186.15714			0.1	2.142857143	898	7.664286	96.77143	6.428571429	588.714	0.884286	13.8571429	1	0.05	0.011142857	0.277143	0.0022	0.304143
	StdDev					0.53531	344.984971	3.41166835	1.90061	85.813594			1.499E-17	0.377964473	376.9787792	0.243916	34.91445	5.563486403	272.655	0.181002	2.67261242	0	0.047609523	0.004561746	0.19847	0.002946	0.086511
	Count					7	7	7	7	7			7	7	7	7	7	7	7	7	7	7	7	7	7	7	7

Table 9.2 - IMF Surface Water Results - Site 130

EPL 11455	Statistics	Field Information										Analytical Information															
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Sulphate	Total Suspended Solids	Total Dissolved Solids	Total Kjeldahl Nitrogen	Total Organic Carbon	Oil & Grease	Phosphorous	Total Copper	Total Iron	Total Lead	Total Zinc
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		17/11/2015	Site 110	9:30	JE						No flow																
		23/01/2016	Site 130	13:45	JE						No flow																
		1/02/2016	Site 130	9:45	JE	7.88	523.4	17.68	5.24	171.3	Low flow, clear	CA1600635-003	0.1	2	639	7.67	37.4	7	447	0.7	12	1	0.02	0.002	0.45	0.006	0.006
		10/05/2016	Site 130	10:30	JE & J.Ev						No flow																
		6/06/2016	Site 130	11:15	JE & J.Ev	6.35	78.3	10.2	9.32	207	Clear, fast flow	CA1603233-003	0.1	3	113	7.04	7.2	15	72	1	14	1	0.1	0.002	0.8	0.001	0.012
		20/06/2016	Site 130	10:00	JE & J.Ev	6.69	119	9.92	9.5	248	Clear, fast flow	CA1603478-003	0.1	2	156	7.21	7.7	25	136	1.46	11	1	0.08	0.003	0.91	0.0009	0.014
		6/07/2016	Site 130	12:15	JE & J.Ev	7.02	292	7.34	10.88	201	Clear, fast flow	CA1603810-003	0.1	2	367	7.7	27.5	4	247	0.64	10	1	0.02	0.002	0.62	0.0003	0.01
		20/07/2016	Site 130	12:20	JE & J.Ev	7.05	355	11.8	9.7	0	Fast flow	CA1604088-003	0.1	2	405	7.7	24.5	4	288	0.81	13	1	0.02	0.002	0.53	0.0003	0.009
		25/07/2016	Site 130	10:50	JE	6.99	157	6.6	11.16	205	Clear, fast flow	CA1604161-003	0.1	2	261	7.51	14.8	8	197	1.22	18	1	0.04	0.003	0.98	0.0007	0.011
		27/07/2016	Site 130	11:30	JE	7.2	190	7.65	11.02	274	Clear, fast flow	CA1604218-003	0.1	2	268	7.6	16.3	7	211	1.11	17	1	0.03	0.003	0.67	0.0005	0.012
2015/16	Minimum					6.35	78.3	6.6	5.24	0			0.1	2	113	7.04	7.2	4	72	0.64	10	1	0.02	0.002	0.45	0.0003	0.006
	Maximum					7.88	523.4	17.68	11.16	274			0.1	3	639	7.7	37.4	25	447	1.46	18	1	0.1	0.003	0.98	0.006	0.014
	Average					7.02571	244.957143	10.17	9.54571	186.61429			0.1	2.142857143	315.5714286	7.49	19.34286	10	228.286	0.991429	13.5714286	1	0.044285714	0.002428571	0.708571	0.001386	0.010571
	StdDev					0.47106	156.12465	3.79087941	2.0484	88.904864			1.499E-17	0.377964473	176.5350363	0.262679	11.04609	7.571877794	119.702	0.296447	2.99205297	0	0.03258688	0.000534522	0.196081	0.002053	0.002573
	Count					7	7	7	7	7			7	7	7	7	7	7	7	7	7	7	7	7	7	7	7

Table 9.3 - IMF Surface Water Results - Site 150

EPL 11455	Statistics	Field Information										Analytical Information															
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Sulphate	Total Suspended Solids	Total Dissolved Solids	Total Kjeldahl Nitrogen	Total Organic Carbon	Oil & Grease	Phosphorous	Total Copper	Total Iron	Total Lead	Total Zinc
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		17/11/2015	Site 150	9:30	JE						No flow																
		23/01/2016	Site 150	13:55	JE						No flow																
		1/02/2016	Site 150	9:10	JE						No flow																
		10/05/2016	Site 150	10:05	JE & J.Ev						No flow																
		6/06/2016	Site 150	11:05	JE & J.Ev	6.52	116	10.2	8.95	248	Fast flow	CA1603233-001	0.1	3	166	7.21	16.6	20	96	0.96	14	1	0.12	0.007	0.8	0.0042	0.078
		20/06/2016	Site 150	9:30	JE & J.Ev	6.57	334	10.5	9.2	184	Fast flow	CA1603478-001	0.1	3	434	7.47	42.7	23	262	1.36	18	1	0.09	0.012	0.79	0.002	0.181
		6/07/2016	Site 150	11:35	JE & J.Ev	6.32	439	6.92	10.5	192	Fast flow	CA1603810-001	0.1	2	570	7.9	48.6	2	383	0.52	8	1	0.1	0.003	0.29	0.3	0.058
		20/07/2016	Site 150	11:30	JE & J.Ev	7.04	753	12.1	8.6	0	Medium Flow	CA1604088-001	0.1	2	872	7.73	70.4	4	551	0.73	12	1	0.01	0.004	0.29	0.0003	0.098
		25/07/2016	Site 150	10:20	JE	7.22	324	6.3	10.67	220	Fast Flow	CA1604161-001	0.1	2	513	7.66	42.1	6	351	1.15	17	1	0.04	0.006	0.67	0.0006	0.107
		27/07/2016	Site 150	11:05	JE	7.73	371	7.4	10.5	280	Fast Flow	CA1604218-001	0.1	2	534	7.75	42.2	3	385	1.09	17	1	0.03	0.006	0.47	0.0005	0.098
2015/16	Minimum					6.32	116	6.3	8.6	0			0.1	2	166	7.21	16.6	2	96	0.52	8	1	0.01	0.003	0.29	0.0003	0.058
	Maximum					7.73	753	12.1	10.67	280			0.1	3	872	7.9	70.4	23	551	1.36	18	1	0.12	0.012	0.8	0.3	0.181
	Average					6.9	389.5	8.90333333	9.73667	187.33333			0.1	2.333333333	514.8333333	7.62	43.76667	9.666666667	338	0.968333	14.3333333	1	0.065	0.006333333	0.551667	0.051267	0.103333
	StdDev					0.52926	208.373463	2.34180842	0.92036	98.44931			1.5202E-17	0.516397779	227.6843575	0.244786	17.18775	9.309493363	151.071	0.303013	3.82970843	0	0.044158804	0.003141125	0.234982	0.121863	0.041951
	Count					6	6	6	6	6			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

Table 9.4 - IMF Surface Water Results - First Flush System

EPL 11455	Statistics	Field Information										Analytical Information															
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Sulphate	Total Suspended Solids	Total Dissolved Solids	Total Kjeldahl Nitrogen	Total Organic Carbon	Oil & Grease	Phosphorous	Total Copper	Total Iron	Total Lead	Total Zinc
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		17/112015	First Flush	9:40	JE						No flow																
		23/01/2016	First Flush	13:50	JE						No flow																
		1/02/2016	First Flush	9:30	JE	7.89	144.8	19.02	3.31	191.8	Low flow, constant, clear, bugs & seeds present in sample	CA1600635-002	0.1	5	183	7.74	7.1	20	108	1.07	10	1	0.08	0.006	1.19	0.0049	0.023
		10/05/2016	First Flush	10:20	JE & J.Ev	7.49	147.1	14.1	7.23	286.3	Clear, low flow	CA1602721-001	0.1	3	158	7.56	12.6	20	103	0.88	9	1	0.07	0.006	0.54	0.0074	0.035
		6/06/2016	First Flush	10:20	JE & J.Ev	6.39	89.7	10.13	7.69	225	Clear, low flow	CA1603233-002	0.1	4	127	7.32	10.9	30	64	0.81	7	1	0.07	0.007	0.89	0.0113	0.051
		20/06/2016	First Flush	9:45	JE & J.Ev	6.89	121	10.6	7.45	219	Clear, low flow	CA1603478-002	0.1	11	157	7.5	8.8	6	82	1.02	11	1	0.07	0.008	0.76	0.0057	0.076
		6/07/2016	First Flush	12:00	JE & J.Ev	6.98	164	7.22	7.29	185	Clear, some turbidity	CA1603810-002	0.1	10	204	7.63	9	22	135	1.3	11	1	0.08	0.008	1.62	0.0104	0.062
		20/07/2016	First Flush	12:00	JE & J.Ev	7.12	186	12.3	9.3	0	Low flow	CA1604088-002	0.1	6	212	7.76	8.8	10	124	0.84	8	1	0.04	0.004	0.64	0.0045	0.031
		25/07/2016	First Flush	10:35	JE	7.2	124	7.48	8.83	215	Clear, low flow	CA1604161-002	0.1	5	193	7.7	8.3	13	131	0.89	8	1	0.05	0.005	0.82	0.0075	0.037
		27/07/2016	First Flush	11:20	JE	7.37	136	7.63	9.98	268	Clear	CA1604218-002	0.1	4	194	7.76	8.6	14	129	0.86	8	1	0.05	0.005	0.00078	0.0072	0.036
2015/16	Minimum					6.39	89.7	7.22	3.31	0			0.1	3	127	7.32	7.1	6	64	0.81	7	1	0.04	0.004	0.00078	0.0045	0.023
	Maximum					7.89	186	19.02	9.98	286.3			0.1	11	212	7.76	12.6	30	135	1.3	11	1	0.08	0.008	1.62	0.0113	0.076
	Average					7.16625	139.075	11.06	7.635	198.7625			0.1	6	178.5	7.62125	9.2625	16.875	109.5	0.95875	9	1	0.06375	0.006125	0.807598	0.007363	0.043875
	StdDev					0.44513	29.0853301	4.04517702	2.02573	87.474632			1.4836E-17	2.927700219	28.73027274	0.15496	1.705401	7.623975341	25.5622	0.164529	1.51185789	0	0.015059406	0.001457738	0.472998	0.002444	0.017732
	Count					8	8	8	8	8			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

Table 10 - Dust Deposition Results - DG18

Site Name	Date	ALS Batch Code	Ash Residue	Combustibles	Calculated Rainfall	Soluble Matter	Insoluble Solids	Total Solids
			g/m2/mth	g/m2/mth	mm	g/m2/mth	g/m2/mth	g/m2/mth
DG18	Sep-15	CA1504089-0	0.39	0.21	14	1.1	0.6	1.7
DG18	Oct-15	CA15050090	0.73	0.57	35	0.9	1.3	2.2
DG18	Nov-15	CA1600556-0	0.34	0.26	32	0.7	0.6	1.3
DG18	Dec-15	CA1600020-0	0.55	0.2	10	0.9	0.7	1.6
DG18	Jan-16	CA1600641-0	0.76	0.54	114	0.4	1.3	1.7
DG18	Feb-16	CA1601422-0	0.79	0.21	10	1.2	1	2.2
DG18	Mar-16	CA1602038-0	1.32	0.48	11	0.2	1.8	1.8
DG18	Apr-16	CA1602710-0	0.8	0.3	20	0.2	1.1	1.1
DG18	May-16	CA1603243-0	1.29	0.91	23	0.3	2.2	2.5
DG18	Jun-16	CA1603770-0	8.6	3.2	112	2.6	11.8	14.4
DG18	Jul-16	CA1604344-0	0.67	0.23	27	0.2	0.9	0.9
DG18	Aug-16	CA1604906-0	1.1	0.4	39	0.4	1.5	1.9

2015/2016	Min	0.34	0.2	10	0.2	0.6	0.9
	Max	8.6	3.2	114	2.6	11.8	14.4
	Avg	1.45	0.63	37.25	0.76	2.07	2.78
	stDev	2.27	0.84	36.72	0.68	3.10	3.69

Appendices

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Appendices

Appendix 5 Monitoring Trend Graphs

Figure 5.1 - Surface Water Trends - Site 115

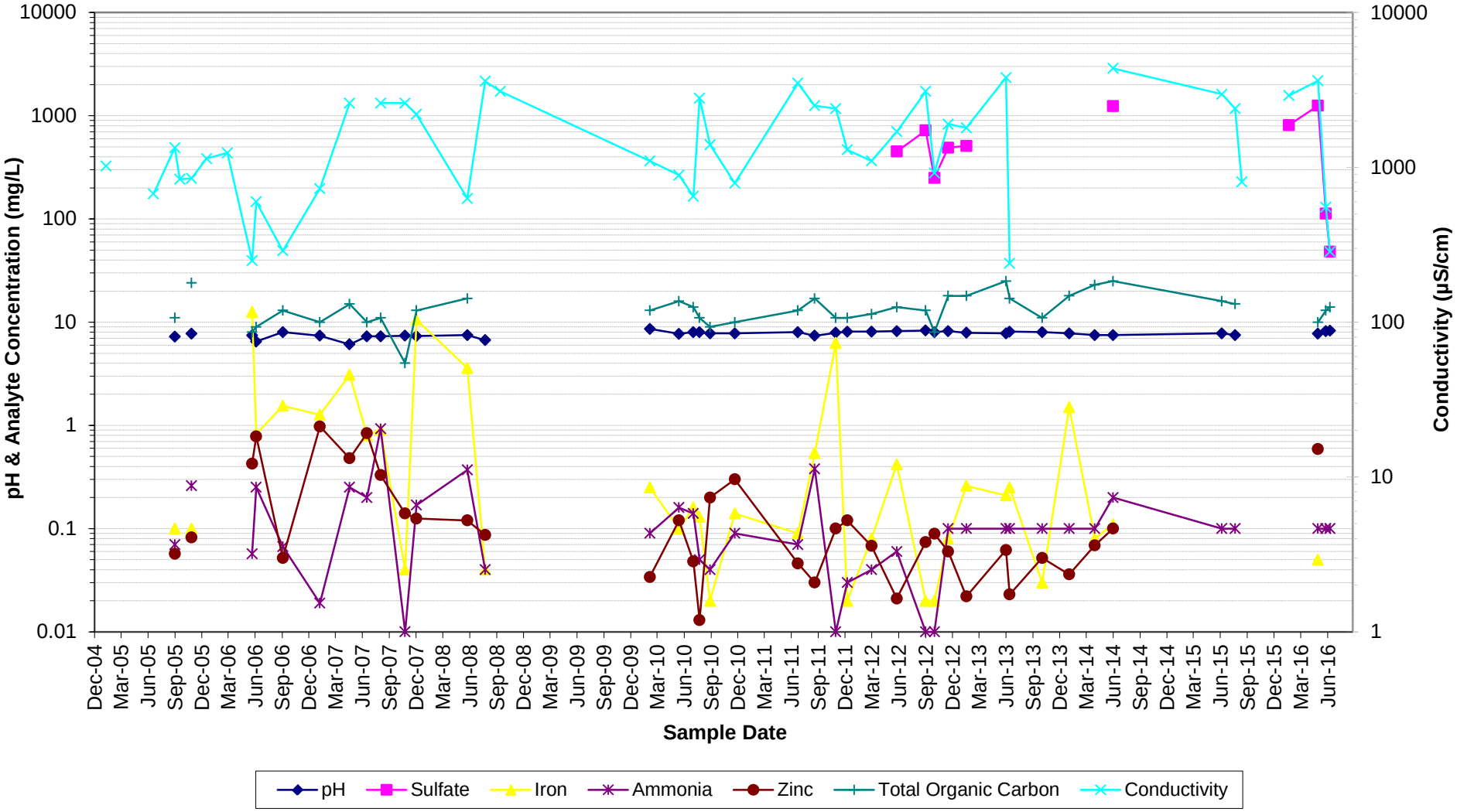


Figure 5.2 - Surface Water Trends - Spring 2

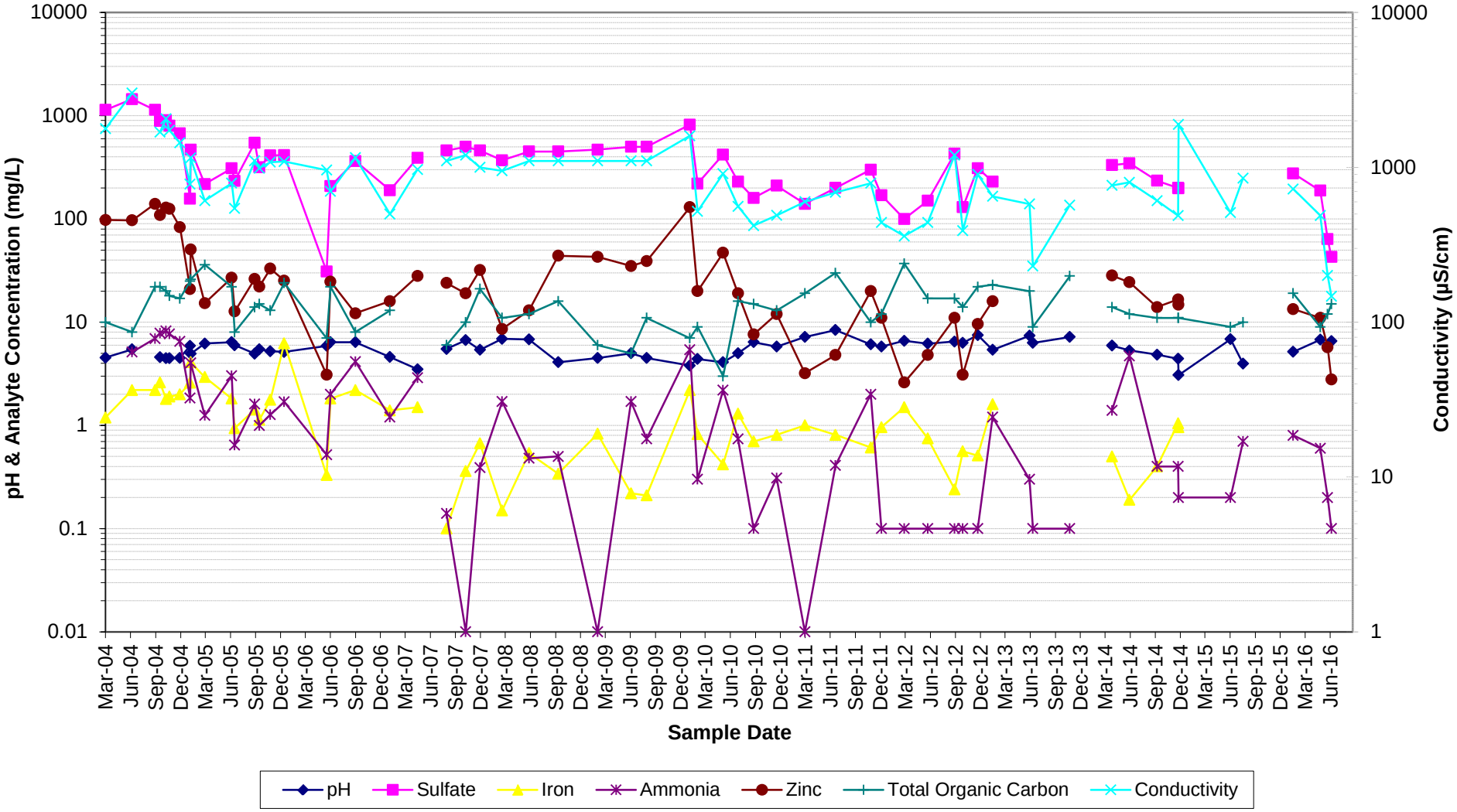


Figure 5.3 - Surface Water Trends - Site 105

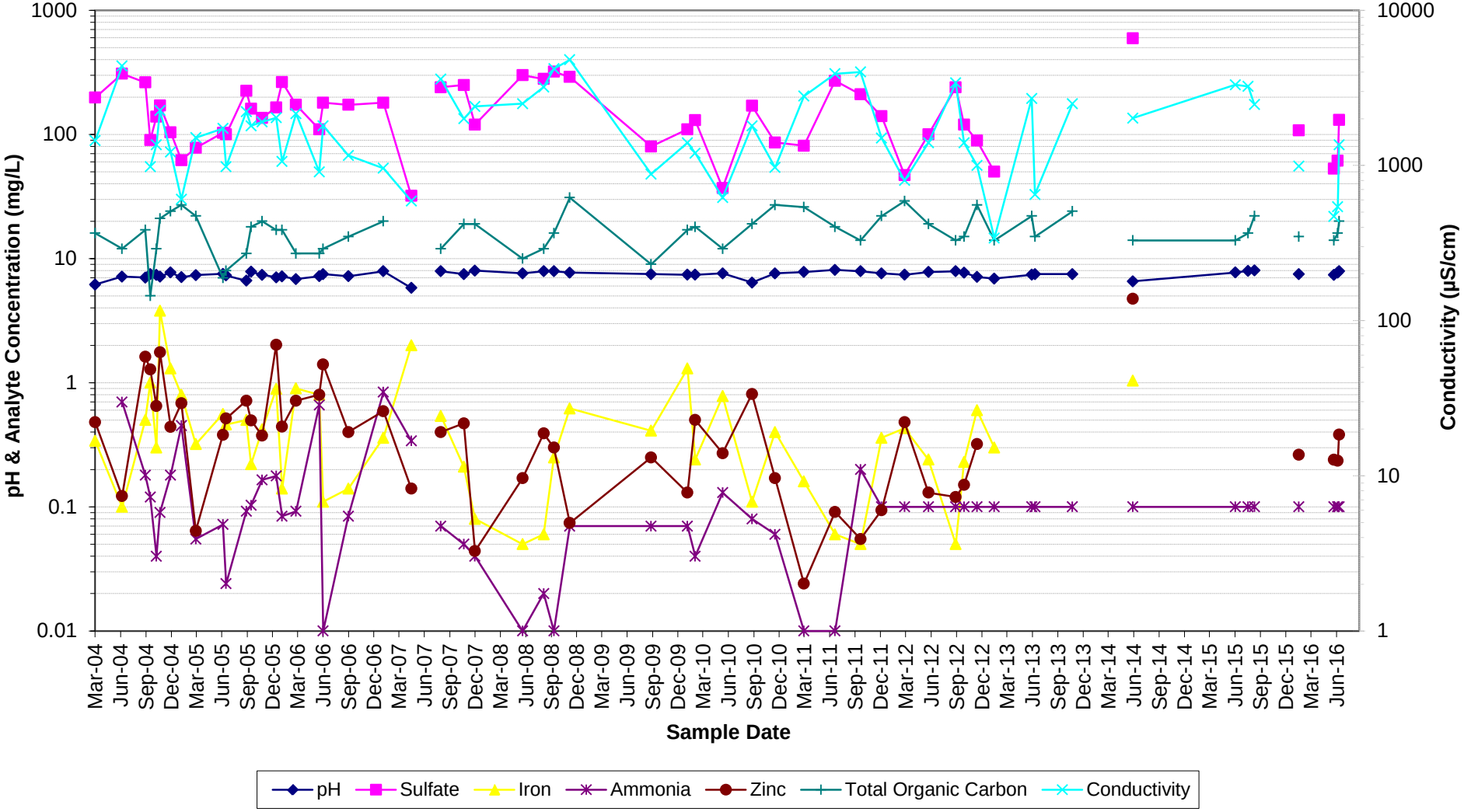


Figure 5.4 - Surface Water Trends - WM200

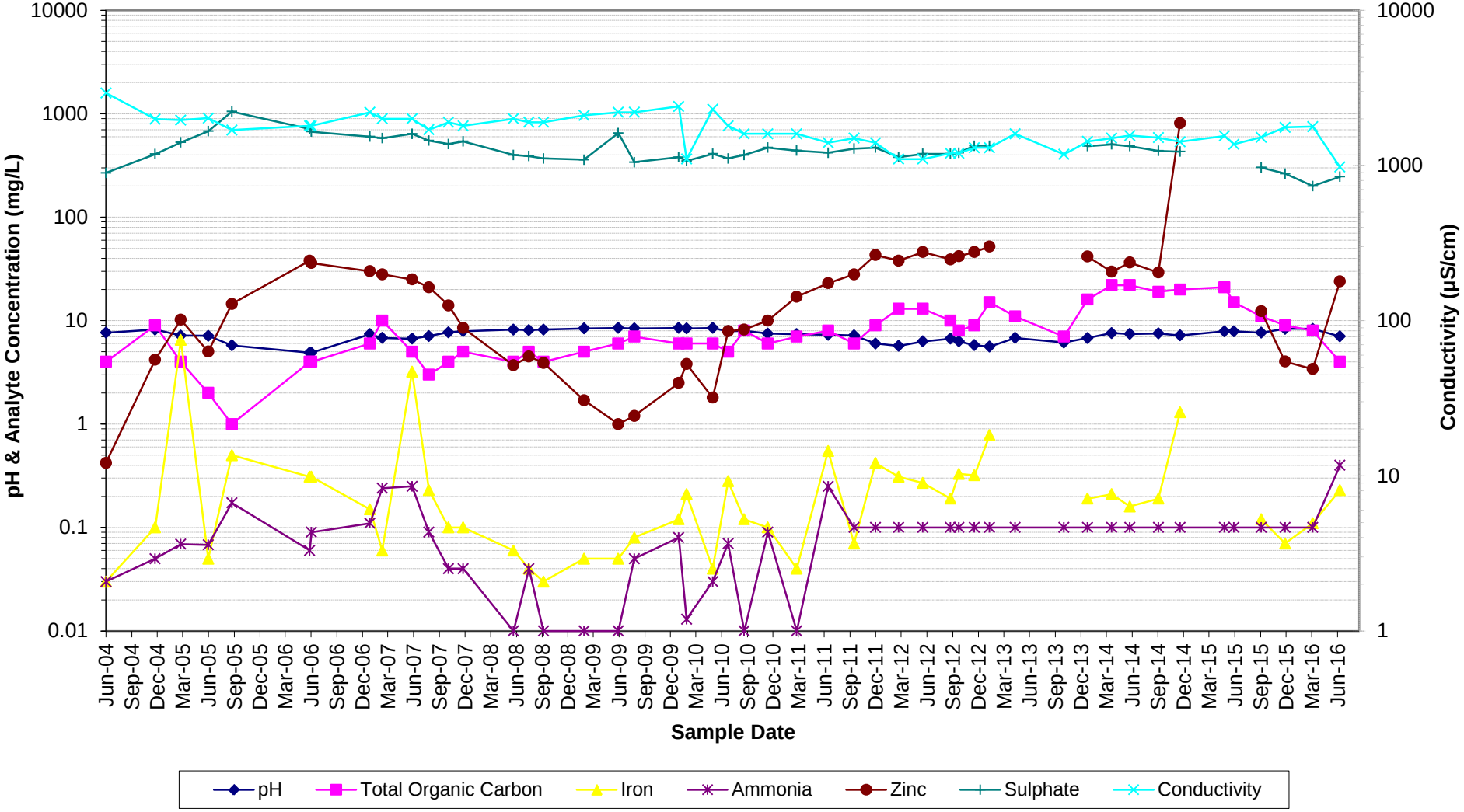


Figure 5.5 - Surface Water Trends - WM201

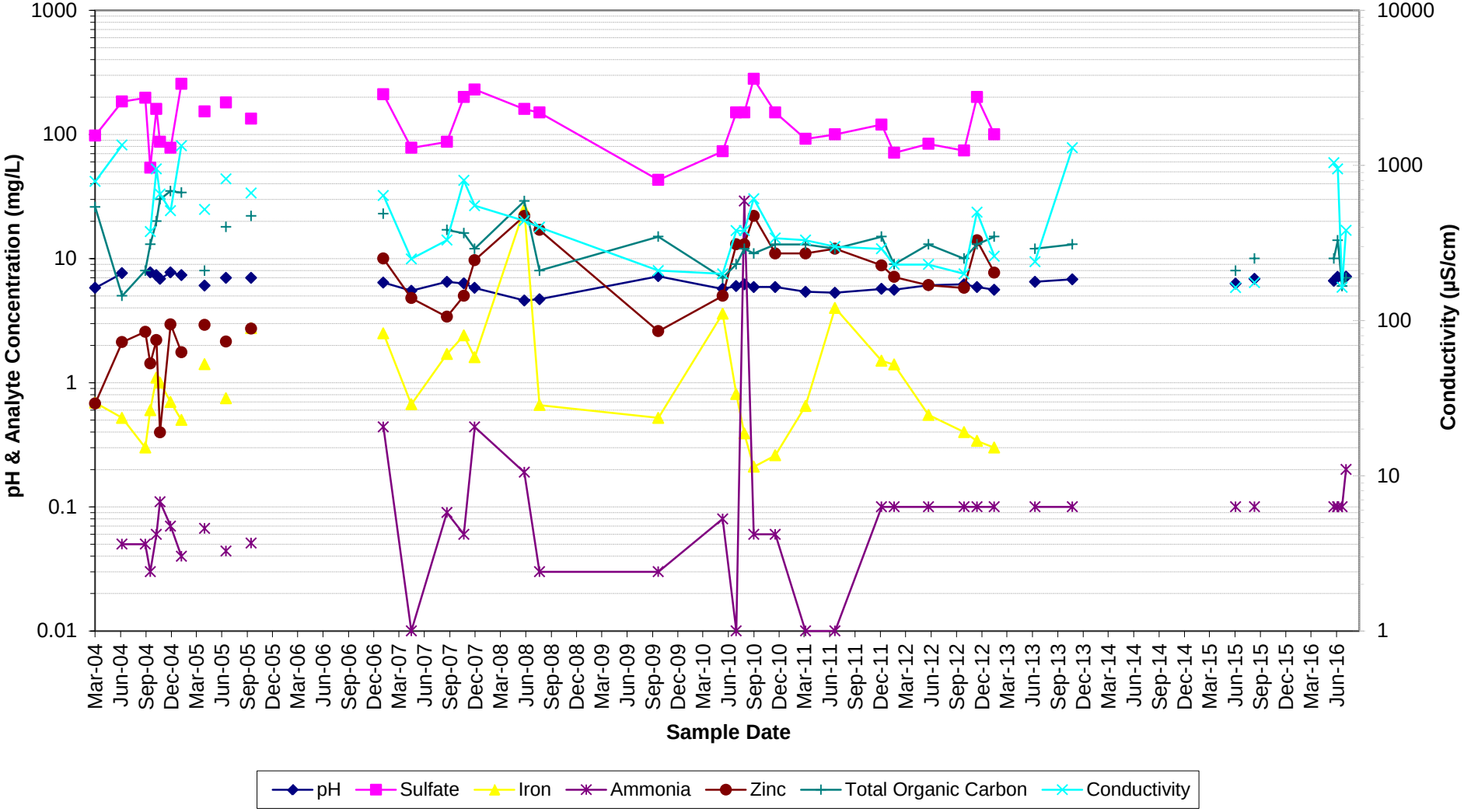


Figure 5.6 - Surface Water Trends - WM202

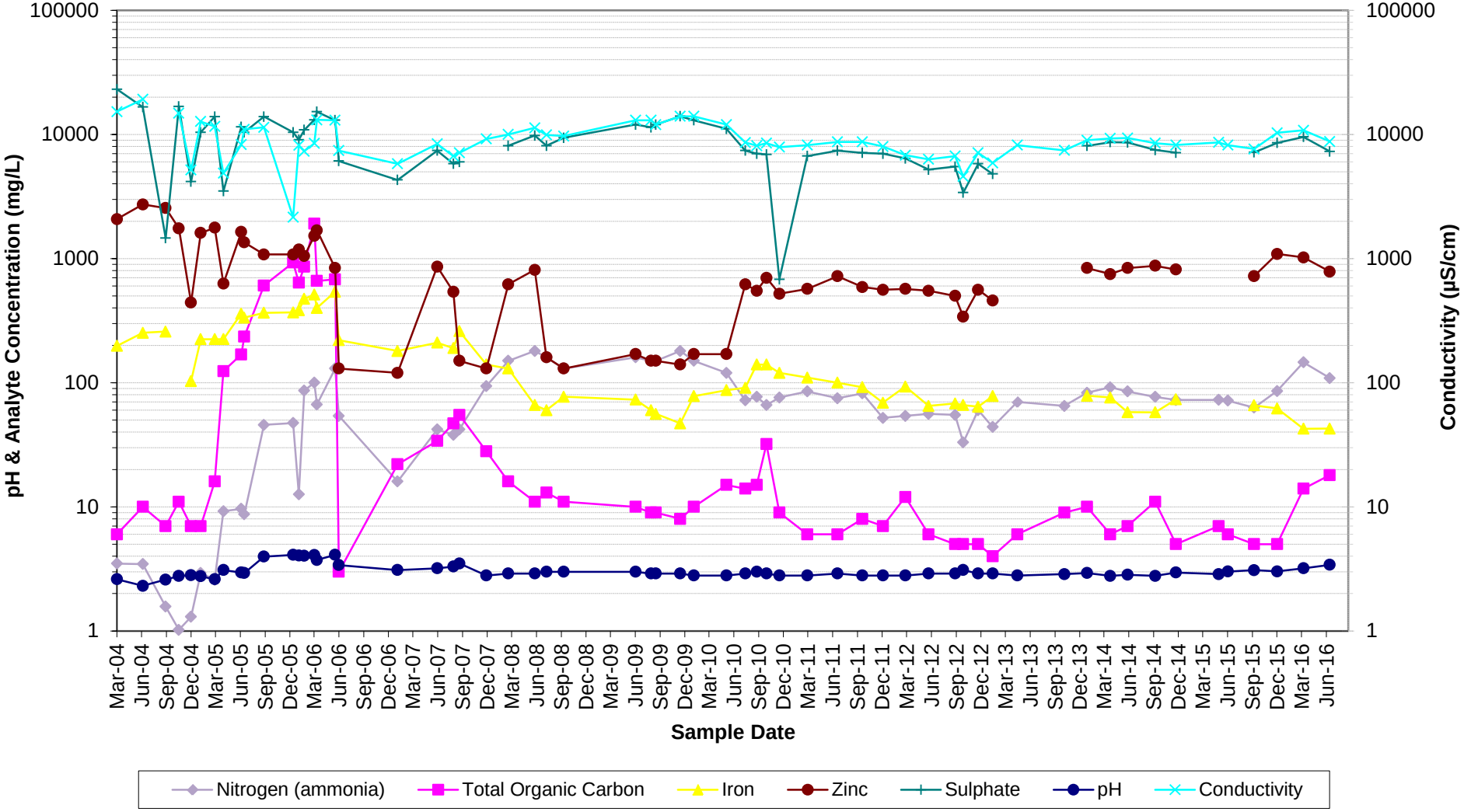


Figure 5.7 - Surface Water Trends - WM203

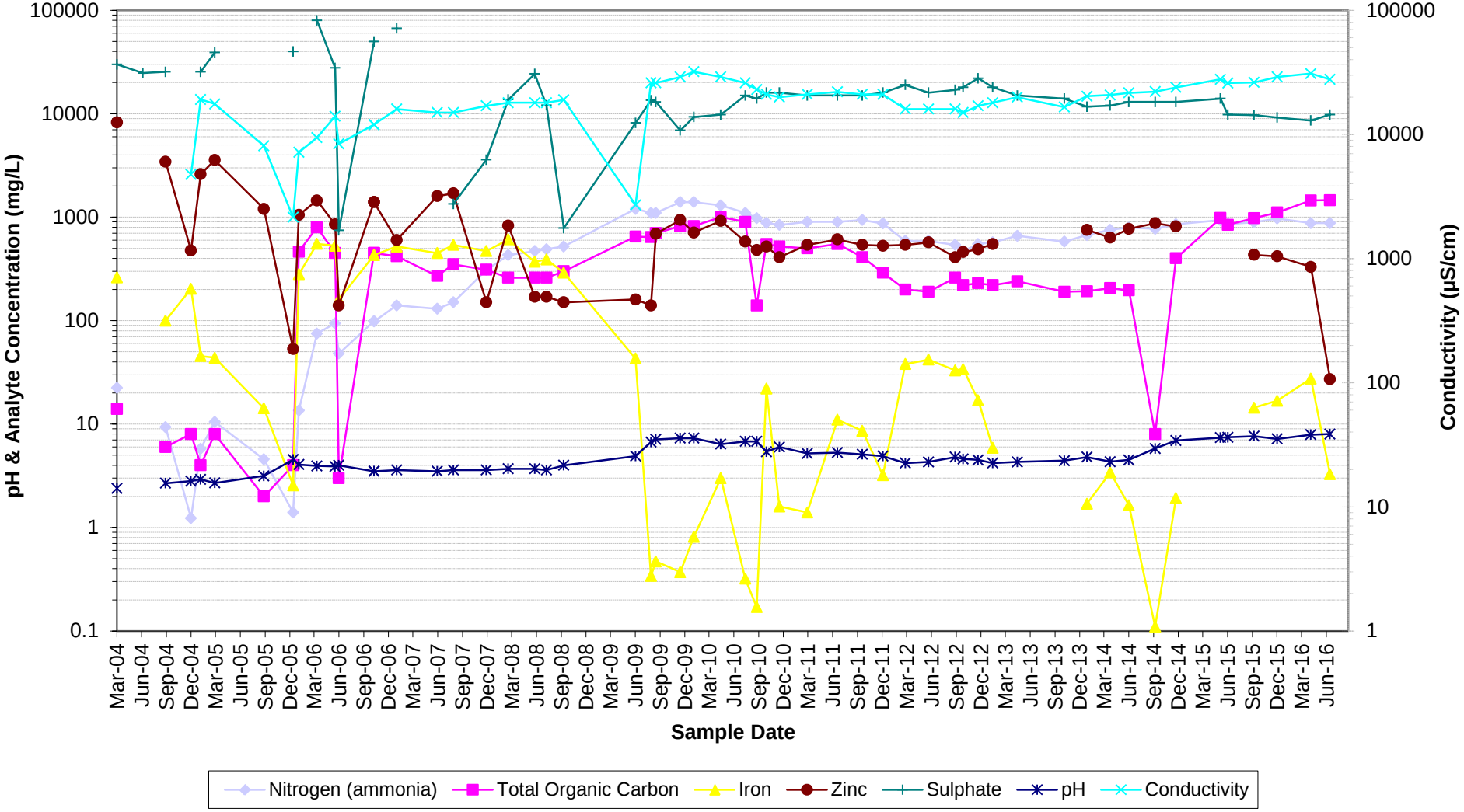


Figure 5.8 - Surface Water Trends - Pond 3

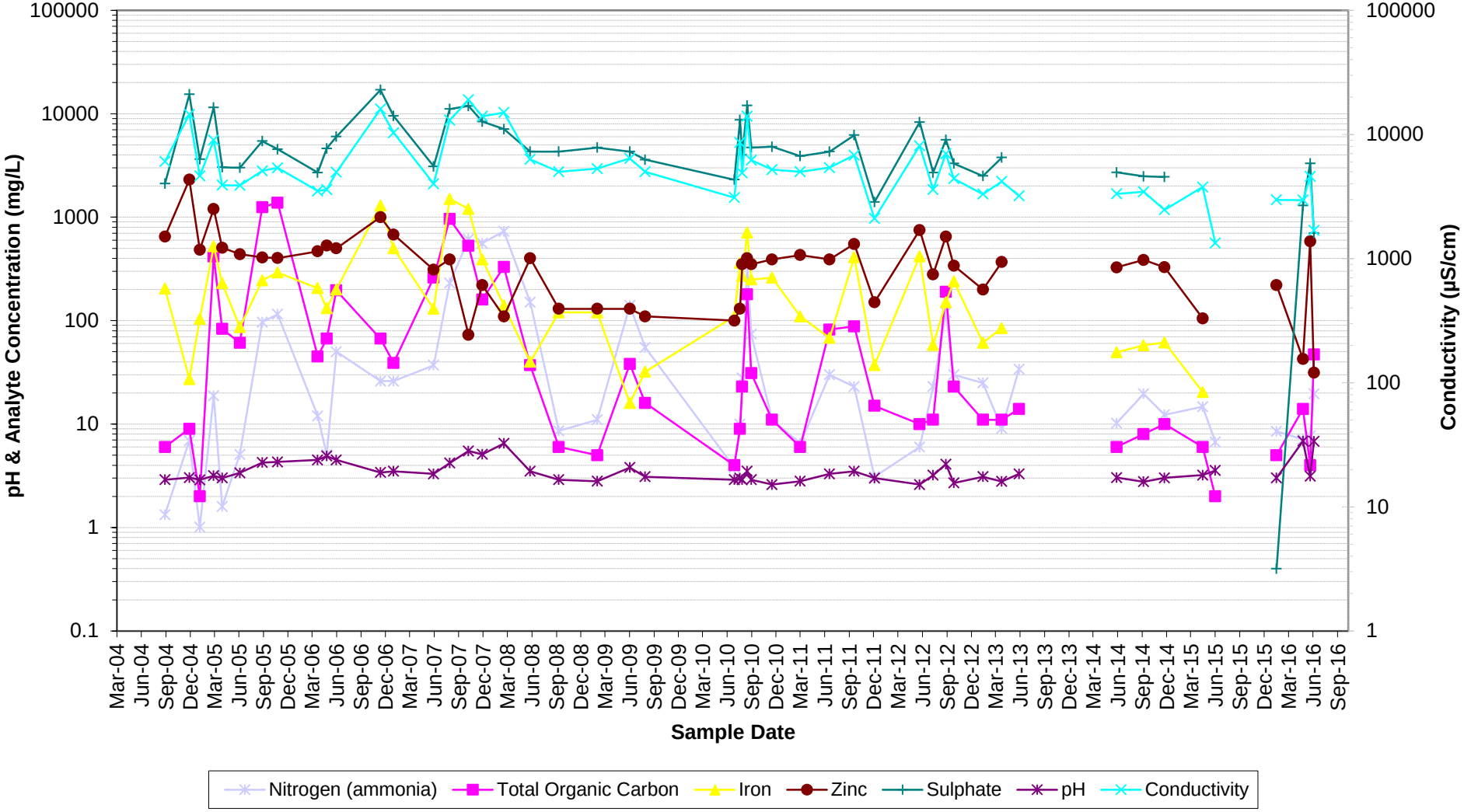


Figure 3.2.5.1 - Groundwater Trends - MB1

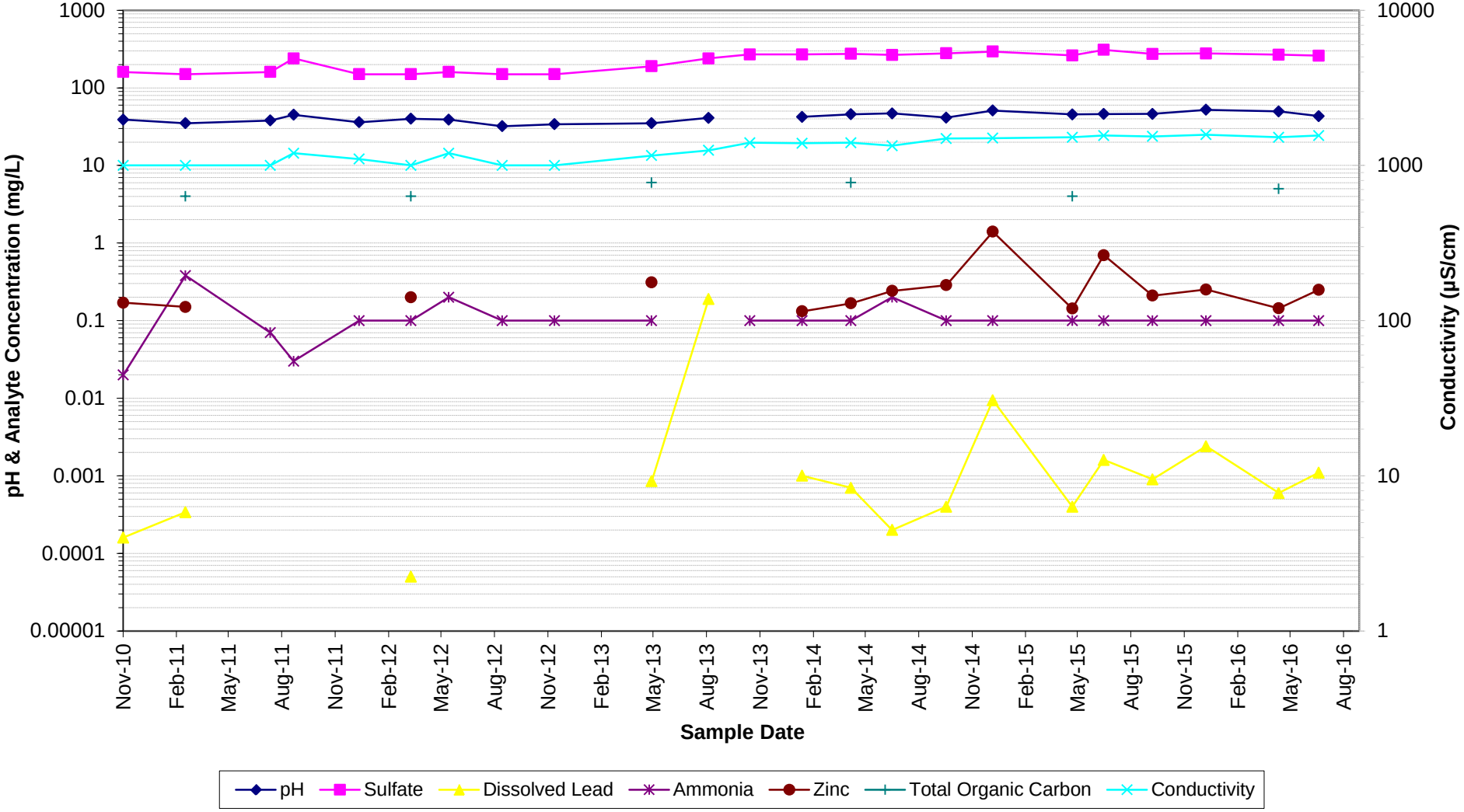


Figure 3.2.5.2 - Groundwater Trends - MB2

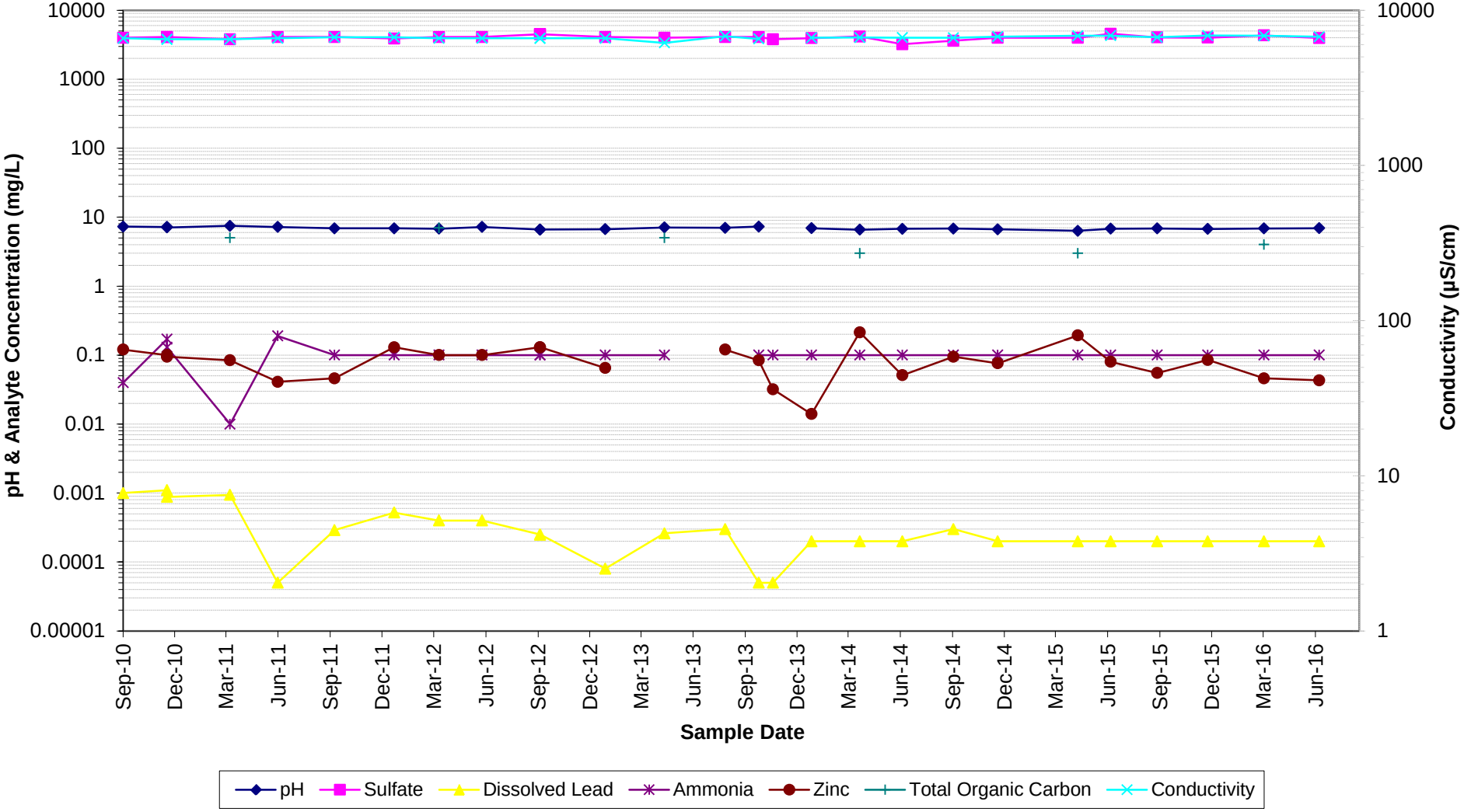


Figure 3.2.5.3 - Groundwater Trends - MB3

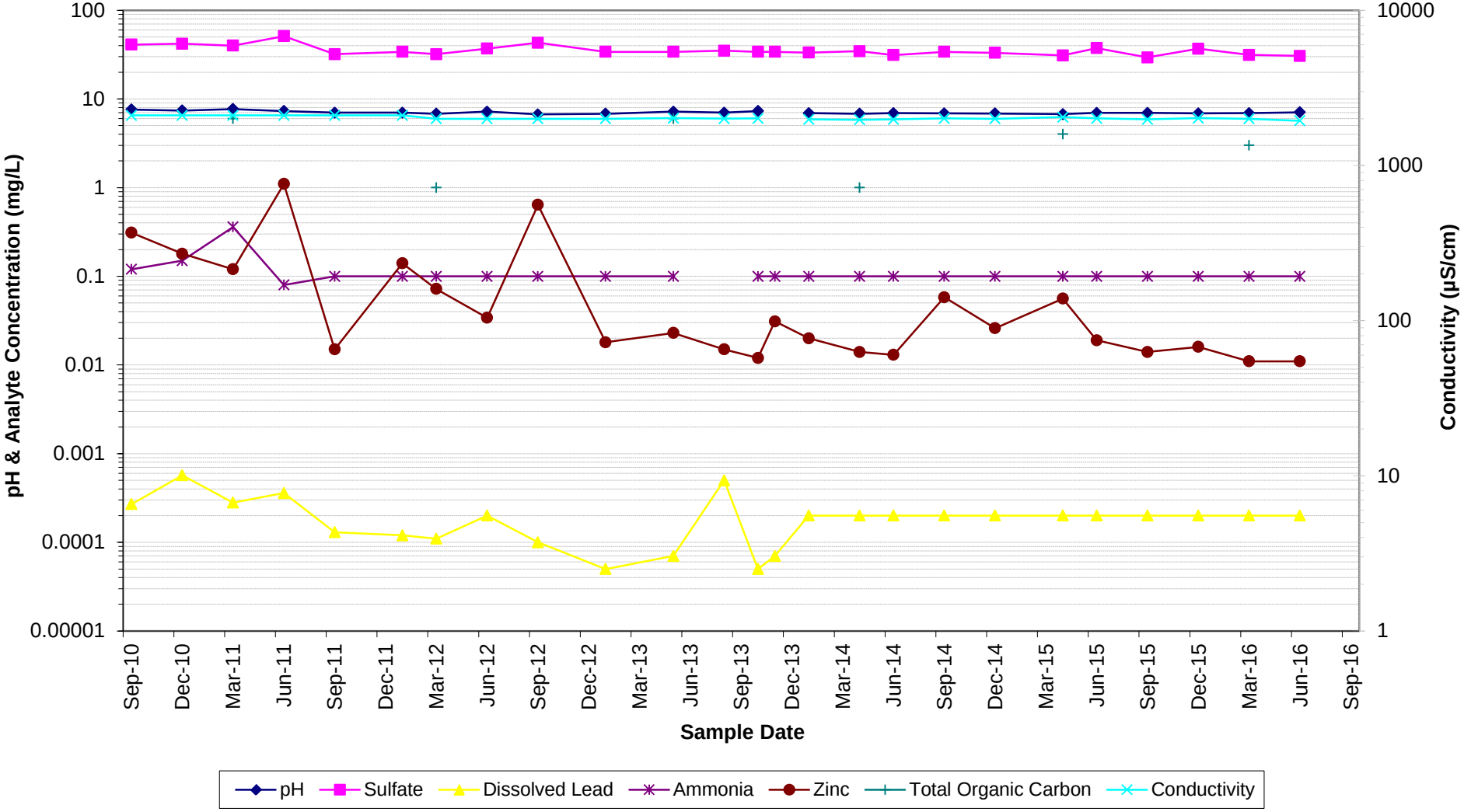


Figure 3.2.5.4 - Groundwater Trends - MB4

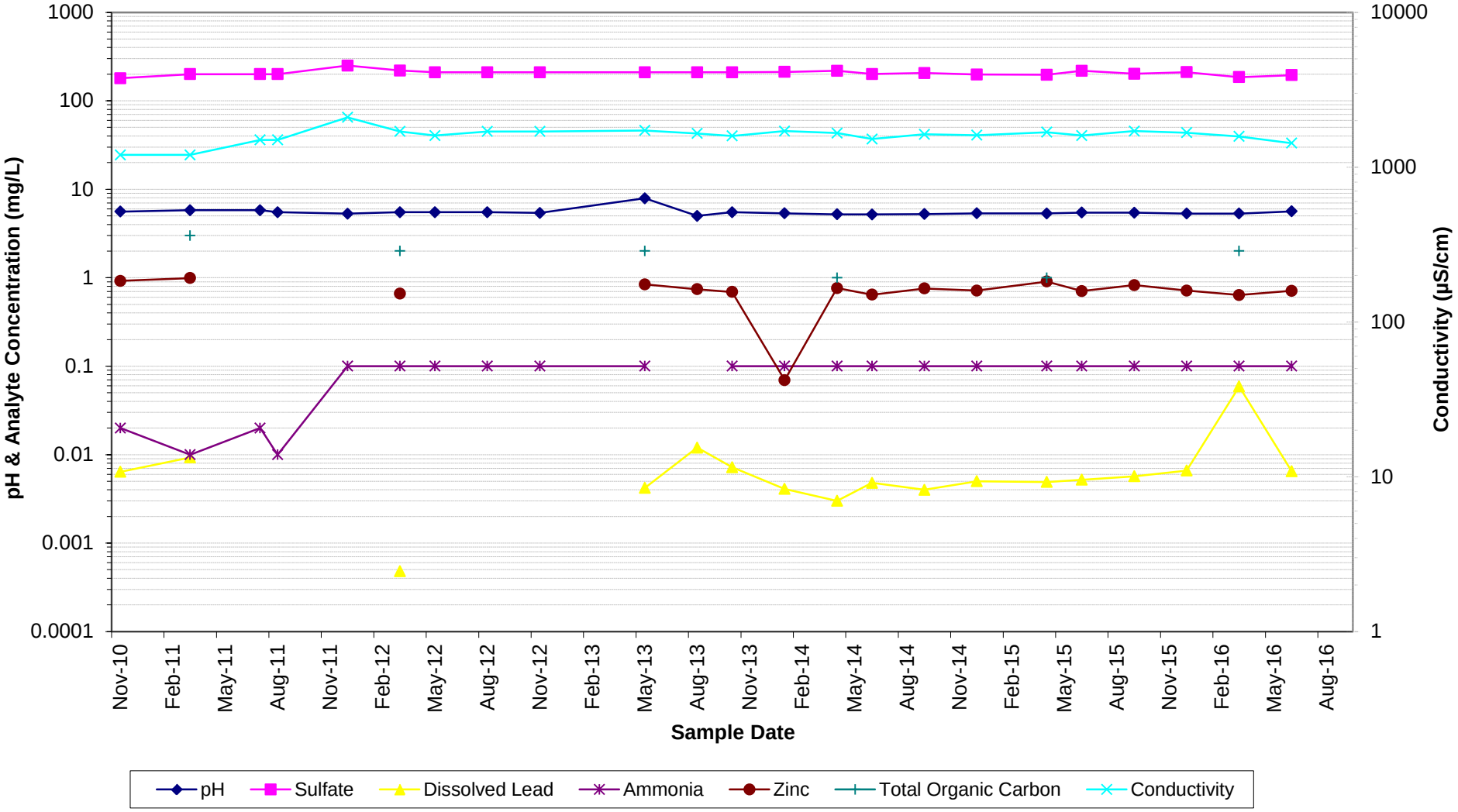


Figure 3.2.5.5 - Groundwater Trends - MB5

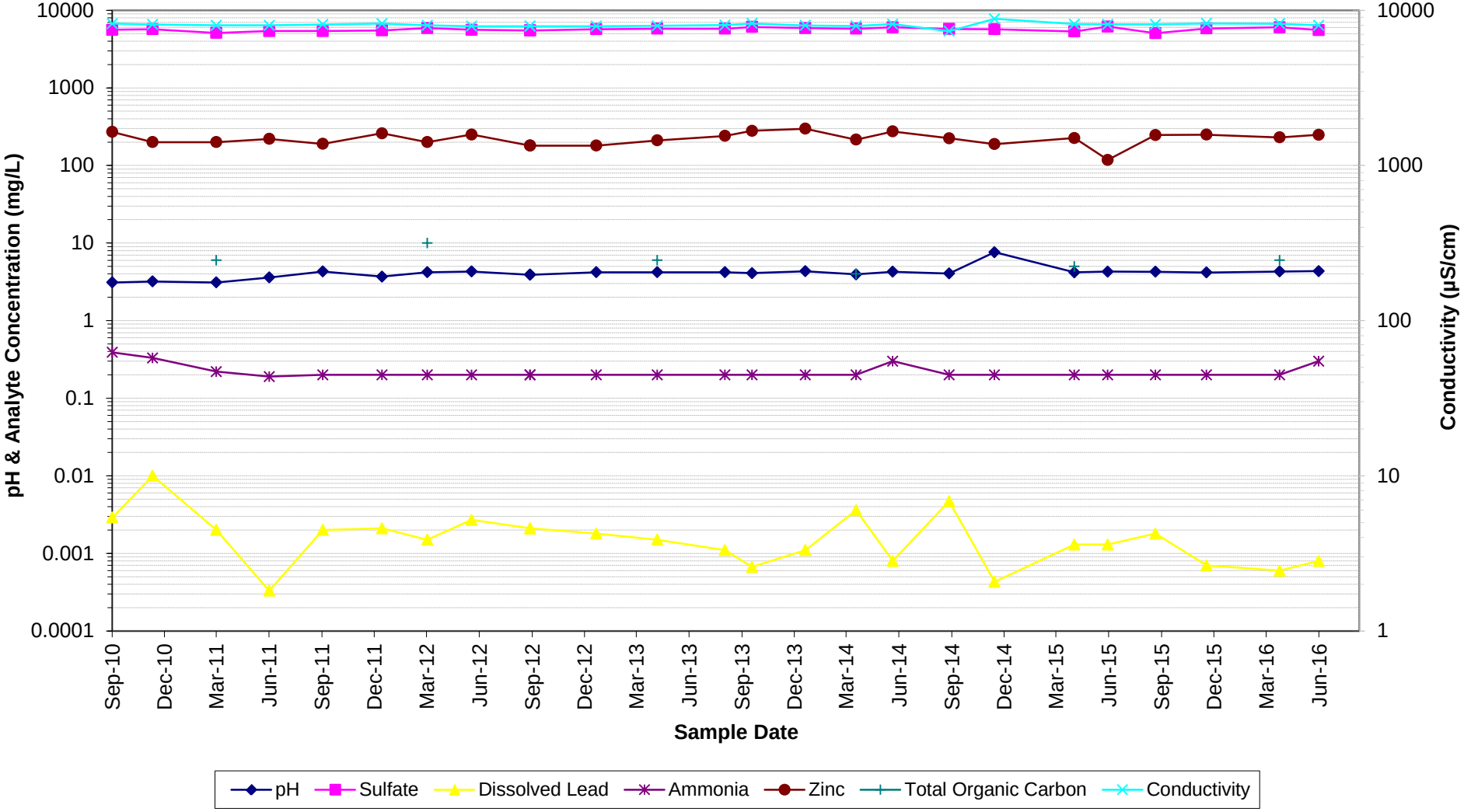


Figure 3.2.5.6 - Groundwater Trends - MB6

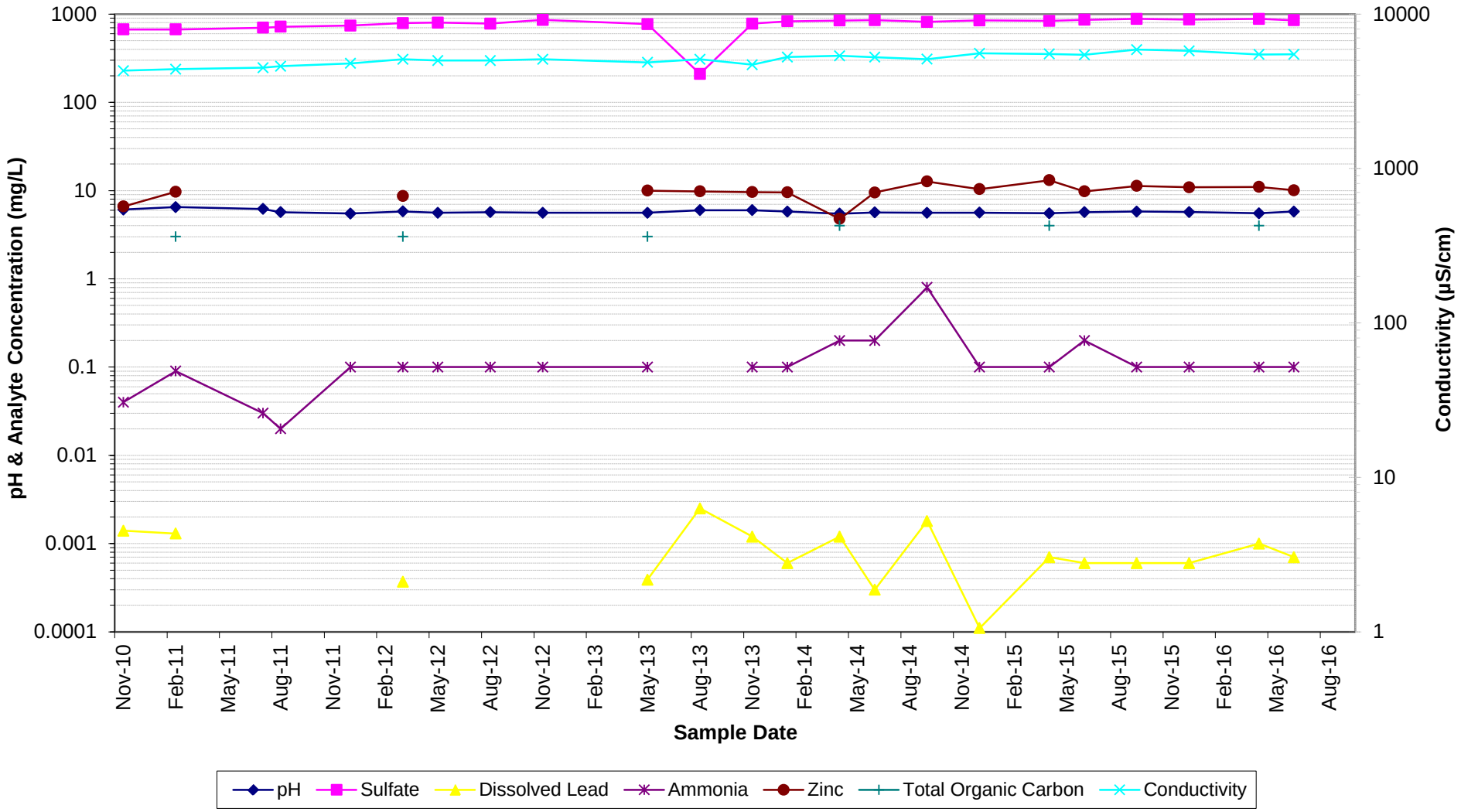


Figure 3.2.5.7 - Groundwater Trends - MB7

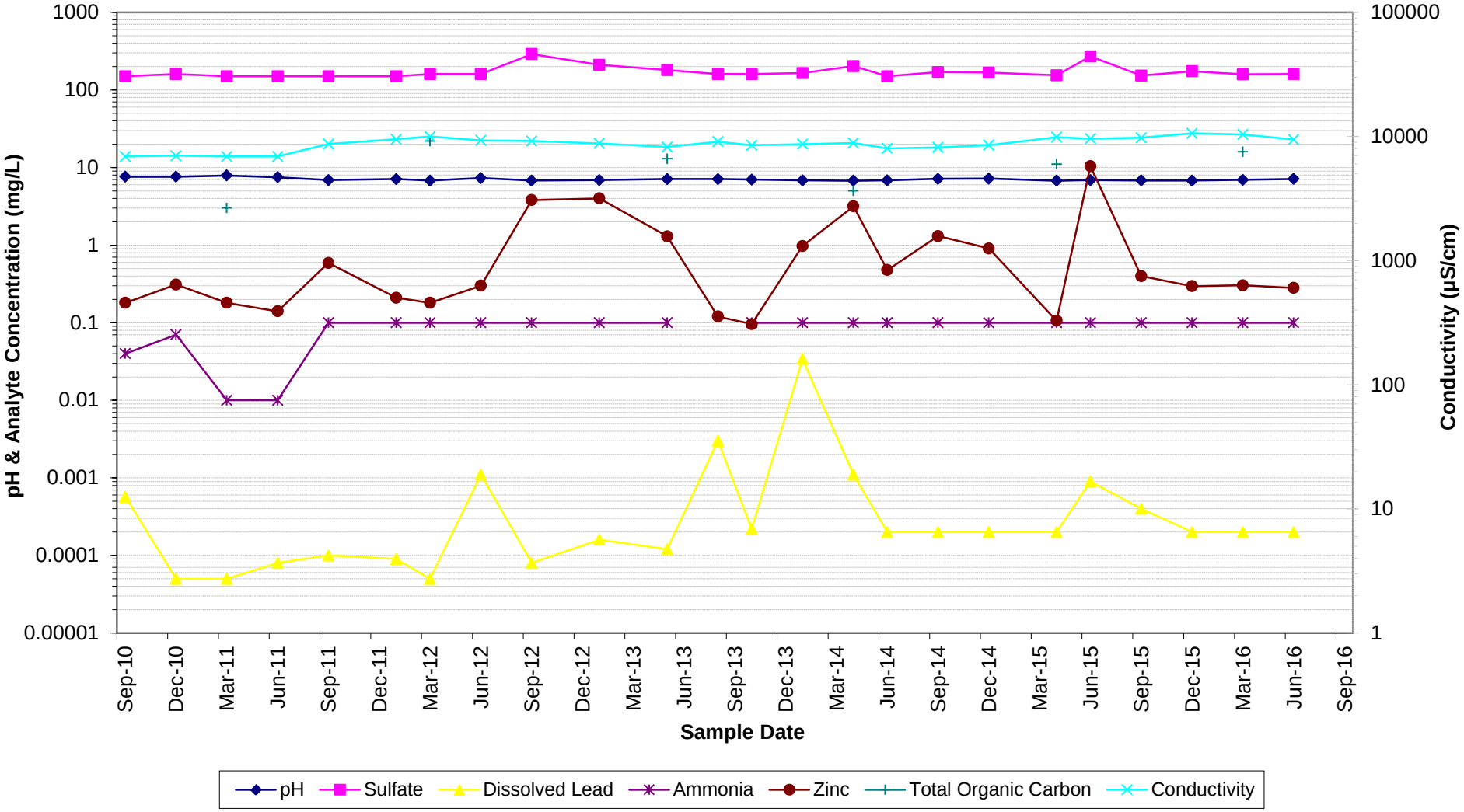


Figure 3.2.5.8 - Groundwater Trends - MB8

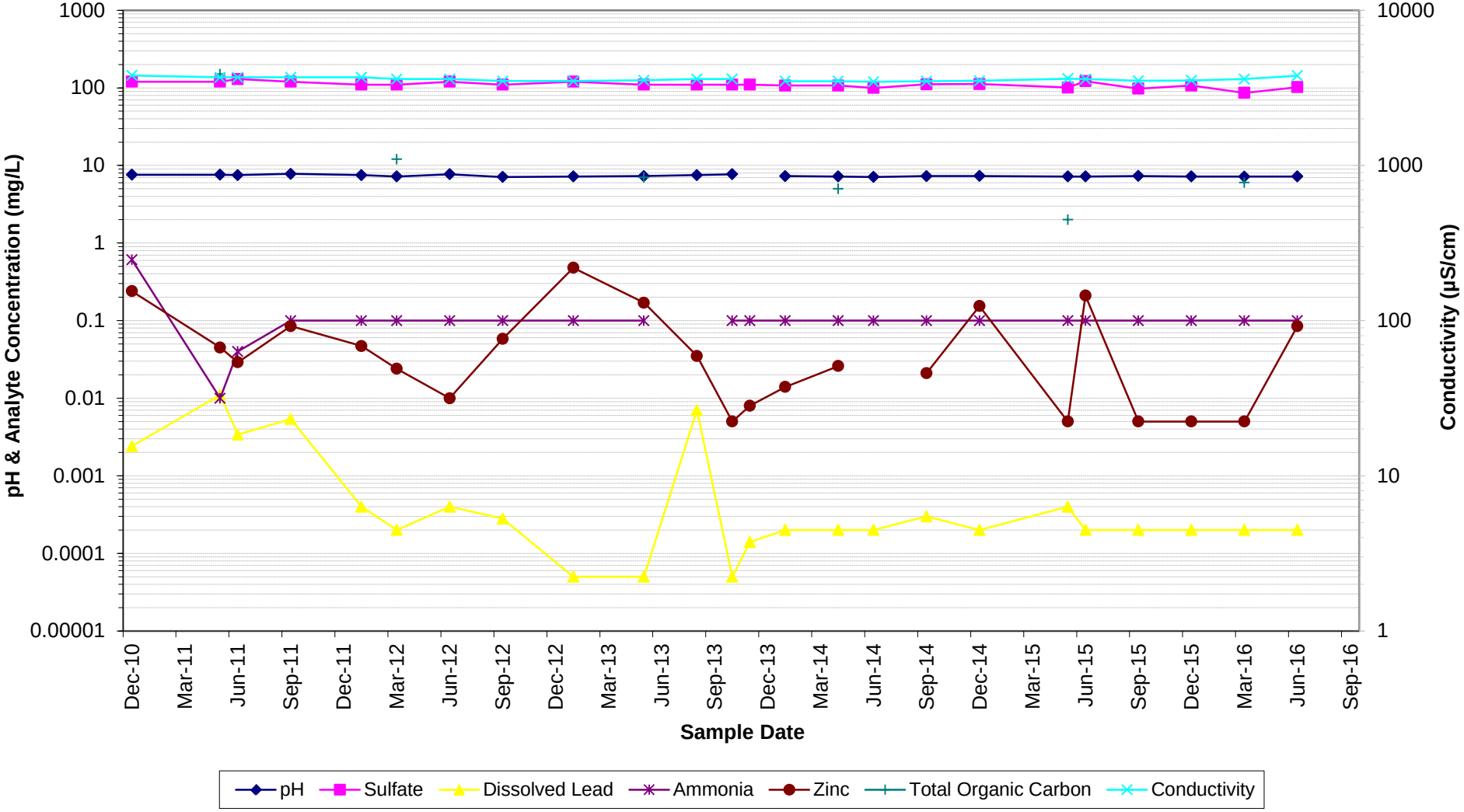


Figure 3.2.5.18 - Groundwater Trends - WM1

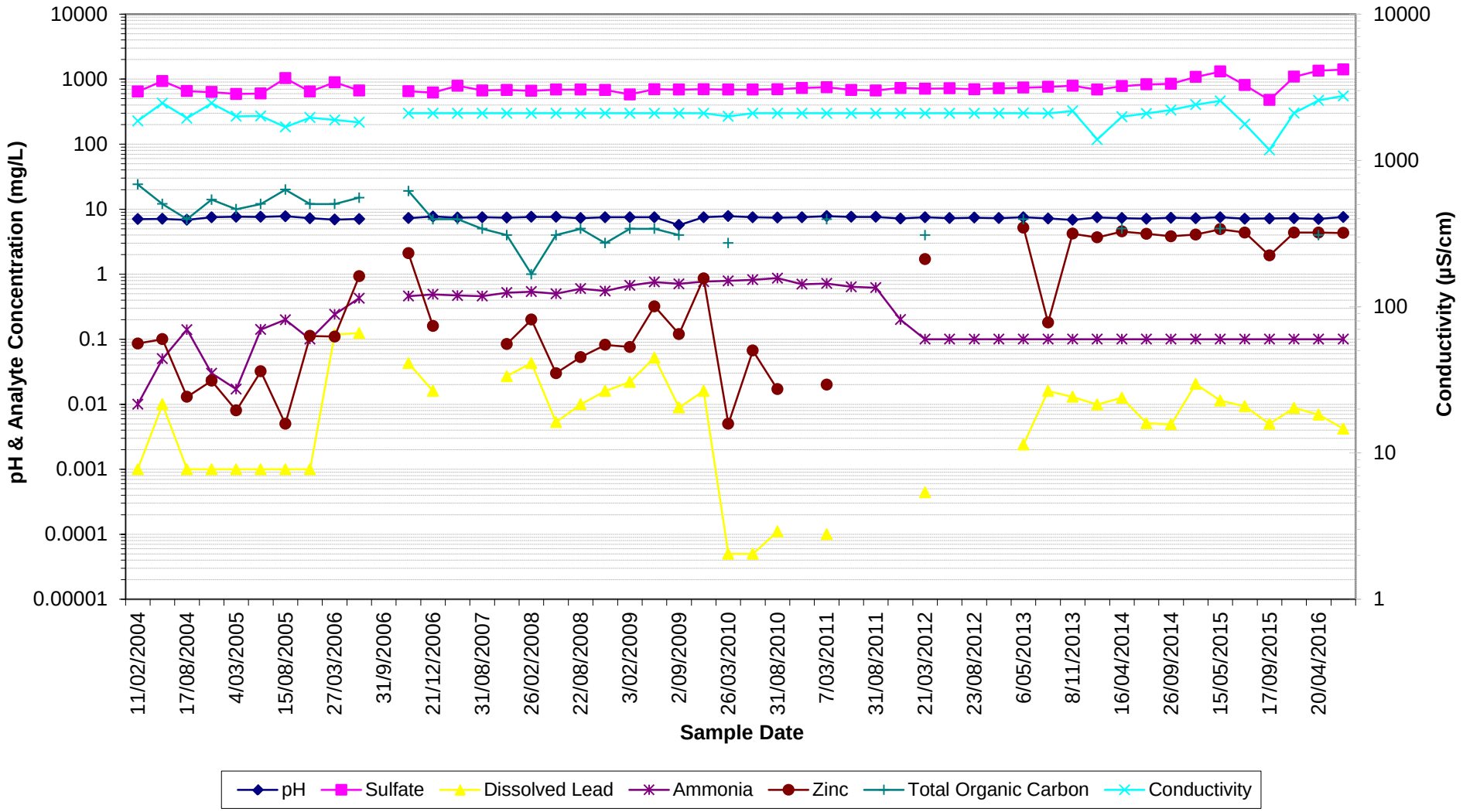


Figure 3.2.5.19 - Groundwater Trends - WM4

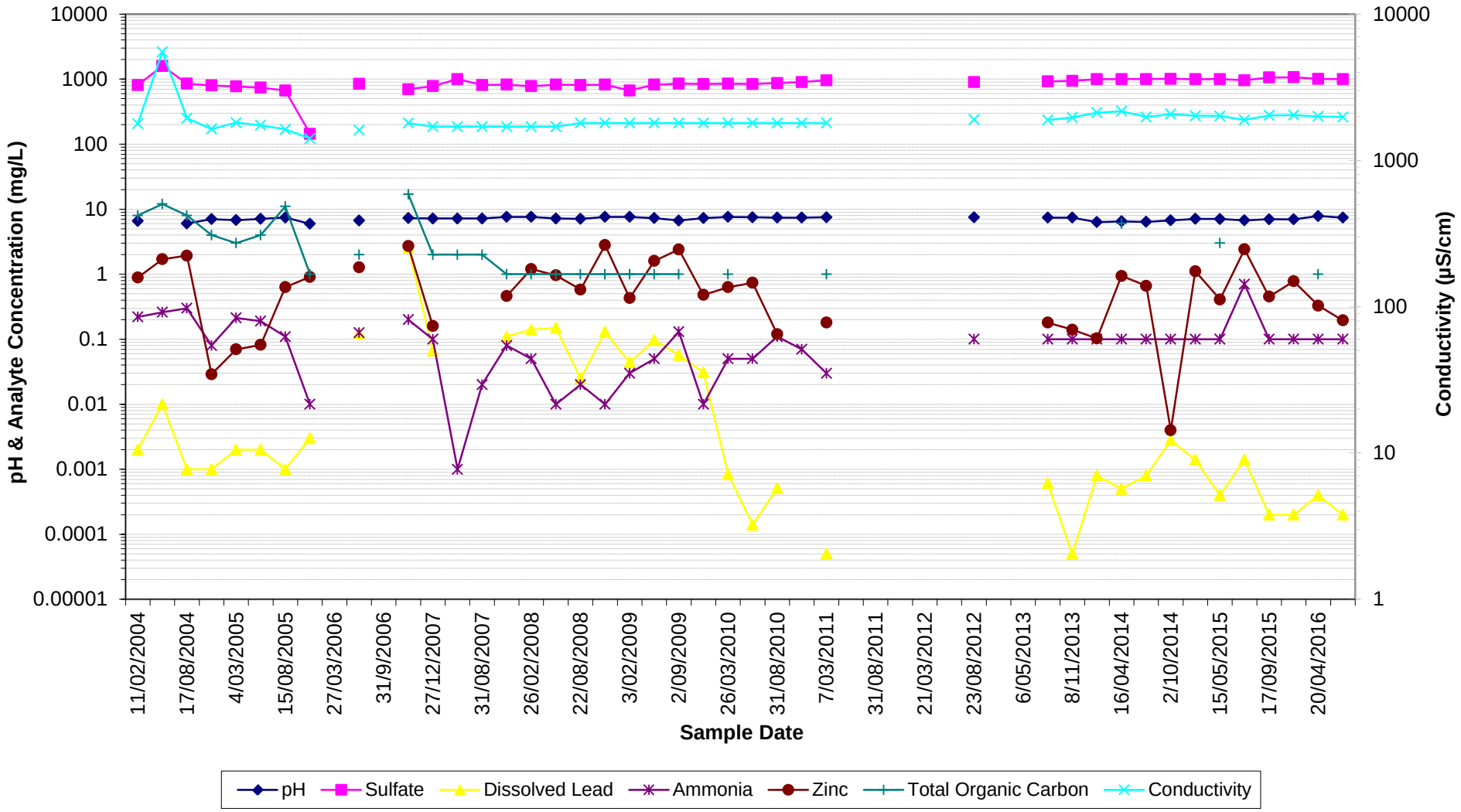


Figure 3.2.5.20 - Groundwater Trends - WM5

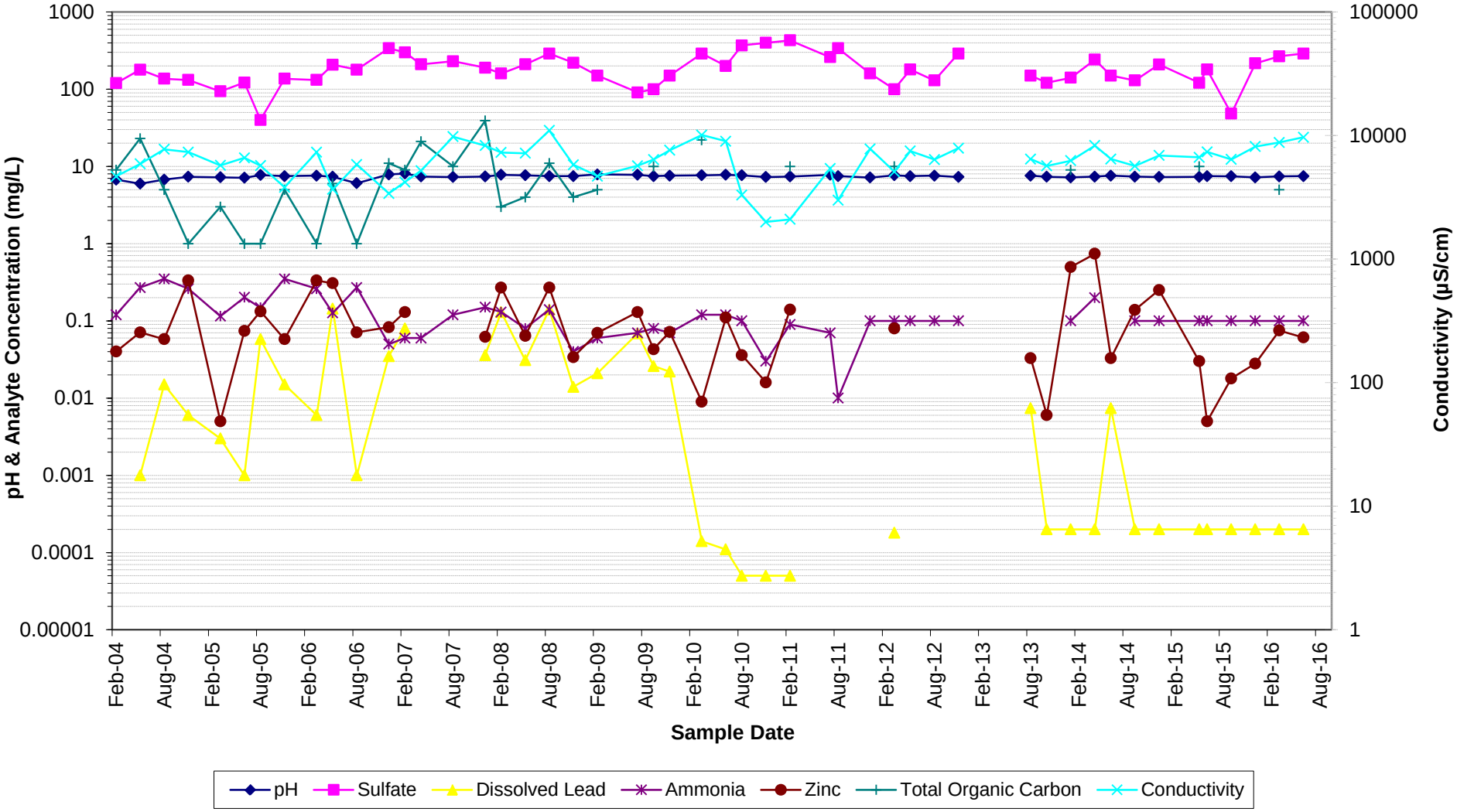


Figure 3.2.5.21 - Groundwater Trends - WM6

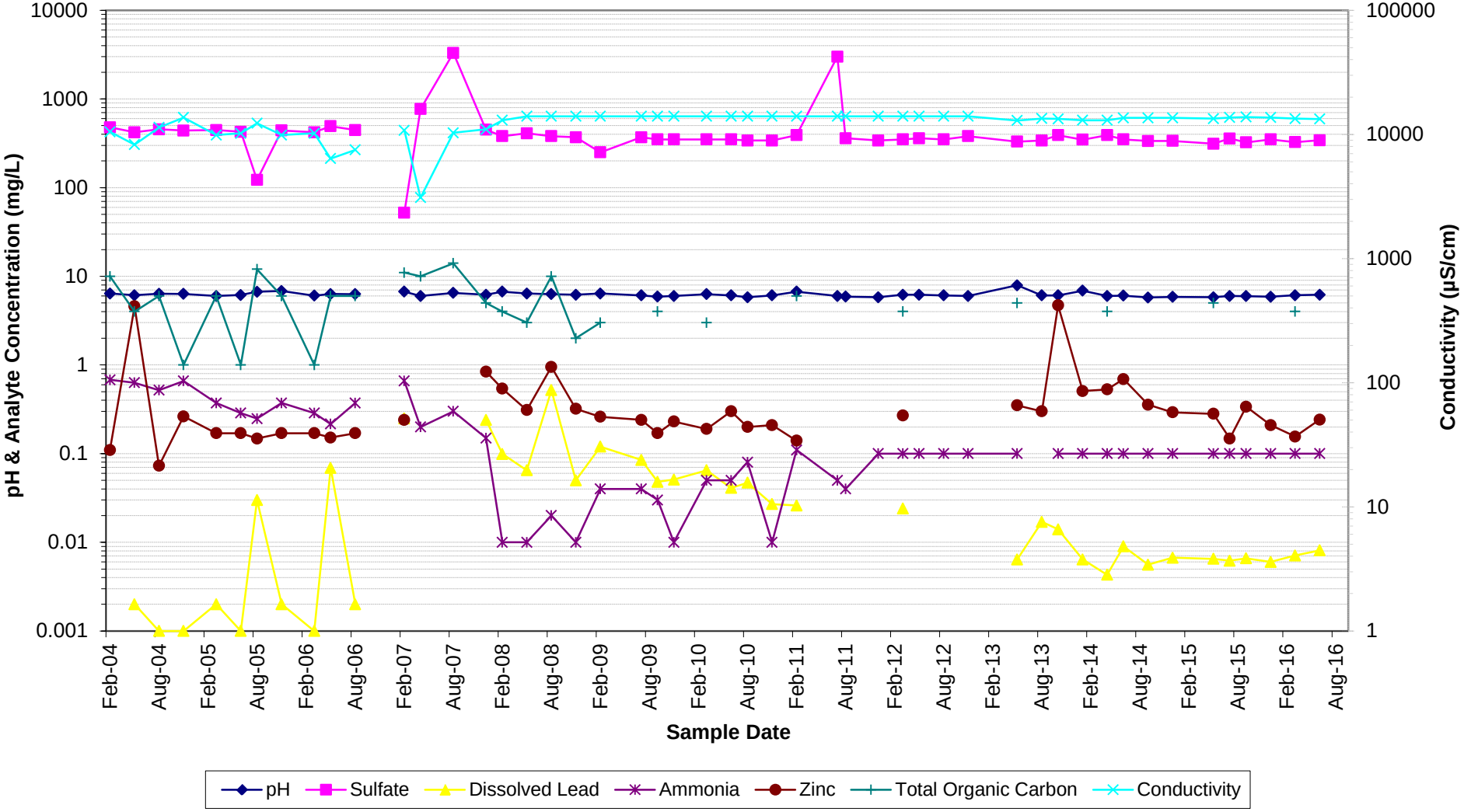


Figure 3.2.5.22 - Groundwater Trends - MW8S

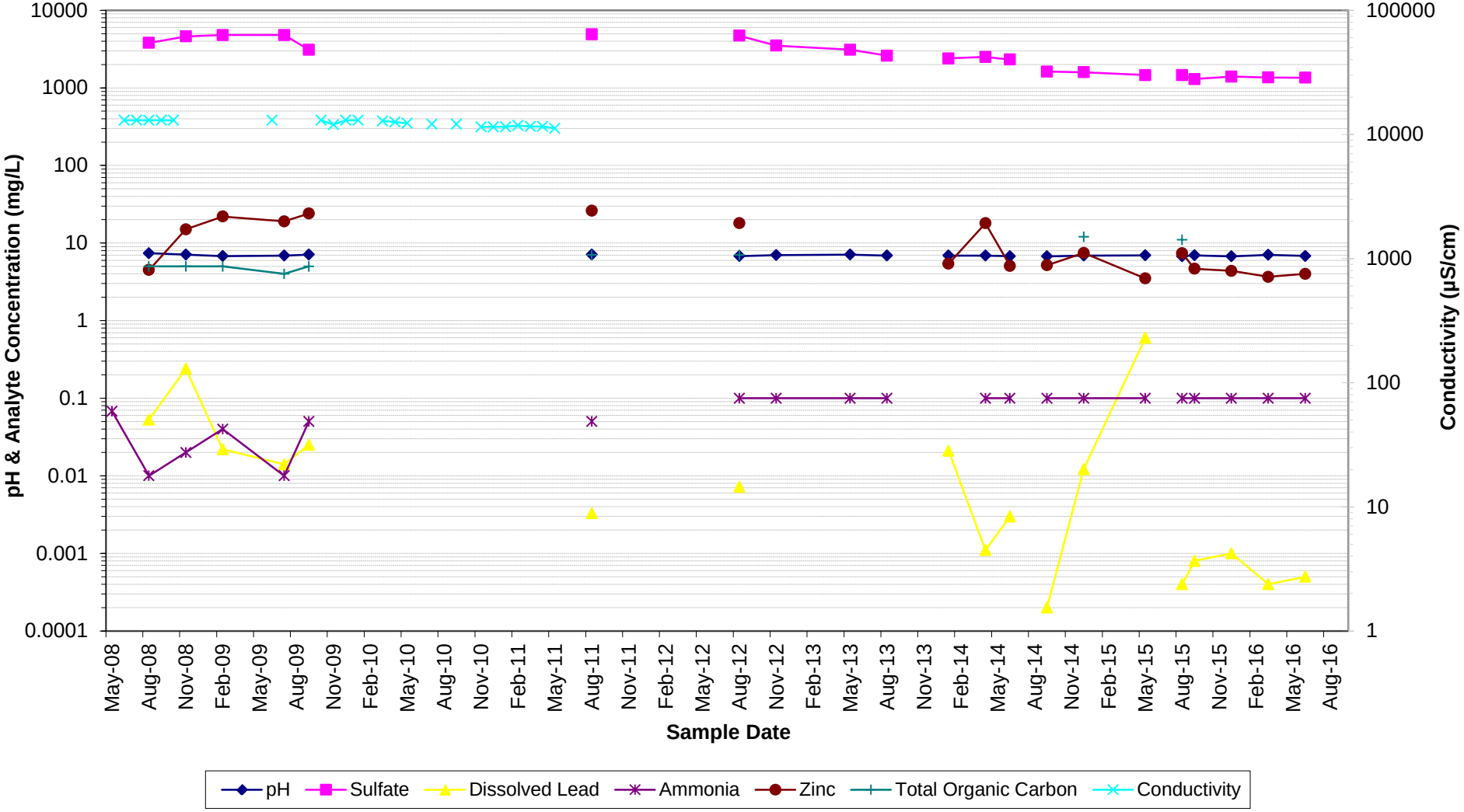


Figure 3.2.5.23 - Groundwater Trends - MW8D

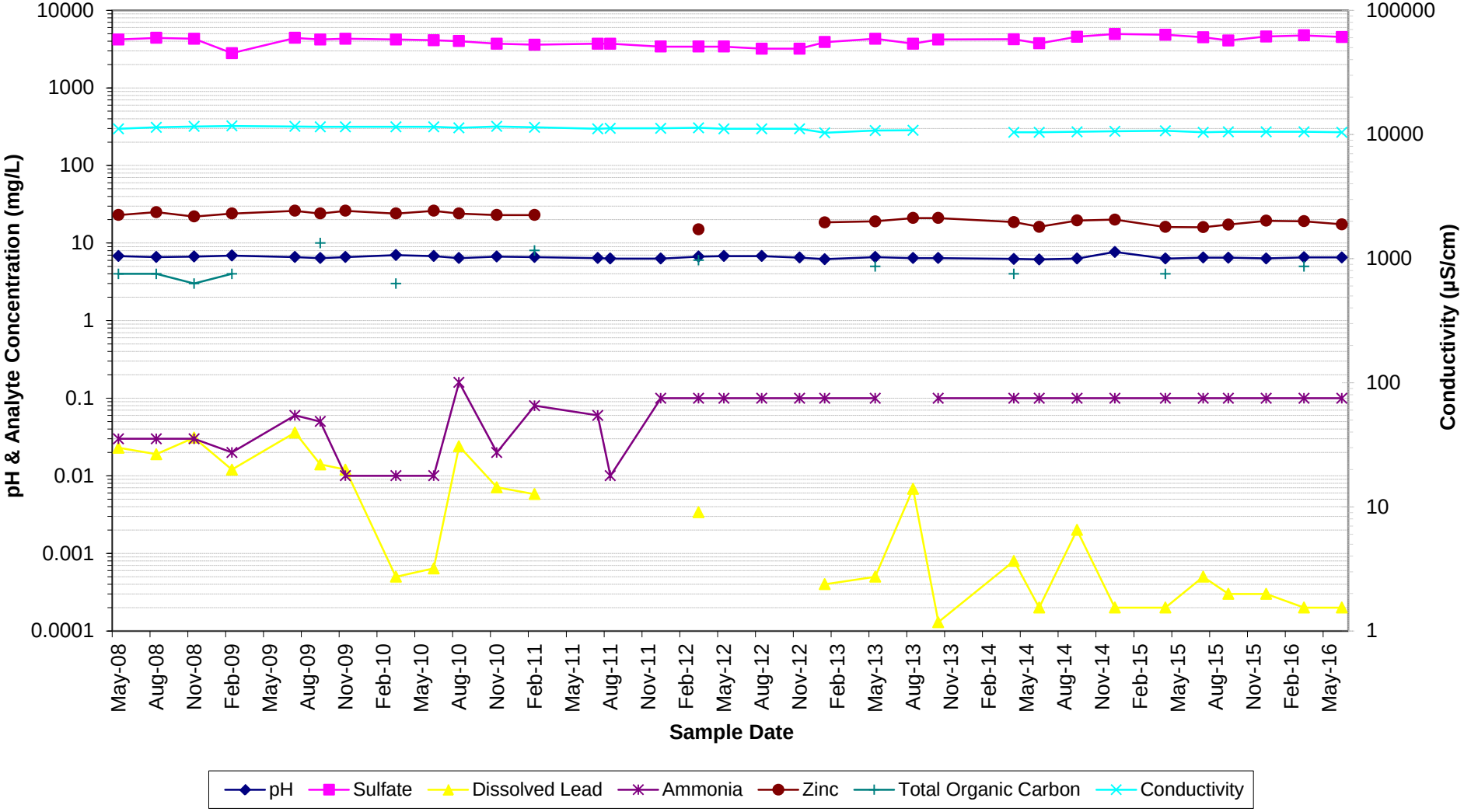


Figure 3.2.5.24 - Groundwater Trends - MW9S

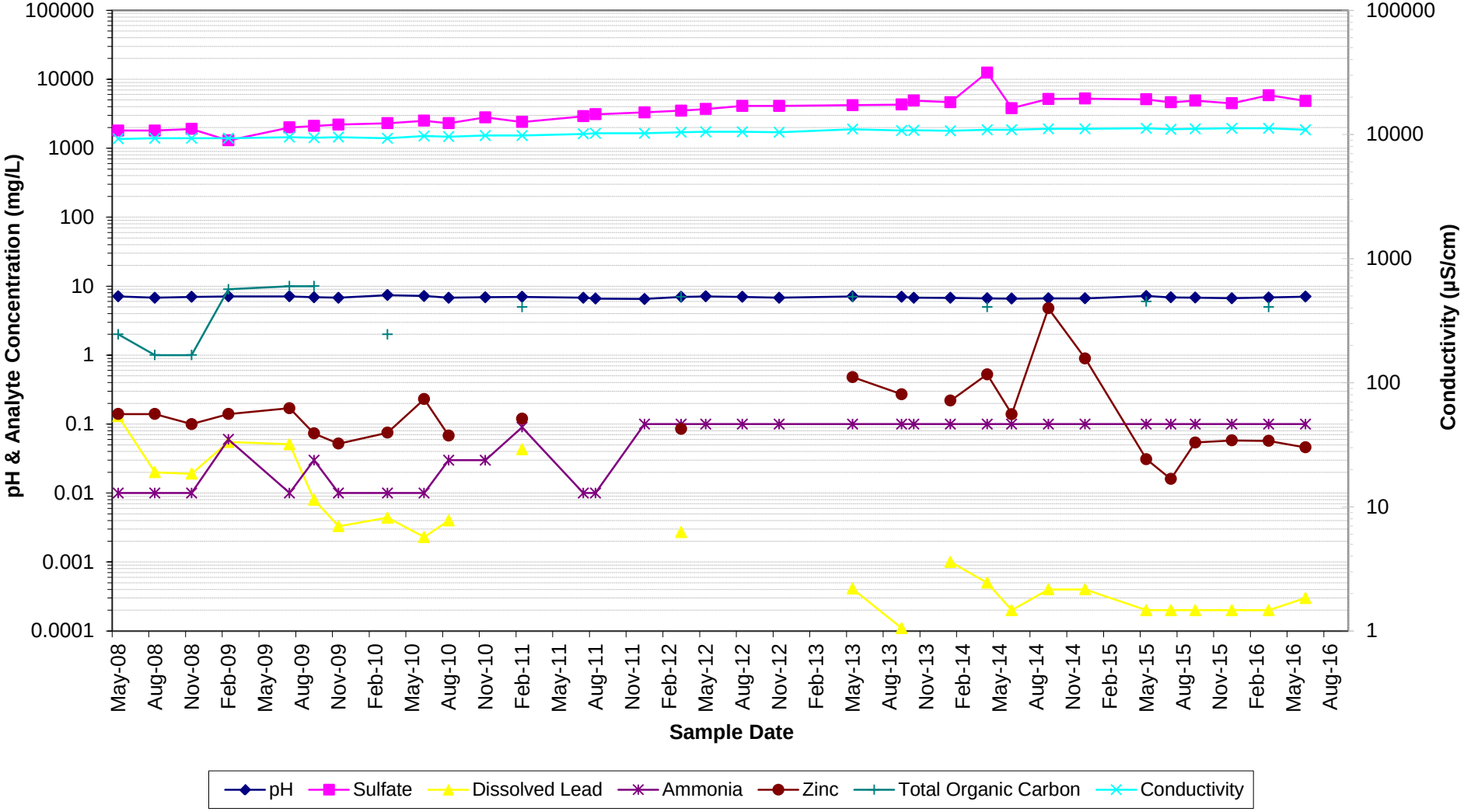


Figure 5.2.1.1 - IMF Surface Water Trends - Site 110

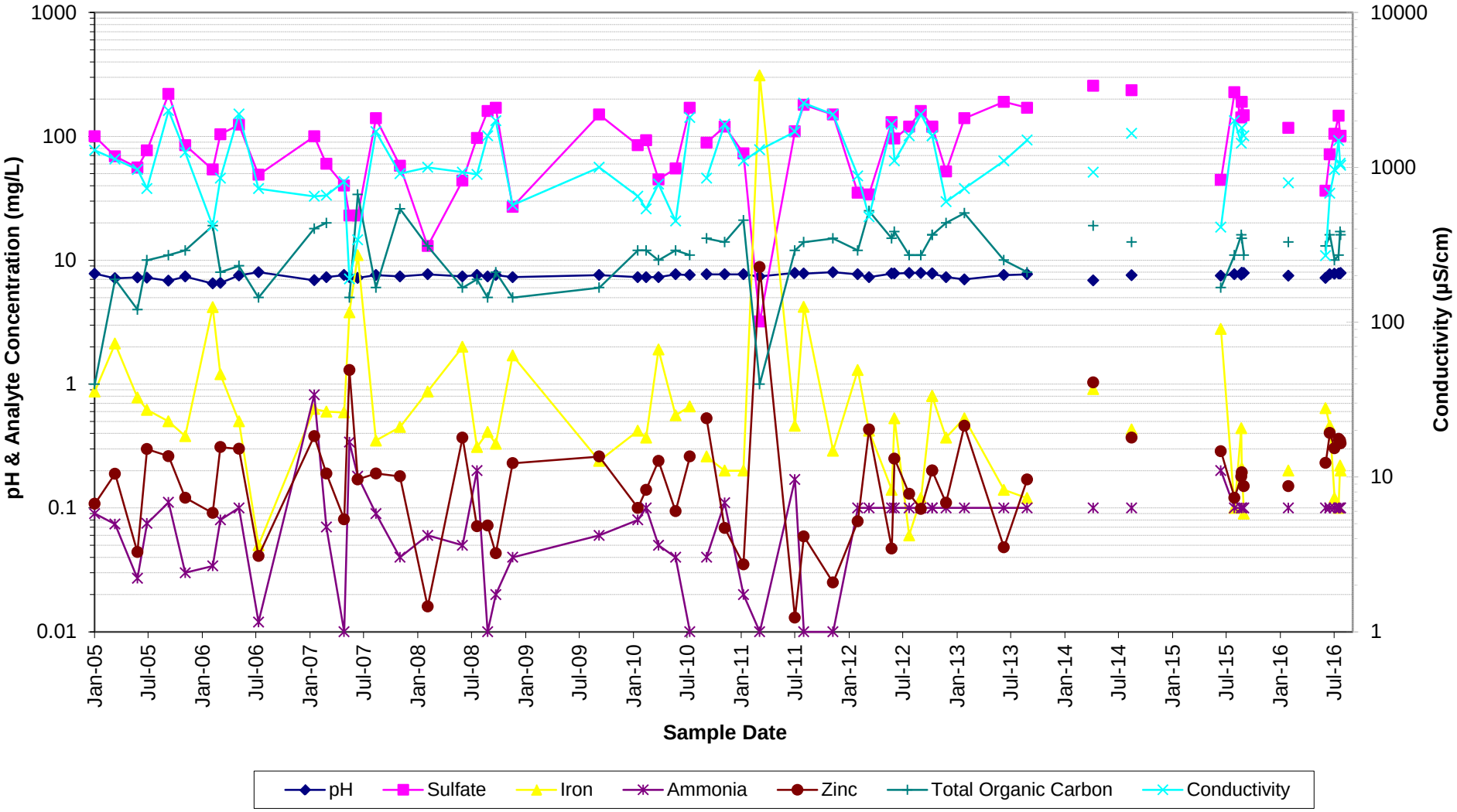


Figure 5.2.1.2 - IMF Surface Water Trends - Site 130

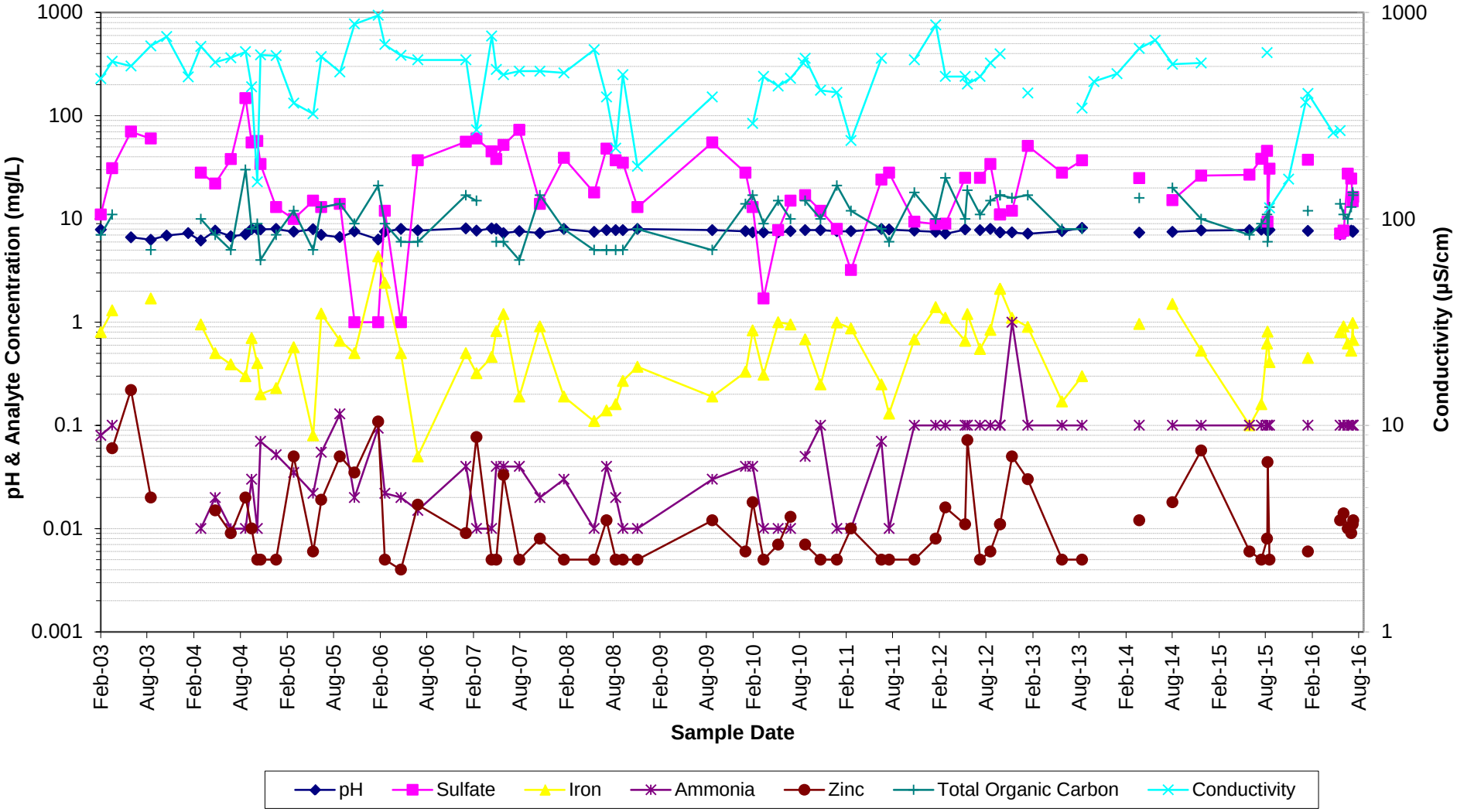


Figure 5.2.1.3 - IMF Surface Water Trends - Site 150

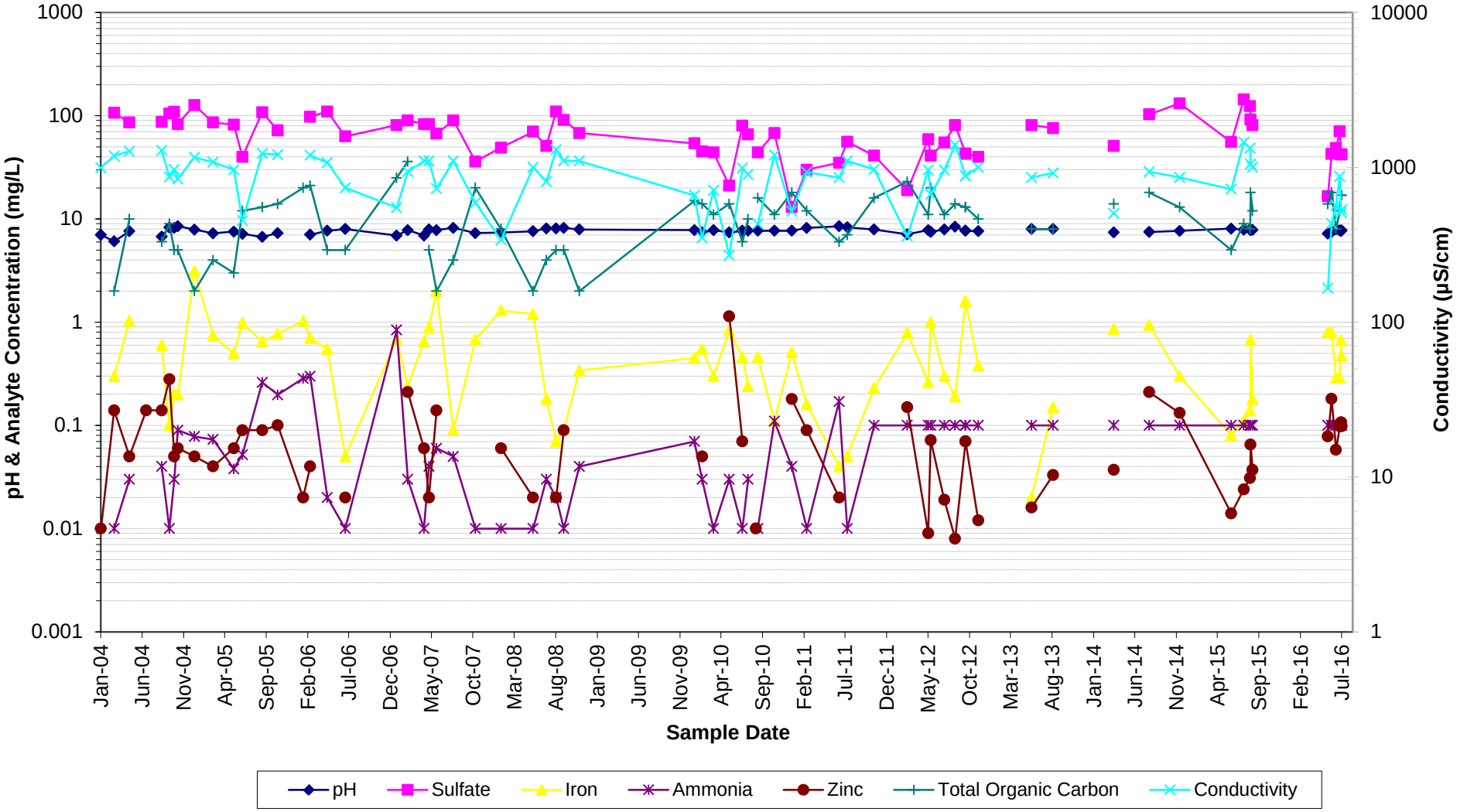
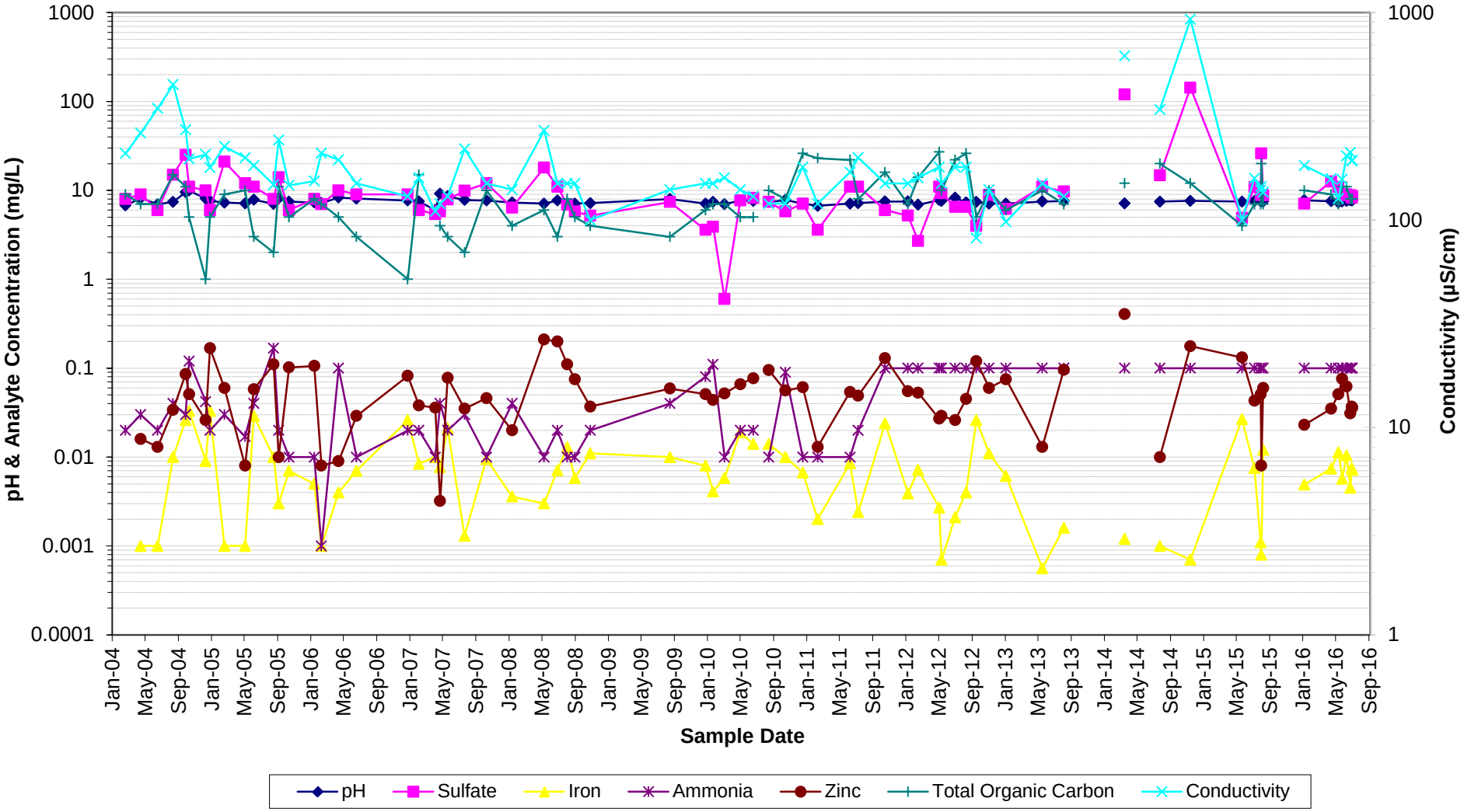


Figure 5.2.1.4 - IMF Surface Water Trends - First Flush



Appendices

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Appendices

Appendix 6 MB19 and MB20 Monitoring Results

Appendix 6 - MB19 & MB20

Table 11.1 - Groundwater Results - Monitoring Bore 19

Statistics	Field Information											Analytical Information													
	Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids
			AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L
	16/09/2015	MB19	2:40:00 AM	JE/RBE	6.57	5460.2	13.86	2.17		0.97	776.55	CA1503738-001	529	0.1	529	0.1	1460	7240	800	557	1.8	234	6.83	2430	6130
	14/12/2015	MB19	10:45:00 AM	JE/JEv	6.94	5446	15.45	2.7	186.5	1.7	775.82	CA1505642-001	548	0.1	548	0.1	1360	7070	738	503	1.7	229	6.73	2250	6750
	23/03/2016	MB19	9:00:00 AM	JE/JEv	6.43	6823	15.5	1.82	124	2.07	775.45	CA1601801-001	591	0.1	591	0.1	1180	6840	740	483	1.8	231	6.85	2060	6840
	27/06/2016	MB19	10:45:00 AM	JE/JEv	6.41	7317	14.97	5.95	144	0	777.52	CA1603632-002	566	0.1	566	0.1	1050	8080	879	694	1.7	325	6.75	3650	7890

Table 11.2 - Groundwater Results - Monitoring Bore 20

Statistics	Field Information											Analytical Information													
	Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids
			AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L
	16/09/2015	MB20	14:50	JE/Rbe	6.47	4754.9	14.49	1.13		1.67	776.35	CA1503738-002	502	0.1	502	0.1	826	6180	729	494	1.2	235	6.65	3010	5800
	14/12/2015	MB20	11:10	JE/JEv	6.8	4805	14.88	2.4	280.7	2.28	775.74	CA1505642-002	465	0.1	465	0.1	882	6310	696	485	1.2	250	6.63	3020	6570
	23/03/2016	MB20	9:15am	JE/JEv	6.48	6046	14.7	4.75	210	2.74	775.28	CA1601801-002	489	0.1	489	0.1	667	6260	657	472	1.2	248	6.81	2250	5920
	27/06/2016	MB20	10:25	JE/JEv	6.53	5661	14.72	4.49	234	0.22	777.80	CA1603632-001	413	0.1	413	0.1	691	6270	714	502	1.3	246	7	2820	6060

Appendices

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